COMPARATIVE STUDY OF COST VOLUME PROFIT ALAYSIS OF NEPAL TELECOM LTD. AND NEPAL ELECTRICITY AUTHORITY AS A COMPONENT OF PROFIT PLANING AND CONTROL

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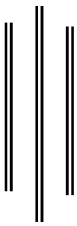

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Recommendation

This is to certify that the thesis

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Comparative study of cost-volume profit Analysis of Nepal Telecom Ltd.
And Nepal Electricity Authority as a component of profit planning and control

Has been prepared as approved by this department in the prescribed format of Faculty f Management. This thesis is forwarded for examination.

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And found the thesis to be original work of the student and written according to the prescribe format of faculty of Management, Tribhuvan University. We recommend the thesis to be accepted as partial fulfillment of requirement for the Master of Business Studies (MBS)

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DECLARATION

I hereby declare that the work reported this thesis entitled "comparative Study of Cost –Volume Profit Analysis of Nepal Telecom Ltd. and Nepal Electricity Authority", submitted Hari Khetan Multiple Campus, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirements for the Master of Business Studies (MBS) under the supervision of supervisors of Mr. Hiralal Yadav of Hari Khetan Multiple Campus.

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ABBREVIATIONS

ADB	:	Asian Development Bank
AGM	:	Annual Generation Meeting
ALT	:	Alternatives
BE	:	Break-Even
BJM	:	Biratnagar Jute Mill
CV	:	Coefficient of Variation
CBS	:	Central Bureau of Statistics
CM Line	:	Contribution Margin Line
CM Ratio	:	Contribution Margin Ratio
CM	:	Contribution Margin
Co	:	Company
C-V-P Analysis	:	Cost-Volume Profit Analysis
DP	:	Desire Profit
DPAT	:	Desire Profit after Tax
DPBT	:	Desire profit before Tax
Ed	:	Edition
Exp.	:	Expenses
FC	:	Fixed cost
FG	:	Finished Goods
FNCCI	:	Federation of Nepal Chamber of Commerce and Industry
MC	:	Contribution Margin
MCM	:	Morang Cotton Mill
MNCs	:	Multinational Companies

MOF	:	Ministry of Finance
MOS (M/S)	:	Margin of Safety
NA	:	Nat Available
NEA	:	Nepal Electricity Authority
NEBICO	:	Nepal Biscuit and Confectionary
NI	:	Net Income
NIDC	:	Nepal Industrial Development Corporation
NRB	:	Nepal Rastra Bank
NTC	:	Nepal Telecom
PF	:	Provident Fund
P/V	:	Profit-Volume
PERT	:	Project Evaluation review Technique
PPC	:	Profit Planning and Control
Prod.	:	Production
Pvt.	:	Private
Q	:	Quantity or Output
R & D	:	Research & Development
R/M	:	Raw Material
Req.	:	Requirement
S	:	Sales
SD	:	Standard Deviation
SP	:	Selling Price
SAFTA	:	South Asian Free Trade Area
TU	:	Tribhuvan University
TC	:	Total Cost

VAT	:	Value Added Tax
VC	:	Variable Cost
VDC	:	Village Development Committee
WTO	:	World Trade Organization

CHAPTER I
INTRODUCTION

1.1 Background of the Study

Nepal is a sovereign independent and a landlocked country. It is situated in South Asia. The total area of the Nepal is 147181 sq. km., which is 0.03% of the total world and 0.3% of Asia. Nepal is located between 26^0, 22' to 30^0, 27' north. The average length of Nepal is 885 km. east to west and average breadth is about 193 km. north to south. It also lies between two powerful countries, i.e. China in the north and India in the east, west and south. Nepal is 22 times small than India and 65 times than China. Nepal is divided into five regions which are Easter region, Central region, Western region, Mid Western region and Far Western region. But according to geographically, it is divided into three regions which are a) The Himalayan region b) The Hilly region and c) The Terai region

The total population of the country is 23151423. Out of this total population, females cover 11587502 and males cover 11563921. The urban population is 14.20% and rural population is 85.80%. The Himalayan region covers 6.3%, Hilly region covers 44.3% and Terai region covers 48.40% of the total population. Nepalese economy is based on agriculture. The total contribution in GDP through agriculture is 39.8% (CBS, 2001).

Nepal has abundant natural resources, but still is backward in term of socio-economic development because of the inability in exploiting the resources. Proper utilization of the available resources helps to make economy of the nation strong through various development works. In order to development of the nation, there should be good situation of political, economic, socio-cultural, science and technological and legal environment. Since some years the economic condition of Nepal is very poor because it was suffering the Maoist problem. Due to Maoist problem, the government was unable to do any kinds of development works properly at the time. But now, the Maoist problem has been solved up to some level. So, the economic growth of Nepal is hopeful. The primary needs of people are communication, education, health water sanitation, electricity,

transportation, security etc. so the government of the nation has to provide such types of facility to people in cheap price and easy way.

Several enterprises were established in the public sector during the 60's and 70's with the industrial sector enterprises mainly set up under the financial and technical assistance of bilateral donors.

Public Enterprises (PEs) are a kind of state agencies established in order to distribute state resources to the people. Their basic goal is to create social justice under the Economy Laissez faire, no existences of such PEs were accepted. But this kind of notion could not remain static. It was the post second world war period which had contributed to the inception of PEs. Both the capitalist and socialist countries have established the PEs with similar expectations. According to Friedman, Public Enterprise is an institution operating a service of an economic or social character, on behalf of the government. But as an independent legal entity, largely autonomous, though responsible to the public through the government (Chandra, 1997:2).

The World Bank Report defines State Owned Enterprises (PEs) as government owned or government controlled economic entities that generate the bulk of their revenues from selling goods and services. The term 'Public Service Corporation' referred to indicate PEs in the USA (World Bank, 1995:4).

The PEs were established to enhance in production, to develop the society and for the welfare of people. But they are not succeeded to meet the goal. Basically, they suffered from poor management, over staffing, political pressure, pressure of donor agency, corruption, huge losses, inadequate planning, lack of contestability, debts. The features of the problems are mostly similar in the nations where PEs are existed. From the second to the seventh plan, Nepal accorded significant priority to Public Sector Undertakings as a vehicle of development. These were envisaged as instruments for production and for carrying out socioeconomic policies in Nepal. Public Sector Undertaking contributed noticeably in:

a) Creating an industrial base in the country;
b) Enhancing domestic production;
c) Substituting imports;

d) Generating employment opportunities; and

e) Contributing to the national treasury

However the performances of PSU's did not prove to be satisfactory. Many suffered from various types of problems and handicaps resulting in economic and financial losses as the government controlled output pricing and internal management decisions (Bajacharya, 1995:22). Public sector has to responsible on Minister, Parliament, Secretary, Bureau of Public Enterprises, Supreme court, Auditor, Controller etc. All exercised a degree of control and jurisdiction and public sector should be accountable towards them (Jain, 1993:126).

In the context of Nepal, public enterprises in Nepal deserve a crucial role for the socio-economic development of our country. It enjoys a strategic and crucial position in our mixed economic. They have been established in many sectors for overall development of the country with different goals and objectives. Accordingly, Nepal Doosanchar Company Limited (Nepal Telecom) and Nepal Electricity Authority has been established under public utility and social- sector.

There are so many standard accounting tools and techniques are used to measure the performance of organization. Among them cost-volume-profit analysis is also one. CVP analysis is a part of profit planning and control. The analysis of relationship between cost, volume and profit is known as cost-volume-profit analysis. It helps to determine the minimum sales volume to avoid losses and the sales volume at which the profit goal of the firm will be achieved. It provides the following answers of the questions such as:

- What minimum level of the sales need to be achieved to avoid losses?
- What should be the sales level to earn a target profit?
- What will be the effect of changes in price, cost and volume on profit?
- Which profit is the most profitable and which one is the least profitable?
- How will profit be affected when sales mixed is changed

CVP analysis measures the BEPof the organization, which is level of no profit no loss. So every organization has to use CVP analysis. It would be more beneficial to Nepalese public enterprises which are suffering from loss but not applying CVP analysis.

1.1.1 Profile of the Nepal Telecom (NTC)

Nepal Doorsanchar Company Limited (Nepal Telecom) was registered on 2060/10/22 under company act 2053 and notice to this effect was published in Nepal Gazette the dated 26th Chaitra 2060, after dissolving then Nepal Telecommunications Corporation (NTC). However, the company names was officially effective from 1st Baiskh 2061 (13th April 2004) and the general public knows it by the name of NEPAL TELECOM as it's registered trademark.

Nepal Telecom, as a progressive, customer spirited and consumer responsive entity, is committed to provide nation-wide reliable telecommunication services to serve as an impetus to the social, political and economic development of the country. Vision of Nepal Telecom is to remain a dominant player in telecommunication sector in the country while also extending reliable and cost effective services to all. Goal of Nepal Telecom is to provide cost effective telecommunication services to every nook and corner of the country. Since 1913 establishment of first telephone line in Kathmandu, it has making 94 years long history in the field of communication services. But various constraints, it is unable to provide services as per the requirement of people in the rural area. Communication is essential means of information to every person.

1.1.2 Profile of Nepal Electricity Authority (NEA)

Nepal Electricity Authority was established in 1985 according to NEA act 1984 to supply electricity, reliable, efficient and accessible to all by undertaking the generation transmission and distribution electricity networking in accordance with the prevailing law. Though Nepal Electricity Corporation (NEC) was established in August 16, 1962 under Nepal Electricity Corporation Act 1962 to generate and distribute electricity is secured efficient economic and orderly manner in Bagmati Zone and Bhimfedi town in Makawanpur. In 1973 Nepal government increased NEC's responsibility in Narayani Zone. Moreover the electricity supply system of the complete central and western development region were transferred to NEC on 12th of February 1978. Before that Bijuli Adda which was under ministry of water and power used to distribute the electricity in Kathmandu valley (Adhikari, 2000:31).

There are various groups in NEA, which are providing services and ready to perform their task in proper way. Like generation business group, the main trust of the agreement was to improve the reliability of the hydropower stations. Transmission and system operation business group, distribution and consumer services business group, electrification group and engineering services business group are various group in NEA.

Nepal is second rich country in the water resources about 83,000 Mega watt electricity can be generated in Nepal. But NEA is not able to meet only the internal demand of the nation. For hydro electricity generation long term project plan, huge amount of capital equipments, technicians and other man power are essential. NEA looks only foreign assistant and faces other difficulties for producing electricity. In rural area, people have not facility of electricity services. Solar powers thermal are the alternative sources of hydro but they are not sufficient in rural area.

1.2 Focus of the Study

Cost volume profit analysis applies the variable costing approach to analyze the built-in relationship between cost, volume and profit. It is powerful tool in the hands of the management for profit planning. it is also a crucial part of overall profit planning of business enterprises. In most of public enterprises of Nepal, CVP analysis is not applied well which has adversely affected their profit planning process. Thus periodically analysis and review of CVP analysis is necessary to ensure smooth functioning of public enterprises.

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

C-V-P Analysis is a greater helpful in managerial decision making, especially cost control and profit planning. "It provides attention-directing and problem solving backgrounds for important planning decisions, such as selecting distribution channels, pricing, special promotions and

personnel hiring. "Know your cost" is an essential theme for any managers. And C-V-P analysis helps to direct managerial attention to important problems and paves the way to their solution" (Horngren, 1970:207).

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

"In its simplest form, it involves the determination of the sales level at which a company neither earns a profit nor incurs a loss, or in other words, the point at which it breaks even. For this reason, C-V-P analysis is often called break-even analysis. However the technique can be expanded to answer additional questions, such as; what sales volume is necessary to earn a desired net income?, what net income will be earned if unit selling prices are reduced in order to increase sales volume? What net income will be earned if a new machine that will reduce unit labor costs is installed? What net income will be earned if the sales mix will be changes? When the technique is expanded to answer such additional questions, the descriptive phrase C-V-P analysis is more appropriate than break-even analysis" (William and Kermit, 1984:336).

Hence, a company may use C-V-P analysis as a planning tool when the sales volume is known and management need to find out how much profit will result. Another way of planning is to begin with a target profit. Then, through C-V-P analysis a company can decide the level of sales needed to reach that profit. Similarly, for the cost control purpose, C-V-P analysis is a way to measure how well different departments in the company are doing. At the end of a period, the company analyzes sales volume and related actual costs to find actual profit. It measures performance by comparing actual costs with expected costs. These expected costs are computed by applying C-V-P analysis to the actual sales volume. The result is a performance report on which management can base the control of operations.

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

So, this study will be focused on details study about cost volume profit analysis of both public enterprises i.e. Nepal Telecom and Nepal Electricity Authority. It also focuses on the weakness of the enterprise's management and to comment on their techniques.

1.3 Statement of Problems

The prime concern of every nation of the world is economic development. Under developed countries are facing several problems in the process of economic development. Nepal is not exception to this condition. The majority of people have not been able to get even basic facilities. Government has established several public enterprises for the sake of providing necessary facilities. Most of PEs is found to be operating unsatisfactory the financial loss and managerial responsibilities for these ailing units have to be borne by the government. This is definitely not contributed to the countries economic growth.

In the communication sector, the government has liberalized its policy and authorized private sector to run communication service. Although up to now profit trend of NTC is increasing trend but now on ward they have to compete with private sector. So NTC should prepare it self to face many challenges which may come for other private company. To meet this challenge NTC should prepare it self and have to realize its management capacity.

In the electricity sector, Nepal Electricity Authority which is purely public sector corporation is not meeting the current demand of electricity of the country. This can be attributed to our government intervention, lack of adequate law to reduce illegal use of electricity, lack of efficient management and so on. So, Nepal Electricity Authority needs to improve its system to become self sustained organization.

