

**COST-VOLUME-PROFIT ANALYSIS OF
HIMALAYAN DISTILLERY LIMITED**

**A
THESIS
SUBMITTED**

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To

Office of the Dean

Faculty of Management

Tribhuvan University

In partial fulfillment of the requirement for the Degree of

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RECOMMENDATION

This is to certify that the Thesis

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HIMALAYAN DISTILLERY LIMITED**

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DECLARATION

I hereby declare that the work reported in this thesis entitled “**COST-VOLUME-PROFIT ANALYSIS OF HIMALAYAN DISTILLERY LIMITED**” submitted to Office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the Master Degree in Business Studies (M.B.S.) under the supervision of **Associate Professor Yamesh Man Singh** of Shanker Dev Campus Faculty of Management, T.U.

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ABBREVIATIONS

BE	=	Break Even
BEP	=	Break Even Point
BJM	=	Biratagar Jute Mill
BNL	=	Bottlers Nepal Limited
C/V Ratio	=	Cost Volume Ratio
CBS	=	Central Bureau of Statistics
CM	=	Contribution Margin
CMPU	=	Contribution Margin Per Unit
CVP	=	Cost Volume Profit
DDC	=	Diary Development Corporation
DOL	=	Degree of Operating Leverage
e.g.	=	Example
EBIT	=	Earning Before Interest and Tax
ENA	=	Extra Neutral Alcohol
FC	=	Fixed Cost
FNCCI	=	Federation of Nepalese Chamber of Commerce and Industries
FY	=	Financial Year
GDP	=	Gross Domestic Product
GON	=	Government of Nepal
HBL	=	Himalayan Bank Limited
HDL	=	Himalayan Distillery Limited
i.e.	=	That is
IRD	=	Inland Revenue Department
Ltd.	=	Limited
MBS	=	Master of Business Studies
MOF	=	Ministry Of Finance

MOS	=	Margin of Safety
NIDC	=	National Industrial Development Corporation
No.	=	Number
NRB	=	Nepal Rastra Bank
NRs.	=	Nepalese Rupees
PE	=	Probable Error
PPC	=	Profit Planning and Control
Pvt. Ltd.	=	Private Limited
Q	=	Quantity
r	=	Correlation Coefficient
Rs.	=	Rupees
SAFTA	=	South Asian Free Trade Area
SML	=	Seagram Manufacturing Limited
S. N.	=	Serial Number
SPPU	=	Selling Price Per Unit
STC	=	Salt Trading Corporation
SWOT	=	Strength Weakness Opportunity Threat
SVC	=	Semi Variable Cost
TC	=	Total Cost
TR	=	Total Revenue
TU	=	Tribhuvan University
VC	=	Variable Cost
WTO	=	World Trade Organization

CHAPTER - I

INTRODUCTION

1.3 Background of the Study

Nepal's annual per capita income is \$721 (The Economic Survey, 2012/13). Its economy is predominantly agrarian, where more than 70% of the economically active population is engaged in agriculture. Its contribution to the GDP is 38.1 %, in which the industrial sector contribution about 15.3% and service sector contributes 46.6%. The service and industry sectors grew more than the agriculture sector in the FY 2012AD. The average annual growth of service and industry sectors were 2.9% and 2.3% respectively, while the agriculture growth rate was 2.1%. Agriculture absorbed about 74% of the labor force. In contrast, the service and industry sectors absorbed only about 28%. About 23.8% percent of the population lives below absolute poverty line. Since per capita income, saving, capital formations are very low the living standard of people is in decreasing trend. The economic growth rate is only 3.9 percent per annum.

Industrialization is universally accepted as a strategy of economic development as well as fundamental goal of most developing countries. Like most other developing countries one of the important aspiration of Nepal has been to bring about a structural change that would transform its agricultural economy into and industrial one. Industrialization not only provides goods and services but also creates employment opportunities. It facilitates an effective mobilization of resources of capital and skill, which might otherwise remain unutilized. It also acts as a vehicle for fostering innovation and technological improvement. Thus, industrialization development has a multiplier effect on the economy. The prevailing state of under development is commonly contributed to lack of adequate industrialization, it is because most of the economically advance nations of the contemporary world reached their living through successful thrust of industrialization. Industrialization is the major tool; with the aid of which the vicious of backwardness and poverty can be broken. Industrialization helps

the unemployed especially from the agricultural sector to find the alternative models of productive activity and move into much more productive activities, thereby reducing automatically the pressure on land.

Apart from its natural beauty, Nepal is also known as industrial developing country. Nepal is just moving towards industrialization with very small manufacturing sector. The globalization, privatization and liberalization processes have made a worldwide pressure on planners and policy makers to design towards rapid growth. Nepal is facing a critical juncture in its modern economic situation. The industrialization will be the remedy of such disease. Industrialization can be defined in many ways according to the existing conditions of a nation and their respective situation of the development.

Industrialization is the major instrument of progress, modernization and social development in the context of Nepal. Industrialization is the process of enabling the idle human and other manufacturing resources in order to develop the nation without worsening the economic condition of the Nation. Industrialization can play a dominant role in a country like Nepal where agro-dominated economy is prevailing. It is because industrial development helps country in enormous ways; it contributes to the National income, absorbs the growing labor forces to reduce significantly the disguised unemployment, lessens the dependence on imports and promotes exports. Mixed economy is prevailing in Nepal where both state control cum private participation in the country's economy are working. Both the Government and private sector are putting their efforts to enhance the condition of the economy from their respects. Nepal is lagging behind in the development process of modern, huge and middle scale industries. An industrial sector is the second leading sector of Nepalese economy after agriculture. Most of the modern industries established within the country are in Govt. sector with foreign collaboration. It reveals that there is a lack of entrepreneur who accommodates industrial investment. There are prevailing practices of measuring the pace of industrial development of the country in the world by taking contribution made by the industrial sector in GDP as chief economic indicator. Thus,

the industrial sector is the key of the advancement of nay country.

Industrialization started in Nepal in 1936 A.D. First industry was established with the first Company Act enacted in the same year. Industrial development in Nepal however started getting regular attention of the government under the aegis of development plans after the dawn of democracy in 1951 A.D. particularly, after the introduction of first five-year plan in 1956A.D. Nepal witnessed the development with quite a large number of manufacturing industries in the public sector, particularly in area like leather, sugar, paper, brick, cigarette, tiles, soaps, agricultural tools and textiles etc. the industrial development strategy of the Govt., however changed after mid 1980's.

The total unemployment rate is estimated to be 30.89%, which is largely accounted for by under employment; the unadjusted unemployment rate is 5%. The government estimates the labor force will increase by 1.05 million during the eleventh plan period, 2011-2010 or 300,000 new workers each year.

Although, the industrial sector of Nepal is not satisfactory. Required acts and rules are made but these are not proper implemented. Establishment and development of industries assist to improve economic condition and regional balance.

Industrialization not only provides goods and services but also creates employment opportunities. It facilitates an effective mobilization of resources of capital and skill which might otherwise main unutilized. It also acts as a vehicle for fostering innovation and technological improvement. Industrial development thus has a multiplier effect on the economy.

In Nepal, the agro and forest based industries dominate the industrial land scrape in terms of numbers employment and value added. The number of agro industries has been gradually increasing. To a greater extent, these industries are absorbing local agricultural and forest products as their raw materials or for value addition activities.

Modern liquor industries are a part of agro and forest based industries. These industries are contributing significantly to the production of agro based products to meet internal as well external demand. Therefore, the promotion of liquor industries should be a critical element of the growth strategy in Nepal. It contributes about 27% to government revenue.

In Nepalese context, manufacturing organizations are facing so many problems. There are need for a large number of good managers and managerial decisions in a developing country like Nepal. Most of organizations are in loss, profit earning is necessary to serve these organizations. Achieving objectives of the business organization, profit motive being the most dominant. A firm would thus succeed to obtain funds from the capital market if it has been incurring profit and profit potential in the future.

The budgeted sales can't recover total cost and achieve profit because lack of profit planning knowledge. One of the most important tool (in profit planning and management accounting) is C-V-P Analysis which plays vital role to locate zero profit sales volume. In that condition, the company neither gets profit nor suffers from loss. It provides an insight in to the effects and inter-relationship of factors which influence profit of the firm.

1.2 Profile of Himalayan Distillery Ltd.

The Himalayan Distillery Ltd is promoted by Jawalakhel Distillery which is the largest liquor player in Nepal's liquor market and for decades has been synonymous with quality products. The founding chairman, 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 generations.

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 promoters have given paramount importance to selecting the best quality equipment

with the sole aim of producing alcoholic beverage of superfine grade making them the bench mark of quality in the market. The distillery has started its initial operation in January 1999AD.

The distillery is located in serene surroundings at the foot hills of the Himalayas in the southern part of Nepal. Its registered office has situated at Parsa district, V.D.C. Lipnibirta-7, Parwanipur. The distillation unit stands as a land mark and is accessible by road. The local airport (i.e. Simra) is only minutes away and the nearest India Boarder Birgunj to Raxaul is 12 Kilometers from the factory site. The Indian Broad Gauge Rail-ways head terminal at Raxaul boarder. The contact office of the company is at Satdobato Chowk of Lalitpur District.

The distillery's present value would cost around Rs. 60.18 million. The par value of the share is Rs. 100 each. The company made provision of 4,130,000 equity shares for issue, out of the authorized capital and provisions are not made for issue of preference shares also. The promoters have owned 58% equity shares (i.e. 2,395,000 equity shares) and remaining 42% (i.e.1,734,600 equity shares) shares were offered to the public.

Himalayan Distillery, sister concern of Jawalakhel Distillery subscribes to the same philosophy of setting new benchmarks. The company's penchant for quality has seen it tie-up with Seagram's one of the well known name in the liquor world to produce and market Seagram's Royal stag and Imperial Blue in the first phase and other brands in the second phase.

The company takes at most care that not a drop of whisky, vodka, rum, brandy and gin leaves the gin leaves the distillery unit it has been sealed in its bottle ready to be drunk and enjoyed. Even the flavors used in the preparation of products are directly imported from Europe. The labels are printed in Thailand and shrink wraps. 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 products in Nepal.

Seagram Manufacturing Limited has agreed to render the following services to the HDL.

- Technical support for blending and bottling process including quality control and supervision.
- Brand Management and marketing support services, for this purpose SML's marketing the sales executives will visit Nepal on regular basis to render the support and assist in marketing and promotional activity.
- SML will provide marketing and promotional materials to be used in the Kingdom of 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.

1.2.1 List of Raw Material

The company uses some raw materials to produce finished products. The raw materials like rectified spirits and E.N.A are produced and re-used, others are taken from Nepalese suppliers and special materials are imported from abroad. The list of raw materials is as follows.

Table: 1.1
List of Raw Materials

Rectified spirits	Starch
Pure Natural alcohol	Stretchable materials
E.N.A	Corns
Vaded Malt sprit	Potatoes
Malt spirit	Different kinds of fruits
Other spirit	Grains

Vegetables	Herbs
Natural oils	Yeast
Sugar	Juniper barriers (from Italy)
Sugar base materials	Coriender seeds (from Romanis, Russia, and Bulgeria
Vaded malt	Flavor
Malts (from Scotland)	Orange and lemon peels (From spain)

(Source: Memorandum of the co. and Nubiz, June 2012:60)

“Quality knows no pinnate, no saturation point. It is a journey that’s internal.” The above line of thought has been company’s guiding principle since inception, be it customer interface, technology application processing or the production phase.

Firmly believing in the ethics of total quality management, the company makes their products go through a series of stringent quality control test to enhance their appeal among their esteemed and highly valued customers. Since inception, it’s been their endeavor to render highly quality product and services to customers. To achieve quality objectives, each one is always on the look out to tap the latest technology in use round the worldwide.

Keeping a close watch on the winds of changes and insuring products innovations, the company has achieved an enviable reputation in a very short period of time. All the while carrying forward the rich and tremendous legacy of Jawalakhe Distillery Pvt. Ltd, of excellent, commitment and perfection.

1.2.2 Product Lines of the Company

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

Table: 1.2
Product Lines of HDL

1.E.N.A.	7. Bonni Charles
2. Royal stag	8. Play boy
3. Emperial Blue	9. Play boy

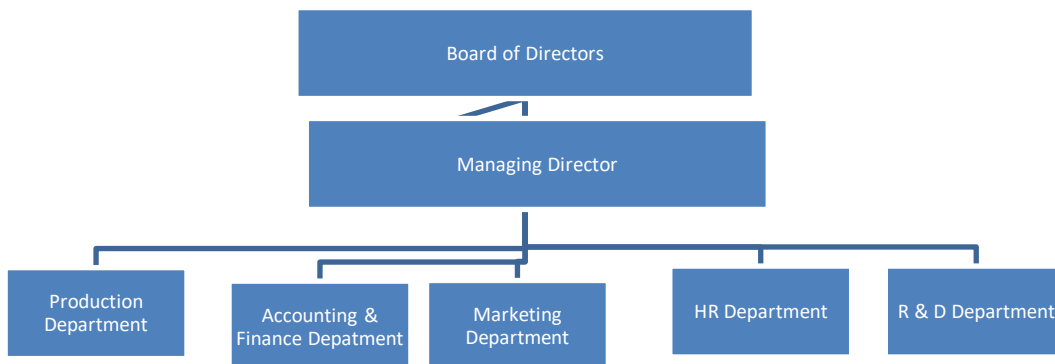
4. Ruslan whit	10. Ruslan V
5. Cleopatra	11. Ja. Dry Gin
6. Triple Cross	12. Blue Diamond etc.

(Source: Annual Reports of HDL)

1.2.3 Organization Structure of the Company

The company is a public limited company. There are seven persons in the board of directors including managing director. Where five persons are elected from promoter-share holders and remaining three persons are selected from public –share holders. The company has employed two hundred persons. There as two persons employed from India. The organizational structure of the company is shown in the chart given below:

Figure: 1.1
Organizational Structure of HDL



(Source:

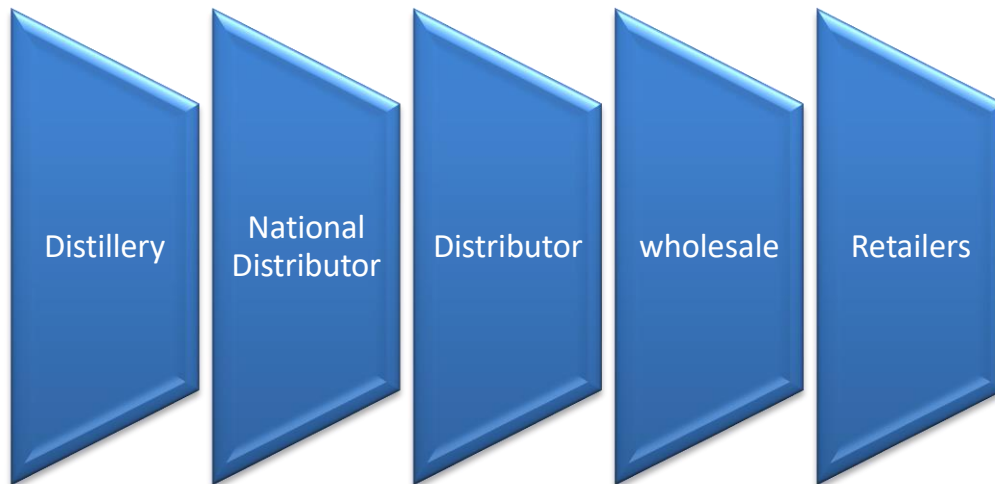
Memorandum of the Company)

1.2.4 Distribution Channel and Major Market of HDL

The company has adopted channel of distribution through National distributors to Distributors then wholesalers and retailers. The retailer includes all kinds of selling stalls. Departmental stores sell more than other retailers. The channel of distribution is shown in the figure below:

Figure: 1.2

Channel of Distribution and Major Markets



(Source: Memorandum of the Company)

1.3 Statement of the Problems

The liquor industry is becoming over competition. Even, unfair and unhealthy competitions are also exercised. In addition, product duplication has evolved as another big headache for the liquor industry. The duplicate products are sold at a lower price than the original products and could be harmful to health of consumers and spoil image of whole liquor industry too. There are also selling and distribution problems. The distribution mediators are practicing ‘pay when sold’ transaction method. These results, manufactures are offering very attractive schemes. The corruption and unhealthy completion is, in fact killing the liquor business. Besides, that quality control is another problem. The export promotional activities are not emphasized. Price increased in petroleum products, raw materials, and others, these are affecting in production expenses unfavorably. The banks are also charging high interest in the boom period.

