COST, VOLUME AND PROFIT ANALYSIS OF NEPAL AUSHADHI LIMITED

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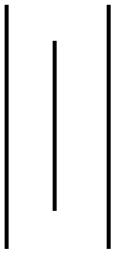

In partial fulfilment of the requirement for the degree of

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RECOMMENDATION

This is to certify that the Thesis

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COST VOLUME AND PROFIT ANALYSIS OF NEPAL AUSHADHI LIMITED

has been prepared as approved by this department in the prescribed format of the faculty of management. This thesis is forwarded for examination.

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VIVA-VOCE SHEET

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And found the thesis to be the original work of the student and written according to the prescribed format. We recommended the thesis to be accepted as partial fulfilment of the requirement for

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DECLARATION

I hereby declare that the work reported in this thesis entitled **"Cost Volume and Profit Analysis of Npeal Aushadhi Limited"** submitted to office of the Dean, faculty of management, Tribhuvan University is my original work done in the form of partial fulfilment of the requirement for the Master Degree in Business Studies (MBS) under the supervision of **Joginder Goet** of Shankar Dev Campus.

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The purpose of preparing this thesis is to fulfil the requirement for the degree of **Master of Business Studies (MBS).** The main objective of this study is to conduct research on the Cost Volume and Profit Analysis of **Nepal Aushadhi Limited**. All efforts have been made to make this thesis real and have tried to show this thesis easy and systematic as far as possible.

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ABBREVIATIONS

A/C	Account
B.S.	Bikram Sambat
BEP	Break Even Point
CM	Contribution Margin
CMPU	Contribution Margin per Unit
CVP	Cost Volume and Profit
CVPA	Cost Volume and Profit Analysis
DOL	Degree of Operating Leverage
FY	Fiscal Year
FC	Fixed Cost
GDP	Gross Domestic Product
Govt.	Government
i.e.	That is
MOS	Margin of Safety
NAL	Nepal Aushadhi Limited
No.	Number
P/L	Profit and Loss
P/V	Profit Volume Ratio
PPC	Profit Planning and Control
Q	Quantity
r	correlation
RDL	Royal Drugs Limited
RDRL	Royal Drugs Research Laboratory
Rs	Rupees
S.D	Standard Deviation
S.N.	Serial Number
SDC	Shankar Dev Campus
SPPU	Selling Price per Unit
SR	Sales Revenue
SVC	Semi Variable Cost
SWOT	Strength, weakness, Opportunity and Threats

T,U.	Tribhuvan University
TFC	Total Fixed Cost
TVC	Total Variable Cost
VC	Variable Cost
VCPU	Variable Cost per Unit

CHAPTER-I
INTRODUCTION

1.1 Background of the Study

Nepal is a small, Himalayan and landlocked country situated between two large countries China and India. It has a total area of 147181sq. extended from east to west with a length of about 885 km and width of 193 km from north to south. Total area of Nepal is about 0.3% of Asia and 0.03% of the whole world. Nepal has per capita income of only $473.Agriculture sector contributes about 40% GDP. It is also main source of employment and national income too. About three-eight percent of the population lives below absolute poverty line. Since per capita income, saving, capital formation is very low and the living standard if the people are in decreasing trend. The economy growth rate is only 36.9 % per annum.

Industrialization is the major instruction of progress. Modernization and social development in the context of Nepal, industries have not developed to the extent of expectation in Nepal. The industrial development process of Nepal started after establishment of Biratnagar Jute Mill and Udyog parishad in 1936. People hesitate to invest due to the lack of appropriate knowledge and sufficient investing capital. Unstable political environment is another reason for it. A state should effort to encourage people for investment and new investment opportunities with the minimum required facilities. For a successful investment, first one knows his/her own financial condition. It is necessary to look in to the factors, which influence the development of industries and to assess those factors.

After re-instate of democracy in 2046B.S. some important changes took place in the field of industry. Some industries were established from the private sector thereafter. The role which manufacturing industry has been playing in the national economy is marginal but gradually, it is in increasing trend and market is also being large due to the increment of consumer needs and desires.

Establishing and running of enterprise are a risky task and it needs huge knowledge of management and profit planning. Profit planning plays a vital role in the development of an industry. Therefore understanding of profit planning is a very essential to conduct a business;

Profit and planning. Profit is the primary objective of business. It is necessary for survival and growth of every business entity. Profit does not just happen, they are managed. Profit is the primary measurement of business success in any economy; if firm is not able to earn profit then it fails to hold the capital for long period. When business firm cannot hold capital, it can't secure and retain other sources, such as manpower, materials, and machine etc. In other words the more profitable firm are more attractive to the holders of the available capital.

There are several different interpretations of the term 'profit'. According to an economist, profit is the reward for entrepreneurship for risk taking. Leader of labour might say that profit is a measure of how efficiently labour has produced and that it provides a base for negotiation a wage increase. An investor will view it as a gauge of the return on his/her money. An internal revenue agent might regard it as a base for determining income taxes. An accountant will explain it simply as the excess of firm's revenue over expenditure of producing revenue in given fiscal year.

Similarly planning is the first essence of management and all other functions are performed within the framework in the planning. Planning means deciding in advance what is to be done in future? Planning starts from forecasting and predetermination of future event. Planning is the whole concept of any business organization. No firm can achieve its predetermined goal and objectives in the absence of proper plan. Hence, it is life blood of any organization which makes efficiently run towards the competitive environment. It is a method of thinking out acts beforehand. Planning is the foundation of perfect realization and a plan is a projected course of action. Management is the scientific process of planning, organizing, staffing, directing, co-ordination, recording, reporting, budgeting, decision making and controlling. Now a day's planning is taken as an important managerial technique of decision making. It is also regarded as a way of management and is given the name profit planning programmes. Profit planning is a part of overall planning process of an organization. Cost volume profit analysis serves as a powerful tool in the hands of management for profit planning.

The systemic relationship between cost volume and profit is shown by cost volume and profit analysis. it is an analytical tool for analysing the relationship among cost, profit and sales or production volume. CVP analysis can be used in profit planning because it provides the

information about the behaviour and the relation of cost, volume and profit. It also provides the information about the sensitivity of profit due to variation in projected amount of output of sales. CVP is an important tool to look in to effects on profit on output or sales and to take appropriate decision. CVP analysis is great helpful in managerial decision making especially in cost control and profit planning. Profit planning is the fundamental aspect of the overall management function. Therefore CVP is also known as complimentary on PPC.

Profit planning can be done only when the management has the information about the cost and selling price of the product. Profit planning and control have wide application. It can be applied in both profit making and non profit making organizations, and also in both manufacturing and non manufacturing business.

In Nepalese context, manufacturing organizations are facing so many problems. There are need for a large number of good managers and managerial decisions in a developing country like Nepal. Most of organizations are in loss. Profit earning is necessary to serve organization for this application, profit planning tools are necessary.

CVP analysis is a systemic method of examining the relationship between changes in activity (i.e. output) and changes in total sales revenue, expenses and net profit. As a model of this relationship CVP analysis simplifies the real world conditions that a firm will face. CVP analysis is a management accounting tool to show the relationship between the elements of profit planning. Profit planning is the function of the selling price of product, demands, variable cost, fixed cost, taxes etc. The whole picture of profit planning is associated CVP interrelationships. A popular technique to study CVP relationship is BEP analysis. BEP analysis is concerned with the study of revenues and costs in relation to sales at where the firm's revenues and total cost will be exactly equal or the net income will be zero. It is a "no profit no gain" situation. This point is a corner-stone of profit planning.

1.2. Introduction of Nepal Aushadhi Limited

The gate for modern medicine was open only after establishment of British Residency in Kathmandu in 1916 with an establishment of a small hospital for the residency staff. The

hospital also provided services to local people. The concept of producing modern medicine in Nepal developed only after his majesty's government drafted a master plan for the utilization of medical plants in 1955 and implemented in 1961. As per the plan Royal Drugs Research Laboratory (RDRL) was established in 1964. This along with various activities started manufacturing of modern pharmaceutical drugs from 1968. The manufacturing unit of RDRL was converted into Royal Drugs Limited (RDL) in 1972 for commercial production.

Royal Drugs Limited (RDL), an enterprise of His Majesty's Government (at present Nepal Government) of Nepal was established in 2029 B.S. in the public sector as an undertaking of HMG (Nepal Government) of Nepal. The company had its beginning in plans which formulated a program for the production and marketing of some medicine by RDRL within the department of medicinal plants, ministry of forest Nepal. Later a separate production unit under the same laboratory was created with the help of technical assistance of the British Government in the form of experience and equipment, and become a milestone in the pharmaceuticals industry of the nation.

It runs for the four years as trial period in manufacturing and marketing of pharmaceuticals. After successful trail period of four years, the production unit was converted into a company act. To begin with, the company began its activities from a small building situated at Thapathali. Now the company is operating at Babarmahal, where it has 43 ropanies of land, which includes 9000 square feet of main factory building and other smaller buildings.
The company initiates its activities with an authorized capital Rs 150,000,0000and paid up capital Rs 6.342.000. Currently the company's authorized capital is of Rs 150,000,000 and paid up capital of Rs 75,499,000. Out of this capital, Nepal Industrial Development Corporation holds shares worth Rs 700,000 and HMG (Nepal Government) owns rest of the shares. The company has also invested shares worth Rs 1,302,000 in Herbs production and processing Company Limited. The company is being assisted by international organization such as; UNIDO, UNICEF, ZAIKA, WHO, UNDP in terms of plants and machines. Currently the company is facing with several drugs manufacturing companies, particularly Indian pharmaceutical companies.

It is noted that the name of RDL has changed due to the development of new political situation of our country, after the JANA- ANDOLAN/2062-2063. It is renamed by Nepal Aushadhi limited.

1.3 productions on NAL

At present NAL is producing various types of drugs. Modern system is uses in quality control. RDL has produced different forms of medicines. This is used by Nepalese people as well as by foreign organizations. NAL is serving the government not only through the supply or drugs but also by contributing to public revenue.

The following forms of medicines are produced by NAL:

- Tablet
- Capsule
- Powder and suspension
- I.V. and E.N.T.
- Ointment
- Jeevan jal

1.4 Functions of the company

NAL operates the following necessary activities to achieve mentioned objectives:

- To import purchase and maintain necessary raw materials, machines and tools of good quality.
- To sell the products in the different part of the country.
- To manage trainings to its staffs for their development and improvement and also to reduce the gap of non-availability of specialist when required by company: through development of manpower, technicians and other personnel.
- To manage technical and non technical staffs from inside and outside the country.
- To receive and use all movable and non-movable properties of the company.

1.5 Statement of the problems

NAL is the first medicine industry of government sector in the country producing different king of medicines. A huge amount of money is invested for this industry. But the financial

performance of the industry is not satisfactory and it is suffering from a heavy loss every year and accumulated loss of Rs 202,851,921 million to the date up to 2067(NAL balance report).

How the business is being operating largely depends on how the business operation is planned. Poor performance is the outcome of poor planning, controlling and decision making. The key motive of every business enterprise is to make and maximize profit. Profit just doesn't happen by chance, it is to be managed. CVP analysis is a supplementary tool of planning of profit. CVP is immensely helpful for developing alternative strategies in sales planning and cost estimation.

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

The NAL is one of the biggest industries in the country. Being a large scale industry large amount is invested from various sectors: therefore, the successful operation of the industry is very much important.

Nepalese forms are still being run with primitive management. The lack of modern management culture, there is a lot of difference between the theory and practice in the business form. In Nepal, the practice of using CVP analysis tools for different management decisions is rare.
CVP analysis provides the techniques of profit planning framework based on published annual report. Performance of Nepalese industry is not satisfactory. CVP analysis tools facilities to carry planning, decision making and controlling functions. The following research question will help to study the application of CVP analysis to make NAL successfully:

- Is NAL practicing CVP analysis for its profit planning?
- What will be the relationship between the cost, volume and profit?
- Why are the NAL suffering from the loss?
- Which part (i.e. CM, BEP, and MOS) of CVP analysis is mostly practiced and which are not practiced till now?

- What are the major difficulties in application of CVP analysis?
- What sales volume is needed to achieve BE?
- What should be the sales volume to earn a desired profit?
- What will be the profit or loss to the specified level of sales?

1.6 Objectives of the study

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

- To analyse different component of costs as per cost behaviour.
- To study the application of CVP analysis in NAL.
- To evaluate the sensitivity of profitability.
- To analyse the CVP and its impact in profitability of NAL.
- To study the profitability and financial position of NAL.

1.7 Significance of the study

The present research work is the study of CVP analysis in NAL. This study will be significance in the following ways:-

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

1.8 Limitation of the study

Every research has some limitations. Basically, not availability of required data and information would be the major limitation of the study. The study id only confined only to CVP analysis as a tool of profit planning and control. Following factor will limit the study:-

The study will cover the data of five fiscal years of NAL.
The study will be base on the secondary data, if there is necessary of primary data researcher will collect and include that also.
The study only focuses on the sensitivity analysis of cost.

1.9 Organization of study

The whole study is divided in to the following five chapters:-

Chapter –I introduction

Chapter -ii review of literature

Chapter -iii research methodology

Chapter –IV data presentation and analysis

Chapter –v summary conclusion and recommendation

The first chapter deal with background, a brief overview of NAL, statement of problems, objective of study, significance of study, limitation of study and organization of the study.

The second chapter dealt with conceptual framework including the fundamental concept of profit planning and control and the tools of profit planning and control. It also dealt with the various theoretical aspect of the CVP analysis and includes the brief review of previous research work.

The third chapter dealt with the research methodology followed to achieve the purpose of the study. It included research design, the period covered, nature and source of data, tools used, research variables etc.

The fourth chapter dealt with the data collected through the various sources were presented. It mainly consist the analysis of sales plan, variable cost plan, fixed cost plan and other relevant factors analysed from profit and loss account and balance sheet. Apart from this, sensitivity analysis and cost volume profit analysis with product mix were analyzed and findings were drawn.

The fifth chapter, the last chapter dealt with the summary, conclusion and recommendation.

CHAPTER – II
REVIEW OF LITERATURE

2.1 Conceptual framework

Profit planning and control is viewed as a process designed to help management effectively to perform significant phases of planning and control functions. The PPC model involves (1) Development and application of broad and long range objective of the enterprise (2) speciation of enterprise goals (3) development of a strategic long range profit plan in broad terms (4) specification of tactical short range profit plan detailed by assigned responsibilities (5) establishment of a system of periodic performance report detailed by assigned responsibilities and (6) development of follow up procedures (welsch, et al., 2000:30).

PPC is a broad term rather than traditional view of budgeting because it (a) requires major planning decision by management (b) entails pervasive management control activities (c) recognizes many of the critical behavioural implications throughout the organization. Profit planning and control is one of the most important approaches that have been developed to facilitate effective performance of the management process. The concepts and techniques of profit planning and control have wide application in individual business enterprises, governmental unit, charitable organization and virtually all group endeavours (Welsch, et al., 2000:31).

In modern day big business, it is virtually impossible for the top manager to have firsthand knowledge of all the relevant factors operating throughout a business. Nor can a single lower level manager be expected to have the range of knowledge, experience and competence to make all the decisions. The quality of the judgement of the total management effort will continue to distinguish the better managed and more successful companies. It is unlikely that clerical techniques, mathematical models simulations will substitute in major respects for managerial judgement in complex endeavours. These important tools can also be used to increase significantly the effectiveness of a management and to place managerial judgement on a more objective and informed foundation (Welsch, et al., 2000:31).

2.1.1 Fundamental concepts of PPC:

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

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

Profit planning is, therefore a fundamental part of overall management function and is vital part of the total budgeting process. The management determines the profit goals prepare budgets that will led them to realization of these goals. Profit planning can be done only when the management has the information about the cost of product both fix and variable and selling price at which it will be position to sell the product (Maheshwori, 2000:171).