Hence, this study is more concerned with the cost-volume-profit analysis by considering all benefits and cost components, management skill of Nepal Telecom and Nepal Electricity Authority. This study will try to find out the following question's answers:

a) What are the major problem facing by both enterprises during the application of cost-volume-profit analysis?,

b) What will be the effect of changes on the prices, cost and volume on profit of both enterprises?
c) Are Nepal Telecom and Nepal Electricity Authority fulfilling their demand as per customer's requirement?
d) Are the cost bear by Nepal Telecom and Nepal Electricity Authority are realistic the relationship between cost, volume and profit?
e) Are earning of Nepal Telecom and Nepal Electricity Authority profit is satisfactory or not?

1.4 Objectives of the Study

The basic objective of this study is to compare the existing cost0-volume-profit analysis system applied by Nepal Telecom and Nepal Electricity Authority and their impact towards profitability. The specific and functional objectives of this study are as follows:

a) To study the present application of cost-volume-profit analysis system of NTC and NEA..
b) To identify Break Even Point (BEP) of NTC and NEA to avoid losses.
c) To study comparatively about profit volume ratio, Break Even Point, Margin of Safety, capacity utilization and sales volume of NTC and NEA.
d) To provide necessary suggestions and recommendations based on analysis for the both enterprise.
e) To evaluate the sensitivity of profitability of NTC and NEA.

1.5 Significant of the Study

Public enterprises in Nepal deserve a crucial role for the socio-economic development of our country. The main role and objectives of public enterprises in Nepalese economy are to increase the rate of economic growth, to develop infrastructure, to contribute in national fund to provide necessary goods and services to the public and to develop the nation equally etc. among the Nepalese public enterprises, NTC ans NEA are big public enterprises which are contributing to the nation by providing necessary services to the people or customers easily and by paying huge amount of tax to the government of Nepal.

The analysis of relationship between cost volume and profit is known as cost-volume-profit (CVP) analysis. CVP analysis helps to determine the minimum sales volume to avoid losses and the sales volume at which the profit goal of the organization will be achieved. It helps management in seeking the most profitable combination of cost and volume. It also helps short run decision about fixed costs, variable costs, volume and selling price for its profit plan on a continuous basis.

So, every organization has to pay attention towards their cost volume profit analysis system. This comparatively study of CVP analysis of NTC and NEA helps to know BEP level, sales revenue to achieve target profit, safety margin and other information and to take correct action to control unusual costs for both enterprises. So, formulation and implementation of the plan of enterprises can success. Hence the policy makers and researcher in the area of telecommunication and hydropower area would be benefited from this study.

1.6 Limitations of the Study

As every research has its own limitation, so this study has also limitations which are as follows:

(i) This study will be connected to the area of cost-volume-profit analysis of NTC and NEA,
(ii) The analysis of data will be based on five years,
(iii) The time is limited and the thesis will fulfill the partial requirement of MBS,
(iv) Majors portion of analysis and interpretation will be done on the basis of available secondary data and information, which are provided by NTC and NEA,
(v) This study is carried out by for academic reason, the outcomes may differ if carried out for reasons by other scholars or experts,
(vi) The comprehensibility and the accuracy of the study will be based on the data available from the management of NTC and NEA, and various published document etc.

1.7 Organization of the Study

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

The first chapter has included background of the study, focus of the study, statement of problem, objectives of study, significance of the study, limitations of the study and organization of chapters.

Similarly, the second chapter has included conceptual framework, approaches to C-V-P analysis, extension of C-V-P analysis, C-V-P analysis for a multiple product firm, and for segments, review of book journals and articles and review of previous research and reports with research gap etc.

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

The fourth chapter has included analysis of sales, fixed costs, variable costs and semi-variable costs. In addition, computation of BEP, CM analysis, MOS and P/V analysis are also computed for analysis and interpretation to fulfill objectives of the research. Major finding are also pointed out.

The last part provides summary, conclusion and recommendations. An extensive bibliography and appendices are also included at the end.

CHAPTER II

REVIEW OF LITERATURE

2.1 Conceptual Framework

An Organization is established to achieve some goals. It has its own objectives. To achieve the goals of organization objectives should clearly mention. In this competitive globalize business age an organization whether it is public or private profit is essential. Profit is not chance, it is result of successful management. The management of an enterprise requires continuing performance of certain managerial responsibilities. These responsibilities collectively are of ten called the function of management. Planning organizing staffing and human resource management, leading and interpersonal influence and controlling are major functions of management. Planning is process of developing enterprises objectives and selecting future course of action to accomplish them. It reduces uncertainty and provides effective direction to the employee by determining the course of action in advance. Controlling means evaluating the firm's activities against the plan & deciding what should be done if the plan is not being followed (Lynch & William, 1995:18). In business organization there may involve various parties like, competitors' employees & trade union,

Government community representative, Investment analysts, suppliers' lender/Bankers, managers, owners, customers etc.

These all parties require various information of decision making their own purpose. Actual position of the enterprises can be found from financial statement. It shows the clear picture of enterprises profit & loss position, balance sheet etc. These are not sufficient to measure the firm's performance and plan. There are various tools and technique to measure and analyze the financial performance and determining various plans in management accounting. Cost volume profit analysis (CVPA) in one the major and popular tools to analyze the financial statement of the firms. It is one of the important part of profit planning and control and budgeting.

Cost volume profit analysis (CVPA) is the process of examining the relationships among revenues cost and profits for a relevant range of an activity and a particulars time frame. It is one of the most important and powerful tools that manager have at their command in short term planning. It helps managers understand inter relationship between cost volume of profit in an organization by focusing on interaction between the following five elements.

a. Price of product
b. Volume or level of activity
c. Per unit variables costs
d. Total fixed costs
e. Mix product sold

CVP analysis can be extended to cover the effects on profits of changes in selling price/service fees, cost, income tax rate, product mix etc. It estimate total cost, total revenue and profit at various sales volume. It provides only an overview of the profit planning process. CVPA provides management with comprehensive overview of the effects on revenue and costs of all kinds of short run financial changes. It is related to profit, sales volume and cost (Munakarmi, 2003: 401).

Cost volume profit (CVP) analysis examines the behavior of total revenues total cost and operating income as changes occur in the output level, the selling price, the variables cost per unit & or fixed cost of a product (Homgreen Datar & Foster,2003:15).

Cost volume profit analysis is a systematic method of examining the relationship between changes in activity (i.e. output) and changes in total sales revenue, expenses and net profit. As a model of their relationship CVP analysis simplifies the real world conditions that a firm will face like most models which are abstractions from reality, CVP analysis is subject to number of underlying assumptions and limitations. Nevertheless it is powerful tool for decision making in certain situations (Drury, 2000).

Most of the business fails after a few years sometimes months of starting because they tend to do anything for volume without thinking how it's going to affect the bottom line. CVPA is a management accounting tool to show the relationship between the elements of profit planning. Profit planning is a function of the selling price of product demand, variable costs, fixed cost taxes etc. The whole picture of profit planning is associated with cost volume profit interrelationships (Bajracharya, Ojha Goet & Sharma, 2004:225).

The key motive of business enterprises is to make & maximize profit. Profit does not happen by chance. It is to be managed. Cost volume profit analysis is supplementary tool of planning for profit. CVP is immensely helpful for developing alternative strategies in sales planning and cost estimation. Cost volume profit analysis is an accounting technique showing the relationship between variables. It is equally applicable for non profit making organization to allocate scare economic resources most effectively among the completing alternative. Allocation of scare resource among the various demanding sectors is the most important part of national planning.

A popular technique to study CVP relationship is break even analysis (BEP). Break even analysis is concerned with the study of revenues and cost in relation to sales at which the firm's revenues and total cost will be exactly equal or the net income will zero. It is no profit no loss situation. This point is cornerstone of profit planning, cost volume profit analysis (CVPA) is popular analysis tool of management. It is very useful in profit planning & control, management decision cost control, budgeting etc.

2.2 Importance of CVP Analysis

Planning controlling and decision making are the essential management functions CVPA helps the manager to plan for profit to control cost & make decision. It helps (Munakarmi, 2003:401-402):

- To determine the break even point in terms of unit or sales value.
- To ascertain the margin of safety.
- To estimate profits or losses at various level of output.
- To assess the likely effect of management decisions such as an increase or decrease in selling price adoption of new method of production to reduce direct labor cost and increase output.
- To help management to find the most profitable combination of costs and volume.
- To determine the optimum selling price.
- To determine the sales volume at which the profit goal of the firm will be achieved.
- To determine the maximum sales volume to avoid losses.
- To determine most profitable and least profitable product.
- To determine new break even point for changes in fixed or variable cost.

Generally CVPA provides information regarding (Munakarmi, 2003:402).

- Minimum level of sales to avoid losses.
- Sales level to earn target profit
- Effects of changes in prices, costs & volume of profits.
- New break even point for changes
- Effect of changes in sales mix on profit.
- Impact of expansion plan on CVP relationship.
- Products those are most profitable & least profitable.
- Whether to continue or discontinue the sales of product or operation of plan.
- Effect on operating profit with the increase in fixed cost.

- Whether to close or not the firm for a short term.

2.3 Application of Cost Volume Profit Analysis

Cost volume profit analysis is applied specially for break even analysis and profit planning. Profit planning is fundamental part of overall management function. Profit planning can be done only when the management has the information about the cost of product fixed & variable and selling price of the product. The most important factors that affect the planning for profit are costs fixed & variable & volume of sales CVP analysis can be applied in the following respects (Dangol, 2004).

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

2.4 Contribution Margin Analysis

Contribution margin is the excess of sales revenue over variable costs, so contribution margin means how much is left from sales revenue after covering variable expenses that are contributed toward profit for the period. Contribution margin is used to first to cover the fixed expenses & then whatever remains, after the fixed expenses are covered, goes toward profit. It the contribution margin is not sufficient to cover the fixed expenses then a loss occurs for the period. Basically contribution margin indicates why operating income changes as the volume of sales changes. It can be expressed as:

Contribution Margin = sales - variable cost or

Contribution Margin = Fixed cost + profit

Contribution Margin Per unit (CMPU) = Selling price - Variable cost per unit

2.4.1 Contribution Margin Ratio (C/M Ratio)

Contribution Margin ratio (C/M Ratio) is also known as profit volume ratio (P/V Ratio). C/M Ratio is equal to contribution margin divided by revenue. The analysis of relationship between profit & volume is known as profit volume analysis, profit/volume ratio (P/V ratio) or C/M ratio establishes a relationship between the contribution & sales value. Percentage of contribution margin to total sales is referred to as the C/M ratio. C/M ratio can be calculated by using either per unit or total revenue minus total variable cost information as follows. Sales revenue-Van able costs

$$\text{C/M Ratio X} \frac{\text{Sales revenue Z Variable cost}}{\text{Sales Revenue}}$$

$$\text{C/V ratio or C/M ratio X} \frac{\text{SPPU - VCPU}}{\text{SPPU}}$$

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

P/V or C/M ratio = 1- Variable cost ratio

$$\text{P/V or C/M ratio} = 1 \text{ Z} \frac{\text{Variable Cost}}{\text{Sales Revenue}}$$

Since fixed costs do not changes within the relevant range in the short run, net profit change by the same amount as the contribution margin changes.

$$\text{P/V Ratio} \quad \text{X} \frac{\text{Changes in Contribution Margin}}{\text{Changes in Sales Revenue}}$$

$$\text{X} \frac{\text{Changes in Net Profit}}{\text{Changes in Sales}}$$

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

VC = sales (1-P/V ratio)

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

The variable usually uses in cost volume profit analysis are:

a. Sales value: The sale value is actually includes the quality of total sales multiply by selling price per unit or sales rupees. Total sales revenue is income of the company.

b. Variable cost: Variable cost is that cost which is directly affected by change in the activity level. Direct material direct labour cost overhead etc, are variable cost. Per unit variable cost always constant. If the output is increase variable cost also increase and if it is decrease variable cost again decrease. Changes of variable cost effects to P/V ratio, BEP & Net income.

c. Fixed cost: Fixed cost remain constant in total amount when there is changed in the level of output. Depreciation, rent, interests etc are fixed costs. It is also called capacity cost. Per unit fixed cost changes but total fixed cost remains constant.

d. Mixed cost: Mixed cost contains both variable and fixed cost. Repair and maintenance electricity charge, telephone, supervision etc. These costs can't be categorized as purely fixed or variable. Mixed cost is known as semi variable cost. Semi variable costs should separate to find total variable & fixed cost.

e. Jumping Cost: Some costs remain fixed over a wide range of activity but jump to a different amount for activity level outside that range. Such costs are called jumping costs or step fixed cost or moving fixed cost or ladder fixed costs.

2.5 Break Even Analysis

Break even analysis, more precisely the break even point tells what quantity of output sold at which total sales revenues equal total costs. Break even point is that quantity of output sold at which the

operating income is zero. Cost volume profit analysis is sometimes referred to simply as a break even analysis. This may be misleading because break even analysis is just one part of the entire CVP concept. It is always taken as an important part of profit planning as it gives the planner many insights into the data with which he or she is working. Profit planning of each firm begins from break even analysis. Break even point is the bridge between the loss area and the profit area. Profit begins from the break even point. It is survival point where all firms must at least remain to sustain or continue the business. Business firm running under BEP can be justified only under the following circumstance (Bajracharya, Ojha, Goet & Sharma, 2004: 23):

- Introduction stage of product life cycle
- Unusual general business condition
- Economic depression

A popular technique to study cost volume profit relationships is break even analysis. It concerns with the study of revenue & costs in relation to sales at which the firm's revenue and total cost will be exactly equal or the net income will be zero. It is a "no profit no loss" situation.