The legal framework is very weak. There are not proper structure of changing excise duty on 25⁰ UP 40⁰ UP category and others. The government charges tax rates to the liquor industry irrationally. Similarly, if people being caught red-handed distributing fake products, they always being got away with minor fines. Another, current problems are political crisis. The political conflict which has resulted in increased

security, limited night life and supply problems due to bandhs (Road block, Nakka Bandhi). Even against drink drive policy by Nepal Government.

Similarly, there are major problems of transportation cause of inconvenient geographical diversity. The problems are faced more at the raining season by landslide and road block.

The above problems have been concerned with the external business environment and liquor industry. In the same way, Himalayan Distillery Ltd. has some internal problems. Out of these, all shares are not subscribed, lack of working capital because of non fully payment by security holders on time, non-payment of bridge gap loan, interest payable on loan for working capital and long term loan etc.

In the Nepalese context, firms are still being run with private management. Every firm has certain way to operate business there are lack of modern management culture in the business firms. In some companies, there is no defined job description for the people, the accounting and finance jobs are put under the same department. These activities occurs lack of budget.

The study had focused to examine on application of cost-volume-profit analysis. In Nepal, the practice of using C-V-P analysis tool for several management decisions is lacking. Though some work of pre-feasibility studies were carried simply for the sale of getting latest figure from different development plans. The research questions posed mainly in this research are as follows:

- Whether Nepalese manufacturing companies are practicing CVP analysis or not?
- What are major difficulties in application of CVP analysis?
- Which part (i.e. CM, BEP and MOS etc.) of CVP analysis is mostly practiced and which are not practiced till now?
- What sales volume is needed to achieve break-even?
- What is the profit or loss to the specified level of sales?

- What should be the sales volume to earn the desired profit?
- What is the relationship between cost, volume and profit?

1.4 Objectives of the Study

This research has set up the following objectives to solve the above problems:

- To explore the relationship of CVP analysis in production firm.
- To segregate the costs of HDL into fixed and variable.
- To find difficulties in using C-V-P analysis.
- To suggest measures to improve its C-V-P analysis as a managerial tool.

1.5 Limitations of the Study

Each and every research has some limitation. Basically, non available of required data and information are the major limitation of the study. The study has been conducted with the following limitations:

- Only five fiscal years from 2007/08 to 2011/12 financial data were used.
- The study was based in the secondary data mostly.
- The accuracy of this study depends upon the true response and data available from the management.
- C-V-P Analysis was made on the basis of totality of the company and the selected product lines only.
- This study would only concern with fulfilling the partial requirement in Master in Business Studies (MBS).

1.6 Organizations of the Study

This study report was divided into five chapters viz. introduction, review of literature, research methodology, presentation and analysis of data, and summary, conclusion and recommendation.

Chapter I - Introduction

The first chapter included the background of the study, profile of HDL, statement of the problem, objectives of study and organization of chapters.

Chapter II- Review of Literature

The second chapter included approaches to C-V-P analysis, extension of C-V-P analysis, C-V-P analysis for a multiple product firm, and for segments, brief description of distillery business, industrial development in Nepal with liquor industry, it's contribution into revenue and other aspects, review of book journals and articles and review of previous research and reports with research gap etc.

Chapter III – Research Methodology

The third chapter included research design, population and sample, source of data, variable studies, tools of data analysis etc.

Chapter IV – Presentation and Analysis of Data

The fourth chapter included analysis of sales, fixed costs, variable costs and semi-variable costs. In addition, computation of BEP, CM analysis, MOS and P/V analysis were also computed for analysis and interpretation to fulfill objectives of the research. Major findings were drawn based on the above analysis.

Chapter V – Summary, Conclusion and Recommendation

The last chapter included summary, conclusion and recommendation where the researcher has attempted to provide relevant recommendation for the improvement of HDL to the extent possible. The last portion of the study report included Bibliography followed by Annex.

CHAPTER -II

REVIEW OF LITERATURE

2.1 Cost-volume -profit Analysis

The relationship between cost, volume and profit is known as cost-volume-profit(C-V-P) analysis. It is an analytical tool for studying the relationship between volume, cost, price and profit. It is also an important tool used for the profit planning in a business. There are three factors of C-V-P analysis which are inter-connected and depended on one another. For example sales revenues are dependent upon sales, selling price to a greater extent will dependent upon the costs and costs upon the volume of the production.

C-V-P Analysis is a greater helpful in managerial decision making, especially cost control and profit planning. "it provides attention-directing and problem solving backgrounds for important planning decisions, such as selecting distribution channels, pricing, special promotions and personnel hiring." (*Reeki & Johanthan 1988:380*) "Know your cost" is an essential theme for every manager and C-V-P analysis helps to direct managerial attention to important problems and paves the way to their solution.

C-V-P Analysis examines the responses of profit to changes in volume. It is useful for single product as well as multiple product firms. This analysis will be designed to include the firm's variable costs of order getting and order filling. It predicts the effects of changes in costs and sales level on the income of the business.

In its simplest form, it involves the determination of the sales level at which a company neither earns a profit nor incurs a loss, or in other words, the point at which it breaks even. Hence, C-V-P analysis is primarily identifies break-even sales. However the technique can be expanded to answer additional questions, such as; what

sales volume is necessary to earn a desired net income? What net income will be earned if a new machine that will reduce unit labor costs is installed? What net income will be earned if the sales changes?

Hence a company may use C-V-P analysis as a planning tool when the sales volume is known and management needs to find out how much profit will result. Another way of planning is to begin with a target profit. Then, through C-V-P analysis a company can decide the level of sales needed to earn that profit. Similarly, for the cost control purpose, C-V-P analysis is a way to measure how well different departments in the company are doing. At the end of a period, the company analyzes sales volume and related actual costs to find actual profit. It measures performance by comparing actual costs with expected costs, expected costs are ascertained by applying C-V-P analysis to compare with the actual sales volume thus helps to prepare performance report. So, a dynamic management, therefore, uses C-V-P analysis 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.

2.2 Approaches to C-V-P Analysis

There are two approaches to C-V-P Analysis, which are described as follows:

2.2.1 Cost and Revenue Approach

One approach to C-V-P Analysis is the cost and revenue approach. This approach can be used to project estimated profits at variable sales volumes.

The zero profit volume that separates the loss and profit zone is referred to as the break-even point. The BEP is used as a measure of risk by comparing the BEP sales with the estimate sales. This comparison helps to identify the margin of safely sales. The margin of safety may also be explained as a the percentage by which sales could fall before the BEP is reached. The margin of safety percentage is computed as follows:

$$\text{Margin of Safety Percentage} = \frac{\text{Expected Sales} - \text{BE Sales}}{\text{Expected Sales}} \times 100$$

2.2.2 Contribution Approach

The term contribution has a special meaning in account and can be said to be the difference between the sales value and variable cost. The definition applies equally to unit as to a product line or service. Contribution is therefore a kind of profit before all the fixed costs are taken into account, and probably lies somewhere between gross profit and net profit in most organization.

An alternative approach to C-V-P Analysis is based on the contribution margin as a function of volume. The contribution margin of a unit is the net balance left after deduction of variable cost of each unit makes towards covering fixed casts. It is calculated as follows:

Contribution margin per unit = selling price per unit – variable cost per unit. The contribution approach should be sued only within the ultimate relevant ranges since it nets revenue against cost.

Companies that separately identify and measure the fixed and variable components of cost often use a contribution margin approach on their periodic income statement prepared for internal management uses. These income statements provide financial data that are uniquely useful for management planning purpose because of the emphasis on fixed and variable costs. Most of the managerial decisions that relate to operations (either directly or indirectly are the basis of costs.

Total contribution margin will change if any one of the following variable changes:

- Volume(units sold),
- Sales price, or
- Variable cost ratio

A budgeted contribution margin income statement makes it possible to answer numerous “what if” questions. For internal management purpose, a contribution margin income statement is preferable.

2.3 Extension and Computation of C-V-P Analysis

2.3.1 Break-even Analysis

"Break-even analysis is the term used to study of the relationship between cost, volume and profit at various level of activity", (Pant, 2003: 253). It is the most widely known form of the C-V-P Analysis.

Break-even analysis uses the same concepts as contribution analysis; however, it emphasizes the level of output or productive activity at which sales revenue equals to total costs making no profit or loss in an organization. Break-even analysis rests upon the foundation of cost variability a separate identification and measurement of the fixed and variable components of cost is essential. It is usually applied on a "total company" basis.

The more significant aspect of the C-V-P Analysis is to examine the effects of changes in costs, volume, and price on profits and use this information in improving the profit plan.

Break-even analysis is used to determine the level of sales mix of products in a multi-products producing company required to just recover all cost incurred during the period.

(A) Break-even Point (BEP)

"The break-even point is that point where total revenue equals total costs incurred, thus it is the point at which a company begins to earn a profit. There is neither a profit nor a loss at the BEP" (Joshi, 1993:161). Although management typically plans for a profit each period, the company suffers from losses. "Management must determine the break-even point in order to compute the margin of safety. When planning new venture or product lines, management can quickly measure the likelihood of success finding the project BEP", (Pandey, 2003:238).

Determining the Break-even point

The following two approaches can be used to compute the break-even point:

- Formula approach
- The chart approach

a) Formula Approach

The BEP can be computed in term of units, or in terms of monetary value (i.e. rupees, dollars, or pounds) of sales or as percentage of estimated capacity.

i) BEP is Unit

The break-even point may be calculated for a single product firm in terms of units of products. The break-even point in terms of unit will be reached when units sold create sufficient revenue to cover their total costs: - fixed and variable. Each unit of the product sold will cover its own variable cost and leave a balance, called contribution,(or marginal income), to cover fixed costs and profit. The break-even point will occur when enough units are sold so, that the contribution equals to total fixed costs. Note that contribution margin per unit is the difference between selling price per unit and variable costs per unit, total contribution margin is equal to unit contribution margin multiplied by units sold and profit is derived when fixed costs are recovered from total contribution. Thus:

Unit Contribution Margin = Unit Selling Price – Unit Variable Cost

Total Contribution Margin = Unit Contribution Margin × Unit Sold

Total contribution margin = Total fixed cost + profit

At BEP, profit will be zero and therefore, total contribution margin will equal to total fixed cost. The BEP in terms of unit can be computed by dividing fixed costs by contribution margin per unit. The formula for BEP is as follows:

$$\text{BEP (in Units)} = \frac{\text{Total Fixed Cost}}{\text{Selling Price Per Unit} - \text{Variable Cost PER Unit}}$$

For positive BEP, the selling price is greater than the variable cost per unit. Mathematically, if the selling price is less than variable cost per unit, a solution for

BEP in terms of negative sales volume does exist, but the negative sales volume in practice is an unacceptable solution. “In case of selling price equals variable cost per unit, no BEP can exist unless firm has zero fixed cost. Under zero fixed costs situation, every sales volume point will be a BEP, because revenue would be exactly equal to total costs at any sales volume”, (Dangol, 2009:142).

ii) BEP (in rupees)

The break-even point for a single product firm can be calculated in terms of rupee value of sales volume, which is as follows:

$$\text{BEP (in Rs.)} = \frac{\text{Total Fixed Cost}}{\text{Contribution Margin Ratio}}$$

BEP in rupees also could be obtaining by multiplying the BEP units by selling price per unit. The advantage of BEP in Rs is that it can be used with both the per unit information as well as total information. This is so because the variable cost to sales ratio will remain same for any sales volume as both variable costs and sales revenue change in direct proportion to sales volume.

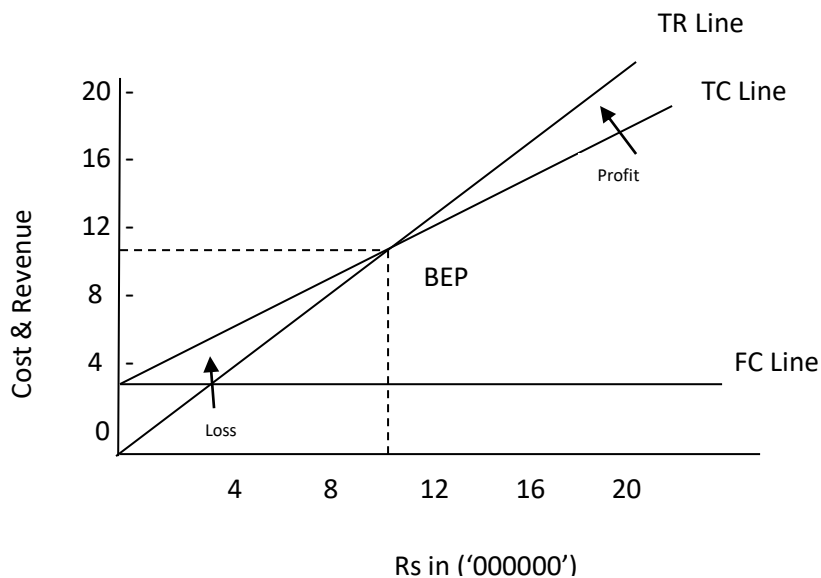
Using total sales and total variable costs information BEP in Rs is particularly significant for the multi-product firms find difficulties in measuring volume in terms of any common unit of products. For such firm, the BEP will be calculated in terms of total rupee sales:

$$\text{BEP (in Rs.)} = \frac{\text{Total Fixed Cost}}{\text{Weighted Contribution Margin Ratio}}$$

iii) The Chart Approach

The BEP can also be computed graphically. A break-even chart portrays a pictorial view of the relationship between costs, volume, and profit. The BEP indicate in the chart will be one at which total cost line and total sales line intersect.

Figure 2.1
Break Even Figure



The following steps are involved in constructing the BEP chart (for cost and revenue approach).

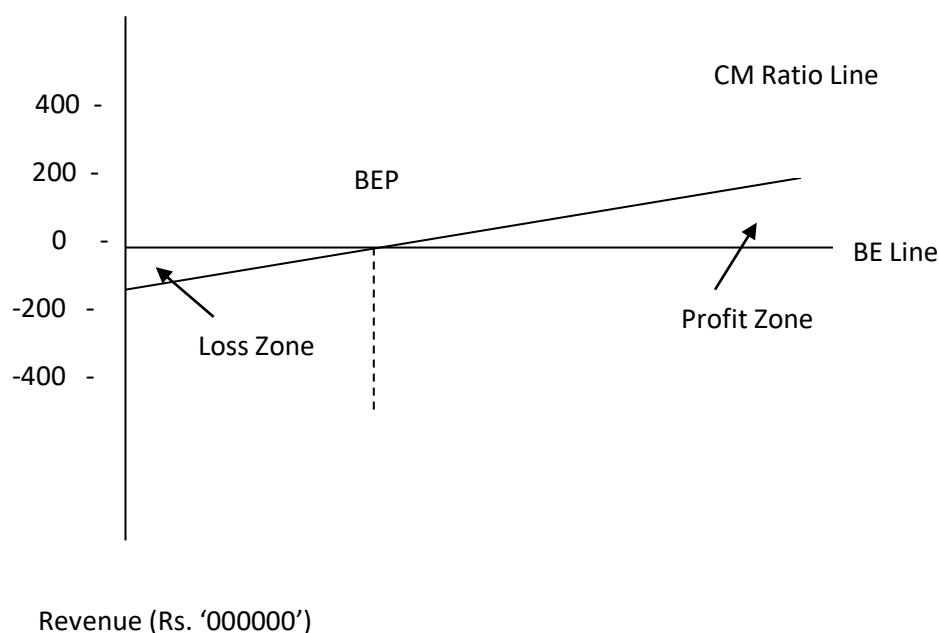
- Sales line: sales volume is plotted on horizontal axis. Sales volume may be expressed in terms of rupees, units or as a percentage of capacity. Equal distances are cut along the horizontal line to show sales volume at different activity levels.
- Cost and Revenue Lines: Vertical axis is used to represent revenue and fixed and variable costs. The vertical line is also spaced in equal parts. A similar vertical line may be drawn on the right hand side of the chart to complete the equate.
- Fixed cost line: The FC line, parallel to horizontal axis, can be drawn through fixed cost point.
- Sales and cost line: The total sales and total cost line can be drawn by marking budget level (of total sales, Rs.1200, 000 and total cost RS.1200, 000 on the right hand vertical line. To draw total sales, the zero sales point should be connected with the sales budget point (Rs. 12, 00,000) on the right hand vertical line. Similarly total cost line can be drawn by connecting fixed costs point (Rs.4, 00,000) with the total cost budget point (Rs.12, 00,000) on the right hand vertical line.