Profit planning is planning for future operation in such a way as to maximize a profit or maintain a specified level of profit. A comprehensive profit planning is also known as broad budgeting schedule development of objectives, specification of short term goals, development of strategies and tactical profit plans. In other words, profit planning is a detail expression of the expected result from the planed decisions. Profit planning is an important approach developed to facilitate for effective performance of management process like as planning, organizing, staffing, controlling etc. Therefore, profit planning carry out the responsibility of forward thinking about the future operation of the organization. It is the precise measurement of operation in terms of quantity (i.e. the maters of profit planning are expressed in numerical value).

Profit planning is a comprehensive statement of intentioned expressed in financial terms for both short term and long term operation of the firm. It is a plan for the accomplishment of

organizational expectations. It is a base for measuring the variation between planed and actual performance. The success of each organization will be determined by reaching or exceeding those targeted plans.

Profit planning is one of the comprehensive approaches that have been developed to facilitate effective performance of management process. It is a systematic and formalized approach for performing significant phases of management planning and control functions. It includes following activities: -

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

The main aim of profit planning is to forecast about future. So it plays the vital role in the development of organization. It is the most important tool in the field of managerial decision making in enterprises. Main proposes of profit planning and control is as follows: (welsch, et al., 1992:30).

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

Profit planning is a part of an overall planning process and is an area in which finance function play a major roles. The success of each enterprise in realizing its optimum profit each year will be determined by the extent to which it establishes, develops, co-ordinate to meet those objectives and exercise control of all facts of its activities so as to have actual results reach or exceed those planned. This entire process constitute the further stated that PPC has the ultimate objectives of attending the optimum profits. (Welsch, et al., 1998:388)

Neil W. Cambrian describes in research report that “Profit Planning and Control” refers to the organizations techniques and procedures where by long and short range plans are formulated, considered and approved. A profit plan is an advance decision of expected decision based on the most efficient operating standards in effect or in prospect at the time is established against which actual accomplishment is regularly compared. In short, it provides a tool for more effective supervision of individual operations and practical administration of the business as a whole.

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

Niemeyer, Jack D and Stimidgall, Rayrall defines the topic profit plan “as an estimation and predetermination of revenue and expenses that estimates how much income will be generated and how it should be spent in order to meet investment and profit requirement”.

A PPC programme helps the management to perform its planning functions by developing a strategic (long run) and tactical (short run) profit plan. Both of these plans include monetary expectation of assets, liabilities profit and return on investment. The foundation for the strategic profit plan includes the objectives, broad goals, planning premises and strategies of the enterprise as developed by top management. The tactical profit plan can actually viewed as the first year of the strategic plan. It is detailed plan for the enterprises and for each of its responsibility centres. PPC programme also help management to perform and control functions by providing realistic goals and standard that are then compared with actual result to measure performance. Under PPC this performance measurement extends from the top to the lowest organizational level in the enterprise.

An outline of fundamental concept of profit planning and control:

- A managerial process that includes planning, organizing, staffing, leading and controlling.

- A managerial commitment to effective management participation by all levels in the entity.
- An organization structure that clearly specifies assignment of management authority and responsibility at all organization levels.
- A management planning process.
- A management control process.
- A continuous and consistent coordination of all the management functions.
- Continuous feed forward, feedback, follow-up and re-planning through defined communication channels.
- A strategic profit plan.
- A tactical profit plan.
- A responsibility accounting system.
- A behavioural management programme.

2.1.2. CVP Analysis as a tool of profit planning and budgeting

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

CVP analysis is an important tools of profit planning because it provides the information about the behaviour cost in relation to volume, production of sales where the business will Break-Even, sensitivity of profit due to variation of output, amount of profit for a projected sales volume and quantity of production and sales for the target profit level etc.
Therefore, CVP analysis is defined as a managerial tool showing the relationship between various ingredients of profit planning.
CVP analysis is an important media through which the management can have an insight into effects on profit because of variations in cost and sales and take appropriate decisions. Profit planning is the fundamental part of the overall management functions. Profit planning can be done only when the management has the information about the cost and selling price of the product.

It consists of three main budgets which are:

- **Operating budget**

The operating budgets cover revenue and expenses. In other words, operating budgets relates to the physical activities or operations of a firm such as sales, production, purchase materials, labour and other different expenses budgets. Operating budget has the following terms:

- **Sales budget**

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

A sales budget is the detail schedule of expected sales for coming period, which is usually expressed in both amount and units. Once the sales budget has been set a decision can be made on the level of production that will be needed to sales and the production budget can be set well. The sales budget is constructed by multiplying the expected sales in units by the sales price (garrison, 1985:173).

Sales budget is prepared from sales forecast where as a sales forecast encompasses potential sales for the entire industry as well as potential sales for the firm preparing the forecast (welsch, et al; 1995:173).It should be broken down not only in time periods but also into geographical or responsibility areas by the use of sales quotas.

- **Production budget**

The second step of PPC is the production budget. The production budget is an estimate of the quantity of goods to be manufacture during the budgeted period. After the sales budget has been prepared, the production requirement of the forthcoming budget period can be determined and organized in the form of the production budget. Sufficient goods will have to be available to meet sales need and provide for desired ending inventory. A portion of these will already exists in the form of beginning inventory. The remainder will have to be produced. Thus, the production budget can be determined by adding budgeted sales units to desired ending inventory and deducting beginning inventory from the total (Horngren, et al., 1999:182).

- **Purchase budget**

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

- **Direct material budget**

After the production needs have been computed, a direct material budget should prepare to show the material that will be require on the production process. Sufficient raw material will have to available to meet production budget for the budgeted period. A Part of this raw material required will already exist in the form of beginning raw material inventory. The reminder will have to purchase from supplier.

- **Direct labour budget**

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

- **Manufacturing overhead budget**

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

- **Selling and administrative overhead budget**

The selling and administrative overhead budget contains a listing of anticipated expenses for the budgeted period that will be incurred in areas other than manufacturing. The budget will be made up of many smaller individual budget submitted by various person having

responsibility for cost control in selling and administrative matters. If the number of expenses item is very large separate budget is needed for the selling and administrative functions.

- **Financial budgets**

Financial budgets are concerned with expected cash receipt or disbursements, financial position and result of operation. The components of financial budgets are:

- **Budgeted income statement**

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

- **Cash budget**

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

- **Budgeted balance sheet**

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

- **Appropriation budget**

The Appropriation budget covers all type of expenditure on advertising and research sector. Apart from the above budget PPC also has relationship with following additional budgets such as flexible budget: Capital expenditure budget, CVP analysis, and complexion of profit planning and performance reports.

- **Flexible budget**

Flexible expense budget relate to expenses or cost. They are also called dynamic, activity or output adjusted expenses budgets. The concept of flexible expense budget is that all expenses are incurred because of passage of time, output activity or combination of time and activity; therefore, it is complimentary to tactical profit plan, which helps to provide and expenses in periodic and performance report. Expenses or cost most be identify into fixed and variable expenses or costs in flexible budget.

- **Capital expenditure budget**

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

- **Zero base budgeting**

Zero base budgeting is the method of budgeting in which managers are required to start at zero budget levels every year and to justify all cost as if the programme involved were being initiated for the first time. No costs are viewed as being ongoing in nature; the manager must start at the ground level each year and present justification for all costs in the purposed budget regardless of the type of cost involved. Zero base budgeting differ from traditional budgeting in which budgets are generally initiated on an incremental basis, the managers starts with last year's budget and simply add to it according to anticipated needs. The

manager doesn't have to start at the ground each year and justify ongoing for existing programme.

- **Activity based costing**

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

- **Completion of profit plan**

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

- **Performance report**

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

2.1.3 Concept of CVP analysis

CVP analysis is the process of examining the relationship among revenues, costs and profit for a relevant range of activity and for a particular period. It is one of the most important and powerful tools that manager have at their command in short term planning. It helps managers

to understand the interrelationship between cost, volume and profit in an organization by focusing interaction between the following elements:

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

CVP analysis seeks to estimate the profit or loss at different activity level. The aim of CVP analysis is to have a fair estimate of:

- Total cost
- Total revenue, and
- Profit at various sales volume

CVP analysis provides only an overview of the profit planning process. It provides management with a comprehensive overview of the effects on revenue and cost of all kind of short run financial changes. It is related to profit, sales volume and cost (Munakarmi, 2002:123).

2.1.4 Cost classification

Classification of an item is to define it as a certain kind. In other words, classification means to put an item or thing under a certain category. Classification of cost depends on the purpose, methods, nature and so on. Same elements of cost can be varied in category depending upon the purpose. Manager if profit planning department should have an in-depth knowledge regarding the nature of costs that on which category does it lie. Otherwise, planning and control of cost is impossible.

2.1.4.1 Classification According to Element of Cost

a) Direct cost

All those expenses which can be directly traced or identified with each unit of the product are direct costs. Key elements of direct cost are as follows:

- **Direct material**

The cost of material, which can be directly and conveniently identifiable or traceable to each unit of product, is defined as direct material. Direct material also known as raw material is the main ingredient of the finished product. A tangible product is almost impossible without the direct material.

- **Direct labour**

The cost of labour that can be directly traced to each unit of product without any apportion basis is known as direct labour. Direct labour is therefore, defined as the employment of those workers who are physically involved in the production of the output.

- **Direct expenses**

Any expenses other than the direct material and direct labour cost, which are directly incurred on a particular product, are called direct expenses.

b) Indirect cost (overhead cost)

All those expenses which can't be directly traced or identified with each unit of product are overhead cost. In fact, overhead costs are indirect cost, which cannot be directly charged to a particular unit a product without allocation based on some appropriate methods. All expenses other than prime cost are overhead of indirect cost.

- **Indirect material**

Items of indirect materials cannot be identified with any one product. Indirect materials are used for the benefits of all products rather than for any one particular product.

- **Indirect labour**

The remuneration of all employees who do not work on the product itself but who assist on the manufacturing operation are classified as the part of indirect labour cost.

- **Indirect expenses**

Any expenses other then mentioned above are classified as indirect expenses. One has to apportion indirect expenses over the products on appropriate basis.

2.1.4.2 Classification According to Function of Cost

Any organization is consisted with various functions. All of these functions incur costs. For a manufacturing business enterprise, costs can be assigning to the following:

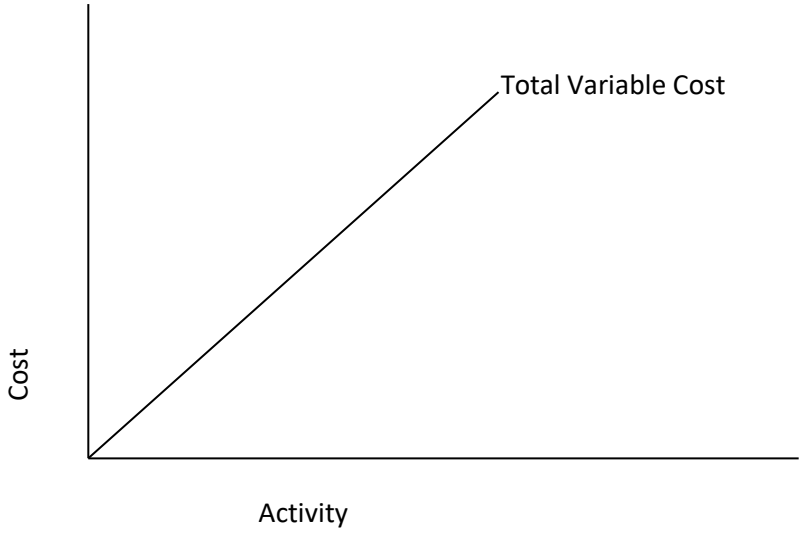
- Manufacturing cost: manufacturing cost are all production cost incurred to manufacture the products and to bring them to saleable condition, including the direct material, direct labour and factory overheads. Manufacturing overhead is knows as factory expenses, factory overhead or factory burden.
- Administrative cost: expenses relating to the overall management of the enterprise are administrative cost.
- Marketing or selling cost: expenses needed for sales promotion, actual sales activities and post sales services are included in marketing or selling cost. These would include all cost necessary to receive customer order and get the finished product or service into the hand of the customers.

2.1.4.3 Classification According to Behaviour of Cost

Management of any organization wants to know how costs will be affected by changes in the organizational activity. There exist relationship between cost and activity is known as cost behaviour. That affects the management functions of the planning, controlling and decision making? Cost behaviour pattern helps to predict the cost of different level of activities

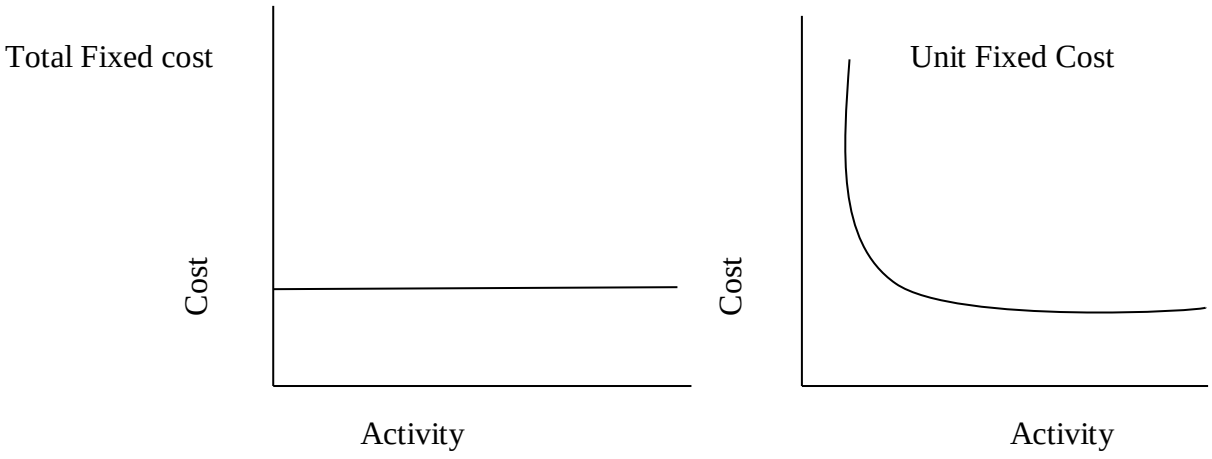
1) **Variable cost**

Variable cost varies in direct proportion to change in the activity level. If the activity level increases by 50 percent, the amounts of variable cost also increase by 50 percent as well. Variable costs in total increase or decrease when the activity levels increase or decrease, But it remains constant of expressed in per unit. The idea that a variable cost per unit is constant but varies in total with the activity level crucial to understanding of cost behaviour patterns.



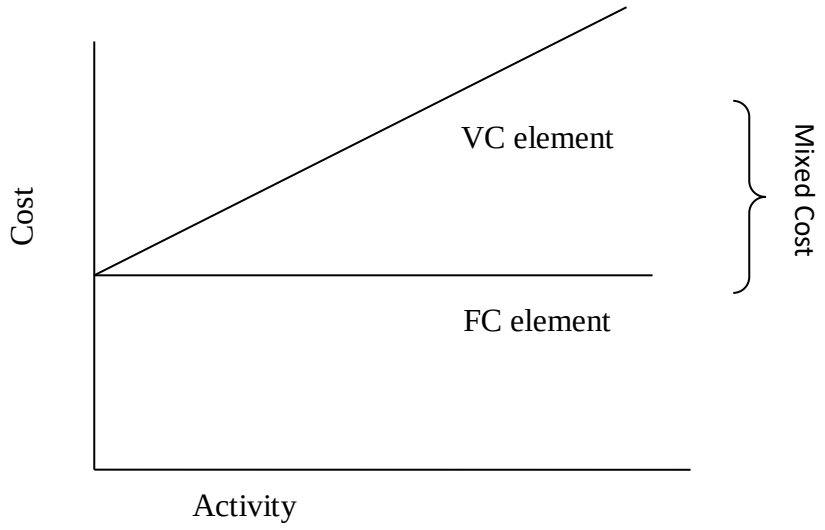
2) Fixed cost

Fixed cost remains constant in total amount despite the changes in the level of activity. That the fixed cost remains unchanged in total as the activity level varies. But a fixed cost per unit does change as activity varies. Fixed cost per unit decreases as the level of activity increases and vice- versa. But for internal uses, fixed cost should not be expressed on unit basis because of the potential confusion involved.