2.5.1 Approaches to Cost Volume Profit and Break-Even Analysis

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

a. Contribution Margin Income Statement Approach

The contribution margin income statement approach to CVPA allows the preparation of Performa statement from the available information BEP & other required CVP relationships can be explained through a contribution margin statement. A contribution margin statement is the variable costing income statement whose philosophy is fixed costs is period costs that should be deducted from the

contribution margin of the same period. Only the variable costs vary proportionately to the level of output or sales.

b. Formula Approach

The most popular practiced approach to the break even point & cost volume profit analysis is the formula also known as the equation. The formula approach uses an algebraic equation to calculate the breakeven point. The answer provided by solving the equation may, sometimes, need to be rounded to whole numbers of units or lot sizes. The rounding of breakeven point units is always done upward because this will provide a small profit rather than the small loss that would be shown from rounding downward (Rainbom, Barfield and Kinney, 1993)

The calculation in the equation approach is similar to that of the contribution margin statement approach. The equation is merely a restatement of the other. To develop the cost volume profit equation.

Table No. 2.1

Contribution Margin Approach	Symbol or Equation
Sales Volume (units)	Q
Selling Price Per Unit	P
Sales Revenue (Rs)	Q x P
Less: Variable Costs	Q x VCUP
Contribution Margin	Q x P – Q x VCPU
Less: Fixed Costs	FC
Net Profit	Q x P – Q x VCPU – FC

Sales – variable expenses – fixed expenses = Net profit

or, Sales = Variable expenses + Fixed Cost + Net Profit

or, Q x P = Q x VCPU + FC + Profit

Therefore,

$$Q \text{ X} \frac{FC \Gamma \text{Pr} ofit}{CMPU}$$

Where, SPPU – VCPU = CMPU

Break even (BEP Units) = $\frac{Fixed \cos t}{CMPU}$ and BEB (Rs) $\frac{Fixed \cos t}{C/M\ Ratio}$

There is no profit no loss at BEP.

Required Sales unit = $\frac{Fixed \cos t \ \Gamma T \arg et\ profit}{CMPU}$

and required sales (Rs) = $\frac{Fixed \cos t \ \Gamma T \arg et\ profit}{C/M\ Ratio}$

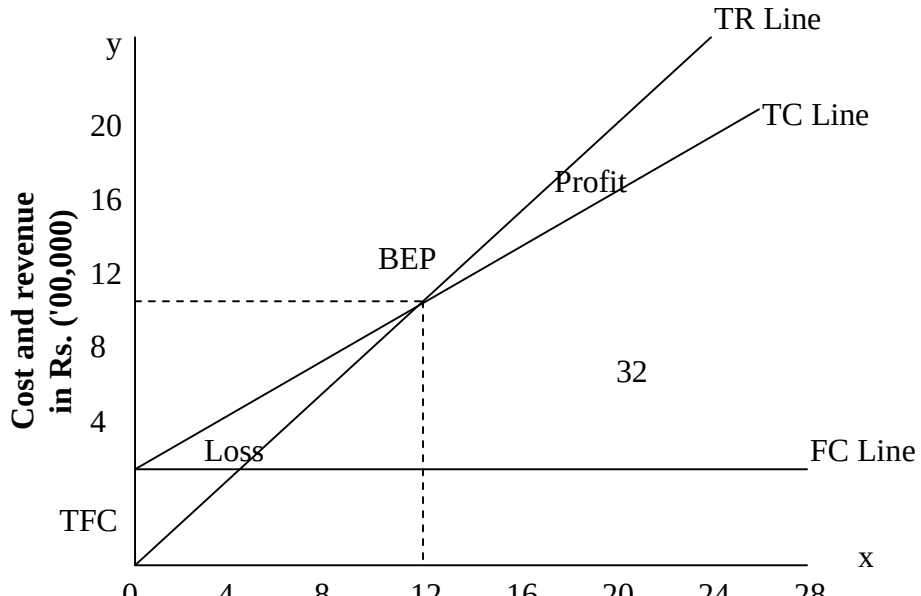
$$\text{Requirement sales for desired profit after tax (in units) X} \frac{\text{Fixed cost } \Gamma \frac{\text{DPAT}}{1\text{ZTax Rate}}}{\text{CMPU}}$$

$$\text{and required sales (Rs) X} \frac{\text{Fixed cost } \Gamma \frac{\text{DPAT}}{1\text{ZTax Rate}}}{\text{C/M Ratio}}$$

The contribution margin & equation approaches are two equivalent techniques for finding the BEP. Both methods reach the same conclusion, so personal preference dictates which approach should be used. Yet it is especially useful in situation in which Unit price & Unit variable costs are not clearly identifiable.

c. The Graphic Approach

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



Sales in Rs. ('00,000)

Figure 2.1: Break-even Chart

The following steps are involved in constructing the BE chart (for cost and revenue approach) (Matz and Usry, 1976:745-746):

1. Sales Line: Sales volume is plotted on horizontal axis. Sales volume may be expressed in terms of rupees, units or as a percentage of capacity. Equal distances are cut a long the horizontal line to show sales volume at different activity levels.

2. Cost and Revenue Lines: Vertical axis is used to represent revenue and fixed and variable cots. The vertical line is also spaced in equal parts. A similar vertical line may be drawn on the right hand side of the chart to complete the square.

3. Fixed Cost Line: The FC line, parallel to the horizontal axis, can be drawn through the fixed cost point.

4. Sales and Cost Lines: The total sales and total cost line can be drawn by marking budget level (of total sales, Rs. 1200000 and total cost Rs. 1200000 on the right hand vertical line. To draw total sales, the zero sales point should be connected with the sales budget point (Rs. 1200,000) on the right hand vertical line. Similarly total cost line can be drawn by connecting fixed costs point (Rs. 400,000) with the total cost budget point (Rs. 1200,000) on the right- hand vertical line.

5. Angle of 45^{o}: If the vertical and horizontal lines are spaced equally with the same distances, sales line will be connected the opposite corners of the graph at angle of 45 degree.

The point of intersection between sales and total cost lines is the BEP. The angle formed by the intersection of sales and total costs lines in known as the angle of incidence. Large this angle, lower the BEP and vice-versa. The area to the left of the BEP is the loss area and represents the uncovered fixed costs, while to the right of it, there is the profit area. The variable cost is represented by the gap between the total cost and the fixed cost.

BEP can be computed by contribution approach as:

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

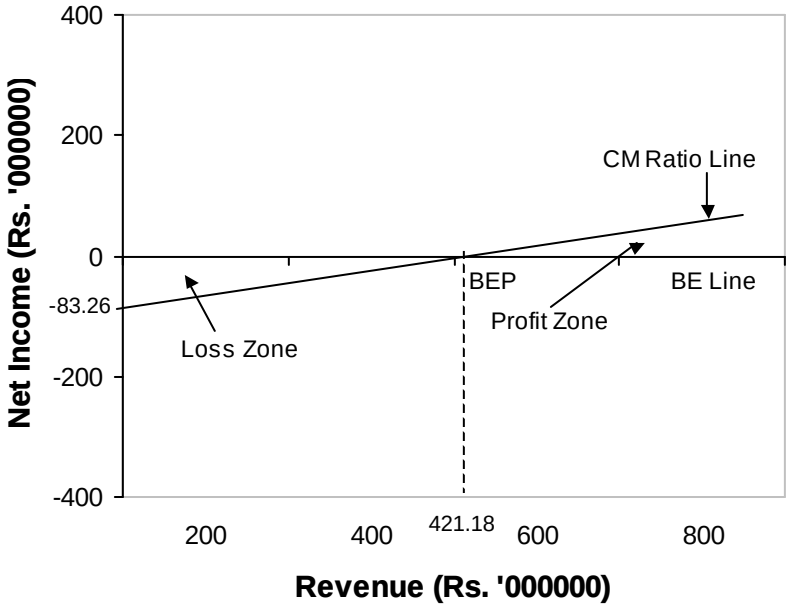


Figure 2.2: BE Graph by Contribution Approach

2.5.2 Application of Break even Analysis

Break even concept can be used to formulate different policies in a business enterprise; Some of these application are (Maheshwari, 2000: 182)

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

2.5.3 Assumption of Break Even Analysis

Contribution analysis and break even analysis are based on a specific set of assumptions that should be clearly understood. These underlying assumptions are (Maheshwari, 2000: 182-183):

- All cost can be classified into two parts, fixed cost and variable cost. There are no costs other than fixed and variable.
- There is a relevant range of validity (activity) for using the results of the analysis and sales change.
- There is only one product or in case of multi products, the sales mix among the products remains constant.
- Basic management policy about operation will not change materially in short run.
- The general price level (Inflation deflation) will remain essentially stable in the short run.
- Sales and production levels are synchronized, that is inventory remains essentially constant or zero.
- Efficiency and productivity per person will remains essentially unchanged in the short run.

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

2.5.4 Limitation of Break-even Analysis

Break even analysis in many business situations can be used for effective decision making, but there are many short comings or limitations in its analysis & interpretations. Some of these can be listed as (Maheswari, 2000: 183-184).

- The assumptions of producer's market phenomenon not hold goods for all types of commodities.
- The fixed cost may remain constant as well as the variable costs may not vary in fixed proportions at different levels of output.
- With variation in the prices of the items or services which also depend on the factors affecting the demand and supply will certainly affect the demand of the commodity. This phenomenon is not covered in break even analysis.
- Identification of fixed and variable costs involved in production process is very complicated. A shift in product mix may change the break even point.
- Customers may be given certain discount on purchase to promote sales. This revenue may not be perfectly variable with level of sales output.

2.6 Economic Characteristics of Cost Volume Profit Analysis

Where volume profit analysis cost are reasonable accurate, they can help management decision making. Essentially, CVP analysis offer greater insight into the economic characteristics of a company and may be used to determine the approximate effect of various alternatives. CVP analysis is based on estimates, however, the arithmetical manipulations generally involve averages, and hence the results should never be interpreted as precise. Rather, the analysis may be characterized approximately as a ‘slide-rule' approach that may be used to develop and test, with a minimum of effort, the approximate effect on costs and profits of several types of management decisions (Welsch. 1979: 467-468)

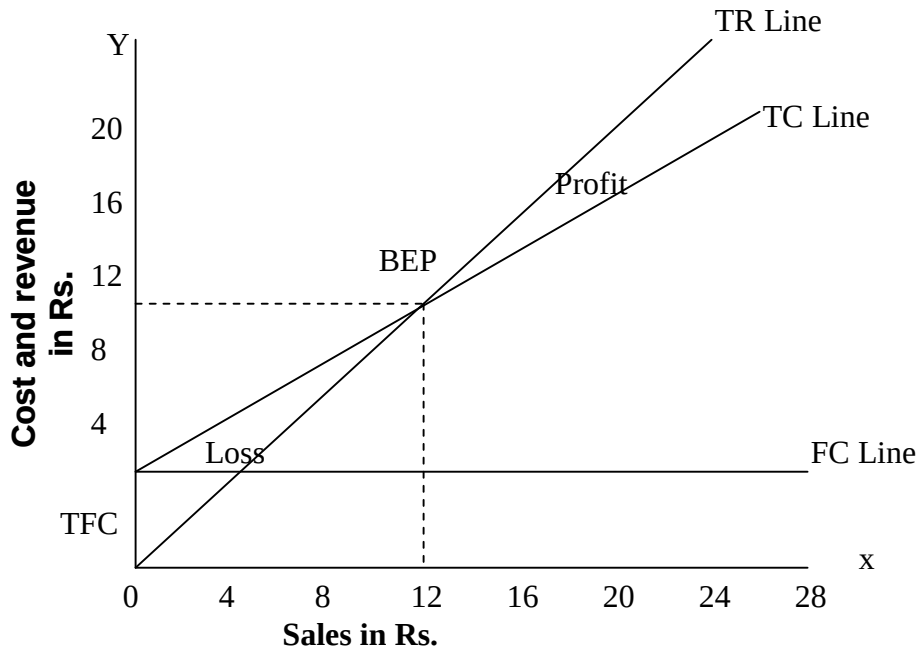


Figure 2.3: Break-even Chart

Above break even chart with economic characteristic indicate few of the economic cartelistic of a business, which are (Welsch, 1979: P 468).

- Fixed cost, variable costs and total costs at varying volumes.
- The profit and loss potential before & after income taxes at varying volumes.
- The margin of safety is the relationship of budget volume to break even volume.
- The preferred dividend or danger point the point below which preferred dividends are not

earned.

- The dead point, the point where management earns only the "going" rate on the investment.
- The common dividend or unhealthy point below which earnings are insufficient to pay the preferred dividends and the expected dividend on the common stock.

All these points and as other can be completed if data are developed for cost volume profit purposes.

2.7 Margin of Safety

Margin of safety is the excess of budget or actual sales over the break-even sales volume. It is the difference between the budgeted or actual sales revenue. It is a position above the BEP. It states the amount by which sales can drop before losses begin to in cure. It gives management a feel for how dose projected operations are to be organizations break even point. Manager often consider the size of the company's margin of safety decisions about various business opportunities Margins of safety is the amount that sales can drop before reaching the break even point and thus provides a certain amount of 'cushion' from losses. The margin of safety can be expressed as units, value or a percentage Formulae are (Munakarmi, 2003: 405):

i. Margin of Safety = Actual sales - BE sales (units & Value)

ii. Margin of Safety (in value) = $\frac{\text{Profit}}{\text{P/V Ratio}}$

iii. Margin of Safety (in units) = $\frac{\text{Profit}}{\text{UCM}}$

iv. Margin of Safety Ratio = $\frac{\text{Actual Sales - BE Sales}}{\text{Actual Sales}}$

v. Margin of Safety ratio = $\frac{\text{Margin of Safety}}{\text{Actual Sales}} \times 100\%$

The larger is the safety margin the greater the chance for the company to earn profit (i.e. larger the margin of safety safer the company). A high margin of safety is particularly significant in times of depression when the demand for the company's or firm's product is falling. Low margin of safety

may result of firm which has low contribution ratio. When both the margin of safety and the P/V ratio are low, management should think the possibilities of increasing the selling price it does not adversely affect the sales volume or reducing variables costs by bringing improvement in manufacturing process (Munakarmi, 2003: 127).