- Angle of 45°: If the vertical and horizontal lines are spaced equally with the same distances, sales line will be connected the opposite corners of the graph at angle of 45 degree.
- The point of intersection between sales and total cost lines is the BEP. The angle formed by the intersection of sales and total costs lines is known as the angle of incidence. Large this angle, lower the BEP and vice-versa. The area to the left of the BEP is the loss area and represents the uncovered fixed costs, while the right of it, there is the profit area. The variable cost is represented by the gap between the total cost and the fixed cost.

BEP can be computed by contribution approach as:

- Break-even line: The break even line, parallel to the horizontal axis can be drawn through the zero contribution point.
- Fixed cost: The fixed are located in the negative vertical line.
- Contribution line: It is drawn from the fixed cost point and forwarded by intersecting BEP lines.

Figure 2.2
BE Contribution Margin Approach



(B) BEP as a Percentage of Capacity

Many firms are interested to compute the break-even point as a percentage of the estimated sales or capacity. This can be done by dividing the break even sales by the estimated sales or capacity. It would be computed by following formula:

$$\text{BEP (\% of Capacity)} = \frac{\text{BEP in Units}}{\text{Estimated Sales or Capacity}} \times 100$$

iv) Cash Break-even Point

Some of the firm's fixed cost is non cash outlays, and for a period, some of its revenue may be in receivable. It may be therefore important to find BEP on a cash basis for financial decision making.

An equation for the BEP based on sales revenue can be derived from the equation for the profit BEP. If noncash items like depreciation, goodwill are eliminated from total fixed cost then the total sales revenue that meets total cash fixed costs is cash BEP sales. The cash break-even point (BEP) can be computed by the following formula:

$$\text{Cash BEP} = \frac{\text{FC} - \text{Non cash outleys}}{\text{CM Ratio}}$$

Where,

$$\text{CM Ratio} = 1 - \frac{\text{Variable cost}}{\text{Sales revenue items}}$$

Other thing beings same, a company with a larger proportion of its fixed costs is the form of non-cash costs will have a lower cash BEP and will have more strength to face business downturn than a company whose fixed cost consist mainly of cash items.

2.3.2 Contribution Margin Analysis

Contribution margin is the excess of revenue over total variable cost related to a particular sales volume. A product line's contribution margin represents its net contribution to paying off fixed costs and to profit.

Adding contribution margin into C-V-P analysis changes the makeup of the equations as well as the format of the income statement. The equation now becomes:

$$S - VC = CM - FC = NI \text{ (i.e. contribution)}$$

Contribution margin is many be expressed as total absolute amount, a unit absolute amount a ration, and a percentage. The variable cost ration or variable cost percentage is defined as all cost divided by sales. Thus a contribution margin ratio of 20 % means that the variable ratio is 80%.

The formula for contribution margin ratio may be written as follows:

$$\begin{aligned} \text{Contribution margin ratio} &= \frac{\text{Sale} - \text{Variable cost}}{\text{Sales}} \\ &= \frac{\text{Sale}}{\text{Sales}} - \frac{\text{Variable cost}}{\text{Sales}} \\ &= 1 - \frac{\text{Variable cost}}{\text{Sales}} \end{aligned}$$

The CM Ratio of 20% or 0.20 indicates that 20% of sales is variable to cover fixed costs and generate profit. In other words, Re 0.20 of 1 sale is available to cover fixed cost and earn a profit. Since profit at the BEP is zero, dividing fixed costs by the contribution margin ratio gives the sales volume that is necessary to cover total fixed costs.

2.3.2.1 Difference among Contribution Margin, Contribution and Gross Margin

Some people use contribution in the similar sense of contribution margin. Actually CM is the excess amount of sales over all variable costs related to a particular sales volume. And contribution is the remain amount, when variable costs and fixed costs

are subtracted from sales revenue. The following equation shows the difference between two terms:

$$\text{Contribution Margin} = \text{Sales} - \text{Variable Costs}$$

$$\text{Contribution} = \text{Sales} - \text{Variable Costs} - \text{Fixed Cost}$$

Similarly, P/V ratio or contribution ratio is also taken instead of CM ratio. Where P indicated profit and V indicated volume. But after understanding, the difference between CM and contribution, the term P/V ratio or contribution ratio never be equivalent to CM ratio.

Too often people confuse the term contribution margin and gross margin. Gross margin (which is also called gross profit) is the excess of sales over the cost of goods sold (that is the cost of the merchandise that is acquired or manufactured and then sold). It is a widely used concept, particularly in the retailing industry.

$$\text{Gross margin} = \text{sales price} - \text{cost of goods sold.}$$

Contribution margin focus on sales in relation to all variables costs where as gross margin focuses on sales in relation to cost of goods sold.

2.3.3 Margin of Safety

The excess of actual or budgeted sales over the break-even sales is known as the margin of safety. The margin of safety (M/S) can be expressed as a percentage of Sales:

$$\text{Margin of Safety} = \frac{\text{Budgeted sales} - \text{BE Sales}}{\text{Budgeted Sales}}$$

The margin of safety indicates the extent to which sales may fall before the firm suffers a loss. Larger the margin of safety, safer the firm. A high margin of safety is particularly significant in times of depression when the demand for the firm's product is falling. A low margin of safety may result for a firm which has a low contribution margin ratio. When both the margin of safety and the CM ratio, management should

think of the possibilities of increasing the selling price, provide it does not adversely affect the sales volume, or reducing variable costs by bringing improvement in the manufacturing process.

2.3.4 Profit Volume Analysis

A modification of the break-even formula results in a tool that relates profit to sales at different operating levels. By writing the break-even formula so that fixed costs are replaced by both fixed costs and profits, the manager can solve for sales volumes needed to produce desired profit levels. The general form of the formula would be:

$$\text{Sales in Amount} = \frac{\text{FC} + \text{Profit}}{\text{CM Ratio}}$$

$$\text{Sales in Unit} = \frac{\text{FC} + \text{Profit}}{\text{SP} - \text{VC}}$$

The formula recognizes the fundamental relationship between sales and profits. The excess of sales over costs or marginal contribution is the direct profit from operations. This excess may be used to cover fixed costs that are not related to the volume of sales or operation. It is also available to cover any financing charges- such as interest on mortgage - to pay federal income taxes and to provide a profit to share holders.

The profit-volume formulas may be applied to different measure of profit. The basic meaning of profit in the formula is WBIT. But EBIT may be broken out to reflect two other profit measures as follows:

$$\text{EBIT} = \text{Net Income} + \text{Taxes}$$

If there are needed of sales volume to earn desired amount of profit, then the following changed formula should be used:

Sales volume to earn desired amount of after tax profit

$$= \frac{\text{FC} + \frac{\text{NPAT}}{1 - \text{Tax rate}}}{\text{CM Ratio}}$$

2.3.5 C-V-P Analysis for a multi Product Firm

C-V-P analysis can be developed for each product separately or multiple product. It is also developed by separating and non separating fixed costs.

2.3.5.1 C-V-P Analysis for Segments by Separating Product Wise Fixed Costs

C-V-P analysis by products is helpful to segment managers in designing the mix of products which will provide the maximum contribution to common fixed costs. When, it is likely that a segment will maximize the contribution per unit of constraining resources.

Once the optimal mix has been determined; production and promotional efforts can be planned. For planning purposes, it is usually assumed that within properly defined relevant range, the proportions in which the various products are produced and sold will remain fairly constant.

To illustrate the application of CVP analysis to segment of a firm, assume that Division Z produces 4 products, A, B, C and D. Each product's BEP point is calculated as follows:

Table: 2.1

Illustration of BEP for Multiple Products

Products	Specific Fixed Costs	Revenue per Product unit	Variable Cost per Product Unit	Contribution Margin	BEP in Units
A	2000	10	5	5	400 units
B	3000	15	6	9	333
C	1000	28	15	13	77
D	100	28	15	13	77

In the above case, BEP for the each product can be calculated only if total costs of the firm are distribution and fixed cost for each product is known.

2.3.5.2 C-V-P Analysis for Segments by Setting Standard Sale mix and in Total Fixed Cost

In this case, it has assumed that the firm is producing a number of products and the sales mix is constant. The relative proportion of sales of product is called the sales mix or the product mix. The firm's overall BEP can be calculated by dividing total fixed cost by the CM ratio for the firm. The multi-product firm's CM ratio for all the products the weights being relative proportion of each product's sales. The CM ratio for the multi product firm can also be calculated by dividing total contribution from all products by total sales. The calculation should be done by following illustration;

Table: 2.2

Illustration of BEP in Overall and Product Wise

Particular	Product A	Product B	Product C	Product D	Total
Sales mix	16%	24%	40%	20%	100%
Sales revenue (Rs)	2000	3000	5000	2500	12500
Variable costs (Rs)	1200	2100	3500	1500	8300
Contribution margin (Rs)	300	900	1500	1000	4200
Fixed cost (Rs)	-	-	-	-	5000
Contribution (Rs)	-	-	-	-	(800)
CM ratio #	0.4	0.3	0.3	0.4	0.336*
BEP in Rs	2381**	3571	5953	2976	1488

CM Ratio = $1 - V/S$

* Overall CM ratio = $1 - \frac{\text{total VC}}{\text{Total sales}}$

$$= (0.4 \times 16\% + 0.3 \times 24\% + 0.3 \times 40\% + 0.4 \times 20\%)$$

$$= 0.336$$

** BEP of Product A = total BEP \times corresponding sales mix

$$= \text{Rs } 14881 \times 16\%$$

$$= \text{Rs } 2381$$

2.3.6 Assumptions of C-V-P Analysis

C-V-P analysis is based on a specific set of assumptions that should be clearly understood. These underlying assumptions are as follows:

a) Cost Classification

“All cost can be classified in to two parts, fixed cost and variable cost. There is no cost other than fixed and variable. Some of the costs can be easily identified as fixed, such as rent of building or variable such as direct material cost. But a large number of costs belong to the mixed category. Such costs, known as semi-variable or semi fixed costs, consist of fixed as variable elements and are difficult to separate” (Dangol, 2005:153). Furthermore, some cost is difficult to determine.

b) Constant Sales Price

The sales price does not change as unit of sales change. It hardly remains constants. It may remain constant under perfect competition. But in real market situation of monopolistic or oligopoly, selling price will have to be reduced to increase the sales volume. Thus, sales revenue will not change in direct proportion with output.

c) Single Product or Constant Sales Mix

Another C-V-P assumption is the firm produces only one product or in the case of multiple products, hat sales mix among products remains constant. The constant sales mix helps to calculated valid BEP in overall case.

d) Constant Fixed Costs

The fixed costs are constant over a relevant range of activity and would increase or decrease in step wise fashion.

e) Short Run Focus

The C-V-P analysis is a short run technique of profit planning. In this technique the basic management policies about operation will not change materially.

f) Total Variable Costs

That total variable costs change in proportions to change volume (i.e., the variable cost per unit is constant over the range of activity being analyzed)

Further, the general price level (i.e. inflation and deflation) will remain essentially stable. Similarly remains essentially constant or zero and the efficiency and productivity per person will remain essentially unchanged.

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

2.3.7 Special Problems in C-V-P Analysis

- There are three special problems in C-V-P analysis that are as follows:
- The activity base
- The change in inventory
- The non operating expenses and income etc.

a) The Activity Base

When two or more production or activities are combined for breakeven analysis, the activity base is usually in amount. Product unit is used for single product. The activity base must be in additive units using a common whole, net sale amount are usually the only satisfactory common denominator because manufacturing. Selling and administrative activities are express in combination.

b) The Change in Inventory

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

Management policy in inventory change is

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

c) The non Operating Income and Expenses

The non operating income and expenses (extra ordinary gains and losses) cause another problem in C-V-P analysis. The main problem is that whether they should be included or excluded in the analysis.

Management policy may be:

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

2.3.8 Application of C-V-P Analysis to Fulfill the Following Purposes

- To plan future operation of business organization,
- To apply budgeted amount and control operations
- To analyze past performance, etc.

2.4 Prospectus and Possible Problems of Liquor Industry

Annual growth rate of around 11 percent prevailed in the Nepalese liquor market registering faster rate of growth than the Indian liquor market. Market wise, gain of liquor is said to be the faster than whisky in term of sales volume. Vodka market has researched at saturation and fall in non-growing segment. Rum has a market in several European countries. With WTO and SAFTA trade norms likely to come in to effect in near future. India is obviously a potential market. China and Burma are also potential

market. Vodka is the largest segment in the world. So, the concerned entity should attempt to conduct export promotion activities.

Presently finished products of alcohol are on a negative list for export to India but this will change in a due course of time. Because, WTO is a reality and once the borders open then liquor products can be exported to India. So the domestic brands will also enter Indian.

Businessmen believe that most local brands will be wiped out in the face of competition from MNCs. Local manufacturers will simply run out of competition from MNCs.

Either way, local players are aware that they are ultimately going to face a battle with multinational companies. The following table shows the major domestic players of liquor industry. These are not separated as parent, holding, subsidiary and Sister Company or firms.

Table: 2.3

Major Players of Liquor Industry in Nepal

Name	Name	Name
Allied brothers	Makalu	Shah Distillery
Bhavani Distillery	Mohini distillery	Shankar Distillery
Chandalika Distillery	Mc Dowell Nepal Ltd.	Shiddha Baba Distillery
Chinnamasta Distillery	Mt. Everest Brewery P. Ltd	Shree Distillery
Dhanusha Distillery	Mohini Hygiene	Snow land
Golden Globe liquors	Mustang Distillery	Summy Distillery
Gorkha Brewery Pvt.Ltd.	Nepal Brewery co(p) Ltd	The Nepal Distillery
Highland Distillery	Nepal Distillery	Trijuga Distillery

Himalayan Distillery	Nepal Liquors	Trishakti Distillery
Himalayan Brewery Co.(P)Ltd.	Rapti Distillery	Triveni Distillery
Himalayan Distillery Ltd.	Rupendehi Distillery	Udayapur Distillery
Himali Distillery	Sarada Distillery	

Source: Nubiz, A Survey of Sale of Liquor Industry, 2011:50

2.5 Review of Related Study

2.7.1 Review of Books

The study of the interrelationship of sales costs and net income is usually called cost volume profit analysis. CVP analysis examines the response of profit to change in volume. It relies on linear cost analysis and on linear revenue assumptions. To gain understanding of CVP analysis, the common examples 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.

“CVP analysis consists essentially in examining the relationship between changes in volume and changes in profit. The scope of CVP analysis ranges from the determination of the optimal output level of a single product department to the determination of the optimal mix of large multi product firm. 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,1989:215).

"All these decision rely on the simple relationship between changes in revenues and costs and changes in output levels. Output should be expanded or the output mix altered if the incremental revenue resulting from the changes 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".

"Cost volume profit analysis includes the related concepts of (a) Contribution analysis and (b) Break even analysis. This concept 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 variability (i.e. flexible or variable expenses budgets), contribution analysis involves a series of analytical techniques to determine and evaluate the effects on profits on change 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", (Khan and Jain, 2005).

In context of Nepal, there are not conducted enough research in the similar topic cost-volume profit analysis. The researcher had attempted to search thesis, dissertation or reports on related topics from different sources like central department of management library, TUCL and other related library of colleges. The researcher had found only one thesis and other reports concerned with current topic of the thesis. The brief review of previous related thesis and reports are as follows:

2.5.2 Review of Articles

This part includes the major related studies which are taken from the selected article. Dopuch, R. (1997), has conducted a research and published his paper in Journals of Nepalese Business studies on "*the Relationship Between Changes in Volume (output) and Changes in Profit*", 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 output mix of a large multi product firm. All these decision rely on the simple relationship between changes in revenues and costs and changes in output levels. Output should be expanded or the out-put mix altered if the incremental revenue resulting from the change exceeds the incremental costs of making the change. Thus all cost –volume profit analysis are characterized by their emphasis on cost and revenue behavior over various ranges of output levels and mixes.

Dopson, Lea R. (2003), has published an article on *"Linking Cost-Volume-Profit Analysis with Goal Analysis in the Curriculum Using Spreadsheet Applications,"* the managerial accounting concept of cost-volume-profit (CVP) analysis predicts the sales dollars and volume required to achieve desired profit (or breakeven) based on known costs. The menu analysis concept of goal value (GV) analysis evaluates each menu item's food cost percentage, contribution margin, popularity nonfood variable costs (e.g., variable labor costs), and selling price. CVP analysis is used to establish targets for the entire operation, whereas GV analysis evaluates individual menu items against those operational targets. GV analysis is based on the operational goals in terms of food cost, other variable costs, selling price, and number of covers. If, for example, the CVP analysis suggests that the number of covers needed to generate desired profits will not likely be achieved, costs should be evaluated. If food and labor costs are reduced to generate a more reasonable sales figure in CVP by increasing contribution margin, then those changes affect the desired food and variable (labor) costs in GV analysis. In addition, desired selling price (check average) and number of covers in GV analysis should be set based on results in CVP analysis. Therefore, the two analyses can be strategically linked. In order to effectively teach the linkage between CVP analysis and GV analysis, the author presents spreadsheet applications that combine the two analyses.