3) Semi- variable cost

Expenditure that cannot be categorized as purely fixed or variable is termed as mixed cost or semi-variable cost. Mixed cost contains both variable and fixed cost elements. In mixed cost, variable cost element is added to the fixed element as such mixed cost line slopes upward in the graph.



In practice, mixed costs are varying common. The fixed portion of a mixed cost represents the basic, minimum cost of just having a service for use. The variable portion of mixed cost represents the cost incurred for actual consumption of goods or services. The variable element varies in proportion to the amount of services or goods that is consumed. (Munakarmi, 2002:25).

2.1.4.4 Classification According to Decision Making

Decision making is one most crucial function of management. Decision making is a process of selecting the best alternative among various courses of action available. For decision making costs can be classified as relevant and irrelevant, avoidable and unavoidable costs, out of pocket costs, opportunity cost, sunk cost and differential cost mention below:

i) **Relevant cost**: relevant costs are those costs which differ from one alternative to the next. Relevant cost pose two fundamental characteristics:
   - Relevant costs are future costs
   - Relevant costs will be different for each alternative

ii) **Irrelevant cost:** all cost other than the relevant cost are irrelevant for decision making:
   - All past cost are irrelevant
   - Those costs, which are likely to be same, under-either alternative is irrelevant

iii) **Avoidable and Unavoidable cost:** sometimes the terms avoidable and unavoidable costs are used instead of relevant and irrelevant costs. Avoidable costs can be saved by dropping the department or product or an alternatives. Therefore, only the avoidable costs are relevant for decision making.

iv) **Out of pocket cost:** out of pocket costs means the cash incurred on an activity, since, out of pocket, cost involves a cash outlay, and it is very important for external reporting and international planning and decision making both.

V) **Opportunity cost**: an opportunity cost can be defined as the potential benefit that is lost or sacrificed when the choice of one course of actions requires the giving up an alternative course of action. In decision making, opportunity costs are as equally important as the out of pocket costs which is not cash outlays. Rather these are the benefits foregone in the next best alternative.

vi) **Sunk cost:** a sunk cost is that cost which has already been incurred and there cannot be any decision made now or in the future. All sunk costs are irrelevant for decision making because these are past costs, which do not alter with the change in decision.

vii) **Differential cost:** the economist's marginal cost concept is same things as the accountant's differential cost concept. Marginal cost is the change in total cost owing to the change in output. More precisely, marginal cost is the increase in cost due to one more unit of output produced. Marginal cost concept has the greater significance in decision making like accepting or rejecting of short term special orders, because the price of the product most cover at least marginal cost.

2.1.4.5 Classification According to Control:

Controllable cost: A cost is considered to be controllable cost if that can be managed or changed with in the related responsibility centre (even lower level of management) and within the given period of time (short run).

Non-controllable cost: Any cost which not subjected to change within the related responsibility centre (lower level of management) and within the short time span is called the non-controllable cost. All costs are controllable at some level in a company. Only at the lower level of management, some costs can be considered none-controllable. Controllability of costs fully depends on two horizon i.e. product cost and period cost.

Product cost: those expenses, which mater for the volume of production and inventory valuation, are product costs. Product costs become assets when incurred in the course of production and expensed when output are sold.

Period cost: those expenses, which do not mater for the volume of output, rather incurred with the passage of time or volume of sales is period costs. All period costs are expensed at the time of occurrence (Singh, et al., 2004:20).

2.1.5 Segregation of semi-variable cost

There are various types of method to break mixed cost into variable and fixed. But in practice high-low method and least-square method are mostly used.

2.1.5.1 High-low method

In the high-low point method the semi-variable cost is segregated into fixed and the variable components using exactly two data points. The two points consists of selecting the periods of highest and lowest activity levels comprising the changes in cost that result from the two levels.

Variable cost per unit (UVC) $= \frac{High\ cost - low\ cost}{high\ activity\ volume - low\ activity\ volume}$

$= \frac{change\ in\ cost}{changes\ in\ activities}$

Fixed cost per period = Total cost – UVC x Activity volume

2.1.5.2 Least – square regression method

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

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

Least square straight line Y on X, Y = a + bX
Where,
a = fixed cost per period
b = variable cost per unit
n = no of observations
x = activity measures (units or hours)
y = total mixed cost observed

since (b) stands for variable cost per unit and (a) stands for fixed cost per period, the value of (a) and (b) should be computed to segregate the mixed cost into variable and fixed components. Value of (a) and (b) can be directly estimated using simple mathematical formula (Singh, et al., 2004:27).

$$b = \frac{N\sum xy - \sum x.\sum y}{N\sum x2 - \sum (x)2}$$

a = y-bx

2.1.6 Application of CVP Analysis:

CVP analysis is applied specially for Break-Even analysis and profit planning. Business organization is run to earn profit. Profit is the fundamental part of the overall management function. Profit planning can be done only when the management has the information about the cost of the product. The CVP relationship will be established by Break- Even analysis. So the CVP analysis is used for:

- Contribution margin analysis
- Break-even analysis
- Profit-volume analysis

2.1.6.1 Contribution margin analysis

CM ratio is also known as profit volume ratio. (P-V ratio). CM ratio equals to contribution margin divide by revenue. The analysis of relationship between profit and volume is known as profit volume analysis. Profit volume ratio of contribution margin ratio establishes a relationship between the contribution and sales value. Percentage of CM to total sales is referred to as the CM ratio. CM ratio can be calculated by using either per unit or total revenue minus total variable cost information as follows:

CM ratio = $\frac{sales\ revenue - variable\ cost}{sales\ revenue}$

Or $\frac{CM}{sales\ revenue}$

Or $\frac{SPPU - VCPU}{SPPU}$

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

CM ratio = 1 – variable cost ratio

CM ratio = 1 – $\frac{variable\ cost}{sales\ revenue}$

Fixed cost do not change within the relevant range in the short period so profit change by the same amount as the contribution margin changes.

CM ratio = $\frac{changes\ in\ CM}{changes\ in\ sales\ revenue}$

Or $\frac{changes\ in\ net\ profit}{changes\ in\ sales\ revenue}$

This ratio is helpful for determination of the desired level of output or profit and the calculation of variable costs for any value of sales.

VC = sales (1 – CM ratio)

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

A business enterprise can improve its profit by improving a profit volume ratio. The management can eliminate the unprofitable lines which are having either a lower profit volume ratio can be increased by:
Increasing sales price per unit
Decreasing variable cost
Increasing the production of product having high profit volume ratio and vice versa.

2.1.6.2 Break-Even analysis

The relation between cost volume and profit can be found out clearly through Break-Even analysis. Break- Even analysis is regarded as a sophisticated method or tool used in management. It is the most widely known form of CVP analysis. CVP analysis is sometimes referred to simply as Break-Even- Analysis. But it is appropriate to say break- even analysis is just one part of the entire CVP concept. Yet, it is always taken as an important part of profit planning as it gives the planner many insights into the data with which he or she is working. Profit planning of each firm began with Break-Even analysis.

Break-Even point:

The break-even point used under break-even analysis. Break-even point is the level of activity where total cost is equal to total sales. It is a specific level of activity or volume or sales, which breaks the revenues and costs evenly. It is a point of “no profit no loss.” If sales or the production is higher than break-even volume, there will be profit. In the same way if the sales is less then break-even sales, there will be a loss. It can be summarised in following way:

Conditions	Results
Actual sales equal to BE sales	No profit no loss
Actual sales exceeds to BE sales	Profit
Actual sales less than BE sales	loss

a) Computation of Break-Even point

i) Formula method

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

Sales revenue = total cost

Or sales revenue = fixed cost + variable cost

For finding out sales revenue, we have,

Sales revenue = selling price per unit x sales units

Symbolically,

Sales revenue = SPPU x Q

For finding out total cost, we have;

Total cost = fixed cost + variable cost per unit * sales unit

Symbolically,

Total cost = FC + VCPU x Q

From the early definition, we have; sales revenue = total cost

I.e. SPPU x Q - VCPU x Q = FC

$Q = \frac{FC}{SPPU - VCPU}$

Where, Q = Break-Even points in units

FC = Fixed cost

SPPU = Selling price per unit

VCPU = variable cost per unit

Similarly,

Sales = FC + VC or, sales – VC = FC

Or, CM = FC and,

Sales x p/v ratio = FC

BEP sales in Rs = $\frac{FC}{PlV\ ratio}$

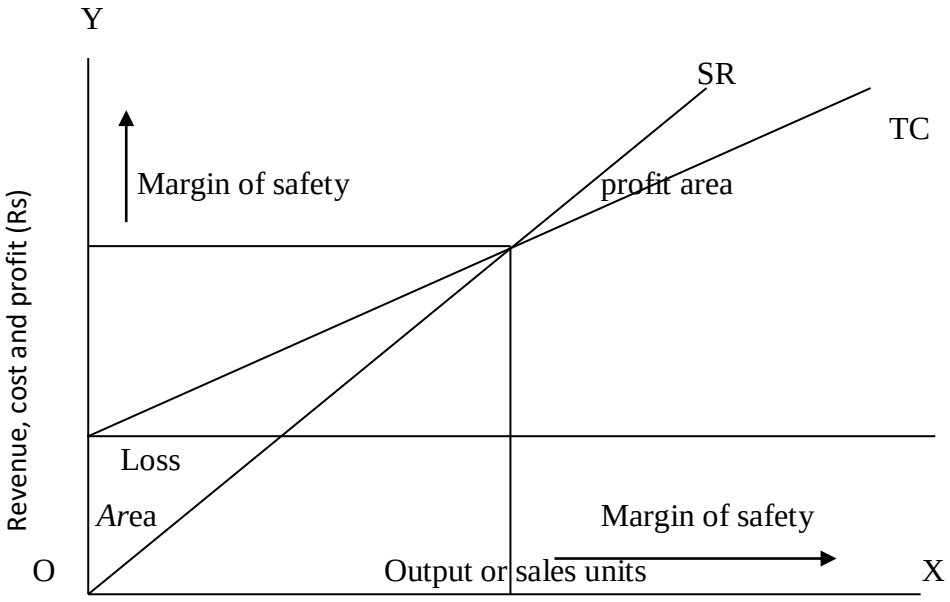
Or, BEP sales (Rs) = BEP units x selling price per unit

Where,

P/v ratio = $\frac{S-V}{S}$

ii) Graphical method

Break-even point can also be determined by using graph. The relation shown among cost, volume and profit with the help of diagram is described as break- even chart. There can be neither profit nor loss at the BE sales. However, if the sales exceed the BE point, the result will be profit. The loss will be reported if the sales are less than BE sales. Below is a simple illustration of BE chart;



OX represents output or sales units. OY represents Rs. i.e. total cost as well as revenue. OF denotes the amount of fixed cost. As the increase or decrease in sales does not have any effect on the amount of fixed cost, the fixed cost curve is parallel to X-axis.

Total cost increase if output or activity increases. It includes fixed as well as variable cost. Hence, it is started from the point of intersection of fixed cost curve and X- axis and slopping upward to right side.

The sales curve is originated from the origin ‘’O’. It is because revenue will be zero. As the sales unit’s increases, sales revenue also increases. Hence, sales curve is also slopping upwards to right side.

An equilibrium point between revenue curve and total cost curve is known as break-even point. P is the BE point and OQ is the BE sales units. If the actual sales volume is more than BE sales, the business will earn profit and when it is less than BE sales, the business will incur loss. In the chart, OPF is regarded as loss area. Loss is the result when the sales trend to be less than BE point. When sales are made less than the equilibrium point, total cost curve is above to sales curve, which is followed by loss. In case of sales being higher than break even sales, sales curve is above to total cost curve. Hence, in this condition there is gain (Dangol, et al., 2061:468).

b) Cash break-even point

For cash BEP, cash fixed cost is considered and fixed cost that does not involve cash like depreciation cost is excluded from cost. Cash BE point is calculated using formula given below:

$$\text{Cash BEP} = \frac{cash\ FC}{plv\ ratio}$$

While calculating cash break-even point, the cash fixed costs i.e. fixed cost less depreciation and deferred expenses is considered. The cash BEP helps the management in determining the level of activity below where there is chance of insolvency on accounts of the forms inability to meet cash obligation unless alternative arrangements are made.

c) Break even capacity

Break-even capacity provides information about what percentage of normal capacity will result the BE point. In other words, break-even capacity provides information about the percentage of normal capacity for break-even point. It is calculated by using following formula:

$$\text{Break-Even capacity} = \frac{BEP\ sales\ x\ 100}{total\ sales}$$

d) Other Uses of Break-Even Analysis:

Break-Even analysis can be used in a changed situation in different elements. The different cases and formula are given below:

i. Required sales for desire profit in units = $\frac{FC+desired\ profit}{unit\ CM}$

ii. Required sales for desired profit in Rs = $\frac{FC+desired\ profit}{plv\ ratio}$

iii. Required sales for desired profit in units after tax =

$$\frac{\left\{FC+\frac{(desired\ profit\ after\ tax)}{1-tax\ rate}\right\}}{unit\ CM}$$

iv. Required sales for desired profit in Rs after tax = $\frac{\left\{FC+\frac{desired\ profit\ after\ tax}{1-tax\ rate}\right\}}{plv\ ratio}$

v. Required sales volume for changes on selling price:

Revised BE point in units = $\frac{FC}{Revised\ unit\ CM}$

Revised BE in Rs = $\frac{FC}{Revised\ plv\ ratio}$

v) Required sales volume for changes in VC:

Revised BE point in unit = $\frac{FC}{Revised\ CM\ per\ unit}$

Revised BE point in Rs = $\frac{FC}{Revised\ plv\ ratio}$

vi) Required sales volume for changes in FC:

New BE point in units = $\frac{present\ FC+additional\ FC}{unit\ CM}$

New BE point in Rs = $\frac{present\ FC+additional\ FC}{plv\ ratio}$

e) Income tax impact

Thus far, we have ignored income taxes. In most nations, however, private enterprises are subject to income taxes. As a shortcut to compute the effect of volume on the change in after tax income, the following formula can be used:

Change in net income = change in sales (units) x CM per unit x (1 – tax rate)

Each unit beyond the break-even point adds to after tax net profit at the unit contribution margin multiplied by (1 – income tax rate). With the tax effect the break-even point, it does not change because there is no income tax at a level of zero profits (Horngren,et al., 2004:65).

2.1.6.3 Profit Volume Analysis

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

$$\text{P/v ratio} = \frac{CM}{sales}$$

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

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

- For the analysis of BEP.
- For determination of selling price.
- For an ascertainment of profit at a budgeted sales volume.
- For an ascertainment of profit on selling price.
- For calculation of sales amount to earn a target profit.
- For determination of profit on cost, price etc.