The following steps are needed to rectify margin of safety:

- With increasing selling price
- With increasing sales volume, if the capacity of fixed cost is not fully utilized.
- With reducing fixed cost if possible.
- With reducing variable cost (with reducing the cost of raw materials, wages and other direct cost).
- With substituting product like by more profitable one.

2.8 Cost Volume Profit Analysis for Multi Product Firms

Sale mix can be defined as the relative combination of two or more product represented in total. It is not only the sales revenue that makes profit. The proportion of sales contributed by different products greatly changes the amount of profit. Managers try to achieve that combination or mix that will yield the greatest amount of profit. If a company sells more than one product, these may not be equally profitable. So, the company's profit will depend upon the ratio of each products sale to total sales revenues. Profit will be greater if high margin item make up a relatively large proportion of total sales than if sales consist mostly of low margin items. Changes in sales mix can cause great variations in a company's profit. A shift to low margin item can cause the total profit to decrease even though total sales increase on the contrary, a shift in the sales mix from low margin items to high margin items can cause the reserve effect total profit may increase even though total sales decrease (Bajracharya, Ojha, Goet & Sharma, 2004:260).

To calculate BEP for sales mix or multi products:

- Calculate contribution margin or profit volume ratio for each product.
- Calculate proportion of sale mix in units or values as follows:

$$Sales\ Mix\ X \frac{\text{Individual Product's sales units or value}}{\text{Total of all product's sales units or value}}$$

Calculate weighted average for all products as follows:

- Weighted average = [sales mix (units) x unit contribution margin]

  = [sales mix (value) x P/V ratio] Calculate Break - even point (BEP)

- $\text{Break even point } X \frac{\text{Total Fixed Cost}}{\text{Weishted averase}}$

2.9 Cost Volume Profit Analysis and Limiting Factors

Because of some critical factors like, raw materials or labour or finishing machine the firm can not produce any number of output of it choices. So, profit planning & decision making of the firm will affect while CVPA is done.

2.9.1 CVP Analysis with a Single Constraint

Scarce resources should be efficiently allocated in order to maximize the contribution margin. A particulars simple and instructive situation arises when there is only one constraining resource. This occur if the firm products are all produced on a single machine and output is limited by hours available on this machine. In the same way, single resource constraint arise, if the firm's products are all produced with only one material and output is limited by quantity available for that materials. When there is a constraint for a scarce resource to have alternative uses.

Then the available capacity for such scarce resource should be allocated to the alternative uses on the basis of contribution per scarce resource. (Munakarmi, 2003:146).

2.9.2 CVP Analysis with Multiple Constraints

Where more than one scarce resource exists the optimum production program can't easily be established by the simple process applied in single resource constraint. Under the circumstances simple allocation of resource or the basis of contribution margin per unit is neither feasible nor desirable. Contribution margin per unit of scarce resource may be different for different ranking of product, because production processes are affected by many constrains factors rather than single constraint. In such situation, linear programming technique may used to optimize product mix. The linear programming formulation is required to determine a production plan which maximizes contribution from the product mix. Linear programming is a mathematical technique which shows how to arrive the optimum results, allocation available resources in a meaningful manner. It is basically concerned with the problem of allocating limit resources among competitive activities in an optimum manner. It is a technique to optimize the allocation of scarce resources in product mix problems which provides a valuable extension to cost volume profit analysis (Munakarmi, 2003:148).

2.10 CVP Analysis Under Condition of Uncertainty

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

Although, margin of safety ratio explains the degree of sensitivity of the project and product in general but it fails to explain certainty in the product and also between the alternatives. To overcome such a difficulty risk and uncertainty analysis like in any other management decision making can also be used in CVP analysis. The objective in CVP analysis under condition of uncertainty is to assess the probability distribution of the profit volume under given distribution of one or more factors, sales price or profits.

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

2.11 Assumptions Underlying CVP Analysis

Break even analysis is the most useful techniques of profit planning & control. It is a device to explain the relationship between cost volume & profit. The discussion of the CVPA (or breakeven analysis) so far is based on the following assumptions (Pandey 1994: 241).

- Cost Segregation: The total cost can be separated into fixed and variable components. Constant fixed cost is the total fixed cost that remains unchanged with changes in sales volume. Constant unit variable cost is the variable cost per unit and total variable cost changes in direct proportion to the sales volume.
- Constant Selling price: The selling price per unit remains the constant that it does not change with volume or because of other factors.
- Constant sale mix: The firm manufactures only one product or if there are multiple products, the sales mix does not change.
- Synchronized production and sales: Production and sales are synchronized, that is inventories remain the same.

2.12 Limitation CVP Analysis

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

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

2.13 Special Problems in Cost Volume Profit Analysis

Cost volume profit analysis is applied to individual products or parts of a business and all the product or activities combined. In later case, there are three special problems may be encountered (Welsch, Hilton and Gordon, 2001:513-518).

2.13.1 The Activity Base

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

2.13.2 The Change in Inventory

Usually the budgeted changes in inventories (i.e. finished goods and work in progress) are in material in amount and thus may be disregarded in cost volume profit analysis. On the other hand, when the change in budgeted inventory is significant, it should be included in the analysis. Including the effect of inventory changes in CVPA requires subjective judgment about what management might do (about making inventory changes) at different volume, levels and the conceptual precision that is desired. Management considers two practical approaches or policies in inventory changes of used a) Disregard and inventory changes b) include the inventory changes.

2.13.3 The Non Operating Income & Expenses

Non operating income (gains) and expenses (loss) and extra ordinary gains and losses of material in amount cause another problem in CVPA. The basic issue is whether they should be included or excluded. Extra ordinary gains and losses are none recurring and unusual, therefore they should be excluded. Non-operating incomes and expenses are recurring but they are not related to on going operations. Management considers the policy may be to (a) include the non operating incomes & expenses (b) exclude the non operating incomes & expenses.

2.14 Sensitivity Analysis

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

Profit = Total sales revenue - Total costs

Net profit = Sales units x SPPV - Sales units x VCPU - fixed cost - Taxes

So that, profit = F (Sales volume, selling, price VC, FC, taxes etc.) Means profit are the function of volume, price VC, FC, taxes and so on.

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

2.15 Risk Measurement: The Operating Leverage and Break Even Point

Operating leverage tells us how profit change in sales. It is evident that profit change more rapidly than sales. Why do profit change more rapidly than the sales? It is because some costs do not change say if sales decline variable costs also decline in the same ratio so that contribution margin also decline proportionately. But fixed costs do not decline so, the net operating income decline more rapidly. The some thing applies in the case of increase well. Sales revenues changes but some parts of costs, known as fixed costs, remain unchanged. This usually net operating in come changes more rapidly. This change is called the operating leverage.

Operating leverage can be measured in terms of the "Degree of operating leverage" (DOL). DOL shows the times of percentage change in net operating income of the given percentage change in sales. DOL may be defined as the percentage change in net operating income (N01) or EBIT associated with a given percentage change in sales. (Pandey, et.al, 2004).

$$DOL\ X \frac{\text{Percentage Change in Net Operating income}}{\text{Percentage change in sales}}$$

Alternatively

$$DOL\ X \frac{\text{Contribution Margin}}{\text{Net Operating income}}$$

$$DOL\ X \frac{Q(SP - VCPU)}{Q(SP - VCPU) - \text{fixed cost}}$$

Where, Q = Total demand in unites

SP = Selling price per unit

VCPU = Variable cost per unit

As we know, BEP (units) = $\frac{\text{Fixed Cost}}{SP\ Z VCPU}$

Leverage decision is meant to substitute variable cost by the fixed costs. To create a degree of operating leverage means the employment of higher amount of fixed cost which eventually increases the break even point also. No DOL is to be said when the DOL occur '1' and in this situation BEP comes to 'O'.

Higher fixed cost increase the DOL and they also increase the break even point, so there is close relationship between the degree of operating leverage and the break even point. A high DOL and high BEP both are the indicators of higher risk. (Bajracharya. Ojha, Goet and Sharma. 2004:249).

2.16 Impact of Changes on Profits

Profit is the functions of variety of factors it is affected by changes in volume, costs & price, profits may be affected by the changes in the following factors (Pandey, 1999:203-208).

a. Effect of price changes: An increase in the selling price increase P/V ratio and as a result will lower the break even point. On the contrary, a decrease in selling price reduces the p/v ratio and therefore, results in a higher break even point.

b. Effect of volume changes: A change in volume not accompanied with a change in the selling price and or costs, will not affect P/V ratio. As a result the break even point remains unchanged. Profit will increase with a increase in volume and will be reduced with a decreases in volume.

c. Effect of price and volume changes: A change in price invariable affects volume. A price reduction may increase demand of the product and consequently, may result in increased volume. On the other hand, increase in price may adversely affect the demand and thus, reduce volume. The impact on profits under these circumstances in not obvious. Profit may increase with a price reduction if volume in crease substantially. Similarly, a price rise may reduce profits if there is material fall in volume.

d. Effect of changes in variable costs: The impact of the changes in variables costs on profit is straight forward if it does not cause any change in selling price & or volume. An increase in variable costs will lower P/V ratio, push up the BEP and reduce profits. On the other hand if the variable cost decline, P/V ratio will increase BEP will be increased and profit would rise.

e. Effect of changes in fixed costs: A changes in fixed cost does not influence P/V ratio. Other factor remaining unchanged, a fall in the fixed cost will, however, lower the BEP and raise profits. An increase in fixed costs caused either due to some external factors or due to some changes in management policy, will raise the 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 decision.

f. Effect of Changes in a combination of Factors: The financial manager or the management accountant, evaluating the profit plans or budgets, must realize that a change in one factors leads to a changes in another factors. Therefore, all such their net impact on profit must be seen.

2.17 Review of Previous Thesis

Review of literature is an essential part of all studies. It is way discover what other research in the area of our problem has uncovered. It is also a way to avoid investigating problems that have already been definitely answered. Review of literature provides the foundation for developing a comprehensive theoretical frame work from which hypothesis can be developed for testing. It also minimizes the risk of pursuing the dead ends in research. But there are very few research paper concerning comparative cost volume profit analysis has been conducted. Few dissertations have been submitted relating to cost volume profit analysis & the study is limited of various constraints. So this study is attempted to review the previous research work on profit planning & control as well as management accounting. As CVP analysis is one of the major tools of PPC, the previous studies related to PPC are reviewed which will helpful to further study.

Mr. Khagendra Prasad Ojha (1995) has done a research on profit planning and control in manufacturing public enterprises in Nepal. For case study he has selected two public enterprises namely Royal Drugs limited (RDL) & Herbs production & processing company limited (HPPCL). His research was in partial fulfillment of MBA, submitted to the central Department of Management, Tribhuvan University. The study has covered a five years period from FY 2046/47 to 2050/51.

Mr. Ojha has pointed out various finding and recommendations based on the analysis of data and information. Some of the major findings are as follows:

a) Objectives of Nepalese public enterprise are 'not clear, conflict between social objectives and profit objectives are hindering profit planning program of PEs.

b) Inadequate planning's of profit due to lack of skilled planner.

c) Inadequate authority and responsibility to planning department.

d) Failure due to inadequate forecasting system.

e) Cost volume profit (price-cost-volume) relationships are not considered when developing sales and pricing strategy.

f) Lack of entrepreneurship & commercial concept in overall operations of the enterprises.

g) In adequate planning of profit due to lack of skilled manpower.

h) Inadequate evaluation of internal and external variables.

Recommendations:- Some remarkable recommendation printed out by Mr. Ojha are as follows:

- Objectives are the end which an enterprise seeks to achieve. Nepalese PEs should clearly define their objectives.
- Profit planning manuals should be communicated from top to lower levels. All personnel should participate on decision making and planning process.
- To eliminate the red tapasim, unnecessary Formalities should be corrected and avoided delays in decision making & functioning.
- Communication of management policy, flexibility in implementation of planning and control program, effective super vision and cost reduction program are the basic steps for effective operation of these enterprises.
- Price cost volume relationship should be taken into consideration while developing sales plan and pricing strategies.
- Qualified & trained manpower of budgeting and planning should be hired.

Mr. Gajendra Kumar Thakur (2001) has conducted research work on topic of cost control mechanism of Jankpur cigarette factory limited for partial fulfillment of MBA, Submitted to the central department of management, Tribhuvan University. The study has covered five years of period from FY 2051/52 to 2055/56. The general objective of the study was to evaluate the cost control technique of JCF has for various finding by Thakur.

Major Findings:

- The cost volume profit analysis has indicated that contribution margin of JCF is not sufficient to meet all its fixed costs. The factory's break even sales during the study period always exceeded the actual sales volume. It is absorbed that the company has not sufficient margin of safety, which was loss figure. The high proportion of variable cost contribution margin was not able to met increasing fixed costs. In the JCF observing the data loss was occurring yearly but sale figure was fluctuating trend. It means decreased sales over total cost did not bring profit but invite losses.
- Overtime, idle time and absenteeism are found most responsible for labour cost increasing.
- JCF was funning in loss during study period due to high production cost, high selling distributing cost, excess labour cost and material cost. So JCF has to make proper plan to control unusual cost. It should b entrusted with responsibility of categorizing the costs on product wise basis.

Mr. Sagar Sharma (2002) has conducted a research work on "Management Accounting practices in listed companies of Nepal." He has focused his study to examine and study to practice of management accounting tools in the listed companies of Nepal. Mr. Sharma's research study is based only on primary data. Stratified random sampling with proportionate allocation of percentage is followed to draw the sample.

Major Finding and Recommendations are:

- Management accounting is to help managers in overall managerial activities by providing information and helping in planning, controlling and decision making.
- Lack of information & extra cost burden are the main reason behind not practicing such tools.
- Different types of management accounting tools which are taught in the colleges are not found applying by the listed companies of Nepal.
- Nepalese listed companies are in infant stage in practicing of management accounting tool such as capital budgeting, annual budgeting, cash flow, ratio analysis, activity costing, cost volume profit relation etc.