Busan, Gabriela (2009), has published an articles on “*Using Cost-Volume-Profit Analysis in Decision Making*”, the cost-volume-profit study the manner how evolve the total revenues, the total costs and operating profit, as changes occur in volume production, sale price, the unit variable cost and/or fixed costs of a product. Managers use this analysis to answer different questions like: How will incomes and costs affected if we still sell 1.000 units? Do you expand or reduce selling prices? Do we expand our business in foreign markets?

Dianna, Wicks (2008), has published an article on “*The Benefits of Analyzing Cost – Volume-Profit Analyzing*”, the Cost-Volume-Profit analysis is a mathematical model used by managers in forecasting profits at various levels of output. It shows the relationship between the selling prices, unit variable cost, fixed cost and quantity of sales. In analyzing the relationship between cost, volume and profits, a company needs to classify its costs into either fixed or variable. Variable costs are expenses that fluctuate with changes in sales, while fixed costs remain constant with changes in sales.

2.5.3 Review of the Previous Thesis

On the topic “*Cost Volume Profit Analysis*” have published by many researchers in their research article. The mentioned theses were reviewed as they are relevant to the present research.

Shrestha, Deepak (2006) has conducted research work on “*Cost Volume Profit Analysis of Dairy Development Corporation*” an unpublished master level thesis submitted to Centre Department of Management, Faculty of Management Tribhuvan University.

Main objective of his research is to examine the practice of CVP analysis & its effectiveness in DDC.

Major Findings

- DDC hasn't been segregating fixed and variable cost, care has been taken in this research to differentiate fixed cost and variable cost with help of degree of variability method.
- DDC hasn't been practicing CVP analysis till now and there is no method adopted to segregate fixed and variable cost.
- DDC has low contribution margin ratio in all the five year under study.
- DDC has high wages & either availability of manpower is more than requirement or inefficiency of workers resulting in low productivity of labor.

Bhandari, Arjun (2008), has conducted a research entitled “*Cost, Volume And Profit Analysis Of Commercial Bank: A Case Study Of Himalayan Bank Limited*” , an unpublished master level thesis submitted to Centre Department of Management, Tribhuvan University.

Main objective of his research is to examine the practice of CVP analysis and its effectiveness in Commercial Bank. In this study the secondary data had been used mostly and related other information had collected by informal interview for segregating cost, Cost analysis, contribution margin analysis, P/V ratio analysis & Break Even analysis.

Major Findings

- CVP analysis has not practiced yet.
- There is no Practice of segregating cost into fixed and variable. The costs are roughly classified and that classification is not scientific and appropriate.
- All the level of management is not involved in profit planning and decision making of the Bank.
- There is no complete and comprehensive budgeting system.
- Lack of the system of SWOT analysis. Liberalized policy of Government, skill manpower, good management team, use of computer technology etc. are strength of Bank where as unable to provide service in rural area, market

competition, conflict in Nation, Industries and Business closed down are weakness and threat.

Rijal, Madhav (2009) had conducted his MBS level thesis on the topic “*Cost-Volume Profit as a Tool to Measure Effectiveness of Profit Planning and Control (A Case Study of NEBICO PRIVATE Limited)*”, is an unpublished master level thesis submitted to Shanker Dev Campus, Faculty of Management ,T.U.

Main Objectives

- To study relationship of cost, volume and profit as a applicable tools of budgeting,
- To evaluate the profitability, financial position and sensitivity of NEBICO’s activities,
- To analyze the cost, volume and profit of the company and it’s impact in profit planning, and
- To provide suggestions and recommendations for improving NEBICO’s condition etc.
- To achieve all above objectives, he had adopted case study research design, by using historical data of the concerned company. He had also used primary as well as secondary sources of data.

Rijal had pointed out some major findings in his research. Most of his research findings were out of objectives of the study. There were 20th major findings available.

Major Findings

- The company’s sales trend has fluctuation but not satisfactory trend of increasing,
- The company’s variable cost is in high proportion than fixed cost in comparison with total cost, which contributes for lower contribution margin.
- NEBICO has no any plan to reduce cost,
- The profit trends of the company was not satisfactory,
- The company had not effective inventory policy,

- There were not effective sales forecasting techniques,
- NEBICO Pvt. Ltd had not practice of segregating the cost in to fixed, variable and controllable or non-controllable.
- Net profit margin, profitability ratios and other things were not satisfactory,
- The company has not utilized its capacity etc.

Main Recommendations

- The use of profit planning and controlling tools were recommended,
- The company had required to classify their cost,
- The company should consider BEP and effective inventory policy,
- The company should stress on effective utilization of fixed costs, and
- All personnel should be participated on decision making and planning process etc.

Sapkota, Partap Dev (2010), has conducted a research entitled “*A Comparative study on CVP analysis of BNL and HDL*”, is an unpublished master level thesis submitted to Shanker Dev Campus, Faculty of Management T.U. In this study the secondary data had been used mostly related other information had collected by informal interview for segregating cost, Cost analysis, contribution margin analysis, P/V ratio analysis & Break Even analysis. The period covered by this Research was five fiscal years data from 2004/5 to 2008/9.

Main Objectives

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

- To analyze different components of cost as per cost behavior,
- To study the present application of CVP analysis in BNL & HDL,
- TO analyze the CVP and its impact in profitability of BNL and HDL,
- To provide suggestions and recommendations on the basic of major findings.

Major Findings

The major findings of this study on the analysis of available secondary data are pointed as follows:

- He both companies do not have practice of classification of costs and variable cost,
- The semi-variable or semi-fixed cost are classified into fixed and variable cost on the basic of estimation or assumption,
- The actual sales of the company have not reached at BEP as a whole,
- The CM ratio of companies is less than 50% which is much low to cover up its fixed cost,
- Both companies have not maintained the broad and long range objectives and periodic report and objectives are limited to the high ranking officials only,
- Relevant internal and external market variables are not fully explored by companies,
- Both enterprises have no financial plan, they have only sales and production plan in terms of required target,
- There is no any plan for effective plan for cost reduction and control,
- There is lack of effective cost control programmed or techniques,
- The profit trend of the company is not satisfactory as compared to profit proportion is very low with fluctuating trend,
- In the both companies there is no effective inventory policy. The inventory management, raw material handling and controlling system are not effective & efficient,
- MIS is not performance based ,
- There are no any proper criteria for performance evaluation financial tools.

Adhikari, Sushil (2012),has presented a research entitled "*Cost-Volume-Profit Analysis of Salt Trading Corporation Limited*". an unpublished master level thesis submitted to Shanker Dev Campus, Faculty of Management T.U. The main objective of this study is examine CVP analysis as a tool to measure effectiveness of PPC of Salt Trading Corporation the other objective are;

- To study the relationship between cost, volume and profit as a tool of budgeting.
- To analysis the cost-volume-profit of the corporation on and its impact on profit planning.
- To evaluate the profitability and sensitivity of cost, price and volume of STCL in relation to sale.
- To provide necessary suggestion and recommendation, wherever necessary based on findings.

Major Findings;

- Total sales of the corporation were in fluctuating trend.
- The corporation has six different product lines out of which contribution from consumable materials and fuel, lubricants, tyre, tube were most significant in the total sales.
- Variable costs of the corporation were in fluctuating trend but fixed costs were in mostly increasing trend.
- The corporation fails to apply semi-variable cost and essential for profit planning and control.
- Contribution margin of the corporation were not satisfactory.
- The position of degree of operating leverage (DOL) was in increasing trend.

2.6 Research Gap

Most of the past research studies about cost volume analysis are related to manufacturing firms. Very few studies were made in the field of distillery makings firms sector. PPC analysis and made projections of sales and production. This research study dealt with the cost volume profit analysis of Himalayan Distillery Ltd. This research work tried to find out the drawbacks in applying CVP analysis in HDL. The previous studies failed to make about the cost estimation and budget variance which was take in this study.

CHAPTER - III

RESEARCH METHODOLOGY

3.1 Research Design

The study was concentrated on examination of Cost-Volume-Profit analysis of HDL. At the planning stage of the research; identification, selection and formulation of a research problems were accomplished. Then objectives were prepared to tackle the problem. To achieve these objectives, required information and data were collected from the reports and bulletins of the company. Hence, secondary sources of data used in this study. Collected data were classified and tabulated. These were the basis with which major findings were drawn and recommendations and suggestions were provided for further improvements.

3.2 Nature and Size of Population

The nature of population includes liquor business of Nepal. Therefore, the size of population includes all the players in liquor business. The manufacturer of liquors, brewery and distillery in Nepal represent population size.

3.2.1 Nature and Size of Sample

HDL is selected as a sample liquor industry. Since, it is pioneer in liquor industry and playing leading role in liquor market. C-V-P analysis is used in the product lines taking the reference of top three most profitable products holding huge sales.

In addition to this, the overall BEP of the company was also calculated to achieve the objectives of research.

3.3 Sources of Data

Data plays vital role in research to research objectives. Without the data, methodology cannot be utilized to derive its conclusion.

For the purpose of C-V-P Analysis of the HDL, the following sources of data, are used.

3.3.1 Primary Data

For the purpose of research work, primary data were collected. The following techniques were adopted for collecting primary data.

- Observation
- Direct meeting
- Personal Interview through questionnaires etc.

3.3.2 Secondary Data

Only primary data cannot fulfill the requirement of the research work. So, secondary data were also used to accomplish the objectives of study. The following procedures were adopted for collecting primary data.

- Library
- Companies publications
- Books and Journals/Magazines
- Booklets, and
- Internet and websites etc.

The output of the research work depends upon accuracy of the applied data. So, the researcher had been tried to collect up to data and accurate data as far as possible.

3.4 Variables Studies

A variable is a symbol to which numerals or values are assigned. A variable can be independent and dependent variables.

- Independent Variables: It is the variables which can influence other variables.
- Dependent Variables: It depends upon other variables.

There are three factors (like Cost, Volume and profit) in C-V-P Analysis, which are interconnected and depended upon one another. So, these three factors are dependent variables. But, testing relationship between these variable following criteria are assumed:

Table: 3.1
Classification of Variables

	Independent Variables		Dependent Variables
	Volume (Sales)		Cost & Profit
	Volume		Rupees & Qty

Source: Field Survey, 2013

3.6 Tools of data analysis

Descriptive and quantitative techniques were used to study the effect of volume change on cost and profit by using the following techniques.

3.5.1 C-V-P Analysis Tools

C-V-P analysis was included the following extension computations:

$$i) \text{ BEP in Units} = \frac{\text{Total fixed cost}}{\text{SPPU} - \text{VCPU}}$$

$$ii) \text{ BEP In Rs.} = \frac{\text{Total fixed cost}}{1 - \frac{\text{Variable Cost}}{\text{Selling Price}}}$$

$$iii) \text{ Contribution Margin} = \text{Sales} - \text{Variable Cost or FC} + \text{Profit}$$

$$iv) \text{ Contribution Margin Ratio} = 1 - \frac{\text{Variable Cost}}{\text{Selling Price}}$$

$$v) \text{ BEP (\% of Capacity)} = \frac{\text{BEP}}{\text{Total Capacity}}$$

$$vi) \text{ Cash BEP in Rs.} = \frac{\text{fixed cost} - \text{Non Cash outlays}}{1 - \frac{\text{Variable Cost}}{\text{Sales} - \text{Non cash items}}}$$

$$vii) \text{ Sales in Units for desire profit} = \frac{\text{FC} + \text{Profit}}{\text{SPPU} - \text{VCPU}}$$

$$\text{viii) Sales in amount for desire Profit} = \frac{\text{FC} + \text{Profit}}{\text{CM Ratio}}$$

$$\text{ix) Sales in amount (to earn desired profit after tax)} = \text{FC} + \frac{\text{DPAT}}{\frac{1 - \text{Tax Rate}}{\text{CM Ratio}}}$$

$$\text{x) Margin of safety} = \text{Planned or Actual Sales} - \text{BEP}$$

$$\text{xi) Margin of Safety} = \frac{\text{Planned or Actual Sales} - \text{BEP}}{\text{Planned or Actual Sales}}$$

3.5.2 Statistical Tools

The Statistical tools were included the following techniques to examine the relationship between the variables; and analysis:

- Tables and Figures
- Mean, Standard Deviation and C.V.

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

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum U}{N} - \left(\frac{\sum U}{N}\right)^2}$$

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

C) Correlation Analysis

$$\text{Coefficient of Correlation (r)} = \frac{N \cdot \sum UV - \sum U \cdot \sum V}{\sqrt{N \cdot \sum U^2 - (\sum U)^2} \sqrt{N \cdot \sum V^2 - (\sum V)^2}}$$

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

Where,

X = Distribution

N = No. of distribution

U = X – assumed Mean

V = Y – assumed Mean

CHAPTER -IV

PRESENTATION AND ANALYSIS OF DATA

4.1 Sales Revenue of HDL

Sales refer to exchange of goods and service for money. The profit making objective of a business is achieved by selling goods and services at a price higher than their cost. In some industries profit depends upon high sales volume. If each unit of product is sold at a relatively low contribution margin, profit can be made only by selling large quantities when fixed costs are high. The following the table shows the actual and the budgeted sales trend of HDL.

Table: 4.1
Actual and Budgeted Sales Trend of HDL

Fiscal Year	Actual Sales (Rs.)	Budgeted Sales (Rs.)	Variance (Rs.)	Achievement (%)
2007/08	41,307,960	139,452,084	(98,144,124)	29.62
2008/09	51,274,070	193,270,106	(141,996,036)	26.52
2009/10	94,865,090	646,846,800	(551,981,710)	14.67
2010/11	203,585,108	543,148,000	(339,562,892)	37.48
2011/12	314,578,626	469,312,000	(154,733,374)	67.03
Average	141,122,170	398,405,798	(257,283,627)	35.42

(Sources: Annual Reports of HDL from the FY 2007/08 to 2011/12)

The actual sales of HDL are at invoice issued. The sales did not include excise duty, VAT and other tax.

The actual sales of the fiscal year 2007/08 was low than the other fiscal years, because is the mass production of the company was started from 1st Baishakh 2065 B.S (2008AD). The company was operated under private Ltd. before. In the year 2009/10 the achievement extremely low due to unreal projection in sales figure.

The above table shows that there is high gap between the actual sales and the budgeted sales. The company's sales were not met the budgeted sales because actual sales of all fiscal years' are lower than the budgeted sales. But the variance is decreasing. So, it can be expected that the gap between actual sales and budgeted sales will be fulfilled in future. The average sales of last five years were Rs. 141,122,170 which is lower than first three years and higher than last two years.

The actual sales volume is in increasing trend. To find out the nature of variability of the actual sales and the budgeted sales of the fiscal years, it is necessary to calculate the arithmetic mean, standard deviation and coefficient of variation. The following table shows the statistical calculation.

Table: 4.2
Summary of Statistical Calculation

Particular	Actual Sales (X)	Budgeted Sales (Y)
Mean ('000000')	141.12	398.41
Standard Deviation (σ)	104.08	198.43
Coefficient of Variance (C.V.)	0.7375	0.4981
Correlation Coefficient (r)	0.52	
Probable error of r (P.E.)	0.2201	

Source: Appendix-I

The table 4.2 shows that the C.V. of the budgeted sales is less than that of actual sales. So, the actual sales are more variable than the budgeted sales.

Similarly, the correlation coefficient between two variables (i.e. the actual sales and the budgeted sales) is 0.52. It shows there is positive correlation between two variables.

The probable error of correlation coefficient (P.E.) is the measure of testing the reliability of the calculated value of r. It is used in interpretations whether calculated

value of r is significant or not. The value of r is less than P.E. (i.e. $0.99 > 0.2201$). So, the calculated value of r is low significance level and it indicated that perhaps there is little evidence of correlation.

4.1.1 Sales of the Selected Product Lines

Three product lines viz. Royal Stag, Ruslan Vodka and Blue Diamond are selected for further analysis and interpretation. The following table shows the sales figure of selected product lines.