2.1.7 CVP analysis for a multi-product firm

Most firms have more than one product and this add complexity to their CVP analysis. For any organization selling multiple products, the relative proportion of each type of product sold is called the sales mix. It is a relative combination in which a company's product are sold. The sales mix is an important assumption in multiproduct CVP analysis. All products are not equally profitable in multiproduct business. This is because such changes in the sales mix can cause interesting variations in company's profit. Since contribution on each product may be different, any change in the mix would affect profit BEP and margin of safety of business as whole. A shift in the sales mix from high item margins to low margin item can cause total profit to decrease even though the total sales may increase. Conversely, a shift in the sales mix from low margins items to high margin items can cause the reverse effect i.e. total profit may increase even though total sales decrease. Break-even analysis is somewhat more complex if a company sells more than one product. The reason is that different products will have different selling prices, different costs and different CM. Consequently, the break-even point will depend on the mix in which the various products are sold. If the sales mix changes, then the break-even point will also change. Thus, to enhance the profit, the firm may introduce required changes in the ratio with the help of break-even analysis.

In multiproduct firm BEP is calculated in aggregate. The sales mix is used to compute a weighted average unit contribution. This is the average of the total products unit CM weighted by the relative sales proportion of each product. Following procedure are followed to calculate BEP for sales Mix/multi product:

a) PV ratio for each product

b) Proportion of sales mix = $\frac{\boldsymbol{individual\ sales}}{\boldsymbol{total\ sales}}$

c) Weighted average CMPU = ∑[sales mix (units) x unit CM]
   Weighted average p/v ratio = ∑[sales mix (Rs) x p/v ratio]

d) Overall BEP in units = $\frac{\boldsymbol{FC}}{\boldsymbol{Weighted\ average\ CMPU}}$

e) Overall BEP in Rs = $\frac{\boldsymbol{FC}}{\boldsymbol{Weighted\ average\ CM\ ratio}}$

2.1.8 Margin of Safety

The soundness of business is indicated by margin of safety. The difference between total sales and break-even sales is identified by margin of safety. The high margin of safety is good for business. It indicates that there can be substantial falling of sale and yet profit can still be made. On other hand, if margin of safety is lower, it indicates the week position of the business. The small reduction in sales or production will adversely affect the profit position of business. If margin of safety is unsatisfactory, the following steps can be taken for improvement:

- By increasing the product and sales volume
- By increasing the selling price
- By decreasing the fixed cost
- by reducing the variable cost
- By changing the sales or product mix ratio.

Margin of safety is ascertained by using the following formula:

a) Margin of safety in Rs = $\boldsymbol{Actual\ sales\ Rs - BE\ sales\ Rs}$

   Or margin of safety in Rs = $\frac{\boldsymbol{profit}}{\boldsymbol{profit\ volume\ ratio}}$

b) Margin of safety in units = $\boldsymbol{Actual\ sales\ units - BE\ sales\ units}$

   Or margin of safety in units = $\frac{\boldsymbol{profit}}{\boldsymbol{unit\ CM}}$

c) Margin of safety % = $\frac{\boldsymbol{Acctual\ sales - Break\ Even\ sales}}{\boldsymbol{actual\ sales}} \times \mathbf{100}$

   I.e. Margin of safety ratio = $\frac{\boldsymbol{Margin\ of\ safety}}{\boldsymbol{actual\ sales}} \times \mathbf{100}$

2.1.9 Cost Structure, Operating Leverage and CVP

The cost structure of an organization is the relative proportion of its fixed and variable costs. A cost structure differs widely among industries and among the firms within an industry. A company which has large investment in plant and equipment is dominated by fixed costs. In contrast, variable cost plays dominant role in labour intensive organization. An organization's cost structure has a significant effect on the sensitivity of its profit to change in volume.

The extent to which an organization uses fixed costs in its cost structure is called operating leverage. The operating leverage is greatest in firms with a large proportion of fixed costs, low proportion of variable cost and resulting high contribution margin.

To a physical scientist, leverage refers to the ability of a small force to move a heavy weight. To the managerial accountant, operating leverage refers to the ability of the firm to generate and increase in income when sales revenue increases. The formula of calculating operating leverage factor is:

Operating leverage factor = $\frac{CM}{net\ income}$

$= \frac{S - V}{S - V - FC}$

An organization's cost structure plays an important role in determining its CVP relationships. A firm with proportionately high-fixed cost has relatively high operating leverage. The result of high operating leverage is that the firm can generate a large percentage of increase in net income from a relatively small percentage of increase in sales revenue. On the other hand, a firm with high operating leverage has relatively high break-even point. This entails some risk to the form.

The optimal cost structure for an organization involves a trade-off. Management must weigh the benefits of high operating leverage against the risk of large committed fixed costs and the associated high break-even point.

2.1.10 Sensitivity Analysis of CVP

Sensitivity is the measurement of responsiveness in outcome with the change in determinant variables. We know that goal of a business enterprise is to maximize profits. Profit is the excess of the revenues over the total costs.

Net profit = total sales revenue – total costs

= sales units x SPPU – sales units x UVC –FC

But none of the factors remains unchanged. Sometimes the manager can intentionally change the price and cost factors as a part of strategic decisions. But the strategy should focus more on the factor, which is more sensitive, or responsive for profits. Therefore to measure the

sensitivity of CVP factors one can see the impact of certain percentage of change in volume, price or cost factors on net profits.

- **Impact of price changes:** an increase in the selling price will increase the p/v ratio and as a result will lower the break-even point. On the contrary a decrease in selling price will reduce the p/v ratio and therefore, result in a higher break-even point.
- **Impact of volume changes:** a change in volume, not accompanied with changes in the selling price and or costs, will not affect p/v ratio. As a result, the break-even points remain unchanged. Profit will increase with increase in volume and will be reduce with the decrease in volume.
- **Impact of changes in fixed cost:** a change in fixed cost does not influence p/v ratio. Other factors remaining unchanged, a fall in the fixed costs will, however, lower the BEP and raise profits. An increase in fixed cost either causes due to some external factors or due to some changes in the management policy will raise BEP. Increase in factory rent or insurance and taxes are examples of external factors, while increased depreciation or salaries of managers may be the result of management decisions.
- **Impact of change on variable cost:** the impact of the changes in the variable cost on profit is straight forward if it is does not cause any changes in selling price and volume. An increase in variable cost will lower p/v ratio, push up the BEP and reduce profits. On the other hand, if the variable cost declines, p/v ratio will increase. BEP will be lowered and profit would rise.
- **Impact of changes in a combination of factors:** the management accountant, evaluating profit plan or budgets, must realise that a change in one factors leads to a changes in other factors. Therefore, all such changes should be carefully visualized and their net impact on profit must be seen.

2.1.11 CVP and Its Impact on Productivity

CVP analysis measures the relationship between cost, volume and profit. The real performance of the company is determined by profit. Profit is the final outcome of the overall activities of the organization. The ultimate goal of the every profit motive organization is to increase profit through satisfying customers need. The higher profit can be achieved through reducing cost and increasing sales revenue. The most accepted way of achieving efficiency or

productivity is cost reduction. Productivity is function of input and output. Achieving high output i.e. profit including low input i.e. cost is defined as productivity.

CVP analysis helps to measure the productivity of the organization. How much cost should be incurred to get different target profit? How much cost should be incurred to get zero profit? Are such types of questions, which can be satisfied through CVP relationship? Certain cost is incurred to produce the product. There are different types of cost i.e. fixed and variable. The nature of fixed and variable cost is totally different from each other. Fixed cost is constant cost, which does not change with changes directly or proportionately with change in activity level. Due to the constant in nature, the organization should invest lower in fixed cost to get higher profit at lower level of sales volume. As the sales increase, profitability is also increase because only the variable cost changes or increase but fixed cost remains same.

In practice, many organizations produce more than one product. In such type of multi product firm, the product has different contribution towards profit. The product, which involves huge amount of cost but contribution towards profit is small, should be dropout. Whereas products, which provides significant profit with small amount of cost comparing to other product should be continued. In this way the limited resources of the organization, which is called productivity that can be possible only through CVP analysis.

2.1.12 Uses of CVP in Profit Planning

Planning, controlling and decision making are the essential managerial functions. CVP analysis helps manager to plan for profit and to control cost. It helps:

- To determine the BE point in term of unit or sales value.
- To estimate the profit or loss at various level of output.
- To ascertain margin of safety
- To help management to find most profitable combination of cost and volume.
- To determine the optimum selling price.
- To determine the sales volume at which the profit goal of the form will be achieved.
- To determine maximum sales volume to avoid losses
- To determine most profitable and least profitable product.
- To determine new BE point for changes in fixed cost or variable cost (*Munakarmi, 2002:124).*

2.1.13 CVP Analysis in the Computer Age

CVP analysis is based on mathematical model i.e. Sales – Variable cost – fixed cost = Net income. The CVP model is widely used as planning model. Managers in a variety of organization use a personal computer and a CVP modelling program to study combinations of changes in selling price, unit variable cost, fixed cost and desired profits. Many non-profit organizations also used computerized CVP modelling. The computer quickly calculates the results of changes and can display them both numerically and graphically. In addition to speed and convenience, computers allow a more sophisticated approach to CVP analysis. Computer analysis can construct a model that does not require all the simplification. Computer model can include multiple cost drivers, non-linear relationship between costs and drivers, varying sales mixes, analyze that need not be restricted to a relevant range.

Use of computer modelling is a cost benefit issue. Sometimes the costs of modelling are exceeded by the value of better decision made using the models. However, the reliability of these models depends on the accuracy of their underlying assumptions about how revenues and cost will actually be affected. More ever, in small organization, simplified CVP models often are accurate enough that more sophisticated modelling is unwarranted (Horngren, et al., 2004:56).

2.1.14 Projected Income Statement

The budgeted income statement shows the expected revenue and expenses for a budgeted period, assuming planed operations are carried out.
The budgeted income statement is one of the key schedules in the master budget. It is the document that tells how profitable operations are anticipated to be in the forth-coming period. After it has been prepared, it stands as a benchmark against which subsequent company performance can be measured.

2.1.15 Flexible Budget

A flexile budget calculates budgeted revenue and budgeted costs based on the actual output level in the budgeted period. A flexible budget is calculate at the end of the period when the actual output is known; a static budget is developed at the start of the budget period based on the planned output level for the period (Horngren, et al., 2004:567).

A flexible budget estimates expenses at different possible level of future operations. A flexible budget is not based on only one level of activity. A flexible overhead budget is defined as a detailed plan for controlling overhead costs, a plan that is valid in the firm's relevant range of activity (Hilton, et al., 2002:480).

2.1.16 Assumption of CVP Analysis

CVP analysis is based on a specific set of assumption that should be clearly understood are as follows:

- Costs can be classified and measured realistically as fixed and variable.
- There is a relevant range of activity for using the results of the analysis.
- The sales price does not change as units of sales change.
- There is only one product, or in case of multiple products, sales mix among the products remains constant.
- Basic management policies about operations will not change materially in the short term.
- General Price level will remain essentially stable in shore term0.
- Sales and production levels are synchronized i.e. inventory remains essentially constant or is zero.
- Efficiency and productivity per person will remain essentially unchanged in the short run. (welsch, et al., 2002:507)

2.1.17 Limitation of CVP Analysis

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

2.2 Reviews of Related Studies

Horngren, et al., (2004:62), state, “CVP analysis examine the behaviour of total revenues, total cost and operating income as changes occur in the output level, the selling price, the variable cost per unit and the fixed cost of the product . ” in their book *cost accounting : a managerial emphasis*. They mean to say that CVP is related to totality of revenues, cost and income in the output level.

"CVP analysis is the systematic method of examining the relationship between changes in activity (i.e. output) and changes in total sales revenue, expenses and net profit. As a model of these relationships CVP analysis simplifies the real-world conditions that a firm will face. Like most models, which are abstractions from reality? CVP analysis is subject to a number of underlying assumptions and laminations. It is a powerful tool for decision making in certain situations." In his book *management and cost accounting*: CVP analyse a systemic method of examining the relations of all kind of changes in total sales revenue, expenses and net profit, which seems to be most convincing. CVP is not a tool by which one can make decision in all the conditions or situations (Bajracharya, et al., 2005:225).

Analysis of CVP in their book Managerial Accounting is: "CVP analysis is a supplementary tool of profit planning. It tells many things about the relationships between the business variables. Total variable costs are proportionate to the sales volume; whereas the total fixed costs remain unchanged within the relevant range of the output levels. That is why net incomes are not in proportion to sales. After knowing this relationship, one can access the profit at forecasted sales volume. Likewise, required sales can be ascertained for the minimum level of profit." It is empirical statement that tells the relationship between the variable in which the total variable cost are proportionate to the sales volume. And it is shown that the total fixed cost remain constant within the relevant range of the output level. They have stated that CVP is not compulsory but a supplementary tool.

Summarise CVP analysis in their book budgeting: profit planning and control (2001:531) as "cost volume profit analysis includes the related concepts of (a) contribution analysis and (b) breakeven analysis. These concepts entered the mainstream of management accounting starting in the 1930s, with major emphasis in the 1950s. Both concepts rest upon the concept of cost variability. Contribution analysis involves a series of analytical techniques to determine or to evaluate the effects on profit of changes on volume, sales prices, fixed expenses and variable expenses. Basically, it applies a concept of a contribution margin income statement: revenue minus variable expenses equals contribution margin. And contribution margin minus fixed expenses equals profit. Breakeven analysis focuses on the breakeven point. Fixed expenses divided by the contribution margin equals breakeven sales volume (the point at which profit is zero because revenue equals total cost). The results of breakeven analysis are usually graphed to show the relationship between revenue (i.e. sales),

fixed expenses and variable expenses within a relevant range of sales volume" Welsch, et al., (2001:531).

2.2.2 Review of Previous Research Work:

2.2.2.1 Review of Books

The study of interrelationship of sales, cost and net income is usually called CVP analysis. CVP analysis examines the 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 examine the relationship between changes in volume and changes on profit. The scope of CVP analysis ranges from the determinations of the optimal output level of a single product department to the determinations of the optimal mix of large multi product firm.

CVP analysis is concerned with examine the relationship between changes in volume and changes in total revenue and costs in the short term. Drury has compared the economists and accountants models of CVP behaviour. 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 accountants models was intended to predict CVP behaviour only within the relevant range, Where a firm is likely to be operating in constant returns to sale. A comparison of the two models suggested that, within the relevant production range, the total cost and revenue functions are fairly similar (Drury, 1989:215).

2.2.2.2 Brief Review of the Previous Research Work

Researches in the area of CVP analysis as a tool to measure effectiveness of PPC (budgeting) of a company in Nepalese context are not made sufficiently. As profit planning and controls and covers major aspects of CVP analysis, researchers made on these sectors are taken into

consideration for review. Many researchers have been made on manufacturing concern except only a few of them are profound.

Here, an attempt is made to review some of the researches submitted on the CVP in the context of Nepal.

Yadhav (2010) has conducted a research topic on *Cost, volume and profit analysis of Nepal Aushadhi limited.* This was submitted to Shankar Dev campus.

His major objectives:

- To analyze different components of costs as per cost behaviour.
- To study the application of Cost, Volume and profit analysis in Nepal Aushadhi Limited.
- To evaluate the sensitivity of profitability.
- To study the financial position of Nepal Aushadhi Limited.

His major findings:

- Sales plan of Nepal Aushadhi Limited is not properly maintained.
- Nepal Aushadhi Limited does not practice the appropriate cost classification technique.
- Top level managers set the goals and not communicated it to the lower level of management.
- Nepal Aushadhi Limited is utilizing only 40% of full capacity.

His major recommendations:

- The industry should use scientific methods of sales planning.
- Nepal Aushadhi Limited should practice the appropriate cost classification techniques.
- Nepal Aushadhi Limited should make good co-ordination within the different departments.
- Nepal Aushadhi Limited should utilize its full capacity.