- As Nepal is proceeding towards globalization and to get membership (now already got the membership) of WTO, companies are recommended to apply management accounting tools to fit with the global environment.

Mr. Suraj Chandra Lamichhane (2003) has conducted the research work on "Budgeting as tools of profit planning of public utility enterprises: A case study of Nepal Telecommunication corporation" for master degree thesis submitted to Shanker Dev Campus, Tribhuvan University. Lamichhane has the objective of study is to apprise and examine the practice and effectiveness of profit plan of NTC has met these findings.

- Achievement of sales is not satisfactory with are more variable than budgeted sales.
- Sales budgets prepared by NTC, according to the nature of its customers.
- NTC has prepared short range sales budget but long range budget is not prepared in detail due to luck of effective programmed.
- Actual production lines in NTC are more fluctuated than budgeted production line due to government influenced.
- There is a problem to analysis and control the cost due to overhead cost is not classified systematically.
- Due to government direct interfere to PEs, has created problem of autonomy in NTC.
- NTC has not practice to prepare projected profit and loss account & balance.
- NTC is suffering from high fixed cost; there is idle cash and bank balance and paying a huge amount of interest in every fiscal year.
- From the analysis of profit plan in NTC there is no proper practice of cost segregation into fixed and variable and there is no systematic approach to record manufacturing costs.
- NTC prepares various functional budgets to implement profit planning system to some extent.

Recommendations are as follows:

- NTC has a large amount of cash in ideal position, which means, lack of effective utilization of resources. Management of NTC should take corrective action on this matter.

- On improving the situation of Net profit, NTC should control its operating as well as non operating expenses. Wasteful expenses like bad debts, repair and maintenance and other management fee are in an increasing way in every year. It should be controlled as soon as possible.
- Various costs, should be classified and control properly.
- Mostly, NTC consider the international market on fixing price but it should be better to follow the different pricing policies on the basis of costing.

Mr. Durga Prasad Baral (2003) has conducted research work on topic of profit planning and control of Nepal Telecommunication Corporation for partial fulfillment of MBS, submitted to Hari Khetan Multiple Campus, T.U. the study has covered five years period of FY 2051/52 to 2055/56 and has pointed out various finding and recommendation.

Major Findings are:

- The management of NTC is not success to utilize of its assets properly and not able to sale telephone lines according to demand of customers.
- Customers' service and line maintained service are not satisfactory.
- Profit is earning but it is not satisfactory in monopoly situation of NTC.
- ISO sector is the main revenue sources but calling rate is decreasing day by day.
- Cash budget shows the huge amount of current assets.
- NTC is completely ignored in variance analysis.
- Analysis shows that fixed cost of corporations highly incurred.
- The corporation has not proper practice of segregating cost into fixed and variable.
- Overhead expenses are not classified systematically and it creates problem to analyze expenses properly.

Recommendations are:

- Budget of NTC is not satisfactory and the variance between actual and budgeted data is not analyzed. So variance of data will be clearly analyzed.

- Cost segregation of NTC is not clear, like wise fixed, variable and semi variable. So it helps the management to maintain their production cost.
- Management should bring the effective programs of cost reduction and control.
- For classification of cost of NTC should be adopted the overhead basis budget because all expenses are included in operating expenses.

Mr. Mahendra Rai (2004) has conducted research work on the topic of Profit planning in public utilities sector of Nepal: A case study of Nepal electricity Authority." For partial fulfillment of MBS, submitted to Shanker Dev Campus, T.U. This study has covered five year period from FY 2054-55 to 2058/59.

Major Findings are:

- There is no proper or systematic way to classify the cost. It consolidates all expenditure pertaining to manufacturing, administrative, salary selling and distribution under single roof as operation and maintenance expenditure budget.
- The operating cost is creating a drastic problem due to payment of the huge amount as interest on long term loan.
- NEA has not adequately considered controllable and non controllable variable affecting the organization.
- Break even analysis shows that the break even sales are lower than actual sales which are the signal of good operational situation.
- NEA ignores CVPA, while developing the sales plan and pricing strategy.
- There is a lack of proper co-ordination among various directorates and departments.

Recommendations: - Rai has given some recommendations to NEA:

- NEA Should stress on efficient control over costs. The widely accepted controlling tools such as standard costing should be applied and separate cost centre should be established.
- Cost volume profit analysis should be considered while formulating profit plan and the NEA should be establishing flexible budget system.
- Variance analysis should be applied in effective way to control operating activities.

- Effective utilization of available resources, priority given to the backward society etc.

Miss Kalpana Bhattarai (2004) has conducted research on the topic "Budgeting in public Enterprises: A case study of Nepal Telecommunications Corporation in partial fulfillment for MBA, submitted Shanker Dev Campus, T.U." She has covered five years period from FY 2053/54 to 2057/58. Bhattarai has stated some finding and recommendations.

Major Findings:

- NTC prepares both term and short term budget but the long term budget is confined only on the top level.
- The corporation is not able to maintain to proper coordination between various directorates is required on the goals and objective of the corporations.
- Because of lack of skilled planners and budgeting experts, budgets are prepared on adhoc basis. So there exists no consistency actual performance with budget.
- Because of high demand of telephone line there exist small gap between actual production and actual sales.
- All expenses are shown under only one budget name as "operating expenses budget."
- CVP analysis shows that BEP is satisfactory. But CVP are not considered while developing the sales plan and pricing strategy which is a vital for profitability.
- Increasing trend in cost is another issue of NTC which needs to be managed.
- Management is totally unknown to profit planning concept, corporate planning and participative management.

Recommendations:

- NTC should prepare effective investment plan to utilize the excess cash balance which is remaining idle.
- NTC should develop its overhead budget in a well classified and scientific way.
- Cost should be clearly identified as fixed and variables.
- Practice of CVP analysis has to be adopted as effective management tools.

- NTC should prepare plan to use installed capacity at its maximum level.
- In order to improve the situation of NTC, privatization of the concern is highly recommended.
- To make budgeting system more progressive, the concept of profit planning and control should be introduced and applied to improve overall performance of its.

Mr. Ghana Shyam Thapa (2004) has conducted the research work on the "Profit planning in Nepal Electricity Authority" for the partial fulfillment of MBS submitted to Shanker Dev Campus, Tribhuvan University. The study has covered a five years of period from FY 2055/56 to 2059/60. Major findings:

- NEA prepares both tactical and strategic profit plan but strategic plan is confined only to the top level executives.
- NEA sales revenue is in increasing trend during the study period.
- Operating costs have not been controlled effectively during the study period.
- NEA is not succeeding to achieve break even point in sales volume.
- NEA has not utilized its available capacity satisfactorily.
- NEA has not maintained sound liquidity during the study period.
- The net profit ration of NEA does not indicate the sound position of profit. NEA is bearing loss in next running years.
- NEA has not prepared plan and program for agriculture sector's consumption as well as not adopted the practice of preparing monthly budget which is necessary for planning & control.
- There is lack of proper co-ordination between various directorates in regard of the goals, objectives and strategies.
- NEA has not considered demand determinates such as family income, price of electricity, connection charges, cost of alternatives available, cost of auto generation of electricity and reliability of NEA service while forecasting demand.
- All the expenses, such as manufacturing administrative and selling and distribution arc not

separated systematically. Authority has combined all expenses together and named it "Operation and maintenance expenditure budget" like wise, operation and maintenance expenditure is very high due to the higher amount of fixed cost and interest on long-term loan.

Recommendations:- Thapa has provided some recommendation as follows:

- A systematic approach to comprehensive profit planning and control is essential. To adopt this approach, existing planners should be trained and new planner should be hired. This can contribute to increase the profitability of NEA.
- NEA should reduce long-term loan to reduce the high interest amount. As a result of which the amount of overhead will be reduced. Similarly, should give emphasis in internal financing to reduce excess external economic burden & complete its projects timely so that they will return to repay long-term loan in time.
- Cost volume profit relationship should be considered while developing the sales plan and pricing strategy. To maintain the break even point. NEA should control fixed and variable cost and increase sales volume.
- NEA should ready to reduce operating cost up to reasonable extent. The cost reduction is a key measure to increase the volume of profit optimum staffing connect should be followed by NEA.
- NEA should bring the practice of preparing monthly budget for sales revenue.
- NEA should apply standard costing system & also establish a cost control center for cost control purpose. NEA's high costs may reduce by applying these measures.
- Profit planning system should be implemented efficiently and strictly. On the other hand NEA can maximize profit by increasing sales volume with cost reduction.

Mr. Madhav Rijal (2005) has conducted a research on "cost volume profit analysis a tools to measure effectiveness of profit planning and control; A case study of NEBICO private limited." He has centered his study to examine CVP analysis as a tool in manufacturing industry and to analyze the CVP and it s impact in profit planning. For the practical fulfillment of MBS submitted to shaker

Dev Campus, Tribhuvan University, Rijal has analyzed the five years financial statement and has pointed out various findings:

- The company's variable cost is in proportion than fixed cost in total cost amount, which contribute for lower contribution Margin.
- The company has high fixed cost (i.e. salary and wages, technical & computer fees, deprecation interest, provident fund & subsidies)
- Company has no any plan to reduce cost. There is lack of effective cost control programs or techniques.
- The profit trend of the company is not satisfactory. As compared to profit, proportion is very low with fluctuated trend.
- The company has no detailed of any systematic expenses plan. The fixed cost, variable cost, mixed expenses plan are the necessary elements for profit planning & control.
- The company has no effective inventory policy. The inventory management, row material handling and controlling system are not efficient and effective.
- The board of directors is the main authority in price fixing and it directly interferes to price of biscuit and confectionary products.
- Nebico Pvt. Ltd. Has not proper practice of segregating the costs into fixed and variable or controllable and non controllable.
- There is no proper co-ordination among production, administration, distribution, inventory and sales department.
- Nebico has not utilized its capacity.

Recommendations points by Rijal are:

- Nebico Pvt. Ltd. Should clearly defines their broad objectives because objectives are the basis guidelines of the company. Duties and responsibilities should be identified in clear cut way between the employees.
- For planning activities tools like budgeting, CVP analysis should performed.
- Classification of expenses item as variable and fixed or controllable and non controllable

must be made with in a specific frame work of responsibility and time.

- Cost central department separately establishes which divided the cost by products and control the costs.
- CVPA and PPC manuals should be communicated from top to lower levels. All personnel should be participated on decision making and planning process.
- Inventory policy, raw material handing and controlling system should make.
- Training programmer should be made in order to increase the labour proficiency and productivity.
- Systematic approach should be made towards comprehensive profit planning. This will increase the profitability of company.

Mr. Dipendra Raj Dhakal (2005) has conducted research work on "Cost volume profit analysis as a tools to measure the effectiveness of profit planning and control: A case study of Gorkhakhali Rubber industry limited" in the partial fulfillment for MBS, submitted to Shanker Dev Campus, T.U. Dhakal has covered five years period for FY 2056/57 to 2060/61 and listed some finding and recommended.

Major Findings are:

- Sales plan of GRIL is not properly maintained. The industry uses the various methods for sales planning like market survey, distribution network etc. but up to date record are not maintained. So they have poor budgeting system.
- GRIL is not practicing the scientific and appropriate cost classification technique costs are classified into fixed and variable as per the decision of the management.
- Out of the total cost of GRIL, variable cost is almost 60% in every year which cause the low contribution margin.
- GRIL is in high interest bracket, out of the total fixed costs almost 60% is to be paid for interest. And the profitability of the company is greatly influenced by high fixed cost.
- This industry does not have any detailed and systematic practice of planning of cost which is one of the essential elements of profit planning and control.

- Lack of coordination between top and lower level of management.
- GRIL is facing problem fluctuating international price of rubber. Sometimes it also faces the problem of row material scarcity as well.
- Out of the two main product truck tyres, the truck tyres are more profitable than non truck tyres as shown by the product contribution margin.
- The financial position of the industry is not satisfactory. Gross profit margin ratio and net profit margin ration are not satisfactory.

Recommends are:

- GRIL should clearly define its goals and objectives. And management should develop annual (tactical) and (strategic) long term profit plan.
- The industry should establish separate costing department, if possible and cost classification must be made with in a specific framework of responsibility and time.
- The industry should consider the cost volume profit relationship while fixing the price of its products.
- GRIL is bearing huge amount of fixed cost for employees' expenses which is not good for the organization. It should initiate the cost control program.
- To improve profit planning system in GRIL, trained and qualified professionals should be hired.
- The industry should utilize its full capacity, so that per unit cost of tyre will be comparatively low.
- Industry should allocate more resources to truck tyres, which might help to improve the present condition of loss etc.

Mr. Rabin Dahal (2005) has submitted a research on "profit planning system and financial condition of Nepal electricity authority." He has covered five years period from 2054/55 to 2058/59.

Major Finding are:

- NEA has a practice of preparing both systemic (long range) and (tactical short range) profit plan.

- Overheads are not classified systematically and it creates problem to analyze is expenses properly.
- NEA is playing a huge amount of interest every year and it is suffering from high fixed costs.
- CVP analysis of the authority has the satisfactory position and also flexible budget analysis, the authority is able to earn operating profit of its utilized capacity.
- The authority does not maintain its periodic performance report systematically.

Recommends are:

- Long loan of the authority should minimize and emphasized internal financing, restructure its capital structure for its share can issue and refund the department.
- Leakage of the electricity should be controlled.
- Overhead cost should reduce and over head budget should separate in systematic and scientific way.
- Classify the costs as fixed variable and semi variable.
- NEA should try to maximize its operating profit. For this cost control program can be launched in one respect and the alternative for, the replacement of long term loan.
- Cost control program should be established.
- Cost volume profit relationship should be considered while developing the sales plan and pricing strategy.
- Even if the authority is operating in monopoly situation, strength weakness threats and opportunity (SWOT) should be properly analyzed.
- To make profit planning system more progressive, the effective implementation of management system is very essential. These should be timely evaluated of relevant variables program should be made more effective, productive and result oriented.
- Regular inspection and monitoring, visit of budget centers should be under taken by the central level.