Table: 4.3

Sales Figure of Selected Product Lines

Fiscal Year	Royal Stag			Ruslan Vodka			Blue Diamond		
	Rs.('000')	Cases	USP Rs.	Rs.('000')	Cases	UPS Rs.	Rs. ('000')	Cases	USP (Rs.)
	1	2	1/2= 3	4	5	4/5=6	7	8	7/8=9
2007/08	15,103	7,983	1,892	-	-	-	-	-	-
2008/09	29,269	15,074	1,942	-	-	-	-	-	-
2009/10	60,817	30,519	1,993	-	-	-	-	-	-
2010/11	141,048	64,819	2,176	9,623	7,982	1,206	17,739	20,640	859
2011/12	253,978	127,450	1,993	22,769	19,560	1,164	42,147	64,525	653

(Source: Based on Annual Reports of HDL from the FY 2007/08 to 2011/12)

The above table shows that the sales figure is in increasing trend. Higher sales volume recovers higher portion of fixed cost, and it assists to maximize profit. The Unit Selling Price (USP) is calculated by dividing total cases sold (unit) to total sales revenue. Total sales and total cases are not separated as different sizes like 750 ml, 375 ml and 180 ml. The company had not proper sales record of different size of product lines. The unit selling price of the Royal Stag was in fluctuation condition; Ruslan Vodka and Blue Diamond had increasing pattern. The number of unit sold of selected product lines was in growing trend.

4.2 Analysis of Cost

Cost is the amount of expenditure, actual (incurred) or notional (attributed), relating to a specific thing or activity. The specific thing or activity may be product, job service, process or other activity.

Cost is the amount of resources given up in exchange for some goods or services. The term 'cost' itself is without any significant meaning, and therefore, it is always advisable to use it with and adjectives or phrase.

Expenses are expired costs, incurred and totally used up in generation of revenue. Examples of expired costs are cost of goods expenses, administrative expenses and selling and distribution expenses. Expenses need not necessarily the benefits obtained. The manufacturing costs are capitalized in the form of finished goods inventory and when a sale is made, they expire (becoming expenses). The cost of unsold inventory which was an assets earlier, now becomes expenses (cost of goods sold) as it has contributed to the generation of revenue.

Factory overhead is treated as cost become this is included in cost of finished goods inventory which is a current asset unless sales in made.

Conventional CVP analysis requires that cost be classified as earlier fixed or variable. Some costs are definitely fixed in nature. Other is strictly variable. But, when costs are examined, some are observed to be neither completely fixed nor completely variable.

The company had not practice of classification of costs into fixed cost and variable cost. To fulfill the objectives of the study costs are classified into fixed or completely variable cost.

4.2.1 Analysis of Fixed Costs

A fixed cost remain unchanged in total amount over a wide rang of production levels. For example, if the factory building is rented for, \$1000 per month, this cost remains the same whether the factory operates on a one shift, two shift, or an around the clock basis. Likewise, the cost is the thousand units are produced, or any other number up to

the full production capacity of the plant. However that while the total amount of a fixed cost remains constant as the level of production changes, fixed cost per unit of product decrease as volume increase. For example, if rent is \$1000 per unit and two units of product are produced in a month, the rent cost per unit is \$ 500, but if production is increased to 10 units per months, rent cost per unit decreases to 500 units per months. The total fixed cost appears on the graph as a parallel of x-axis. Following the table shows the detail fixed costs of HDL.

Table: 4.4
Statement of Detail Fixed Costs

Particular	2007/08	2008/09	2009/10	2010/11	2011/12
<u>Production Expenses</u>					
Salary	189,750	301,798	735,390	907,036	1,359,046
Water & Electricity	149,835	181,715	275,133	383,072	339,920
Repair and Maintenance	163,784	210,042	135,801	371,129	339,863
Total Production Exp.(A)	503,369	693,555	1,146,324	1,661,237	2,038,829
<u>Selling and Distribution Exp.</u>					
Advertisement	1,127,950	1,694,605	22,333,518	5,107,918	278,022
Hoarding Board Rental	-	-	-	-	604,915
Distribution Meeting exp.	-	-	-	370,671	460,576
Total Selling and Distribution Exp.(B)	1,127,950	1,694,605	2,233,518	547,859	3,846,413
<u>Administrative Expenses</u>					
Salary and Allowance	4,698,780	5,684,396	7,959,503	832,769	11,191,531
P\F Contribution	47,503	58,108	221,475	217,661	271,503
Printing and Electricity	238,946	257,471	364,575	429,685	518,615
Water and Stationary	29,985	33,218	44,637	201,038	266,592
Communication Expenses	987,564	1,159,870	1,539,852	1,284,442	2,610,051
Bank Charges	329,875	317,657	246,594	403,446	636,696
Repair and Maintenance	189,320	245,179	1,077,383	1,295,111	2,878,677

Meeting Fee	17,300	19,500	48,552	75,000	65,000
Traveling Expenses	287,000	372,645	1,673,583	2,781,221	289,689
Conveyance and Fuel Exp.	489,876	699,048	741,053	794,174	1,825,888
Computer Software Exp.	-	-	-	90,000	24,000
AGM Expenses	11,587	12,546	13,000	14,396	54,323
Rent	585,672	629,507	716,588	659,823	1,057,164
Tax and Fees	87,987	215,937	134,992	263,902	376,100
Audit Fee	80,000	80,000	80,000	80,000	90,000
Guest Entertainment	349,870	364,995	364,184	459,053	660,584
Notice and Publication Exp.	-	3,360	-	39,375	80,137
Security Exp.	1,195,983	1,253,434	1,046,404	1,049,886	1,135,035
Members Fees and Subscription	67,543	96,443	132,553	88,704	139,438
Legal and Professional Fees	393,654	473,462	2,609,119	3,141,898	1,621,147
Insurance Premium	885,756	1,437,253	3,292,833	2,161,014	2,079,253
Training and Recruitment Exp.	32,000	34,500	17,500	30,246	8,000
Miscellaneous expenses	279,645	337,436	1,048,448	759,968	288,469
Total Administrative Exp.(C)	11,285,846	12,519,985	23,372,728	24,774,250	30,764,327
Depreciation (D)	4,288,931	5,144,651	21,190,039	21,626,888	22,072,743
Interest on Long term Loan (E)	5,685,942	5,830,242	25,493,333	25,493,333	24,535,798
Total Fixed Costs (A+B+C+D+E)	22,892,038	25,883,038	73,435,942	79,034,297	83,258,110

Sources: Annual Reports of HDL (FY 2007/08 to 2011/12)

The items included in the fixed production expenses were fixed salary fixed water and electricity and repair and maintenance. Similarly, the items included in the fixed selling and distribution expenses and administrative expenses, all are fixed cost nature.

Salaries of production department were in increasing trend. Water and electricity of production department were in increased up to the FY 2010/11 and decreased in the

FY 2011/12. Repair and maintenance costs were fluctuation condition. In aggregate it was in increasing trend.

The advertisement expenses increased up to the FY 2010/11 and decreased in the FY 2011/12. Separate hoarding board rental was introduced the FY 2011/12. The distributors meeting expenses were in increasing pattern.

The items of administrative, salary and allowance were included in the salary of office staff. Salary and allowance, and P/F contribution were in increasing trend. Printing and stationery, and water and electricity were also in increasing trend. The communication expenses, bank charges, bank charges, repair and maintenance expenses, traveling expenses, fuel were in increasing trend. The rent expenses were also in increasing trend. Tax and fees security expenses were also in increasing trend.

Similarly, depreciation was also in increasing trend and the amount of interest on long term loan (mortgage loan) remained constant in 2009/10 and the FY 2010/11 and decreased at the FY 2011/12.

The amount of depreciation and interest on long term loan of the FY 2008/09 were only for three months (Baishakh to Ashadh) because the mass production and operation were started from 1st Baishakh 2065 (2008 AD.). So, these are difficult to compare with other fiscal years.

In aggregate, total fixed costs were increasing annually. Advertisement, salary and allowance, communication expenses, insurance premium, depreciation and interest on long term loan were high in the total fixed costs.

To produce finished goods and distribute these goods in the market, the company bears different types of variable costs. The following table shows the detail variable cost of HDL.

Table: 4.5
Statement of Detail Variable Costs

Particulars	2007/08	2008/09	2009/10	2010/11	2011/12
<u>Cost of Goods Sold</u>					
Materials Consumed	20,619,366	27,938,129	52,791,589	100,430,437	110,696,440
Direct Expenses of Purchase	-	-	-	-	27,624,338
Salary and Wages	887,564	1,207,194	2,941,560	3,628,142	5,436,182
Royalty	6,785,643	7,037,660	16,677,566	39,353,267	59,558,440
Water and Electricity	987,345	1,332,578	2,017,644	2,809,196	2,492,744
Repair and Maintenance	446,752	840,170	543,205	1,484,517	1,359,451
Blending Charges	1,198,254	2,038,204	1,317,783	720,270	1,281,035
Other Exp.	121,976	197,965	127,993	174,894	799,610
Total (A)	31,046,900	4,059,100	76,417,340	148,600,753	209,248,240
<u>Selling and Distribution Exp.</u>					
Transportation and Insurance Exp.	1,123,950	1,295,691	1,589,167	4,473,749	858,8130
Travelling Expenses of Sales man	798,259	1,056,124	2,258,036	2,457,080	2,869,649
Complementary Expenses					
Sales Promotion Expenses	315,985	373,047	130,733	2,696,753	4,300,342
Leakage and breakage	587,934	661,655	2,671,160	9,513,773	23,138,079
Other expenses	87,985	85,039	476,803	977,845	4,343,515
	6,523	15,244	53,932	3,120	-
Total (B)	2,920,636	3,486,800	7,179,831	20,092,320	43,239,715
Total Variable Cost (A+B)	33,967,536	44,078,700	83,597,171	168,693,073	252,487,955

Sources: Annual Reports and Audited Financial Statement of HDL (FY 2007/08 to 2011/12)

The cost of material consumed was included raw material and packaging material. The cost of material consumed of the FY 2007/08 to the FY 2010/11 was included direct expenses of purchase but it is shown separately in the FY 2011/12. The direct expenses of purchase was included clearing and forwarding custom duty, freight, local development tax and special duty of raw material as well as packaging material. Salary and wages, water and electricity, repair and maintenance were semi-variable cost nature. It was separated as fixed and variable cost; and variable cost portion is shown in the table above. Out of these items were variable cost natures.

Similarly, all items included under selling and distribution expenses variable cost nature.

Material consumed salary and wages, royalty, transportation and insurance expenses, traveling expenses of sales, sales promotion expenses, leakage and breakage were increasing annually. Water and electricity were increased up to the FY 2007/08 to the 2010/11 and decreased at the FY 2011/12. Repair and maintenance, and complementary expenses were in fluctuation condition. Blending charges was decreased up to the FY 2010/11 and increased at the FY 2011/12. Other expenses of cost of goods and selling and distribution expenses were increasing and decreasing respectively.

Higher portion of total variable cost was covered by material consumed, direct expenses, salary and wages, leakage and breakage and complementary expenses, travelling expenses, and water and electricity items.

Since, increase at production units, materials, taxation, customs duty, fuel and competitive activities; the total variable cost was increasing annually.

4.2.2 Analysis of Variable Cost for Selected Product Lines

The variable costs for different product lines were not same. Different product line had different combination of material, labor and other expenses. Since, not availability

of detail variable cost item of each product lines, the total variable cost and unit variable cost of selected product lines are presented at total form in the table below.

Table: 4.6
Statement of Variable Costs for Selected Product Lines

Particular	2007/08	2008/09	2009/10	2010/11	2011/12
<u>Royal Stag</u>					
A. Total Variable Cost (Rs.)	1,2814,417	25,161,636	53,593,257	116,874,072	203,848,515
B. Production in Units	8,759	15,742	30,519	64,151	127,450
C. Unit Variable Cost (A/B)	1,463	1,578	1,756	1,822	1,599
<u>Ruslan Vodka</u>					
D. Total Variable Cost (Rs.)	-	-	-	7,973,734	18,274,917
E. Production in Units	-	-	-	7,982	19,610
F. Unit Variable Cost (D/E)	-	-	-	999	932
<u>Blue Diamond</u>					
G. Total Variable Cost (Rs.)	-	-	-	14,698,749	33,828,140
H. Production in Units	-	-	-	20,640	64,750
I. Unit Variable Cost (G/H)	-	-	-	712	522

Sources: Annual Reports of HDL (FY 2007/08 to 2011/12)

The total variable cost of selected product lines were increasing causes of increase in production units. The unit variable cost of Royal Stag was increased up to the FY 2010/11, but decreased at the FY 2011/12. Similarly, unit variable cost of Ruslan Vodka and Blue Diamond were decreased. Internal and external business environment, managerial decision, production process and technology factors affect to

change in variable cost. Increasing unit selling price and decreasing unit variable cost is the positive signal of higher CM per unit. It helps to maximize operating profit.

4.2.3 Analysis of Semi-Variable or Semi-Fixed Costs

Semi-variable expenses are significant portion of company expenses, Semi-variable expenses also with change in output or activity but not in proportion to change in activity or output. Semi-variable expenses have some of the characteristics of both fixed and variable costs. Semi-variable expenses are caused by combined effect of passage of time, activity or output and management discretion decision.

The company had not practice of classification of semi variable costs in to fixed and variable cost. Neither had they had any proper basis for classification of these cost nor detail raw records. So, item wise were in sum total.

To simplify the problem discussion were done with the chief of finance of HDL. The following assumptions were adopted to segregate semi-variable costs.

Table: 4.7
Classification of Semi-Variable Cost

Particular	2007/08	2008/09	2009/10	2010/11	2011/12
<u>Production Expenses</u>					
A. Salary and Wages	872,476	1,508,992	3,676,950	4,535,178	6,795,228
Fixed cost (20 %)	174,495	301,789	755,390	907,036	1,359,046
Variables (80 %)	697,981	1,207,194	2,941,560	3,628,142	5,436,182
B. Water and Electricity	988,653	1,514,293	2,292,777	3,192,268	2,832,664
Fixed cost (12 %)	118,638	181,715	275,133	383,072	339,920
Variables cost (88 %)	870,015	1,332,578	2,017,644	2,809,196	2,492,744
C. Repair and Maintenance	992,253	1,050,212	679,006	1,699,314	1,855,646

Fixed cost (20 %)	198,450	210,042	135,801	339,863	371,129
Variables cost (80 %)	793,803	840,170	543,205	1,359,451	1,484,517
D. Total Semi-Variable (A+B+C)	2,853,382	4,073,497	6,648,733	9,426,760	11,483,538

Sources: Annual Report of HDL 2007/08 to 2011/12

4.3 Inventory Consideration of HDL

Inventory is most important thing for smooth running of manufacturing business. It includes raw materials, packaging material, work in progress, finished goods, and pares parts. It plays vital role in production and supply of goods to meet the demand consumers. That is why most of manufacturers invest their working capital in to inventory to reduce uncertainty .But for profit planning; proper mechanism must be adopted to control inventory costs. The following equation shows the computation of inventory.

Raw Material:

$\text{Purchase} = \text{Raw material Consumed} + \text{Closing Inventory} - \text{Opening Inventory}$

Finished Goods:

$\text{Production} = \text{Sales} + \text{Closing Inventory} - \text{Opening Inventory}$

So, the change in any items of above equation changes the value of another. Since the assumption of C-V-P analysis, the inventory must be constant or nil. For the evaluation purpose of Inventory of HDL, only, selected product lines inventory of finished goods are shown in the table below.

Table: 4.8

Statement of Finished Inventory

Particulars	2007/08	2008/09	2009/10	2010/11	2011/12
Royal Stag					
Opening Inventory	321	328	340	340	967
Closing Inventory	328	340	340	967	960
Ruslan Vodka					
Opening Inventory	0	0	0	0	0
Closing Inventory	0	0	0	0	0
Blue Diamond					
Opening Inventory	0	0	0	0	0
Closing Inventory	0	0	0	0	0

(Sources: Annual Reports of HDL from the FY 2007/08 to 2011/12)

Above the table shows that, Royal Stage had nearly constant inventory and fully constant inventory at the FY 2007/08, 2008/09 and the FY 2009/10 respectively but, variable at the FY 2010/11 and the FY 2011/12.

Similarly, Ruslan Vodka had zero inventories and Blue Diamond had also zero inventories up to the FY 2010/11, but variable at the FY 2011/12 and every case contains 9000ml.

So, the inventories of some fiscal years were nearly constant.

4.4 Computation of C-V-P Analysis

C-V-P Analysis helps to determine the minimum sales volume to avoid losses and the sales volume at which the profit goal of the firm will be achieved. As ultimate objectives, it helps management in seeking the most profitable combination of fixed, costs, variable costs, volume and selling price.