Adhikari (2010) has conducted a research topic on *Cost, Volume and Profit analysis as a managerial tool to plan profit of Bottlers Nepal Limited*. This was submitted to Shankar Dev Campus.

His major objectives:

- To study relationship of Cost, Volume and profit as a managerial tool to plan profit.
- To analyze the Cost, Volume and Profit of the company and its impact in planning profit.
- To evaluate the sensitivity of profitability.
- To provide suggestion and recommendation about operation of Bottlers Nepal Limited.

His major findings:

- Segregation of fixed and variable cost is ignored by Bottlers Nepal Limited.
- Enterprises has no financial plan, they have only sales and production plan in term of required target.
- There is no effective plan for cost reduction and control.
- There are no any proper criteria for performance evaluation for financial tools.

His major recommendations:

- To strengthen the effectiveness of Bottlers Nepal limited and to carry out PPC activities, the company should use the PPC tools.
- Classification of expenses and cost form their nature of variability is very essential.
- A system of periodical performance report should be strictly followed.

Timilsina (2010)) has conducted a research topic on *Cost, Volume and Profit Analysis of Himalaya Distilary Limited.* This was submitted to Nepal commerce campus.

His major objectives:

- To analyze different component of cost as per cost behaviour.
- To analyse the compact of fixed cost on profit.
- To analyse BEP of overall firm as well as individual product.
- To show the relationship of cost, volume and profit between the multi products.

His major findings:

- Company has no clear cut boundaries to separate cost into fixed and variable.
- The classification of cost is not scientific and systematic.
- HDL has not been able to use CVP analysis and make the realistic and smart budget.

Dahal(2009) has conducted a research topic on *cost, volume and profit analysis as a tool to measure the effectiveness of profit planning with reference to Dabur Nepal Ltd*. this was submitted to Nepal Commerce Campus.

His major objectives:

- To analysis financial performance.
- To forecast future production and sales.
- To analysis the CVP of the company and its impact in profit planning.

His major findings:

- Dabur Nepal Pvt. Ltd. Constitutes lack of adequate inventory policy.
- No control over external factor i.e. it has poor SWOT analysis.
- Dabur Nepal Pvt. Ltd is not able to co-ordinate among various departments.

His major recommendations:

- The company should practice appropriate inventory policy.
- It should analyze its strength and weakness in internal environment of company and opportunity and threats in external environment of the company.
- The company should try to make involvement of more personnel in decision making process.

Dangol(2009) had conducted a research topic on *profit planning in manufacturing public enterprise; a case study in Hetauda cement industry ltd*. This was submitted to Shankar Dev Campus.

Her major objectives:

- To study the application of profit planning concepts.
- To analyze the BEP.
- To analyze the profitability of the company.

Her major findings:

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

Her major recommendations:

- The company should apply effective sales forecasting technique.
- There must be co-ordination between different departments.
- Duty and responsibility of the staffs must be clarified.

2.2.3 Research Gap

There is a significant gap between present research work and previous research works. There are many of researches which are conducted mainly on profit planning and control of public enterprises. In most of the researches, profit planning tools are analyzed in one way of the order but there impacts are rarely explained. But none of these has conduct on CVP analysis of NAL. It is therefore, this present research work has been conducted in order to fulfil the objective. For this purpose, the researcher examines the current practice of cost volume profit analysis in the manufacturing industry, namely Nepal Aushadhi limited.

CHAPTER- III
RESEARCH METHODOLOGY

3.1 Research Design

This study attempted to show the relationship among the cost volume profit and functional budgets for solving the problems that has occurred in Nepal Aushadhi Ltd. CVP analysis of Nepal Aushadhi Ltd was presented and analyzed by descriptive research design and analytical method. A study design is the arrangement of the conditions for collection and analyze of the data in manner that aims to combine relevance to the study purpose with the economy.

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

3.2 Research Population and Sample

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

Research population would be all manufacturing company of Nepal. Due to various circumstances it would not be possible to attempt all the number of research population regarding in the dissertation. To convenient the research, only one Nepal Aushadhi Limited is taken for the research study.

3.3 Source and Type of Data

Data and information are the foundation of any study. Data may be obtained from several sources; it is not easy to list them in detail. Each research project has its own data needs and data sources. Secondary data were taken from annual reports, auditor's reports, balance sheet, profit and loss account, cost detail sheet, previous thesis and other relevant published and

unpublished documents related to NAL for further information informal interviews were conducted with the concern authority.

3.4 Variable or Studies

Variable are characteristics of person, things, groups, objectives etc. Variable is thus a symbol to which numerals or values are assigned. In other words, a variable can take on many values are assigned. It is concerned with two types of variables, independent variable and dependent variable, which are presented as below:

Independent Variables

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

Dependent Variable

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

Table: 3.1

Classification of variables

S.N	Independent variable	S.N	Dependent variables
1	Sales units	1 2	Sales Rs Cost(variable & fixed) profit

3.5 Method of Analysis and Presentation

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

3.6 Descriptive Technique

Descriptive technique is fact –findings operation from adequate information. It is a type of study, which is generally conducted to access the opinions, behaviours or characteristics of a given population and to describe the situation and event occurring at present. Descriptive

technique is a process of accumulating facts. It does not necessary seek to explain relationship, test hypothesis, or get at meanings and implications of a study.

3.7 Quantitative Techniques

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

3.8 CVP Analysis Tools

C-V-P analysis is included the following techniques:

Contribution margin (CM) = sales – variable

Contribution margin ratio = $1 - \frac{\text{variable } cost}{sales}$

BEP in units = $\frac{total\ fixed\ cost}{SPPU - VCPU}$

BEP in Rs = $\frac{Total\ fixed\ cost}{CM\ ratio}$

Required sales for desired profit in units = $\frac{Fixed\ cost - desired\ profit}{CMPU}$

Required sales for desired profit in Rs = $\frac{FC - Desired\ profit}{CM\ ratio}$

Required sales in units for DPAT $= \left\{\frac{FC + \frac{DPAT}{}(1-t)}{CMPU}\right\}$

3.9 Statistical Tools

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

- **Bar Diagram**

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

- **Mean**

The sum of all the observations divided by the number of observations is called means. In such cases all the items are equally important. It is usually developed by X.

It is defined by the following formula:

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

Where,

$\sum X$ = sum of observations

N = no of observations

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

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

The SD is calculated by the following formula:

$$\text{SD} = \frac{\sqrt{X-X}}{N-1}$$

- **Coefficient of Variance (CV)**

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

$$\text{Coefficient of SD.} = \frac{6}{X}$$

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

$$\text{C.V.} = \frac{6}{X} \times 100$$

- **Correlation Analysis**

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

$$\text{Co-efficient of correlation(r)} = \left(\frac{\sum(X-X)(Y-Y)}{\sqrt{\sum(X-X)(Y-Y)}}\right.$$

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

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

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

$$\text{Co-efficient of determination (r2)} = r \times r$$

$$\text{Probable error (P.E)} = 0.6745 \text{ X } \frac{1-r2}{\sqrt{N}}$$

CHAPTER – IV

DATA PRESENTATION AND ANALYSIS

4.1 Budgeted and Actual Sales of NAL

The individuals who are best able to forecast sales are usually the sales force and product managers. Their ability to accurately forecast sales depends on the nature of the industry and on characteristics of the product. Demand is seasonal for many products, in which case month's forecast usually incorporates information about sales for the same month of the last year. The following tables present the budgeted and actual sales revenue of NAL for five fiscal years from 2062/2063 to 2066/2067.

Table: 4.1

Budgeted and actual sales

Year	Sales(in Rs 000)		Achievements
	Budgeted	Actual	% of budgeted sales to actual
2061/62	142,059	75,5640.96	41.98
2062/63	142.059	60,106.90	42.31
2063/64	170,000	66,207.80	38.95
2064/65	140,000	51,805.78	37.00
2065/66	140,000	50,259.17	35.90

Source: Audit reports

The above table shows that there is more difference between budgeted and actual sales. There is more a difference of more than 50% between the budgeted and actual sales. The achievement is highest in fiscal year 2062/2063 which was 42.31% and lowest in fiscal year 2065/2066 which is 35.90% so, according to this table it can be said that the plan was not systematic because of the company is under 50% sales. The functions of the budgeted and actual sales indicate that the plan was not scientific. Therefore, it can be said the budgeted

sales did not consider past sales data, market research, environmental scanning, expert opinion etc. The actual sales revenue of NAL of the five fiscal years was in function. There are positive as well as negative functions between years. The sales revenue has decreased over the year except in F/Y 2063/2064.

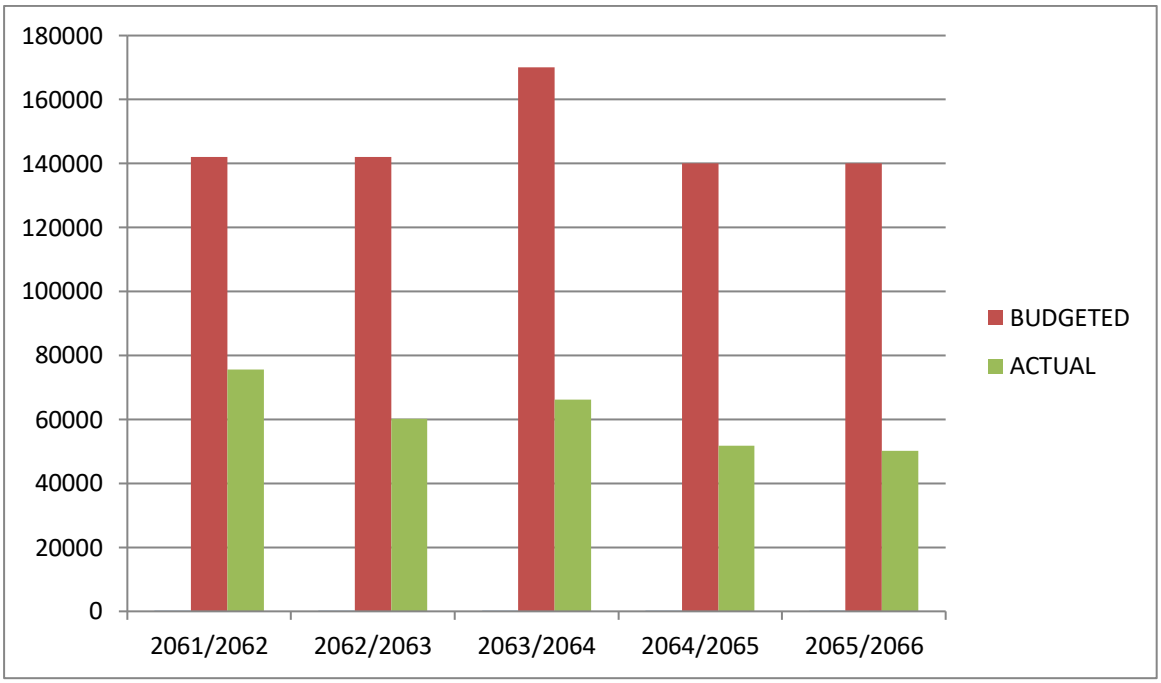
The total sales revenues of NAL are in function. There must be various reasons which cause the various on sales revenue. The significant factor responsible for the variation in sales revenue are demand conditions of the products, cost of the productions, political situation of the country, political conflict, poor government policy, top competition with the imported products, product quality etc. Most company face a down-sloping demand curve for their products, which implies that forecasting sales revenue requires production sales volume at the planned sales price.

In the fiscal year 2062/2063, the actual sales revenue collected by the company through its products is only Rs 601063900 which is 20.46% less than the sales revenue of Rs 75564960 previous year of 2061/2062.but in the year 2063/2064 sales revenue increased by 10.51% as compared to the previous year sales of Rs 60106900. During the financial year 2064/65 the sales revenue dropped to Rs 50,805,780 form Rs 66,207,800. It was 21.75% less as compared to the FY 2063/64. Like previous year during the financial year 2064/65 sales revenue also decreased to 50,259,170 form Rs 51,805,780. In other words, the sales revenue of 2064/65 decreased by 2.99% as compared of the previous year. Therefore, the above mentioned fact clearly shows that the sales revenue trend of the industry is unstable.

The presentation of the budgeted and actual sales figure will be more effective by following graph:

Figure: 4.1

Budgeted and actual sales



The above diagram shows that there is wide difference between budgeted and actual sales. There is a difference of more than 50% between the budgeted and actual sales. Total sales revenue of FY 2061/62 is highest. But as compared to the budgeted and actual sales, the achievement of actual sales is highest in fiscal year 20662/63 which is 42.31% of the budgeted sales and lowest in fiscal year 2065/66 which is 35.90% of budgeted sales.

In order to find out the nature of variability of the budgeted sales and sales achievement of different years, arithmetic mean, standard deviation and coefficient of variation of budgeted and actual figure of NAL for the five fiscal years are calculated.

4.2 Summary of Statistical Calculation

Table: 4.2

Summary of statistical calculation

Statistical tools	Sales	
	Budgeted	**Actual**
Mean	146823.6	60788.92
Standard deviation	11624.72	9059.45
Coefficient of variance(CV)	7.9%	14%
Correlation(r)	0.36	
Probable error(P.E.)	0.026	
6*P.E.	0.222(6*0.026)	

Sources appendix -1

The table 4.2 represents the calculated statistical values. This table shows that mean of the budgeted sales is more than mean of the actual sales. There is wide difference between the budgeted and actual sales. But standard deviation of actual sales is less than the budgeted sales and there is more fluctuate between budgeted and actual sales. The coefficient of variation of actual sales is more than C.V. of budgeted sales. This shows that budgeted sales fluctuated less than actual sales. Having similar C.V., the budgeted sales are more homogeneous or more consistent than actual sales.

While studying two variables at the same time, if it is found that the change in one variable is reciprocated by corresponding change in the other variable either directly or inversely, than the two variables are known to be associated or correlated. Otherwise, the two variables are known to be dissociated or miscorrelated or independent. If two variables move in the same direction i.e. an increase or decrease on the part of one variable introduces an increase or decrease on the part of the other variable, then the two variables are known to be positively correlated, Otherwise known to be negatively correlated. But in this case, the correlation coefficient(r) between two variables i.e. budgeted and actual sales are 0.94 (i.e. $0 < r < 1$). It shows that positive correlation between budgeted and actual sales, but r is very closer to 1 show it is called high by positive correlation between the budgeted and actual sales.

The probable error (P.E.) may be used to test if an observed value of correlation coefficient. If r < P.E. (r) i.e. of the observed value of r is less than the P.E., than the correlation is not at all significant. If r > 6 P.E.(r) i.e., if the observed value of r is greater than 6 times of its P.E., than r is definitely significant. In the other situation, nothing can be concluded with certainty. But in this situation, the value of r is greater than 6 P.E. (I.E. 0.36 > 0.156), the calculate value of r is definitely significant.

4.3 Time Series Analysis of Sales Revenue

The time series may be define as a collection of magnitudes belonging to different periods of variable or composite of variables. Such as: productions, sales, per capita income, price or index of industrial production. It helps in understanding past behaviour, planning future operations, evaluating current accomplishment and facilities comparison. When such analysis is coupled with a careful examination of current business indicators one can undoubtedly improve substantially upon guest mates (i.e. estimates based upon pure guesswork) in forecasting future business conditions.