2.18 Research Gap

Many public or private enterprises are not practicing various accounting tools and techniques to measure its performance in Nepal. Researcher should face problem for analyzing financial statement. Though there is significant gab between present researcher work and the previous

research works. Most of the researches, profit planning tools are analyzed in one way or the other but impacts are rarely explained. Especially comparative CVP analyses in public or private enterprises have not been done yet by other researcher. For this purpose practice of CPA in NTC & NEA is studied. It will also clear the contribution of public enterprises to build strong economic condition of the nation.

CHAPTER III
RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, efforts have been made to present and explain the specific research design for the sake of attaining the research objectives. The basic aim of the study is analysis and interpretation of cost, volume and profit analysis of Nepal Telecom and Nepal Electricity Authority. where the study had needed to follow an appropriate research methodology, to achieve objectives of the study. The chapter has focused on research design, nature and size of population and sample, sources of data, variable studies, tools for analysis, and limitations of the study.

3.2 Research Design

In order to make any types of research a well research design is necessary, which fulfills the objectives of the study. The research design is the strategy for conducting research. It describes the general framework for collecting, analyzing and evaluating data after identifying (i) what the researcher want to know, and (ii) what has to be dealt with in order to obtain required information (Wolf and Pant, 1999:209).

This study attempts to show the relationship among cost, volume and profit margin of safety, BEP and effective application within the conceptual framework. Comparative cost volume profit analysis of these two public enterprises are presented and analyzed by descriptive research design and analytical method. But the qualities aspect of the research such as effectiveness of CVP in

enterprises, views of various manager and personnel and the theoretical prescription are explained in words wherever necessary.

3.3 Population and Sample

The research had been defined nature and size of population and sample, which are as follows:

3.3.1 Nature and Size of Population

The natures of population were included public enterprises of Nepal. And size of population was included all players in public service sector. Due to various circumstances it could not be possible to attempt all the number of research population in this research. So, researcher has taken two public enterprises Nepal Telecom and Nepal Electricity Authority.

3.4 Sources of Data

There are vital role of data in research to clear and complete research objectives. Without the data, methodology can not be utilized to bring the conclusion. There be better to collect only proper and required data from needed sources.

For the purpose of C-V-P Analysis of the Nepal Telecom and Nepal Electricity Authority, there were collected mainly from both sources of data, which are as follow:

3.4.1 Primary Data

Primary data is original in nature. For the purpose of research work, primary data were collected. Basically, following techniques were adopted:

a) Observation
b) Direct meeting
c) Personal Interview through questionnaires etc.

3.4.2 Secondary Data

It is the published data which has been used by first person or other. Only primary data can't fulfill the requirement of the research work. If it be possible, there need to face several problems. So, adoption of secondary data is also suitable to accomplish the objectives of study. The following procedures of collection of secondary data were adopted:

a) Library
b) Companies publications
c) Books and Journals/Magazines
d) Booklets, and
e) Internet and websites etc.

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

3.5 Variables Studies

A variable is a symbol to which numerals or values are assigned. In other words, a variable can take on values. The researcher had used two types of variables-independent and dependent variables. Variables studies are as follows:

(i) Independent Variables: It is the variables which can change other variables. In other words, a cause of it changes others.

(ii) Dependent Variables: It is the opposite of independent variables. It depends upon other variables. It changes causes of other variables.

The researcher has been defined the term C-V-P Analysis in the first chapter. There are three factors (i.e. Cost, Volume and Profit) of C-V-P analysis, which are interconnected and depend on one another. So, these three factors are dependent variables. But, testing relationship between these variable following criteria are assumed:

Table No. 3.1: Classification of Variables

	Independent Variables		Dependent Variables
a.	Cost	a.	Profit
b.	Volume (Sales)	b.	Profit
c.	Cost and Volume	c.	Profit

3.6 Tools of Data Analysis

Collected data must be explained and analyzed to clear objectives of the study. Basically, following two techniques are used to explain the collected data.

3.6.1 Descriptive Techniques

These techniques were used to simplify the research report for better understanding as well as analysis and interpretation of collected data in theoretical form.

3.6.2 Quantitative Techniques

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

C-V-P Analysis Tools

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

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

(ii) $\text{BEP in Rs.} = \frac{\text{Total fixed costs}}{1 - \frac{\text{Variable Cost}}{\text{Sales Price}}}$

(iii) Contribution margin = Sales - Variable Cost or FC + Profit

(iv) Contribution margin ration = $1 - \frac{\text{Variable Cost}}{\text{Sales}}$

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

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

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

(viii) Sales in amount for desire profit = $\frac{\text{FC} + \text{Profit}}{\text{MC\%}}$

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

(x) Margin of Safety = Planned or Actual Sales - BEP

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

3.6.3 Statistical Tools

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

(a) Mean, Standard Deviation and Coefficient of Variation (C.V.).

(b) Time Series Analysis (Trend Analysis).

(c) Correlation Analysis.

(a) Mean, Standard Deviation and C.V.

Mean $= \frac{X}{N}$

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

$$C.V. = \frac{\exists}{\overline{X}} \mid 100$$

(b) Time Series Analysis (Trend Analysis)

Trend analysis is also one of the most useful statistical tools. It is used for studying forecasting. A widely and most commonly used method to describe the trend is the method of least square.

The straight-line trend is given by the following formula:

$$Y = a + bx$$

Where,

Y =Values of dependent variables

a = y intercept

b= slope of the trend line

x = values of independent variable (Time)

$$a = \frac{\phi y}{n} \qquad b = \frac{\phi xy}{\phi x^2}$$

Where,

y = Sum of the observation in serious Y

xy = Sum of the observation in serious X & Y

x^2 = Sum of square of the observation in serious X

The straight line trend implies that irrespective of the seasonal and cyclical swings and irregular fluctuations, the trend value increase or decrease by a constant absolute amount 'b' per unit of time. Hence, the liner trend values from a series in arithmetic progression, the common difference being 'b' the slope of the trend line

(c) Correlation Analysis

$$\text{Coefficient of Correlation (r)} = \frac{N.\ UV\ Z\ U.\ V}{\sqrt{N.\ U^2\ Z f\ U\AA}\ \sqrt{N.\ V^2\ Z f\ V\AA}}$$

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

Where, X = distribution

N = No. of distribution

U = X – assumed Mean

V = Y – assumed Mean

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Data presentation and analysis is the important part of the research work. It is known as the heart of research. Major findings of the research depend on data presentation and analysis. Here, the researcher has tried to present and interprets the collected data in systematic manner and meaningful ways. Mainly to fulfill the objectives of the study require factors about CVP analysis are presented and analyzed. CVP analysis is important and very popular tools to measure the financial statement of the organization. It shows the relationship among the variables. Cost volume profit analysis of these public enterprises, NTC and NEA are comparatively presented. For that purpose sales revenue, profit, income statement, contribution margin and sensitivity test are done. Because these are the major variables of cost volume profit analysis.

4.1 Sales Plan of Nepal Telecom and Nepal Electricity Authority

Sales planning are the necessary components of profit planning and control. It provides the basic management decision about marketing and help to develop comprehensive sales plan. Every organization prepares sales plan. If the sales plan is unrealistic it will not beneficial to the organization. Revenues of the organization should managed and try to increase continuously.

Nepal Telecom is one of the major companies of Nepal. It has very high revenue since its establishment. One of the monopolist companies in communication service, Nepal Telecom prepares its sales plan both tactical and strategic. Major income or revenues of the NTC is taken as operating income. Under operating income NTC's revenues are local Telephone, Domestic Trunk Telephone, International Telex, leased circuits, Tele Fax, Mobile and Internet, Interconnection and others.

Non operating income of company can be taken as others income these are, interest on Bonds, T. Bills, interest from Bank deposits, interest from pension fund, income from Interest, investment and others. Here the operating income of NTC is shown in table for five years from FY 2003/04 to 2007/08

Table No. 4.1

Operating Revenue of Nepal Telecom

(Amount Rs. in '000)

Year	Sales/Operating Revenue Rs	Amount Change	% Change
2003/04	5487179	-	-
2004/05	6159520	672341	12.55
2005/06	7208087	1048567	17.02
2006/07	8312244	1104157	15.32
2007/08	8584144	271900	3.27

Source: Annual Report of Nepal Telecom, 2009

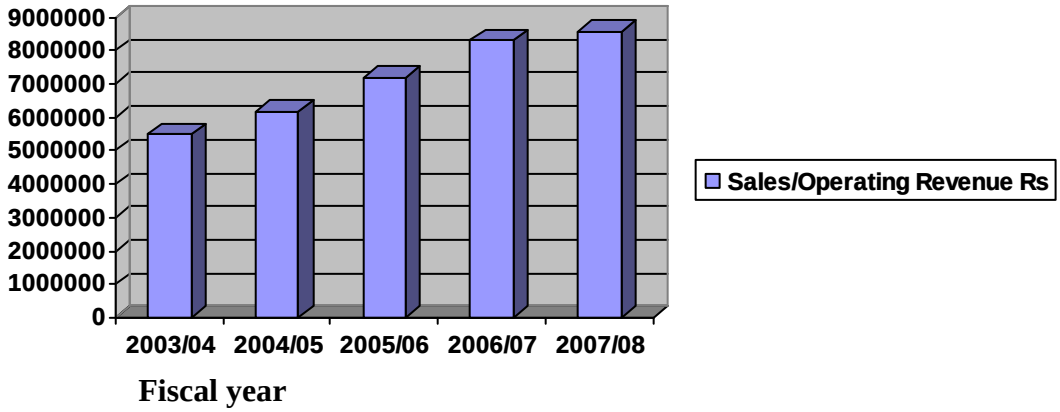
Above table shows the operating income of NTC. The revenues of NTC are affected by various factors. Being monopolist in communication sector NTC has not satisfactory revenue. Though, it has to face the challenge with other private company in recent year. A communication service in Nepal is very weak position. Mainly in remote area of the nation is lacked of communication services, like telephone, internet, email etc. It can generate more revenues if the services reach in all sectors of the nation. Revenue of NTC in fiscal year 2003/04 is Rs. 5487149 thousand; Company is able to increase the revenue by 12.55% in fiscal year 2007/08. During the fiscal year 2005/06 the company is able to increase its revenue by 17.02% and amount is Rs. 7208087 thousand. It is nearly 2% more than previous year increase percent. In fiscal year 2006/07, the company has Rs. 8312244 thousand revenues which are more in amount of previous years but in percentage it has reduced nearly 2%. In year 2007/08 company has revenue of Rs. 8584144 thousand. It is only able to increase its' revenue by 3.27% in previous year amount. NTC's operating revenues increased percent is not satisfactory. Various factors like; political, legal Economic as well private sectors participation are main cause to reduce company's revenues.

The presentation of the above total operating income figure will be more effective by following figure.

Figure No. 4.1

Operating Income of NTC

Operating Income/Sales in 000



To analyze the trend of actual sales of the company least square method can be used to forecast possible future sales for given time or year. A straight line trend shows the relation between time and actual revenue (sales) of this relevant year. In this method it is assumed that the sales consistently changes with change in the time and such change can be expressed by the component of time factor. In this method time factor is considered as independent factor and sales is considered as dependent factor upon time. Then the straight line trend of actual sales 'Y' depends upon the time (x), which is expressed as:

$Y=a+bx$

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

$$y \text{ X } Na \Gamma b \quad x.....(i)$$

$$xy \text{ X } a \quad x \Gamma \quad x^2 .....(ii)$$

Table No. 4.2

Time Series Analysis, Fitting Straight-Line Trend By Least Square Method of Neal Telecom

Year	Income 'y'	Time 'x'	x2	Xy
2003/04	5487	1	1	5487
2004/05	6160	2	4	12320
2005/06	7208	3	9	21624
2006/07	8312	4	16	33248
2007/08	8584	5	25	42920
n=5	x X35751	x X15	x^2 X55	x X115599

Substituting the value of table in equation (i) and (ii)

35751= 5a+15b……. (iii)

115599= 15a+55b ……. (iv)

Therefore

A= 4646.4

B= 834.6

Thus, y= 4646.4+ (834.6) x, is the trend line of sales which shows the positive sales revenue in the future.

By using this trend we can estimate the actual sales for the 2008/09, 2009/10 and 2010/11.

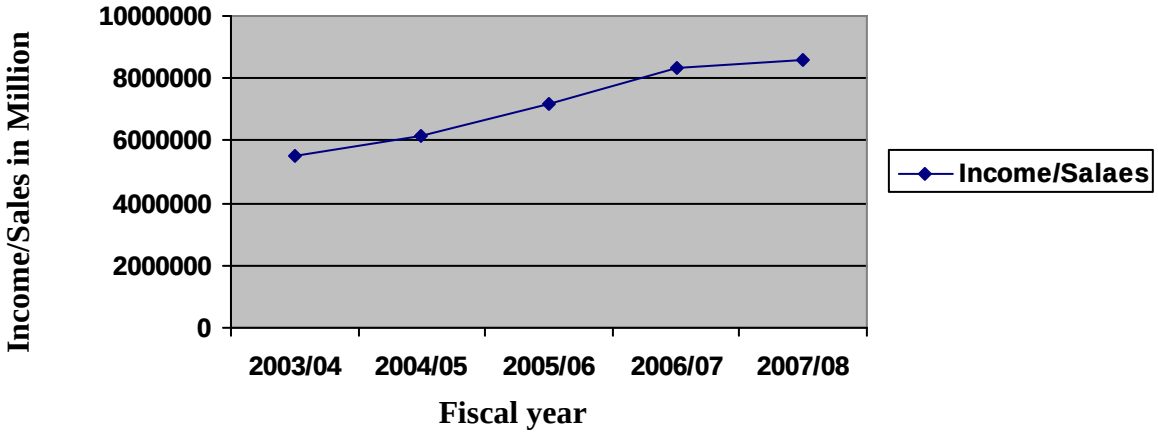
Here,

2008/09	**2009/10**	**2010/11**
Y= 4646.4+ 834.6×6	Y= 4646.4+ 834.6×7	Y= 4646.4+ 834.6×8
= 4646.4+5007.6	= 4646.4+5842.2	= 4646.4+6676.8
Y= 9654	Y= 10506.6	Y= 11323.2

Therefore if the trend does not change, the possible sales of NTC for the year 2008/09, 2009/10 and 2010/11will be Rs. 9654 million, 10506.6 million and 11323.2 million respectively.