4.4.1 Computation of BEP in Rs. for the Entire Company

Locating the point where total revenue equals total costs incurred, the following formula is used:

$$\text{BEP in Rs} = \frac{\text{Total Fixed Cost}}{\text{CM ratio}}$$

Following the table shows the computation of BEP in Rs HDL.

Table: 4.9
Computation of BEP in Rs. for the HDL

Particulars	2007/08	2008/09	2009/10	2010/11	2011/12
A. Fixed cost (Rs.)	22,892,038	25,883,038	73,435,942	79,034,297	83,258,110
B. Sales Revenue	41,307,960	51,274,070	94,865,090	203,585,108	314,578,626
C. Variable cost	33,967,536	44,078,700	83,597,171	168,693,073	252,487,955
D. CM (B-C)	7,340,424	7,195,370	11,267,919	34,892,035	62,090,671
E. CM Ratio (D/B)	0.1777	0.1403	0.1188	0.1714	0.1974
F BEP in Rs (A/E)	128,820,339	184,442,037	618,260,324	461,142,662	421,822,174

Sources: Annual Reports of HDL (FY 2007/08/ to 2011/12)

The BEP in Rs of each fiscal years were very high than actual sales. In other words, the actual sales of each fiscal year were not reached at BEP. It indicated that the company has not reached at that point where total sales revenue recovers total cost. The actual sales of the FY 2007/08, 2008/09, 2009/10, 2010/11 and 2011/12 were less than BEP by 127512379, Rs. 158558999, Rs. 525545454, Rs. 2545454545 and Rs. 10724545 respectively.

Causes of Higher BEP

- **Low Actual Sales and High Variable Cost:** Since actual sales of each fiscal year was low. This results the lower contribution margin course of higher variable cost.
- **Low CM Ratio:** Since low sales and low contribution margin, the CM ratios were less 20%. The low CM ratio recovers low portion of fixed costs, this results there were need of high sales revenue to reach at BEP.
- **Higher the fixed Cost:** The fixed cost to variable cost ratio be not more than 50%. But the ratio was high in the FY 2007/08 to the FY 2009/10 and low at the FY 2010/11 and 2011/12. Not recovery of higher portion of fixed cost results higher BEP.

Comparatively low difference between actual sales and BEP sales were the result of increasing CM ration and decreasing fixed cost to variable cost ratio.

4.4.1.1 Computation of BEP for Selected Product Lines

To find out either sales revenue of selected product lines were met the BEP or not, BEP in units and BEP in Rs. both computation are done. The computation of BEP for selected product lines assist to analyze which product is profitable and which one is poor, or which need to push, or continue, or drop. The following tabular computation shows the BEP of selected product lines.

Table: 4.10**Computation of BEP for Selected Product Lines**

Particulars	2007/08	2008/09	2009/10	2010/11	2011/12
<u>Royal Stage</u>					
A. Specific fixed cost (Rs.)	2,247,980	3,517,900	3,714,460	5,363,240	8,238,578
B. Unit selling price (Rs.)	1,892	1,942	1,993	2,176	1,993
C. Unit variable cost (Rs.)	1,463	1,598	1,756	1,822	1,599
D. CM per Unit (B-C) (Rs.)	429	344	237	354	394
E. CM Ratio (D/B)	0.2267	0.1771	0.1189	0.1627	0.1977
F. BEP in units (A/D)	5,240	10,226	15,673	15,150	20,910
G. BEP in Rs (B X F)	9,914,080	19,859,773	31,235,944	32,967,261	41,673,822
H. Actual sales in Units	8,752	15,074	30,519	64,819	127,450
<u>Ruslan vodka</u>					
A. Specific fixed cost (Rs.)	-	-	-	1,065,758	2,450,842
B. Unit selling price (Rs.)	-	-	-	1,206	1,164
C. Unit variable cost (Rs.)	-	-	-	999	932
D. CM per Unit (B-C) (Rs.)	-	-	-	207	232
E. CM Ratio (D/B)	-	-	-	0.1716	0.1993
F. BEP in units (A/D)	-	-	-	5149	10952
G. BEP in Rs (B X F)	-	-	-	6,209,199	12,748,018
H. Actual sales in Units	-	-	-	7,982	19,560
<u>Blue Diamond</u>					
A. Specific fixed cost (Rs.)	-	-	-	2,883,832	3,896,783

B. Unit selling price (Rs.)	-	-	-	859	653
C. Unit variable cost (Rs.)	-	-	-	712	522
D. CM per Unit (B-C) (Rs.)	-	-	-	147	131
E. CM Ratio (D/B)	-	-	-	0.1711	0.2010
F. BEP in units (A/D)	-	-	-	19,618	29,746
G. BEP in Rs (B X F)	-	-	-	16,851,862	19,424,422
H. Actual sales in Units	-	-	-	20,640	64,525

Sources: Annual Reports of HDL (FY 2007/08 to 2011/12)

The BEP in units of Royal stag was lower than actual sales of all fiscal years. In other word, the actual sales of Royal Stage were crossed the BEP. The actual sales were excess than BEP by 4848 units, 14846 and 2011/12 respectively; So Royal Stag was in profitability condition. The BEP in Rupees was also calculated in the table above.

The contribution margin per units was in fluctuation condition. Although, the contribution margin ratio was lower but actual sales crossed the BEP. The main causes of that were lower the fixed cost. The product was established many years ago, so additional fixed cost was not needed to charge. Another way, the product had produced at huge quantity, where high portions of fixed costs were utilized that directly increase the operating profit.

Similarly, Ruslan Vodka and Blue Diamond were started to produce and distribute from the FY 2010/11. The contribution margin of Ruslan Vodka and Blue Diamond were decreased at the FY 2011/12, but CM ratio was increased. Increasing the CM ration indicates utilization of higher portion of fixed cost. In this way actual sales of Ruslan Vodka and Blue Diamond were also crossed the BEP. The actual sales of Ruslan Vodka was higher than BEP by 2833 units and 8608 units of the FY 2010/11 and 2011/12 respectively. The actual sales of Blue Diamond were also higher than

BEP by 1022 units and 34799 units of the FY2010/11 and 2011/12. So, these two product lines were also in profitability.

The two product lines Ruslan Vodka and Blue Diamond are producing and distributing under franchising agreement with Jawalakhel Distillery Pvt. Ltd. The products were established so many years ago. As a result, extra product launch cost, advertisement and other fixed costs were saved. Causes of lower fixed costs, mass production and monopoly market, the Ruslan Vodka was crossed the BEP. In addition, the Blue Diamond was also crossed the BEP.

In conclusion, the selected production lines was crossed the BEP and all these three were profitable.

BEP in graph for entire company and selected product lines are shows below: (FY 2011/12 only).

Figure 4.1

HDL in Entire Form (By Cost and Revenue Approach)

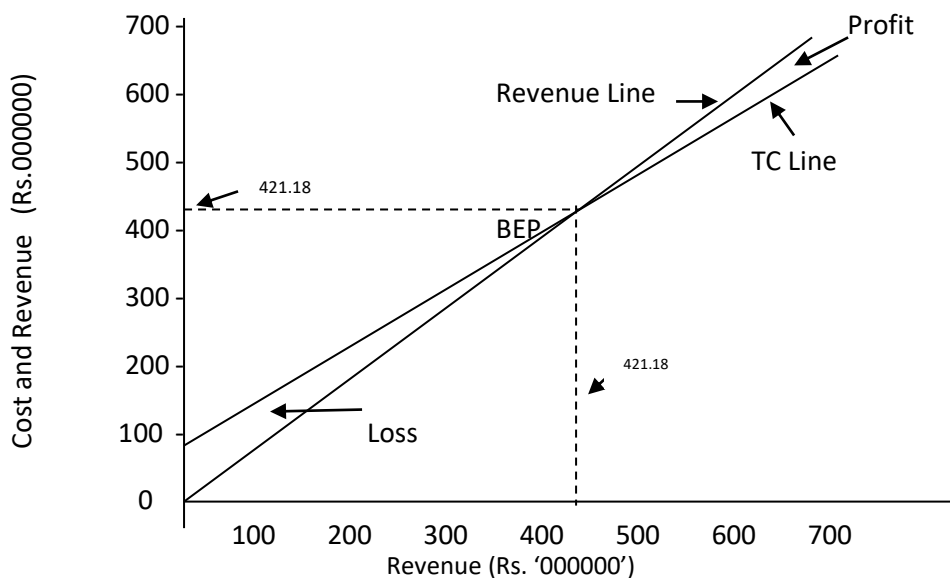


Figure 4.2
HDL in Entire Form (By Contribution Margin Approach)

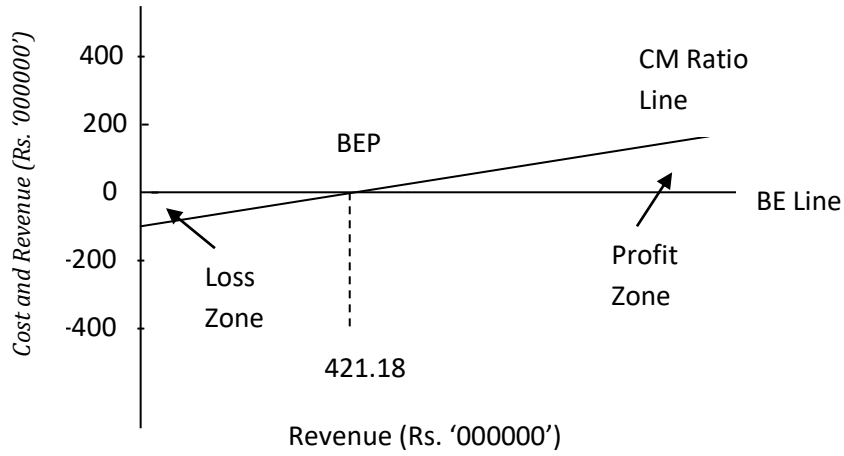


Figure: 4.3
Royal Stage

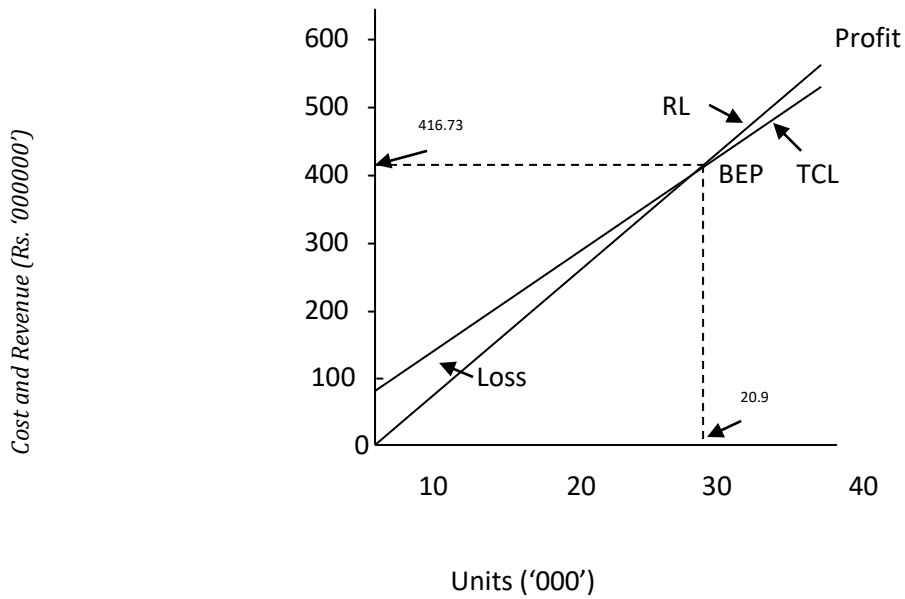


Figure: 4.4
Ruslan Vodka

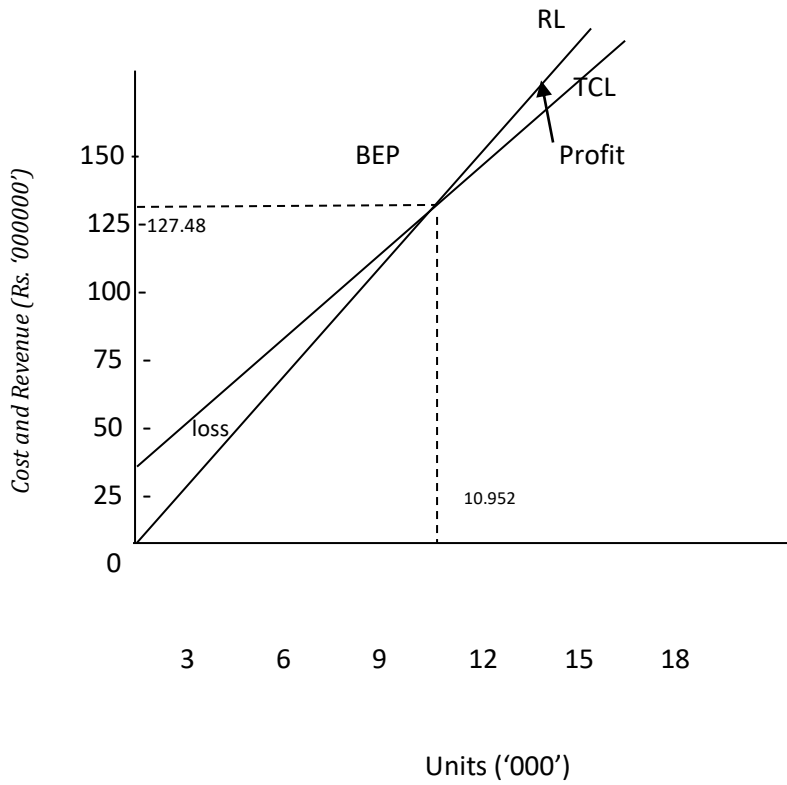
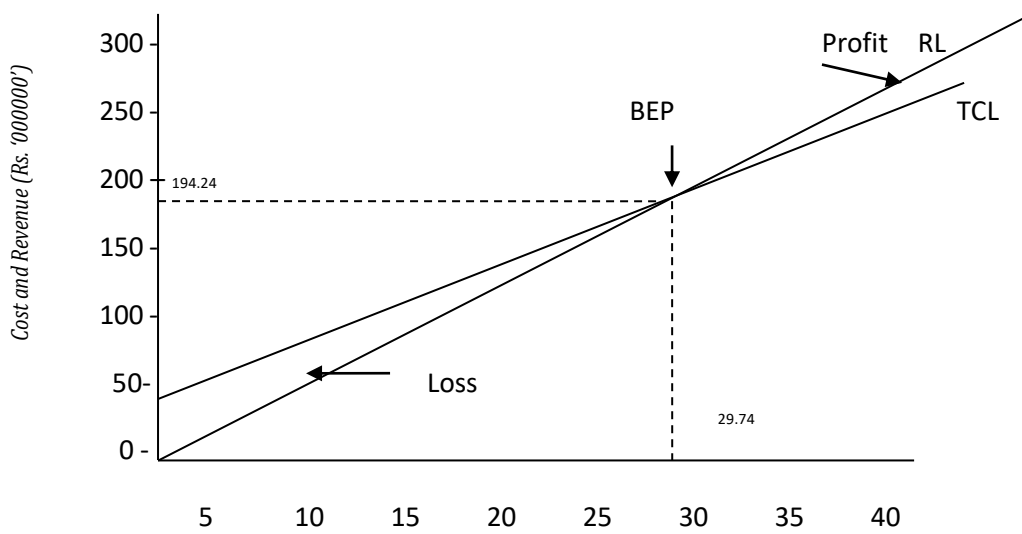


Figure: 4.5
Blue Diamond



4.4.1.2 Computation of BEP as Percentage of Capacity

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

Table: 4.11

Computation of BEP as Percentage of Estimated Sales of HDL

Particulars	2007/08	2008/09	2009/10	2010/11	2011/12
A. BEP in Rs.	128,820,339	184,442,037	618,260,324	461,142,662	421,822,147
B. Estimated sales	139,452,084	193,270,106	6,468,468,000	543,148,000	469,312,000
C. BEP as percentage of estimated sales	92.38%	95.43%	95.58%	84.90%	89.88%

Sources: Annual Reports of HDL (FY 2007/08 to 2011/12)

Similarly, computation of BEP as percentage of capacity had possible to compute regarding selected products lines. The production capacity of HDL is to produce 2,500 cases daily where six categories of products – Ruslan Vodka, Royal Stag, Ultimate, J. Dry Gin, Playboy, and Blue Diamond are produced in the combine form regularly. The total production of six products might be mot more than 2,500 cases daily. Following the computation shows the annual production capacity.