There are various methods to analyze the time series but in this thesis to analyze the trend of actual sales, least square is most appropriate to estimate the possible future sales for given time or year. A straight line trend will show the relationship between time period and actual sales of the relevant year. In this method, it is assumed that the sales consistently changes (increase or decrease) with the change in time and such change can be expressed by the components of time factor is considered as independent factor and sales is considered as dependent factor upon time. Then straight line trend of actual sales (Y) depends upon the time (X), which is expressed as:

$$Y = a + bX \quad \text{..... (**)}$$

In order to determine the values of the constants “a “and “b” the following two normal equations are to be solved:

$$\sum y = Na + b\sum x \dots\dots\dots\dots\dots (i)$$

$$\sum xy = a\sum x + b\sum n2 \dots\dots\dots\dots (ii)$$

Where N represents number of year for given date.

4.4 Fitting the Straight Line Trend by Least Square Method

From the appendix – II

A = 60788.92

B = 5891.27

Substituting in (**), the trend line is given by the question:

Y = 60,788.92 + [-5,891.27 X]..... (***)

Substituting X= -2, -1, 0, 1, 2 in (***), we obtained the trend values for the years 2061/2062 to 2065/2066 respectively. The trend values are given in the last column of the above table 4.3.

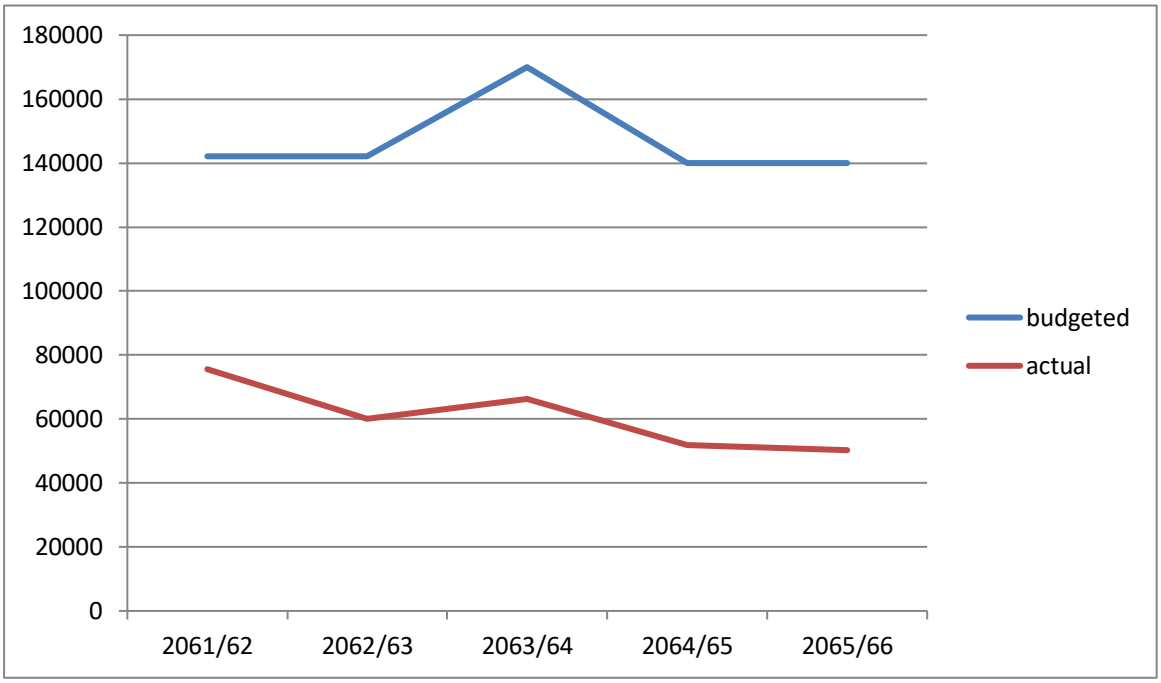
The estimated sales revenue in 2066/67 is obtained on putting X = t – 2062/63 = 2066/67 – 2062/632 = 4, in (***).

Thus (Y) 2065/66 = 60,788.92 + [-5,891.27 *4] = 37223.84 (Rs 000) therefore, if the trend does not change, the possible sales for the fiscal year 2066/67 will be Rs 37223.84 x 1000 = 37,223,840.

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

Figure: 4.2

Time Series Analysis of Sales Revenue



4.4.1 Variable Cost of NAL

A cost that varies proportionately with the variation in volume of activity level is known as variable cost. A variable cost per unit remains fixed where as total variable cost keeps on fluctuating with activity level. Unless otherwise mentioned labour costs, material cost and other cost of direct nature are example of variable cost.

Table: 4.3

Variable Cost for the Five Fiscal Years

Particulars	**2061/62**	**2062/63**	**2063/64**	**2064/65**	**2065/66**
Printing &stationary	207892	209,745	238,300	157,832	120,555
Misc. Expenses	207264	216,265	242,239	218,589	159,047
Distribution cost	4352993	58,29,921	7,157,705	4,982,989	4,084,821
VAT	158,620	148,650	167,630	221,700	132,680
Cost of sales	68,634,781	52,850,570	48,659,616	45,961,043	45,340,279
Total	73,561,550	59,255,151	56,465,490	51,542,153	49,837,382
% of variable cost on production cost	71.48	41.56	54.90	52.96	52.76

Note: where, production cost = fixed cost + variable cost

The above table shows that there is variation in production cost for different year. FY Different factors are responsible for making change in production cost such as fluctuation in price of raw materials in international market, packaging material. The total variable cost of FY 2061/62 was Rs 73,561,550 and it decreases every year.

4.4.2 Fixed Cost of NAL

Fixed costs are those cost which remain the same regardless of level of sales. Depending in types of business, some typical examples would be rent, interest on loan, insurance, depreciation on plant and equipment, and salary of permanent full-time workers. The fixed costs of the company are given in the following table:

Table: 4.4

Fixed cost for the five fiscal years

Particulars	2061/62	2062/63	2063/64	2064/65	2065/66
Salary	19,985,451	17,832,336	17,627,216	20,771,642	12,998,037
Rent	96,000	96,000	96,000	96,000	96000
Auditing	50,000	50,000	50,000	50,000	55,000
BOD meeting exp.	69,200	69,200	69,200	69,500	69,000
Bank charge	198462	254,864	313,620	146,024	7,435
Insurance	1,709,864	1,735,995	1,959,040	377,187	302,740
Donation	20000	25,000	31,000	16,000	-
Training	16000	-	300	13,800	-
Diesel boiler machine	146,826	280,499	140,909	508,769	258,407
Misc. Exp.	3,028,895	2,909,635	2,977,890	3,204,433	3,004,532
Repair & maintaining	198,568	179,192	205,458	122,822	109,847
Deposit interest	-	-	218,685	228,000	-
Consumed goods	88,761	65,778	79,274	52,550	16.721
Electricity & water	1,781,387	1,374,439	1,601,118	2,358,957	1,048,262
Anniversary exp.	8,935	6,428	7,198	996	-
Analysis charge	9,652	6,735	7,546	1,023	-
Reward	24,055	35,165	38,267	34,449	20,611
Research	17,600	815	913	-	-
Advertisement	96,743	63,153	66,580	60,120	35,611
Interest exp.	-	8,412,280	13,285,966	8,582,844	7,139,682
Depreciation	1,805,226	1,466,831	1,498,453	1,539,094	1,613,617
Medicine exp.	-	15,187,85	5,511,707	673,783	1,249,830
UPDAN	-	33,264,229	600,851	6,854,024	16,576,145
Total	29,351,628	83,316,428	46,387,192	45,785,019	44,624,483

The fixed cost in the FY 2061/62 was lowest of 29,351,628 and the highest fixed cost which is Rs 83,316,428 in the FY 2062/63. However, there was no more fluctuation in the salary cost between the FY 2062/63 which was Rs 17,832,336 and 2063/64 which was Rs 17,627,216. Salary was highest in the FY 2064/65 which was Rs 20,771,642. Thus it can be concluded that the fixed cost increased in FY 2062/63 due to highest interest expenses in comparison to the all other fiscal year.

4.5 Profitability of NAL

Profit is the major element of each and every business organization for survival, further development and fulfils social expectation. In modern business, effectiveness and efficiency of any business organization or management are measure on the basis of profit. However, the concept of profit is changing from time to time. At present, reasonable profit approach has been becoming at a strong position.

Since the industry is suffering from loss for so many years, therefore it is not relevant to analyze only the net profit (loss) of the industry. For this reason gross profit is requested to be analyzed apart from net profit. Gross profit is the amount left after deducting cost of sales from total sales revenue. The profit pattern of NAL is presented below. The profit pattern analyzed on the basis of actual sales achievement.

Table: 4.5

Profit trend of NAL

Years	Gross profit		Net profit(loss)		Operating expenses	
	Rs	%	Rs	%	Rs	%
2061/62	6,930,174	9.17	(27,010,153)	35.74	101,107,952	133.80
2062/63	7,256,329	12.07	(82,222,900)	136.79	132,692,468	22.76
2063/64	17,548,189	26.5	(36,128,189)	54.57	88,068,263	133.02
2064/65	5,844,736	11.28	(43,380,483)	83.74	87,205,233	168.33
2065/66	4,918,889	9.79	(41,634,693)	82.84	85,702,566	170.53

Note: where, operating expenses = cost of sales + selling expenses + administrative expenses

The industry is suffering from net loss for so many years. The amount of loss is highly fluctuated, in the FY 2061/62 the net loss of the industry was Rs 27,010,153 and it is increased to Rs 82,222,900 in FY 2062/63. There are numerous reasons for continuous loss

of the industry which are: liquid political condition of the country, unstable political environment, top competition with the imported medicines, fluctuation in the price of raw material in the international market etc. Apart from the above mentioned factors there are other internal and external factors causing the continuous loss of the industry which are utilization of capacity, excessive strikes and BANDHS, price problem due to under utilization of the production capacity. The industry was not able to make operation profit (profit before interest and depreciation) in each fiscal year from 2061/62 to 2065/66 due to huge amount of administrative expenses.

The income statement of the FY 2065/66 is shown as follows:

Table: 4.6

Income statement for the year ended 2065/66

Particulars	2064/65
Sales revenue	50,259,168
Less: cost of sales	45,340,279
Gross profit (loss)	(4,918,891)
Add: other income	2,568,004
Total GP including other income	7,486,895
Less:	
Selling expenses	4,532,714
Administration expenses	35,835,573
Operation profit (loss)	(32,881,392)
Less: other fixed costs	
Interest	7,139,682
depreciation	1,613,617
Net profit (loss)	(41,634,693)

4.5.1 Gross Profit Margin Ratio

One of the most common ratios in operational analysis is the calculation of gross profit as a percentage of net sales. It is calculated by dividing the gross profit by sales.

Gross profit margin = gross profit/sales

The gross profit margin reflects the efficiency with which management produces each unit of product. This ratio indicates the average spread between the cost of goods sold and sales revenue. A high gross profit margin ratio is a sign of good management. A gross profit margin ratio may increase due to any of the following factors e.g. (a) higher sales price, cost of goods sold remaining constant (b) lower cost of goods sold, sales price remaining constant (c) a combination of variations in sales price and costs, the margin widening, and (d) an increase in the proportionate volume of higher margin items. A low gross profit margin may reflect higher cost of goods sold due to firm's inability to purchase raw materials at favourable terms, inefficient utilization of plant and machinery, or over investment in plant and machinery, resulting in higher cost in production.

Gross profit margin ratio (for the FY 2065/66) = $\frac{4918889}{50259170} \times 100$

= 9.79%

Gross profit margin ratio calculated from the FY 2061/62 to2065/66 in table 4.6.

4.5.2 Net Profit Margin Ratio

Net profit margin ratio establishes a relationship between net profit and sales and indicates management's efficiency in manufacturing, administration and selling the products. This ratio is the overall measure of the firm's ability to turn each rupee sales into net profit. The net profit margin ratio is measured by dividing profit after tax by sales:

Net profit margin ratio = profit after tax/sales

The gross profit margin has increased over years, but net profit margin has either remain constant or declined, or has not increased as fast as the gross margin, this implies that the operating expenses relative to sales have been increasing. The increasing expenses should be identified and control. Gross profit margin may decline due to fall in sales price or increase in the cost of production. As a consequence, net profit margin will decline unless operating decrease significantly.

Net profit margin ratio (for the FY 2064/65) = $\frac{(41634691)}{50259170} \times 100$

= (82.84) %

Net profit margin ratio calculated from FY 2061/62 to 2065/66 in table 4.5. This result shows that the company has suffered the huge amount of net loss and this is not the indication of efficiency of the business and utilization of resources. But still this figure indicates that one rupee increased in sales help to further increase of loss by Rs 0.82. The gross profit margin and net profit margin ratio is shown by the following graph:

Figure: 4.3

Trend of gross profit and net profit in percentage

4.5.3 Operating Expenses Ratio

The operating expenses ratio explains the changes in the profit margin ratio. This ratio is computed by dividing operating expenses by cost of goods sold plus selling expenses and general and administrative expenses (excluding depreciation and interest) by sales.

Operating expenses ratio = operating expenses/sales

The operating expenses ratio is a yardstick of operating efficiency, but it should be used cautiously. It is affected by a number of factors, such as external uncontrollable factors,

internal factors, employees and managerial efficiency (or inefficiency), all of which are difficult to analyze. Further, the ratio cannot be used as a test a financial condition in the case of those firms where non-operating expenses ratio indicates the average aggregative variation in expenses, where some of the expenses may be increasing while other may be falling. Thus, to know the behaviour of specific expenses items, the ratio of each individual operation expenses to sales should be calculated.

Operating expenses ratio (for the FY 2065/66) = 85702566/55259170

= 170.53%

Operating profit margin ratio calculated from FY 2061/62 to 2065/66 in table NO. 405. The operating expenses ratio for this company indicates that 170.53% of sales have been consumed together by the cost of goods sold and other operating expenses. This implies that the company should not cover the cost of goods sold and other operating expenses.

4.6 CVP analysis of NAL

The study of relationship between cost, volume and profit is known as CVP analysis. CVP is the study of the effect of changes in costs and volume on a company's profits. Now a day, CVP analysis has become a powerful instrument in management decision making, specially cost and profit planning. CVP analysis helps to determine the minimum sales volume rupees avoiding losses and the sales volume at which the profit goal of the company will be achieved. So it is very important for sales and production plans because without the knowledge of BEP, it is very difficult to determine the sales level for certain level of profit. Profit planning can be done only when the management has information about the cost of products, both fixed and variable cost and the selling price of the product. It is useful in setting selling price, determining production mix and maximizing use of production facilities. CVP analysis is specially applied for profit planning and control. On the calculation of BEP in NAL, following assumption should be considered:

- Activity base is selected in terms of sales revenue.
- The concept of cost variability is valid, so cost can be classified as fixed and variable.
- There is no opening and closing stock.
- Sales mix ratio among the products remains constant.