Figure No. 4.2

Graphical Presentation of Sales Trend of NTC



Nepal Electricity Authority has been playing crucial role in the sector of utilities. Electricity service is very essential to every people. Nepal Electricity Authority is not able to fulfill the demand of customers. The Electricity Authority is running in loss since last five years. Authority is earning profit from operation but high expense on interest and depreciation it is forced to bear loss. Revenue of electricity authority is sales of electricity. Sales plan of electricity is essential for its performance improvement. Electricity authority has categorized its customers in various types and charges the price based on that category. Sales revenue of NEA has been presented in table for five years from fiscal year 2003/04 to 2007/08.

Table No. 4.3

Sales Revenue of Nepal Electricity Authority

Amount Rs. (in million)

Year	Actual Sales in Rs.	Rs. Change	% Change
2003/04	8160.80	-	-
2004/05	9476.20	1315.40	16.12
2005/06	11012.60	1536.40	16.12
2006/07	11874.70	862.10	7.83
2007/08	12605.2	730.5	6.15

Source: Annual Report of Nepal Electricity, 2009

Above table No. 4.3 shows the sales revenues of the NEA for five years FY 2003/04 to 2007/08. The sales revenue of NEA is increasing as stable percentage in year 2003/04 and 2004/05. But in year 2005/06 & 2006/07 sales revenue is decreased nearly 8%. Sales revenue of NEA in recent years is not satisfactory.

Table No. 4.4

Nepal Electricity Authority

Sales in Unit (Gwh)

Year	Actual Sales in Unit	Unit Change	% Change
2003/04	1407.127	-	-
2004/05	1540.03	132.903	9.44
2005/06	1701.556	161.526	10.49
2006/07	1800.814	99.258	5.83
2007/08	1964.393	163.579	9.08

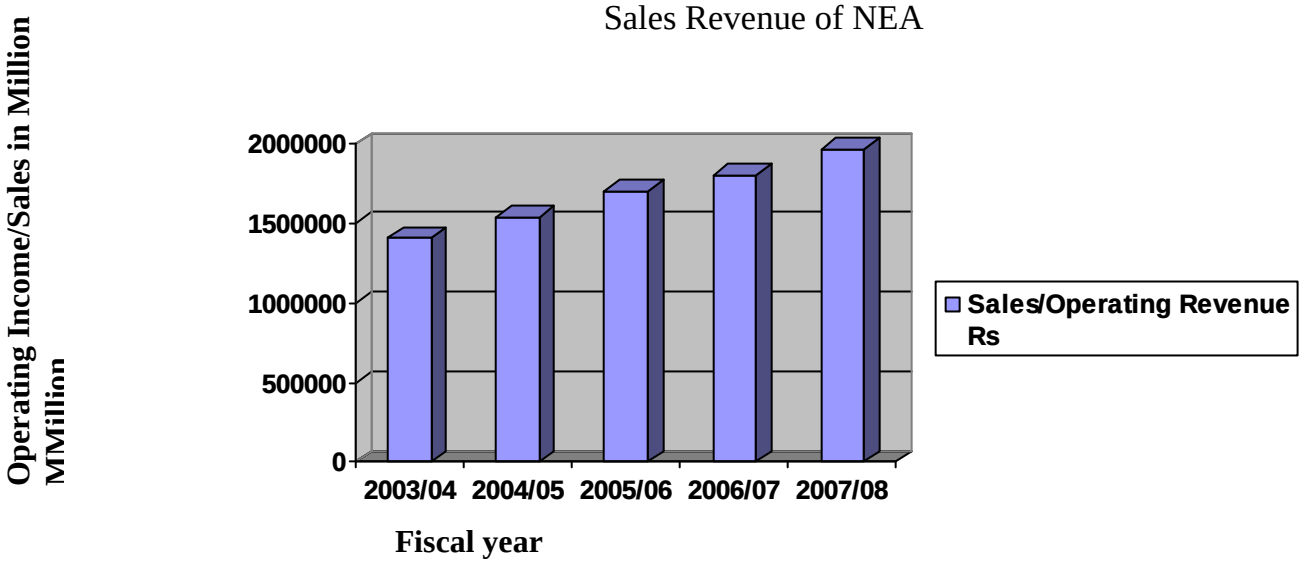
Source: Annual Report of Nepal Electricity, 2006

In table No. 4.4, the sales unit of NEA is shown. Though, in comparative cost volume profit analysis researcher is going to show the BEP in Rs. only. Here the sales unit of NEA is shown. Sales unit relates with sales revenue. Higher the sales unit higher will be the sales revenue. Sales unit of NEA is increasing in fluctuating trend. In year 2003/04electricity sales is increased by 9.44% and in 2004/05 it again improves nearly 1%. But in year 2005/06 NEA's sales unit of electricity is increase only 5.83%. It is lesser in prior year comparison. In year 2006/07 NEA sales unit is increased by 9.08%.

The presentation of the above sales revenue of NEA will be more effective by following figure.

Figure No. 4.3

Sales Revenue of NEA



To analyze the trend of actual sales of the company least, square method can be used to forecast possible future sales for given time or year.

Table No. 4.5

Time Series Analysis of Nepal Electricity Authority

Year	Income 'y'	Time 'x'	x2	xy
2003/04	8160.80	1	1	8160.8
2004/05	9476.20	2	4	18952.4
2005/06	11012.60	3	9	33037.8
2006/07	11874.70	4	16	47498.8
2007/08	12605.2	5	25	64114.5
n=5	x X53347.2	x X15	x^2 X55	x X170675.8

Straight line trend of actual sales (y) depends upon time (x), which is expressed as

y = a+bx

Substituting the value in equation (i) and (ii)

$y \text{ X} Na \Gamma b \quad x$.....$(i)$

$xy \text{ X} a \quad x \Gamma \quad x^2$.....$(ii)$

Here,

53347.2= 5a+15b……. (iii)

170675.8= 15a+55b ……. (iv)

Now,

a= 7152.72

b= 1172.24

Thus, y=a+bx

Y= 7152.72+1172.24x is the trend line of sales which shows the positive sales revenue in the future.

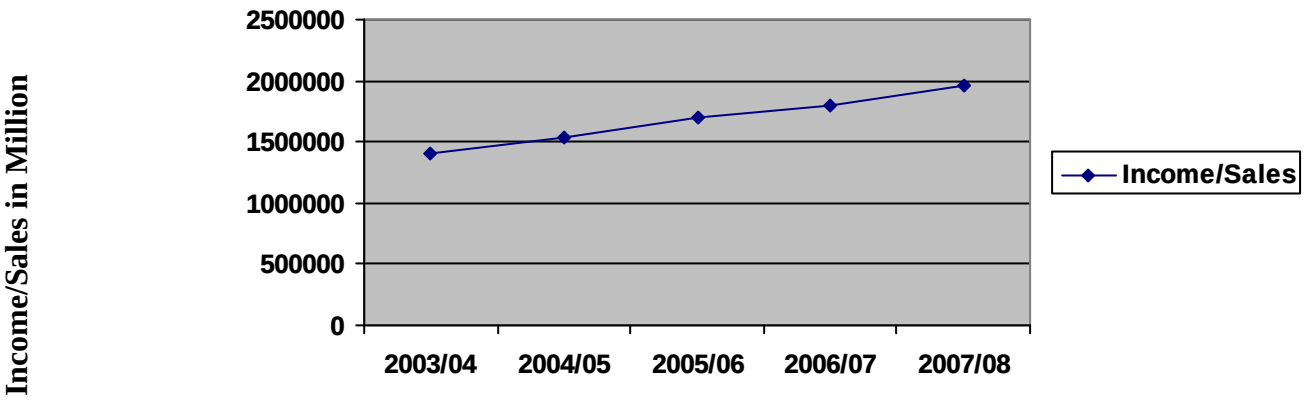
By using this trend we can estimate the actual sales for the 2008/09, 2009/10 and 2010/11.

2008/09	2009/10	2010/11
Y= 7152.72+1172.24×6	Y= 7152.72+1172.24×7	Y= 7152.72+1172.24×8
=7152.72+7033.44	=7152.72+8205.68	=7152.72+9377.92
=14186.16 million	=15358.4 million	=16530.64 million

Therefore, if the trend does not change, possible sales of NEA for the year 2008/09, 2009/10 and 2010/11 will be Rs. 14186.16 million, 15358.4 million and 16530.64 million respectively.

Figure No. 4.4

Graphical Presentation of Sales Trend of NEA



4.2 Cost Plan of NTC and

The cost is the amount which is expenses for production of goods and services or used in operation. When we take any goods or service we have to pay some amount for that. Organization has to bear various types of costs. Like variable cost, fixed cost or semi-variable cost. Variable cost can be control, so it is also called controllable cost. But fixed cost can not control and it is known as uncontrollable cost. For operation of business cost is required but it should control to earn profit. Different organization bears different types of cost. For the cost volume profit analysis production and operation cost should be segregated. Variable cost and fixed cost is very much necessary to find for CVP analysis. Every organization can segregate their various types of cost into fixed and variable. Both NTC and NEA have different types of cost or expenses. But the public enterprises in Nepal have not practice CVP analysis. So they don't have segregated the cost into fixed or variable.

Different types of cost under different headings are shown below about both the enterprises.

Cost of NTC

1) Employee cost:	2) Operation and maintenance
Salaries and wages	Maintenance office equipment
Pf contribution	Maintenance building

Earned lave salary	Maintenance plants/ machinery
Clothing and other allowances	Power heating and lighting
Overtime allowances	Fuel for vehicles
Medical expenses	Foreign and carriages
Pension and gratuity	International channel rent
3) Administrative expenses	Advertisement
Traveling expenses	Training expenses
Rent rates	Postage
Special charge	Subscription and donation
Bank charge	Legal and professional fees
Entertainment	Expenses on lost of goods
Office furnishing	Royalty/ contribution on Rural Dev. Fund
Insurance	Miscellaneous expenses
Statutory and tax audit fee	Obsolete and damaged fixed assets
Bad debts	Licenses fee
Provision for doubtful debt	Deterred revenue expenditure
Commission	Security expenses
Meeting fees expenses	Membership fee
Printing and stationery	Telephone expenses

4) Interest on subscriber's deposit

5) Interest on loan

6) Depreciation

7) Bonus

8) Incentive package

9) Loss gain on foreign currency

Cost of NEA

1) Generation cost
2) Transmission expenses
3) Distribution expenses
4) Administrative expenses
5) Interest
6) Depreciation
7) Loss on foreign exchange
8) Deferred revenue expenditure written off

4.3 Variable Cost of NTC and NEA

Variable cost varies in proportion to change in output or activities level but per unit variable cost is constant within a certain period. Variable costs are controllable cost so management has to give priority to control variable cost. In NTC and NEA cost volume profit analysis is not practicing. So, costs are not segregated into variable and fixed. Based on the nature of the costs and assumption various types of cost of both enterprises are segregated into fixed and variable cost. Variable cost of NTC and NEA are as follows:

Table No. 4.6

Variable Cost of NTC

Amount in Rs. '000

Particulars	2003/04	2004/05	2005/06	2006/07	2007/08
Operation and maintenance cost	453831	503303	490886	463300	552162
Commission expenses	-	-	9110	11183	20138
total variable cost of NTC	453831	503303	500796	474483	572300
Change %	-	10.9%	(0.50%)	(5.25%)	(20.60%)
Variable cost of NEA					
Generation	4343.4	5728.7	5169.9	6565.9	7246.5
Transmission	137.3	158.0	158.0	199.5	215.9
Distribution expenses	982.22	1174.4	1308.6	1376.1	1484.2
Total variable cost of NEA	5462.92	7061.1	6655.6	8141.5	9158.9
Change %	-	29.26%	(5.73%)	(22.31%)	(12.50%)

Operation and maintenance costs and commission are taken as variable cost in NTC. In NEA generation, transportation and distribution expenses are taken as variable cost.

From the above table no. 4.6 shows the variable cost of both enterprises. Total variable cost of NTC is operation and maintenance cost and commission expenses. Total variable cost in the year 2003/04 variable cost is Rs. 453831 thousand and increased 10.9% in this year. In year 2004/05 variable cost are decreased by 0.50% and 5.25 % in year 2005/06. But in year 2006/07 variable cost of NTC is increased by 20.60%. Variable cost is controllable cost. So, management should try to reduce this cost.

In NEA variable costs is increased by 29.26% in year 2003/04 and reached the amount Rs. 7061.1 million in years 2004/05. In fiscal year 2004/05 the variable cost of NEA is reduced by 5.73% and

increased 22.31% in year 2005/0. In year 2006/07 the variable cost is increased by 12.50% and reached the amount Rs. 9158.9 million in 2007/08.

4.4 Fixed cost of NTC and NEA

Fixed costs remain constant in total despite the changes in the level of activity within every year. When production cost or service cost are changed but fixed cost remains same. The per unit fixed cost may decrease while the numbers of production units are increased. Though, fixed cost in total may vary for different fiscal year. The fixed costs of NTC and NEA presented here are based on the assumption and nature of cost. Because of cost segregation tools are not applied in these enterprises. Fixed cost of NTC and NEA is presented in table below.