Annual production capacity=daily production capacity* working days in year

$$=2,500 \text{ cases} * 280 \text{ days (assumed)}$$

$$=700,000 \text{ cases.}$$

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

Table: 4.12**Computation of BEP as Percentage of Capacity for Selected Product Lines**

Particulars	2007/08	2008/09	2009/10	2010/11	2011/12
A. Annual production Capacity	700,000	700,000	700,000	700,000	700,000
<u>Royal Stag</u>					
B. BEP in units	5,240	10,226	15,673	15,150	20,910
C. BEP Production capacity (B/A) X 100	0.75%	1.46%	2.24%	2.16%	2.99%
<u>Ruslan Vodka</u>					
D. BEP in units	-	-	-	5,149	10,952
E. BEP Production capacity (D/A) X 100	-	-	-	0.74%	1.56%
<u>Blue Diamond</u>					
F. BEP in units	-	-	-	19,618	29,746
G. BEP Production capacity (F/A) X 100	-	-	-	2.80%	4.25%
H. Total BEP in units (B+D+F)	-	-	-	39,917	61,608
I. Total BEP/Production capacity (H/A) X 100	-	-	-	5.70%	8.80%

Sources: Annual Reports of HDL (FY 2007/08 to 2011/12)

From table 4.14 BEP in cases of Royal Stag was covered only 0.75%, 1.14% and 2.24% of total production capacity at the fiscal year 2007/08, 2008/09 and 2009/10 respectively. The percentage was decreased at the FY 2010/11 rather than the FY 2009/10. But, BEP as percentage of capacity was increased at the FY 2011/12 by nearly 3%.

The Ruslan Vodka's BEP as percentage of capacity was 0.74% and 1.56% of the FY 2010/11 and the FY 2011/12 respectively. Its percentage was also increased at the FY 2011/12.

Similarly, BEP as percentage of capacity of Blue Diamond was 2.80% and 1.25% for the FY 2010/11 and 2011/12 respectively. It's percentage was also increased at the FY

2011/12. The percentage was more than remaining products – Ruslan Vodka and Royal Stag at the FY 2011/12.

The total BEP in cases of selected products lines were 39917 cases and 61608 cases of the FY 2010/11 and the FY 2011/12 respectively. Selected three products lines were utilized the total production capacity by 5.70 and 8.80% at the FY 2010/11 and 2060/61 respectively.

4.4.1.3 Computation of Cash BEP of HDL

The cash BEP in Rupees was computed at entire form of the company. The following table shows the computation of cash BEP in Rs. of HDL for the FY 2007/08 to the FY 2011/12.

Table: 4.13

Computation of Cash BEP of HDL

Particulars	2007/08	2008/09	2009/10	2010/11	2011/12
A. Total Fixed Cost (Rs)	22,892,038	25,883,038	73,435,942	79,034,297	83,258,110
B. Deprecation (Rs)	4,288,931	5,144,651	21,190,039	21,626,888	2,207,247
C. Net F.C. in Rs	18,603,107	20,738,387	52,245,903	57,407,409	61,185,367
D. Total Actual Sales (Rs)	41,307,930	51,274,070	94,865,090	203,585,108	314,578,620
E. Debtors (Rs)	-	-	3,737,110	949,413	1,360,867
F. Cash Sales (Rs)	41,307,960	51,274,070	91,127,980	202,635,695	31,321,775
G. Variable Cost in (Rs)	28,954,371	35,375,849	64,339,630	125,352,387	18,646,478
H. Contribution Margin	12,353,589	15,898,221	26,788,350	77,283,308	12,675,297
I. CM Ratio	0.2991	0.3101	0.2940	0.3814	0.4047
J. Cash BEP in (Rs)	62,196,948	66,876,450	17,707,153	1,505,117,591	15,118,697

Sources: Annual Reports of HDL (FY 2007/08 to 2011/12)

The cash sales of initial two fiscal years were not reached at Cash BEP. But cash sales were crossed the cash BEP at later two fiscal years. The excess amounts were Rs. 52118104 and Rs. 162030788 at the FY 2010/11 and the FY 2011/12. So, out of debtors, the company had at profitability condition at the FY 2010/11 and the FY 2011/12.

4.4.2 Analysis of Contribution Margin

The analysis of contribution margin is divided in to two parts, which are

- Analysis of contribution margin in entire form of HDL, and
- Analysis of contribution margin for selected production lines.

4.4.2.1 Analysis of Contribution Margin in Entire Form of HDL

The contribution margin was increasing trend from the FY 2008/09 to the FY 2011/12 according to previous table no. 4.11. The contribution margin ratio was also increasing trend except the FY 2009/10. Increasing the CM ration was indicated that recovery of higher fixed cost. But these ratios were less than 20%. Since higher fixed costs at increasing trends; and lower CM ratio, the company actual sales were not reached at BEP. For higher CM ratio, sales must be increased and variables cost must be decreased. Other way fixed cost should be constant or controlled, or sales and production should be done in mass.

4.4.2.2 Analysis of Contribution Margin for Selected Production Lines

Accounting to table no. 4.12, the contribution margin of Royal Stage was at fluctuation condition. The CM ratio was increased except the FY 2009/10. The CM ratios were less than 20%, but the CM ratio of the FY 2011/12 was nearly 20%. In spite of lower CM ratio, the actual sales of ROYAL Stage were crossed the BEP causes of lower fixed costs and comparatively maximum production and sales.

Similarly, the contribution margin of Ruslan Vodka was increasing. The CM ratios were also increasing and were nearly 20%. Since, lower fixed costs and market monopoly sales, the product had also crossed the BEP.

Another product, Blue Diamond the contribution margin was decreased, but CM ratio was increased. The CM ratio of the FY 2011/12 was higher than 20%. Since lower fixed costs and mass production and selling, Blue Diamond had also crossed the BEP.

In this way, the CM ratio of selected product lines was nearly 20 %. To increase the CM ratio sales should be high and variables cost should be minimized as far as possible by using proper decision making.

4.4.3 Margin of Safety Analysis

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

Table: 4.14
Computation of MOS of HDL

Particulars	2007/08	2008/09	2009/10	2010/11	2011/12
A. Budgeted sales	139,452,084	193,270,106	646,846,800	543,148,000	46,931,2000
B. BEP in Rs.	128,820,339	184,442,037	618,260,324	461,142,662	421,822,174
C. Margin of Safety (A-B)	10,631,745	8,828,069	28,586,476	82,009,338	47,489,826
D. MOS ratio (C/A) x 100	7.62%	4.57%	4.42%	15.10%	10.12%

Sources: Annual Reports of HDL (FY 2007/08 to 2011/12)

According to table 4.15, MOS ratio was low. The low MOS ratio was the result of low CM ratio. Since, low actual sales comparatively than BEP, there were not raised condition of suffering loss regarding sales fall because the actual sales were increasing annually.

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

Similarly, according to previous Table No. 4.12 shows, the difference amount of actual sales and BEP were highly positive at selected product lines. It was indicated that here were high MOS ratio. As a result, it could be ensure that selected product lines Royal Stage, Ruslan Vodka and Blue Diamond, would be profitable at depression period where demand of the products be lower or falling condition.

4.4.4 Profit-volume Analysis

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

P/V Analysis is also dividing into pars which are:

- P/V Analysis in entire form of the Co.
- P/V Analysis for selected product lines.

4.4.4.1 P/V Analysis in Entire form of the HDL

For profitability of the company, the following computations are done.

Computation of profit at Estimated Sales of the FY 2008/09

Estimated sales for the FY 2008/09 = Rs. 23,221,111,111

F.C will be constant at the FY 2008/09 = Rs. 23,121,212,111

And CM ratio will be 20% or 0.2

Now, profit = (Estimated sales X CM ratio) – FC

$$= (1,241,414,115 \times 0.20) - 251,541,442$$

= Rs. -32,511,411,411

If, estimated or forecasted sales be Rs. 121,121,112,221 CM ratio and fixed cost be same of the FY 2011/12, the profit for the FY 2008/09 be

Profit = (131,215,115 X 0.2245454) – 2,655,546,654

= Rs. 454,545,454

In this way following the table shows the profit and sales at different alternatives for the operating planning for the FY 2008/09 or next year.

Table: 4.15

Computation of Sales and Profit at Different Alternatives

Particular	Alt.-I	Alt.-II	Alt.-III	Alt.-IV
A. Fixed cost Rs.	71,185,367	79,500,000	80,000,000	85,250,000
B. CM ratio	0.20	0.30	0.40	0.25
C. Actual Sales (given) Rs.	314,578,626	425,050,000	400,000,000	450,000,000
D. Profit [(C x B)-A] Rs.	(8,269,642)	48,015,000	80,000,000	27,240,000
E. Profit (Desired) Rs.	15,500,000	60,000,000	75,000,000	50,000,000
F. Req. Sales (A+E)/B Rs.	433,426,835	4,650,000,000	387,500,000	541,000,000
G. Profit (x % of Sales assumed)	10% of C	10% of C	3% of C	2.5% of C
H. Profit Amount	31,457,863	42,505,000	12,000,000	11,250,000
F. Required Sales (A+H)/B Rs.	513,216,148	406,683,333	230,000,000	386,000,000

In this way, adopting P/V analysis or alternative techniques shown on the table above, the management of the company can profit plan by defining costs, volume, unit selling price and cost improvement manufacturing process /technology.

4.4.4.2 P/V Analysis for Selected Product Lines

Although selected product lines viz. Royal stag, Ruslan Vodka and Blue Diamond were at profitable condition. In addition, further profit planning should be done for addition profit achievement or cost control purpose.

Following the table shows computation of desired profit and required sales of selected products at different alternatives.

Table: 4.16
Computation of Profit and Sales for Selected Product
Lines at Different Alternatives

Particular	Alt.-I	Alt.-II	Alt.-III	Alt.-IV
<u>Royal Stag</u>				
A. Specific Fixed cost (Rs.)	5,363,240	8,238,578	7000,000	8,500,000
B. Contribution Margin (assumed)	250	395	-	-
C. CM ratio (assumed)	-	-	0.20	0.30
D. Sales in Rs (assumed)	20,000	30,000	-	-
E. Sales in Rs. (assumed)	-	-	32,500,000	35,000,000
F. Profit [(D x B) – A]	(363,240)	3,611,422	(500,000)	2,000,000
G. Desired profit in Rs. (assumed)	5,000,000	25,000,000	10,500,000	30,000,000
H. Required Sales [A+G]/B	41453 units	84148 units	Rs. 87,500,000	Rs. 128,333,333
<u>Ruslan Vodka</u>				
A. Specific Fixed cost (Rs.)	2,000,000	250,000	150,000	3,000,000
B. Contribution Margin (assumed)	220	250	-	-
C. CM ratio (assumed)	-	-	0.18	0.25
D. Sales in Rs (assumed)	10,000	10,000	-	-
E. Sales in Rs. (assumed)	-	-	9,000,000	9,000,000
F. Profit [(D x B) – A]	200,000	Nil	120,000	(750,000)

G. Desired profit in Rs. (assumed)	5,000,000	6,000,000	12,000,000	10,000,000
H. Required Sales [A+G]/B	31,818 units	34,000 units	Rs. 75,000,000	Rs. 52,000,000
<u>Blue Diamond</u>				
A. Specific Fixed cost (Rs.)	250,000,000	3,000,000	2,800,000	2,750,000
B. Contribution Margin (assumed)	150	200	-	-
C. CM ratio (assumed)	-	-	0.20	0.40
D. Sales in Rs (assumed)	25,000	25,000	-	-
E. Sales in Rs. (assumed)	-	-	20,000,000	10,000,000
F. Profit [(D x B) – A]	1,250,000	2,000,000	1,200,000	1,250,000
G. Desired profit in Rs. (assumed)	2,000,000	3,000,000	2,500,000	1,500,000
H. Required Sales [A+G]/B	30,000	30,000	26,500,000	10,625,000

By adopting above P/V analysis alternatives, management of the company can easily profit plan and estimate target profit plan and estimate target profit at estimated sales. In addition, unit selling price and unit variable cost can set for target profit with adjustable fixed costs.

Apart from above computation, the company's is profit after tax recovered sales volume can be calculated by the following computation.

If desired profit after tax = Rs. 213,145,454

Income Tax rate = 25%

Fixed Cost = Rs. 8,000,000

CM ratio = 0.30

Then,

Required sales for desired profit

$$\begin{aligned}
 &= FC + \frac{DPAT}{\frac{1 - \text{Tax rate}}{CM \text{ Ratio}}} \\
 &= 8,000,000 + \frac{3750000}{\frac{1 - 0.25}{0.30}} \\
 &= \text{Rs. } 5445,454,545
 \end{aligned}$$

4.5 Major Findings of the Study

Findings regarding research are divided in divided in to two parts, which were major findings, and other findings the major findings are concern with objectives of study, and other findings are derived n course of conducting this research and are as such:

Data presentation and analysis was conducted to fulfill the objectives of study, where following points were found as major findings:

- The company had not practiced of classification of costs into fixed costs and variable cost.
- The total fixed cost of the company was increasing annually.
- Advertisement, salary and allowance, communication expenses, insurance premium, depreciation and interest on long term loan were higher portion of total fixed cost and the amount of these items were highly incremental condition .
- The variable costs were also at increasing trends, and vital items were material with direct expenses in purchase, royalty, sales promotion expenses, transportation and insurance expenses, salary and wages, leakage and breakage, complementary expenses, traveling expenses, and water and electricity.
- The unit variable cost of Royal Stag was fluctuating but Ruslan Vodka's and Blue Diamonds unit variable cost was decreased.
- The semi-variable or semi-fixed costs were classified into fixed and variable cost on the basis of estimation or assumption.
- The actual sales of the company had not reached at BEP as a whole.
- The CM ratio in about 20 % which is much low to cover up its fixed cost.
- The actual sales of selected product line:- Royal Stag, Ruslan Vodka and Blue Diamond were more than BEP at all presented fiscal year.
- The CM ratios of selected product lines were also less than nearly 20%.
- Selected product lines were utilizing their specific fixed cost.
- Since lower fixed costs and mass production and sales of selected product lines cause profitability.
- The overall BEP was nearly 85% to 96% of estimated or budgeted sales figure.

- The total BEP of selected product lines were utilized nearly 6% to 9% of total capacity.
- The cash sales of initial three fiscal years were not reached at cash BEP but it was increased from the FY 2010/11. The difference amount was more than Rs. 162 million in the FY 2011/12. The difference amount was more Rs. 162 million at the FY 2011/12.
- The CM ratio regarding cash BEP was 29% to 40%.
- The MOS ratio was more than 10% at last year and 15% at previous year.
- For profit achievement, the company should be adjusted fixed cost, variable cost, sales and profit by P/V Analysis.
- The P/V analysis alternatives might be helpful for profit planning at corresponding sales.
- The actual sales of selected product lines were increasing rapidly.
- Royal stage had constant and flexible both types of inventory of Ruslan Vodka and Blue Diamond had zero inventory.
- The company's production trend is in increasing trend etc.

CHAPTER - V

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

Business organization establishes profit objectives and builds budget plans so that the objective may be realized. In profit planning, management must know the selling price of the unit of product, the variable cost to make and sell it, and the difference between the selling price and the unit variable cost. In short management must know what the contribution margin is for each unit of each product line that is handled. Several factors affected profits. They are selling price, the number of unit sold (quantity), the unit variable costs, the total fixed costs and the combination in which the various product lines are sold. All these factors must be considered in profit planning.

Cost-Volume-Profit Analysis, a most important tool of profit planning means of predicting the effect of changes in cost 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 breaks even. Often Break-even analysis is known as C-V-P Analysis. But Break-even Analysis is a special case of CVP 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 way company may use C-V-P analysis as planning tool when sales volume, unit selling price and variable cost and fixed cost are known, then to find out profit, as target profit at certain sales volume. By using C-V-P analysis tools, the management of the company can control the costs also.

The C-V-P analysis tool was applied in the Himalayan Distillery Ltd to find out whether the tool was practicing or not. Himalayan Distillery Ltd, one of the leading alcoholic manufacturer which is the largest player in Nepalese liquor market and for decades has been synonymous with quality product, had not practicing C-V-P analysis tool to forecast desire profit. Cause of none practicing the C-V-P analysis tools, costs were not segregated as fixed cost and variable cost where there were not proper mechanism to segregate semi-variable cost or semi-fixed costs in to fix and variable costs. To solve the problems regarding C-V-P analysis and not application, some objectives was formulated: cost segregation as fixed and variable, unit variable by adopting suitable mechanism and computation of C-V-P analysis by its extension tools. To fulfill the objectives of the study historical as well as managerial research design was adopted. Primary as well as secondary sources of data were used.