Table: 4.7

Income statement and various component of CVP analysis for five years

Particula	2061/2062	2062/2063	2063/2064	2064/2065	2065/2066
Sales revenue	75,564,96	60,106,899	66,207,805	51,805,787	50,259,168
VC	73,561,550	59,255,151	56,462,490	51,542,153	59,837,494
CM	2,003,405	851,748	9,742,315	263,626	421,786
Fixed cost	29,351,628	83,316,428	46,387,192	45,787,019	44,624,483
Net P/L excluding OI	(27,348,223)	(82,464,680)	(36,644,877)	(45,521,394)	(44,202,697)
Other income	338,070	241,780	516,688	2,140,910	2,568,004
Net P/L including OI	(27,110,053)	(82,222,900)	(36,128,189)	(43,380,484)	(41,634,693)
CM ratio	0.02651	0.01417	0.14715	0.00509	0.008398
VC ratio	0.97349	0.98583	0.85285	0.99491	0.99161
BEP in Rs	1,107,190,796	5,879,776,147	315,237,458	8,995,092,141	5,318,770,322
MOS in Rs	(1,031,625,841)	(5,819,669,248)	(249,029,653)	(8,943,286,363)	(5,268,511,154)
BEP % on sales	1465.217%	1782.198%	476.133%	17363.106%	10582.687%
MOS % on sales	-1365.217%	-9682.158%	-376.133%	-17263.103%	-10482.687%

Source: including other income/OI = other income

4.6.1 Analysis of CM ratio

CVP analysis included both contribution analysis and break even analysis. Contribution analysis involves a series of analytical techniques used to determine and evaluate the effects

of profit on sales revenue (i.e. units sold), sales price, fixed cost and variable cost. Ti focuses on contribution margin. The term 'profit' used in CVP analysis is the amount of contribution margin available from the sales revenue to absorb fixed cost and also to contribute towards company's profit goal after deducting all variable costs of sales. Therefore, CVP analysis requires distinction of cost into variable and fixed. All semi variable costs need to be clearly segregated into fixed and variable component. Contribution margin is the excess of sale over the variable cost. It can be presented as follows:

Contribution margin (CM) = sales revenue – variable cost
Or CM for FY 2061/62 =Rs (75,564,955 – 73,561,550) = Rs 2,003,405
CM for FY 2065/66 = Rs (50,259,168 – 49,837,382) = Rs 421,786

The above table 4.7 shows the calculation of CM of NAL for the fiscal year from 2061/62 to 2065/66. CM for the five years shows the fluctuating trend. High CM is signal of high profit, low CM is the signal of the low profit. Above clearly shows that CM of NAL is not satisfactory because it don't cover the fixed cost. By this result, the company is bearing huge amount of loss.

In the same way, the CM ratio establishes a relationship between the contribution margin and sales volume. It can be presented as follows:

$$\text{CM ratio} = \frac{contribution\ margin}{sales\ revenue}$$

CM ratio for the FY 2061/62 = Rs 2,003,405/Rs 75,564,955
= 0.02651
CM ratio for the FY 2065/66 = Rs 421,786/Rs 50,259,168
= 0.00839

The above table 4.7 shows the calculation of CM ratio of NAL for the fiscal year from 2061/62 to 2065/66. CM ratio is not also satisfactory of this company. So, management should try to increase the value of the ratio by reducing the variable cost or by the increasing the selling price.

4.6.2 Analysis of Break-Even Point

Break-even analysis is a technique widely used by production management and management accountants. It is based on categorizing production cost between those which are "variable" (costs that change when the production changes) and those that are "fixed" (costs not directly related to the volume of production). Total variable and fixed cost are compared with sales revenue in order to determine the level of sales volume, sales value or production at which the business makes neither a profit nor a loss (BEP). Through contribution margin approach, BEP can be expressed as: if other income is not included in the revenue then BEP is:

$$\text{BEP in Rs} = \frac{total\ fixed\ cost}{CM\ ratio}$$

BEP in Rs for the FY 2061/62 = Rs 29,351,628/0.02651

= Rs 1,107,190,796

BEP in Rs for the FY 2065/66 = Rs 44,624,483/0.2651

= Rs 5,318,770,322

If other is included in the revenue then BEP is:

$$\text{BEP in Rs} = \frac{total\ fixed\ csot - other\ income}{CM\ ratio}$$

$$\text{BEP in Rs for the FY 2061/62} = \frac{Rs\ 29{,}351{,}628 - Rs\ 338{,}070}{0.02651}$$

= Rs 1,094,438,250

$$\text{BEP in Rs for the FY 2065/66} = \frac{Rs\ 44624483 - Rs\ 2568004}{0.02651}$$

= Rs 5,012,691,170

From, the above calculation, the BEP (if other income is not included) of NAL for the base year 2061/62 is Rs 1,107,190,796 and for FY 2065/66 it is Rs 538,770,322. If other income is included then the BEP of NAL is Rs 1,094,438,250 in FY 2061/62 in FY 2061/62 and in FY 2065/66 it is Rs 5,012,691,170. Similarly the table no. 4.7 shows the calculation of BEP of NAL for five fiscal years from 2061/62 to 2065/66. The break-even of NAL for five years shows decreasing and increasing trend. In all the five fiscal years, break-even sales are higher than the actual sales of NAL which shows that it is necessary to increase in sales to recover loss and management should plan for its cost control.

As from the table no. 4.7, the industry is always suffering from loss because of the high fixed costs viz. Electricity, interest and UPDAN expenses. The industry is operating in loss and far away from BE sales except in the FY 2063/64, where it is close to BE sales as compared to other years. It is observed from the table that at least the sales volume should be made more than five times just to be break-even condition i.e. neither profit nor loss. Otherwise the company should be decrease the cost to attain at break-even point. The verification of BEP is shown below:

Table: 4.8

Verification of BEP, if other income is not considered

Particulars	**2061/62**	**2062/63**	**2063/64**	**2064/65**	**2065/66**
Sales revenue	1,107,190,796	5,879,776,147	315,237,458	8,995,092,141	5,318,770,322
Variable cost	1,007,839,168	5,796,459,719	268,850,266	8,949,307,122	5,370,145,839
Contribution margin	29,351,628	83,316,428	46,387,192	45,785,019	44,624,483
Fixed cost	29,351,628	83,316,428	46.387,192	45,785,019	44,624,483
Profit (loss)	0	0	0	0	0

Table: 4.9

Verification of BEP, if other incomes if considered

Particulars	**2061/62**	**2062/63**	**2063/64**	**2064/65**	**2065/66**
Sales revenue	1,094,438,250	5,862,713,338	311,726,157	8,574,481,139	5,012,691,108
Other incomes	338,070	241,780	516,688	2,140,910	2,568,004
Total revenue (A)	1,094,776,320	5,862,955,118	312,242,845	8,576,622,349	5,015,259,184
Variable costs	1,065,424,632	5,779,638,690	65,855,653	8,530,837,030	4,970,634,701
Fixed costs	29,351,628	83,316,428	46,387,192	45,785,019	44,624,483
Total costs (B)	1,094776,320	5,862,955,118	312,242,845	8,576,622,349	5,015,259,184
Profit (loss) (A-B)	0	0	0	0	0

4.6.3 Margin of Safety Analysis

Margin of safety (MOS) is a cushion available to a business firm to protect it against the future business happenings. The larger is the margin of safety, the greater is the chances of for the firm to earn profit or vice versa. Margin of safety is also defined as excess of actual or

budgeted sales over and above the break-even sales. In other words, it is the difference between actual or budgeted sales and break-even sales. It states the amount by which sales can be drop before losses begin to incur in an organization. The formula for its calculation is:

Margin of safety (MOS) = total sales – break-even sales

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

If other income is not included in the revenue than MOS is:

MOS for FY 2061/62 = Rs 75,564,955 – Rs 1,107,190,796
= Rs (1,031,625,841)
MOS for FY 2065/66 = Rs 50,259,168 – Rs 5,318,770,322
= Rs (5,268,511,154)

If other income is included in the other revenue then MOS is:

MOS for FY 2061/62 = Rs 75,564,955 – Rs 1,094,438,250
= Rs (1,018,873,295)
MOS for FY 2065/66 = Rs 50,259,168 – Rs 5,012,691,180
= Rs (4,962,432,012)

For the above calculation, margin of safety (MOS) is negative in both fiscal year i.e. 2061/62 and 2065/66. Similarly, the table no. 4.8 shows the calculation of MOS both considering and not considering other income of NAL for five fiscal years from 2061/62 to 2065/66. In the all five years, NAL's break-even sales is higher than actual sales, so margin of safety is in negative and less by 1365.087%, 9681.816%, 376.141%,17267.447% and 10479.898% from FY 2061/62 to 2065/66 respectively. During the fiscal year 2063/64 the MOS is less negative i.e. 376.141% as compared to other fiscal years.

When other income is considered it is deducted from total fixed cost. This is because, income reduces the cost as a result BEP sales level of NAL is decreased than previous time. Margin of safety is also reduction than prior time. But still margin of safety is negative.

4.6.4 Analysis of operating leverage

Operating leverage is a measure of extent to which fixed costs are being used in an organization. The relationship of a company's variable and fixed cost is reflected in its operating leverage. Operating leverage is a measure of how sensitive net income is to percentage change in sales. An organization with high fixed cost and low variable cost reflects in sales. An organization with high fixed cost and low variable cost reflects high operating with high break-even point. It shows the direct proportionate relationship between fixed cost and sales. It is calculated by:

$$\text{Operating leverage} = \frac{contribution\ margin}{EBIT}$$

If the quotient becomes positive, operating leverage may be favourable otherwise it is unfavourable. In other words, impact on profit that arises out of an increase in sales represents a favourable leverage. Similarly, a decrease in sales has a negative impact on operating profit and implies an unfavourable leverage. In profit planning the objective is to maximize profit and minimize costs. So, leverage that has been unfavourable (or negative) impact on profit (i.e. due to decrease in sales) is not desirable. If sales fall, the firm with a high operating leverage would suffer more loss then the firm with no or low operating leverage.

Operating leverage for FY 2065/66 = 421,786/ (37,063,015)

= (0.01138)

Table: 4.10

Degree of operating leverage

Particulars	**2061/62**	**2062/63**	**2063/64**	**2064/65**	**2065/66**
Sales revenue	75,564,955	60,106,899	66,207,805	51,805,778	50,259,168
Variable cost	73,561,550	59,255,151	56,465,490	51,542,153	49,837,382
Contribution margin	2,003,405	851,748	9,742,315	263,626	421,676
FC excluding interest	29,351,628	83,316,428	46,387,192	45,785,019	44,624,483
EBIT	(27,348,223)	(82,464,680)	(36,644,877)	(45,521,394)	(44,202,697)
DOL	(0.07326)	(0.01150)	(0.41707)	(0.00714)	(0.01138)

The table 4.10 shows the calculation of DOL of NAL for five fiscal years from 2061/62 to 2065/2066. The DOL of NAL for five years shows decreasing and increasing trend. DOL of FY 2065/66 is -0.01138 indicates that if sales increase by 100 percent, operating loss will increase by 1.138%. Therefore, a levered form is always riskier than an un-levered firm in bad times. But in good times, a levered form's net operating incomes increases in sales. Therefore, it is riskier for NAL when the time is not favourable or the market condition is not satisfactory. Similarly, the above table shows that, if sales increase by 100% then the operating loss will increase by 7.326%, 41.707% from FY 2061/2062 to 2065/2066 respectively.

4.7 Impact of changes in various variables on profit

Sensitivity analysis is the measurement of responsiveness in outcome with the change in the determinant variables. As we know the profit is the function of volume, price, fixed cost, variable cost etc. Here, the researcher systemically deals with the following sensitivity analysis.

4.7.1 Effect of change in sales

Break-even sales of the industry will change when selling price per unit changes. But break-even level does not change when the total amount of sales revenue is changed due to change in sales unit. Because change in sales revenue impacts on CM which is the cause of change in CM ratio, BEP and MOS.

Table: 4.11

Income statement by 10% change in sales (FY 2065/66)

Particulars	Original sales revenue	10% increase in selling price	10%decrease in selling price
Sales revenue	50,259,168	55,285,085	45,223,251
Less: variable cost	49,837494	49,837,494	49,837,494
Contribution margin	421,676	5,447,491	(4,604,242)

Less: fixed cost	44,624,483	44,624,483	44,624,483
Net income (loss)	(44,202,809)	(39,176,892)	(49,228,725)
Change in net income (loss)	-	5,025,917	5,025,917
CM ratio	0.00839	0.09854	(0.10179)
BEP in Rs	5,318,770,322	452,856,535	(438,397,514)
% change in BEP	-	(91.49)%	(108.24)%

The above table shows that when sales price is increased by 10%, net loss is deceased by Rs 5,025,917. Similarly, CM ratio is increased to 0.09854 from 0.00839. The break-even amount is decreased to Rs452, 865,535 from Rs 5,318,770,322 by 91.49%. When the selling price is decreased by 10%, net loss is increase by Rs 5,025,917 from the original loss by Rs 44,202,809. CM ratio is negative 0.10179 when sales price is decreased: BEP amount is negative to Rs 438,397,514, due to negative of CM ratio, from the original BEP RS 5,318,770,322. When sales value is increased 10% the BEP value is decreased by 91.49%. In the contrary, 10% decreased in sales price, the increased BEP by 108.24%.

4.7.2 Effect of Changes in Variable Cost

Other things remaining constant, if the variable cost is changed then the BEP and CM ratio also changes. When variable cost is increased CM ratio will be decreased and as a result profit will be decreased and vice versa when variable cost is decreased.

Table: 4.12

Income statement by 10% change in variable cost (FY 2065/66)

Particulars	Original variable cost	10% increase in variable cost	10% decrease in variable cost
Sales revenue	50,259,168	50,259,168	50,259,168
Less: variable cost	49,837,494	54,821,243	44,853,745
Contribution margin	421,676	(4,562,075)	5,405,423
Less: fixed cost	44,624,483	44,624,483	44,624,483

Net income (loss)	(44,202,809)	(49,186,558)	(39,219,060)
Change in net income (loss)	-	(4,983,749)	4,983,749
CM ratio	0.00839	(0.09077)	0.10755
BEP in Rs	5,318,770,322	(491,621,494)	414,918,484
% change in BEP	-	(109.24)%	(92.20%)

The above table shows that when variable cost of NAL is increased by 10%, net loss of the company increased by Rs 4,983,749. CM ratio is (0.09070) from 0.00839 and BEP is also negative to Rs 491,621,494 from Rs 5,318,770,322 by (109.24) %. When variable cost is decreased by 10%, net loss of the industry is decreased by Rs 4,983,749 where CM ratio is 0.10755 and break- even sales becomes Rs 414,918,484 or BEP decreases by 92.20% on actual level.

4.7.3 Effect of Changes in FC

In CVP analysis, the change in fixed cost does not being any change in contribution margin ratio. Other factor remaining constant, when fixed cost is changed net income (loss) and BEP amount are also changed. Here 10% change in fixed cost of NAL is measured as follows:

Table: 4.13

Income statement by 10% change in fixed cost (FY 2065/66)

Particulars	Original FC	10% increase in FC	10% decrease in FC
Sales revenue	50,259,168	50,259,168	50,259,168
Less: variable cost	49,837,494	49,837,494	49,837,494
Contribution margin	421,676	421,676	421,676
Less: fixed costs	44,624,483	49,086,931	40,162,038
Net income (loss)	(44,202,809)	(48,665,257)	(39,740,361)
Change in net income (loss)	-	4,462,448	(4,462,448)
CM ratio	0.00839	0.00839	0.00839
BEP in Rs	5,318,770,322	5,850,647,318	4,786,893,325
% change in BEP	-	10%	(10) %

The above table 4.13 shows that when fixed cost of NAL is increased by 10%, net loss of the industry is increased to Rs 48,655,257 from Rs 44,202,809. There are no effects on CM ratio while fixed cost is changed. So CM ratio is same but break-even sales revenue of the industry is increased off to Rs 5,850,647,318 from Rs 5,318,770,322. BEP level increase due to increase in fixed cost because to recover additional amount of fixed cost. It is required to increase in sales. When the fixed cost of NAL is decreased by 10%, net loss is decreased by Rs 4,462,448. CM ratio remains constant because CM ratio does not change due to change in fixed cost; BEP reduces to Rs 4,786,893,325 from Rs 5,318,770,332 due to decrease in fixed cost.