Hence, descriptive and quantitative techniques were used to analysis and interpretation the data. After it, some finding: major and other were also achieved.

5.2 Conclusion

Since, not adopting C-V-P analysis tool for profit planning, before operation of venture, the company had incurring loss up to the FY 2011/12. The actual sales of the FY 2008/09 to the FY 2011/12 were not reached at BEP. The huge amount had invested in to fixed costs. The contribution margin was very low cause of higher unit variable cost. Depreciation and interest on long term loan was increasing rapidly. Other controllable costs were also increasing. Since lower actual sales than BEP or estimated sales, the MOS ratio was satisfactory.

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

Hence, avoiding C-V-P analysis tool and not utilizing full capacity, the company was bearing loss. Promoter and director, and staff of the company were enjoying by achieving allowance and salary respectively. Other part, general share holders were

not achieving dividend and government could not claim for income tax since loss and recovery situation.

5.3 Recommendation

To solve the problems regarding C-V-P analysis the following points are recommended:

- To achieve accurate result, the management should segregate cost in to fixed and variable cost, unit variable cost truly,
 - The company should adopt cost behavior mechanism to segregate costs into fixed and variable,
 - The management of the company should adopt C-V-P analysis tool to achieve at least zero profit,
 - To reach at BEP, the company should increase sales revenue,
 - The company should increase CM ratio to cover higher portion of fixed cost. It be possible either increasing unit selling price or decreasing unit variable cost,
- ❖ The company should control fixed costs by following techniques:
- The management should control unnecessary staff. Only skilled, and qualified manpower, should be involved,
 - The company should install suitable automatic plant which consume low manpower, fuel electricity and heat, and it should be maximum utilized,
 - For short term profit planning, the company should not adopt high capacity machinery,
 - The company should adopt modern filing system,
 - The company should control fixed assets which increases long term loan or hire purchase loan that directly increases interest expenses,
 - The company should control printing, stationery, postage and telecommunication expenses,
 - The office equipment should operate when necessary. Useless operation increases fuel and electricity expenses and repair and maintenance also,

- Useless space of building can provide on hire to others,
 - The company should use job evaluation and merit rating,
 - The directors of the company should act without or with low allowance for certain fiscal years,
 - The company should operate training activities for improvement efficiency,
 - Time to time work study is also needed.
- ❖ The company should also minimize variable cost by adopting following techniques:
- The company should select economic suppliers and transportation to minimize materials cost,
 - The company should install new technology machinery and equipment for economic production process which consume low fuel, electricity, produce low wastage, and provide expected output,
 - The company should manage sound store management,
 - The company should practice standard costing,
 - The company should conduct production planning and control,
 - Value analysis and design improvement should be done,
 - Coding and classification and quality control should be also applied,
 - The company should be control leakage and breakage,
 - The company should adopt PERT to minimize transportation cost,
 - Suitable sales promotion activities should be done to prevent damaging sales,
 - The company should practice profit-volume analysis at different alternatives to acquire desire profit or forecasted required sales for it,
 - The company should consult outsider expert regarding C-V-P analysis if the accounting /financing department have no time to practice profit planning tools,
 - Others:

For overall profitability of the company, the company should analysis other profit planning tool i.e. decision making where department wise, product wise, make or buy,

drop or continue, decision are provided. The company HDL is also multiple products producer and it produces some materials like ENA, denature spirit and GNA for self-consumption. There may be high cost rather than outsider suppliers. So, decision making tools also can adopt for profit planning purpose.

Above recommendations are concerned with short term profit panning (C-V-P Analysis) which might be helpful to plan the profit and future operation for HDL. Hence, the recommendation would be helpful to improve C-V-P relationship of HDL.

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APPENDICES

Appendix-I

Let Actual Sales and Budgeted Sales be Denoted by X and Y Respectively

Computation of Mean and S.D

Fiscal Year	X (‘000000’)	Y (‘000000’)	U = X - A	V = Y - B	UxV	U ²	V ²
2007/08	41.31	139.45	-99.81	-258.95	25220.23	9962.04	67055.10
2008/09	51.27	193.27	-89.85	-205.13	17899.5	8073.02	42078.32
2009/10	94.86	646.85	-46.26	248.45	-11368.5	2139.99	61727.40
2010/11	203.59	543.15	62.47	144.75	9420.859	3902.50	20952.56
2011/12	314.58	469.31	173.46	70.91	12973.04	30088.37	5028.23
N = 5	$\sum X =$ 705.61	$\sum Y =$ 1992.03	$\sum U =$ 5.61	$\sum V =$ 17.03	$\sum UV =$ 54145.12	$\sum U^2 =$ 54165.92	$\sum V^2 =$ 196841.61

Computation of Mean:

For Actual Sales

$$\text{Mean } (\bar{X}) = \frac{\sum x}{N} = \frac{705.61}{5} = 141.12$$

For Budgeted Sales

$$\text{Mean } (\bar{Y}) = \frac{\sum y}{N} = \frac{1992.03}{5} = 398.41$$

Let, A = Assumed Mean for X = 140

B = Assumed Mean for Y = 395

Computation of Standard Deviation (σ)

For Actual Sales

$$(\sigma_x) = \sqrt{\frac{\sum U^2}{N} - \left(\frac{\sum U}{N}\right)^2} = \sqrt{\frac{54172.21}{5} - \left(\frac{5.61}{5}\right)^2} = 104.08$$

For Budgeted sales

$$\begin{aligned}
 (\sigma_y) &= \sqrt{\frac{\sum V^2}{N} - \left(\frac{\sum V}{N}\right)^2} = \sqrt{\frac{196899.62}{5} - \left(\frac{17.03}{5}\right)^2} \\
 &= 198.43
 \end{aligned}$$

Computation of C.V.

For Actual Sales

$$\text{C.V.}_X = \frac{\sigma}{X} = \frac{104.08}{141.12} = 0.7375$$

For Budgeted Sales

$$\text{C.V.}_Y = \frac{\sigma}{Y} = \frac{198.43}{398.41} = 0.4981$$

Computation of Correlation Co-efficient (r)

$$\begin{aligned}
 r &= \frac{N \cdot \sum UV - \sum U \cdot \sum V}{\sqrt{N \cdot \sum U^2 - (\sum U)^2} \sqrt{N \cdot \sum V^2 - (\sum V)^2}} \\
 &= \frac{5 \times (54145.12) - 5.61 \times 17.03}{\sqrt{5 \times 54172.21 - (5.61)^2} \sqrt{5 \times 196899.62 - (17.03)^2}} \\
 &= \frac{2697702.22}{520.41 \times 992.07} = \frac{270630.06}{516283.15} = 0.52
 \end{aligned}$$

$$\begin{aligned}
 \text{Probable Error of } r \text{ (P.E.)} &= 0.6745 \times \frac{1 - r^2}{\sqrt{N}} \\
 &= 0.6745 \times \frac{1 - 0.52^2}{\sqrt{5}} \\
 &= 0.6745 \times \frac{0.7296}{2.236} \\
 &= 0.2201
 \end{aligned}$$

APPENDEX-II

FIGURES

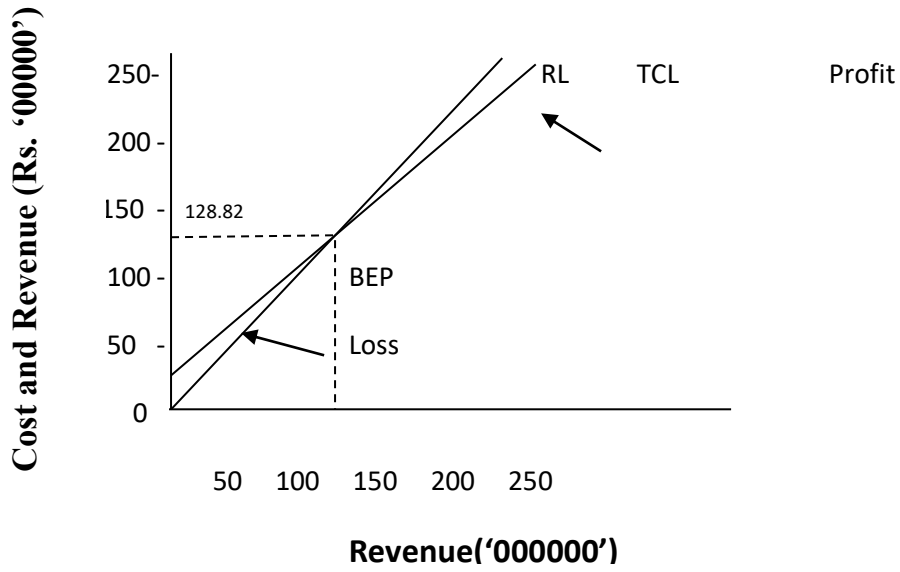


Figure 4.1 BEP in Graph for FY 2007/08

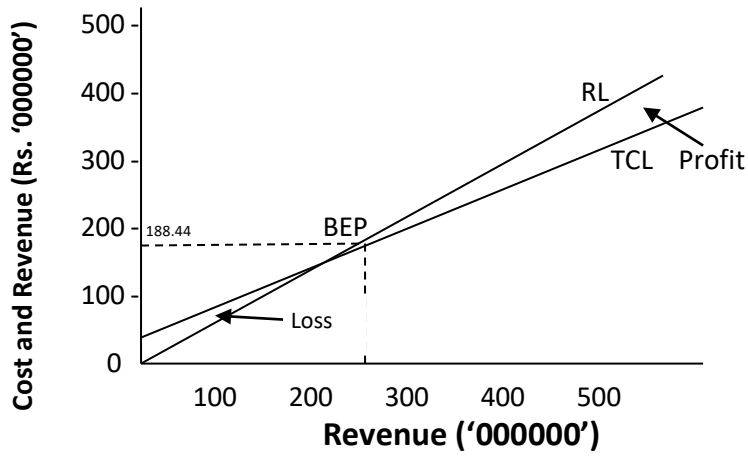


Figure 4.2 BEP in Graph for FY 2008/09

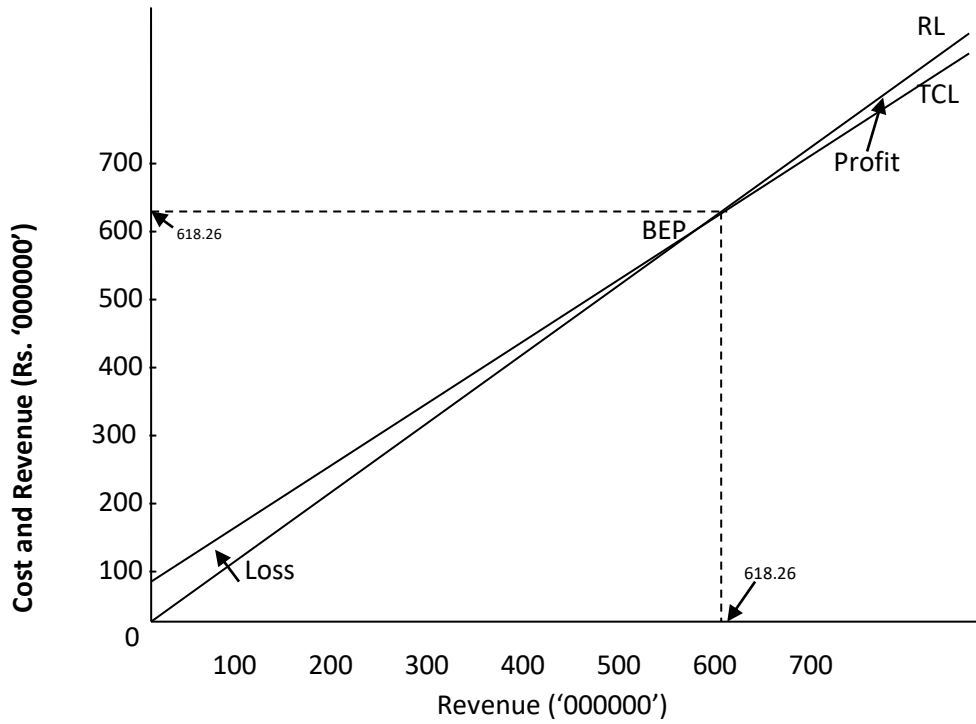
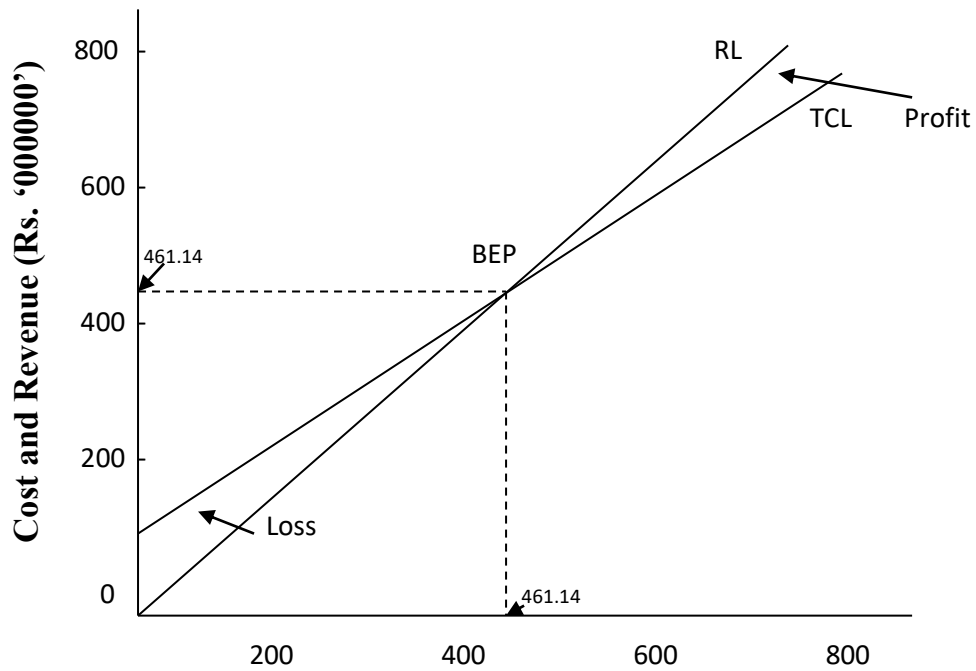


Figure 4.3 BEP Graph for FY 2009/10



Appendix- III
Questionnaires

1. When and where had Himalayan Distillery ltd. Established?

- a. B.S.
- b. Zone
- c. Dist.
- d. VDC/Municipality

2. Where does the registered and contact office have located?

- a. Zone,
- b. Dist.,
- c. VDC/Municipality

3. What were the main objectives to establish this company?

- a.
- b.
- c.
- d.

4. What are the transaction of the company to achieve objective objectives?

- a.
- b.
- c.
- d.

5. What are the product of company?

- a.
- b.
- c.
- d.

- e.
- f.
- g.
- h.

6. What kind of raw materials are being used by HDL?

- a.
- b.
- c.
- d.
- e.
- f.
- g.
- h.
- i.
- j.

7. Who are the supplier of Raw materials?

- a. Indigenous
- b. Foreign

8. How the finished products are produced (i.e. production process)?

.....

9. What type of Plant and Machinery have been installed?

- a. Automatic
- b. Semi-automatic

10. How many employee are engaged in this company?

.....

11. What are the major market of the company's product?

- a. All kind of Hotels
- b. Restaurant and Bar
- c. Departmental Stores
- d. Retail Outlets

12. What are the channel of distribution have adopted?

.....
.....

13. What are the organizational structure of the company?

.....
.....

14. What are the process of managerial decision making?

- a. top to bottom
- b. bottom to top
- c. participating all staffs

15. Is the company practicing CVP Analysis tools to forecast or evaluate cost, volume and profit?

- a. Yes
- b. No

16. How the specific fixed costs and variable costs are segregated for specific product lines and what are their amounts?

.....
.....

17. What are the major difficulties faced when prepared C-V-P Analysis?

- a.

- b.
- c.
- b.

18. Out of BEP, does the company practice P/V Analysis?

- a. Yes
- b. No

19. What are the major difficulties regarding sales expansion?

- a.
- b.
- c.
- d.

20. What are the largest top three product of the company?

- a.
- b.
- c.

21. Since, Nepal got the membership of WTO, how do you assess export potentials?

.....
.....

22. Is the government supporting any to liquor industries?

.....
.....

23. What are the problems faced by the liquor Industry?

.....
.....

24. Does the liquor business be satisfactory in Nepalese Context?

.....
.....