4.8 Break-even Analysis of Multi-products

Sales mix can be defined as the relative combination of product represented in the total sales. NAL has 6 products, which are not equally profitable. Profit depends to some extent on the sales mix that company is able to achieve. The break-even analysis of multi product company like as NAL is complex because different products will have different selling prices, different

costs different contribution margins. Break-even points depends on the mix in which the various product are sold.

$$\text{Overall BEP in Rs} = \frac{fixed\ cost}{weighted\ CM\ ratio}$$

$$= 44{,}624{,}483/0.00839$$

$$= \text{Rs } 5{,}318{,}770{,}322$$

The sales mix and CM ratio of each product are classified on the basis of sales. In the calculation, the overall break-even point of NAL is Rs 5,318,770,322. This is computed by dividing the fixed cost by the company's weighted CM ratio. If the sales mix changes, then the break-even points also change. The details sales of all product of NAL to be a BEP for the FY 2065/66 is presented below in table 4.14:

Table: 4.14

Product wise BEP sales

S.N.	Products	Sales	Sales mix.	Product wise BEP (overall BEP x sales mix.)
1	Tablet	48,455,871	0.96412	5,127,932,842
2	Capsule	256,824	0.00511	27,178,916
3	Powder & suspension	617,183	0.01228	65,314,500
4	I.V. & E.N.T.	5,529	0.00011	585,065
5	Ointment	188,472	0.00375	19,945,389
6	Jeevan jal	735,292	0.01463	77,813,610
Total		50,259,170	1.00	5,318,770,322

4.9 CVP analysis and uncertainty

The organization fails to cover fixed cost in the long run which can result in the demise of any organization, if much attention is given to the traditional CVP model (which ignores uncertainty). The basis CVP model is not adequate, bearing the decision making process. If one or more variable of the CVP analysis are subject to uncertainty, the management should analyze the potential impact of this uncertainty. An any given decision problem, all four of

factors viz. Unit selling price, unit variable cost, total fixed cost and the expected sales volume of each product can be uncertain. However, to simplify analysis several parameters can be taken as certainty equivalents. For the purpose, sales price, variable and fixed costs will be assumed be certain, while sales is assumed to be uncertain with the normal distribution. This means that the probability distribution for profit can be also be assumed to be normal.

4.9.1 The Normal Probability Distribution

The normal probability distribution curve is bell shaped and symmetrical with equal mean and median. To confirm whether a distribution is normal it is usually necessary to ascertain the mean (μ) and standard deviation. To compare two distributions it is necessary to translate the observations of both distributions into Z- values. Basically, Z- values convert each distribution into a standard normal from with a mean of zero, and a standard deviation if one. The formula used:

$$Z = \frac{X-\mu}{6}$$

Where,

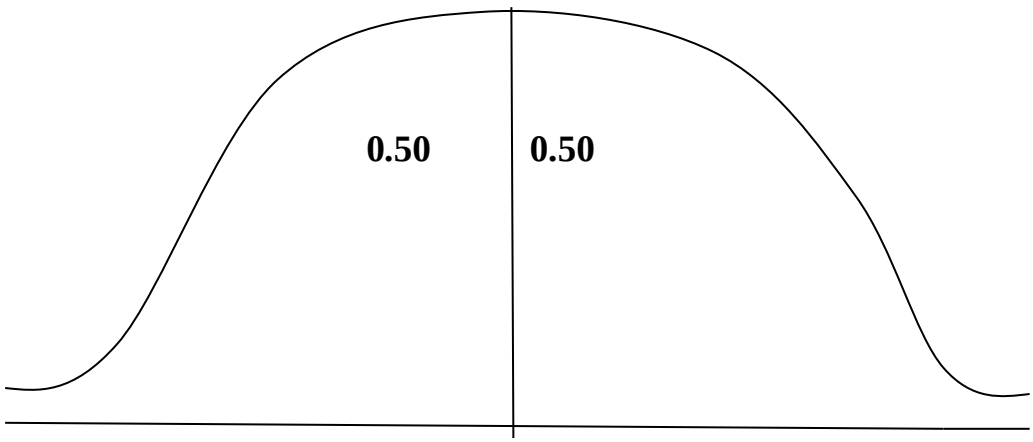
X= value of variable

μ= mean value

6= standard deviation

Figure: 4.5

Normal probability distribution curve



In the figure Mean value x has divided the total diagram into exactly two equal parts i.e. 0.50 or50% and total area of curve is one.

Here, BEP for NAL = Rs 5,318,770,322

Expected mean sales (μ) = Rs 60, 788, 92

Standard deviation (6) = Rs 9,378

The calculation is presented in table no. 4.2 computation of position to establish the probability of different profit level for the FY 2065/66 as follows:

1) The probability of at least BE sales

Using Z value

$$Z = \frac{5,318,770,322 - 60,788,922}{9378}$$

= 560,672

Area between Z = P (0<Z<560,672)

= 0.50 or 50%

The break-even point lies 560,672 of NAL, from the mean of our standard normal distribution curve. The probability distribution can be estimated form standard normal table. The figure of 0.5000 represents the probability of achieving the BEP by 50%.

2) The probability of sales of Rs 43,115,110

$$Z = \frac{43,115,110 - 60,788,922}{9378}$$

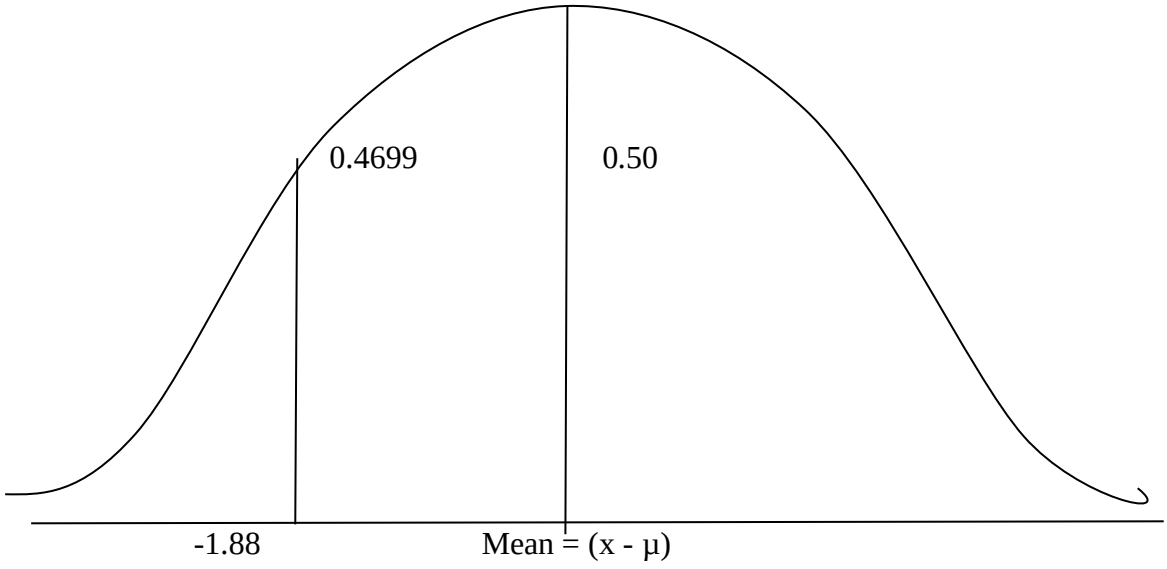
= 1.88

The value of Z from Z- table is 0.4699

The probability of sales Rs 43,115,110 is 0.4699 or 56.99%.

Figure 4.6

Normal probability of sales Rs 43,115,110



4.10 Impact of Income Tax

The industry was suffering from the huge amount of loss and its accumulated loss was Rs 230,376,418. So in this regard, there would be no meaning of making analysis of impact of income tax.

4.11 Major Findings

On the basis of analysis, observation and informal discussion, the followings major findings are drawn:

- Sales plan of NAL is not properly maintained. The industry has not use scientific method of sales planning.
- Sales trend of NAL shows the negative trend which can further increase the net loss.
- Break-even sales have more than actual sales so the industry is suffering from huge loss every year.
- NAL do not participative the scientific and appropriate cost classification techniques. Costs were classified into fixed and variable as per the decision of the top level management.
- Out of total cost of NAL, variable cost is 97.30%, 98.58%, 85.29%, 99.49% and 99.16% for the fiscal year 2061/62 to 2065/66 respectively.
- MOS of NAL is negative in every year, the industry might be bearing high risk.
- The industry has 405 employees including skilled technical and non- technical staffs. Out of total staff, 380 staffs are permanent and 25 staffs are working on daily wage system.
- Board of directors of NAL has sole responsibility of price fixing. Recommendations are collected from finance, production and marketing department and the board of directors fixes the price of the products.
- Top level managers set the goals but these goals and objectives are not clearly communicated to the lower level of management.
- The profitability of the industry is very poor. Every year the industry is suffering from loss and which is accumulated to Rs 230,376,418 up to fiscal year 2065/66
- NAL is utilizing only 50% capacity.

- The industry imports the raw materials from India and other country.
- The standard of factory building by WHO is not recommended, so they are going to construct the new building and will production make continue with more capacity.

The industry is facing problem of poor communication among production, administration, technical, marketing and finance department. The operating profit ratio is very low which is not satisfactory. The net profit margin ratio is negative and the operating expenses ratio is very high, it shows that the financial condition of the industry is not good. As the D0L is negative in every year, it suffers huge amount of loss even if the sales revenue decrease slightly. On the basis of sales, the largest top three products of the industry are tablet, powder and suspension and jeevan jal. The industry is facing the problem of raw materials dependency and the fluctuation international price. Sometimes it also faces the problem of raw material scarcity as well and very tough completion market. There is significant different between budgeted and actual sales of the industry.

If other income is considered then BEP of the industry was Rs 1,094,438,250, Rs 5,862,713,338, Rs 311,726,157, Rs 8,574,481,139 and Rs 5,012,691,180 from FY 2061/62 to 2065/66 respectively. Similarly if the other income is not considered the BEP of the industry were Rs 1,107,190,796, Rs 5,879,776,147, Rs 315,237,458, Rs 8,995,092,141 and Rs 5,318,770,322 form financial year 2061/62 to 2065/66 respectively. The sensibility analysis, when variable cost is increased by 10% then contribution margin and BEP are negative. Similarly, if the selling price is decreased by 10% then CM ratio is negative at the result BEP is also negative.

CHAPTER – V

SUMMARY, Conclusions **AND RECOMMENDATIONS**

5.1 Summary

In the present era, industrialization has become essential element for the development of the country. Industry promotes economic development by providing employment and by mobilizing the unutilized resources. Therefore, the strong need of public sector and private sector felt for the growth and economic development of the country through industrialization. Many public and private enterprise were established till now.

NAL is only one medicine industry under government taking and its main purpose is to provide on reasonable price various kinds of essential medicine to the people at a reasonable price.

Use of CVP analysis in the Nepalese organization is also lacking. Hence the basic problem in the Nepalese organization is failing to use management tools, especially accounting tools. Hence, this study has been conducted to encourage the readers and the organizations to use such tools and methodologies in their management decision making and planning to that profitability could be maintained.

The main objective of present studies is to examine the state of application of CVP analysis. So the study was fully devoted to, examine the CVP analysis of the industry. As per the objective of the study, various primary and secondary data were collected for five years from 2061/62 to02065/2066.

The collected data from primary and secondary sources were analyzed with descriptive and analytical approach. Sales trend analysis, costs analysis, profitability analysis, sensitivity sales mix analysis etc were done with the help of both statistical and financial tools. Primary data were collected through inter-action with the concerned employees and questioner filled by senior's levels staff of NAL. Whereas secondary data were drawn from the various documents like annual reports of NAL, newsletters etc published by industry. From the variable analysis of CVP variables, the company shows different results. The industry has low CM ratio, high variable and fixed cost and negative margin of safety. The variable cost

ratio is 93.35, 98.53, 85.29, 99.49, and 99.16 % from the FY 2061/62 to 2065/66 respectively. It shows that the variable cost was very high, the DOL was negative in every year

Of the industry and it has very risky position and would suffer from further loss if the situation pessimistic. The gross profit margin was very low and net profit margin was negative and the operating expenses ratio was very high. It shows that financial position was not satisfactory. The industry is suffering continuous loss every year because of its high fixed cost for interest and extra UPDAN. The industry did not apply scientific methods of cost classification and expenses budget. The cost classification was done on the basis of high level managers decision of the industry NAL has not participated CVP analysis.

5.2 Conclusions

NAL has substantial gap between budgeted and actual achievement. Company's goals and objectives are not clearly communicating with its employees. Various popular profit planning tools like JIT, zero bases budgeting, CVP analysis are not participated in NAL. Cost segregation into fixed, variable and semi variable are not done. Fixed cost is in increasing trend from the last 3 fiscal years. Long term liability is also increasing: big portion of income is spent over paying interest. Even though the operating costs are in increasing trend no specific technique is utilized till now to control cost or reduce them. Classification of cost is not mentioned on scientific and systematic basis for the realistic budget and not been able to practice CVP analysis as a tool to PPC.

Study of NAL through CVP analysis shows, company has low CM 0.51% and 0.84% for FY 2061/62 and 2065/66 respectively. The company has always been run up below BEP and the loss of the industry is being accumulated every year and its accumulated loss till FY 2065/66 is 230,376,418. The sensitivity of CVP analysis in response to change in fixed cost is proportionate where as it is very high in response to change in sales revenue and variable costs. The DOL is negative in every year; it shows the industry is in risky position. CVP relationship is not considered in NAL while developing sales plan, production plan and pricing strategy. As the decision making power is concentrated in top level management, participative approach is to set the goals is rarely applied in the organization. The sales mix analysis shows that out of various groups of product, tablet is more profitable.

Underutilization of capacity has become a big issue for the organization. If the management does not start utilizing full capacity right now and initiative is not taken to effective cost control programme, NAL may bear further loss in future and it might be bitter experience in the history of industrial sector of the country.

5.3 Recommendations

Most of the organizations, especially in Nepalese perspective are failing to achieve their business objectives; to maximize profit. It is because of the lack of properly use of accounting and financial tools and methodologies in management decision making and planning process. As Nepal has already got the membership of WTO, SAFTA and other international organizations, Nepalese industries should fit with this environment. Nepali products will be in the trap of cut throat competition. The future of Nepalese industries largely depends on their strategic fit and for tin's, manager should be aware of the current business issues. To have strategic advantage over the competitions, Nepalese industries required identifying the various tools of accounting and relevant aspects should be analyzed and applied. Hence, the following recommendations would help to improve the present condition of NAL:

- NAL should apply CVP analysis; it is because none of the organization in the dynamic world is in a position to maximize profit without applying such tools.
- NAL have not applied suitable scientific methods of cost classification. So, the mixed costs should be divided into fixed and variable portions so that CVP analysis could be applied.
- Variable cost of the industry is very high. The CM ratios of the industry are 2.65%, 1.42%, 14.71% 0.51%, and 0.84% for the FY 2061/62 to 2065/66 respectively. Hence the industry seems to have higher amount of variable costs. So the classification of expenses and cost form their nature of variability is essential.
- The industry should try to reduce the fixed costs.
- The company should try to maximum and effective utilization of fixed cost to generate profit.
- There should be systematic classification of cost as fixed and variable components. There is no system of analysis of cost and clear cut policy to separate semi-variable cost into fixed and variable. The costs are roughly classified and such classification is not scientific and appropriate.

- The industry should follow effective advertising policy and marketing representative should be involved to increase present sales volume and to find new areas where profit potential is high.
- The industry should consider the cost – volume – profit relationship while fixing the price of its products.
- The industry should put stress on effective utilization of FA.
- NAL should consider the product line to improve its position. As shown by the analysis, the tablets products are more profitable than other products. Therefore, the industry should allocate more resources to produce tablets, which might be helpful to improve the profitability of NAL.
- Finally, a system of periodical performance reports should be strictly followed to be conscious about poor performance and take corrective action immediately.

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