From the table no. 4.7 there is increasing trend in the fixed cost of NTC. In the year 2003/04 total fixed cost is Rs. 2431802 thousand increased by 12.37%. It has increased 12.43% in 2005/06 but in 2006/07 fixed cost is increased by 25.17%. It is more than other years. In year 2008/09 total of NTC is Rs. 3194348 which less than the previous year. The company is able to reduce the fixed cost by 16.27% in this year.

In other hand, NEA's total fixed cost is increasing in fluctuation trend. Total fixed cost of NEA is Rs. 3584.48 million in year 2003/04 and increased 12.91% in this amount and reached 40471 million in year 2004/05. In year 2004/05 its total fixed cost is increase by very high percentage nearly 38% but in year 2005/06 fixed cost is increased only 0.56% and in FY 2006/07 fixed cost is increased by 9.54%. The total fixed cost of NEA is very high because of high amount of interest on long-term loan and depreciation. High fixed cost increase the break even level. So, unusual fixed cost should control if possible.

Table No. 4.7

Fixed Cost Analysis of NTC

Amount in Rs. (000)

Particulars	2003/04	2004/05	2005/06	2006/07	2007/08
Employee cost	773630	664192	717408	927254	1136819
Administrative expenses	577402	949569	861460	1443909	920773
Interest on subscriber's deposit	67396	68375	82249	86650	57036
Interest on loan	143654	38407	15955	3292	696
Depreciation	799491	863863	931685	1016309	1048436
Bonus	170396	174982	180670	183763	187999
Incentive package	407825	131231	120969	125449	93713
Loss (gain) on foreign currency	(207992)	(157993)	162000	28443	(251124)
Total fixed cost of NTC	2431802	732626	3072396	3815069	3194348
Change procedure	-	12.37%	12.43%	24.17%	(16.27%)
Fixed cost analysis of NEA					Rs. (million)
Administrative expenses	850.08	447.4	536.1	489.1	511.6
Interest	1188.2	1395.5	2973.4	2991.5	3324.6
Depreciation	1119.3	1420.1	1656.7	1686.0	1838.8
Profit/ loss on foreign exchange	-	271.6	-	59.1	50
Deferred revenue expenditure	426.9	512.5	411.1	320.1	350
Total fixed cost of NEA	3584.48	4047.1	5577.3	5545.8	6075
Change percentage	-	12.91%	37.81%	(0.56%)	9.54%

4.5 Semi Variable Cost Analysis

Semi variable cost is combined cost both fixed and variable. Fixed cost should bear for certain level and if the level of output or services is increased excess amount should spend that cost can be taken as variable cost. For example repair and maintenance, supervision, fuel, energy, etc. Costs consists both fixed and variable cost. NTC and NEA have not segregated the cost into variable or fixed. So, semi variable cost also accumulated in total cost. Therefore above mentioned costs are classified into variable and fixed as per suggestion and detail by the guide and senior staff of the enterprises.

4.6 Cost Volume Profit Analysis of Nepal Telecom and Nepal Electricity Authority

Cost volume profit analysis is a popular and very reliable management accounting tool to measure and analysis the financial performance of the organization. It is a part profit planning and control. CVP analysis can be extended to cover the effects on profits of changes in selling price or service fees, cost, income, tax rate and product mix. CVP analysis provides the management with a comprehensive overview of the effects on revenue and costs of all kinds of short run financial changes. CVP analysis helps to determine the minimum sales volume to avoid losses and the sales volume at which the profit of the company will increase. When the management has detail information about variable and fixed cost, selling price and sales volume of the product then the company can determine the break even level of its product. Income statement shows the picture of company, how it is earning profit. Here, the income statements of NTC and NEA are shown based on its revenues, variables and fixed costs etc.

Table No. 4.8

Income Statement of NTC for the Year 2002/03 to 2006/07

Amount Rs. in Million

Particulars	2003/04	2004/05	2005/06	2006/07	2007/08
1.Operating income	54.87	6160	7208	8312	8584
2.Total variable cost	454	5.3	5.1	474	572
3.Contribution margin (1-2)	5033	5657	6707	7838	8012
4. Total fixed cost	2432	2733	3072	3815	3194
5. Profit (3-4)	2601	2924	3635	4023	4818
6.Other income (non operating income)	441	396	461	543	610
7.Profit including non operating income (5+6)	3042	3320	4096	4566	5428
8. Profit % on revenue	47.40%	47.47%	50.43%	48.40%	56.13%

Table 4.8 shows the income statement of NTC. NTC is earning profit in increasing trend. Variable and fixed costs are also increasing. Profit on sales is 47.40% and 47.47% in year 2003/04 and 2004/05 respectively. In year 2005/06 profit is 50.43% which more than previous year. In year 2006/07 company profit is reduced near about 2% and only able to earn 48.40% but in year 2007/08 company has earned 56.15% profit on sales revenues. It is higher than previous year. But the company can earn more than this percent because of its monopolist in communication sector.

Table No. 4.9

Income Statement of NEA for the Year 2003/0 to 2007/08

Amount Rs. (million)

Particulars	2003/04	2004/05	2005/06	2006/07	2007/08
1.Sales revenue	8161	9476	11013	11875	12605
2.Total variable cost	5463	7016	6657	7142	9159
3.Contribution margin (1-2)	2\698	2415	4356	3733	3664
4.Total fixed cost	3584	4047	5577	5546	6067
5.Profit loss (3-4)	(886)	(1632)	(1221)	(1813)	(2411)
6.Other income	593	460	513	671	566
7.Profit loss including other income	293	1172	708	1142	1845
8.Profit (loss) % on sales revenue	(3.59%)	(12.37%)	(6.43%)	(9.62%)	(14.39%)

Nepal Electricity Authority (NEA) is suffering form loss since 2002/03 to recent years. Loss on sales is 3.59% in year 2003/04. In FY 2004/05 loss on sales is 12.37% which is very high than previous year. In year 2005/06 and 2006/07 there are 6.43% and 9.62% loss respectively. But in year 2007/08 loss on sales is very high than other previous years. In this year loss on sales is 14.39%. This shows NEA profit position or financial performance is not good. It should find out its break even level of sales revenue to earn profit.

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

In cost volume profit analysis we have to compute various ratios which are important part of CVP analysis. Cost volume profit analysis aim will fulfill when we are able to analyze these all parts of CVP's tools. Contribution margin is the difference between sales revenue and variable cost. This

amount equals with fixed cost and profit. Contribution margin=sales-variable cost. Contribution margin is known as profit volume ration (P/V ratio) or C/ M ratio. This can compute by dividing the sales to contribution margin. Break even point (level) is "no profit no loss" point. Where cost and sales revenue become equals. It is very necessary to know the BEP for every organization. BEP can compute in Rs. or (level of output) unit.

$$\text{BEP in unit} = \frac{Fixed\ \cos t}{CMPU}$$

$$\text{And BEP in (Rs)} = \frac{Fixed\ \cos t}{P/V\ ratio}$$

Margin of safety is the excess of budgeted or actual sales over the break even levels sales volume. The firms don't incurred loss on safety margin because it is higher than BEP. The firm earns profit in this level.

Table No. 4.10 shows the detail cost volume profit system of NTC. Relationship among various variables shows the actual position of NTC about contribution margin, BEP level, and safety margin and its percentage. As well as BEP volume of the NTC is computed including other income this shows different break even volume that when excluding it in previous part.

Contribution margin of NTC is 0.92, 0.92, 0.93, 0.94, and 0.93 in fiscal years 2003/04 to 2007/08 respectively.

Company is in profit position because its margin of safety is above the break even volume. Percentage of BEP on sales are 48.17%, 47.17%, 45.71%, 45.82%, 48.83% and 40% from year 2003/04 to 2007/08 respectively. NTC has Rs. 2844 million safety margin in 2003/04 which is 51.53% of actual sales. The MOS are 52.29%, 54.18%, 51.17% and 60% in remaining four years. MOS is Rs. 5150 million in year 2007/08.

Table No. 4.10

Computation of Various ratios of NTC

Amount Rs. In million

Particulars	2003/04	2004/05	2005/06	2006/07	2007/08
1.Sales	5487	6160	7208	8312	8584
2.Contribution margin	5033	5657	4707	7383	8012
3.P/V ratio (CM/ sales)	0.92	0.93	0.93	0.94	0.93
4.Fixed cost	2432	2733	3072	3815	9194
5.BEP (fixed cost/ PV ratio)	2643	2939	6603	4059	3434
6.BEP % on sales	48.17	47.71	45.82	48.83	40
7.Margin of safety (AS-BE)	2844	3221	3905	4253	5150
8.MOS as percentage of sales	51.83	52.19	54.18	51.17	60

BEP considering other income and other expenses

$$\text{BEP Rs.} = \frac{Fixed\ cost\ Z other\ income\ \Gamma other\ expenses}{P/V\ ratio\ (C/M\ ratio)}$$

1.Fixed cost	2432	2733	3072	3815	3194
2.Non operating income (other income)	441	396	461	543	610
3.Fixed cost after deducing other income	1991	2337	2611	3272	2584
4.PV ratio	0.92	0.92	0.93	0.94	0.93
5.BEP (3/ PV ratio)	2164	2540	2808	3481	2778
6.Margin of safety (AS-BE)	3323	3620	4400	4843	5806

7.MOS as percentage of sales	60.56	58.77	61.04	58.12	67.64

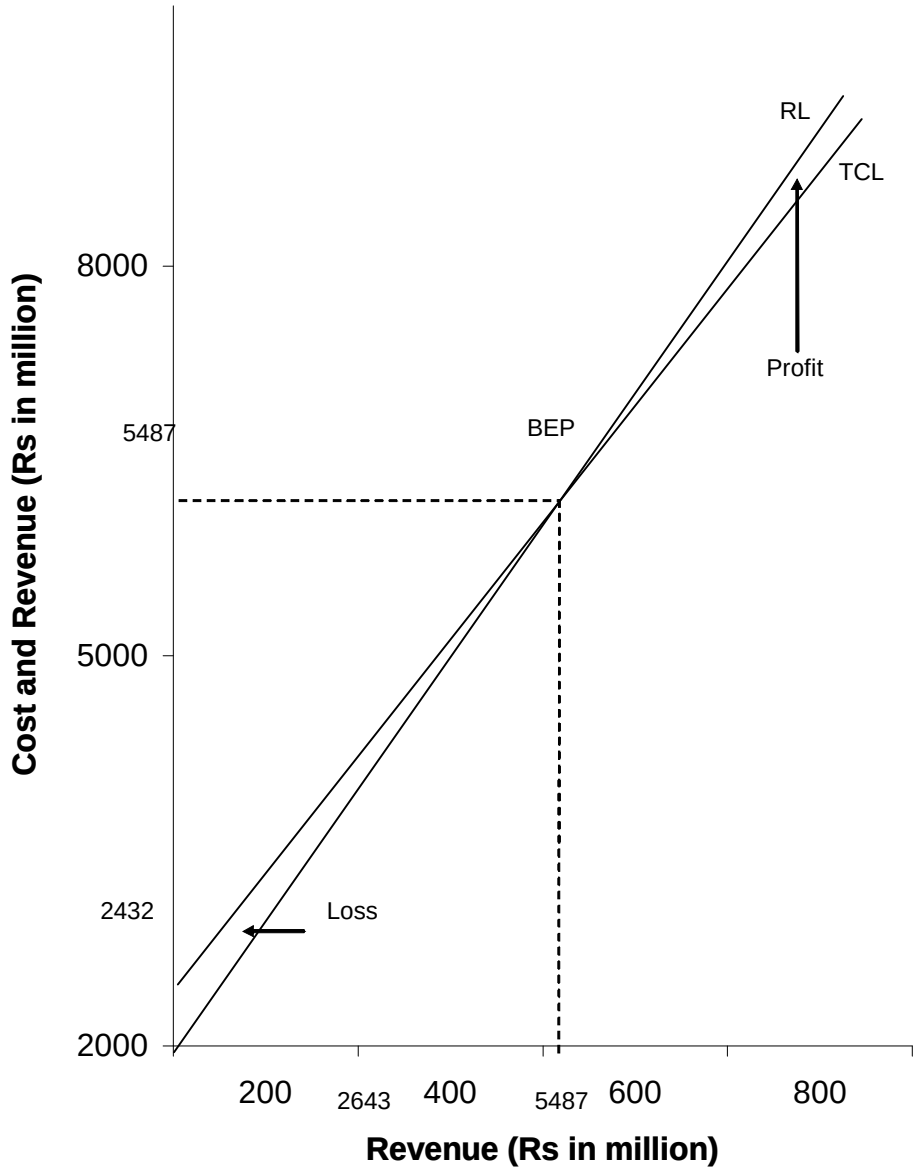
Other income, which is non operating income of NTC is including in fixed cost and computed BEP and margin of safety. It has reduced the BEP volume and increased the safety margin and its percentage. Lower the break even volume is good for the company to earn profit.

The computation can be represented in graphical form which is as follows:

Graphical presentation of BEP (Rs.) for the FY 2003/04 (From Appendix II)

Figure No. 4.5

Break Even Level of NTC



Here,

Fixed cost= Rs. 24532 million

Variable cost= Rs. 454 million

Total cost= Rs. 2886 million

Sales revenue= Rs. 5487 million

BEP sales= Rs. 2643 million

Profit= Rs. 2601 million

A simple break even chart of NTC for the fiscal year 2003/04 is shown above. Sales revenue is shown in X-axis and cost amount is shown in Y-axis required information and BEP chart for other years are given in appendix.

From the above chart, the total fixed cost of the company is Rs. 2432 million. It is parallel to X-axis. Variable cost directly varies with cost of production; therefore it is sloping upward to right side. If no operation of the company variable cost become zero but the company should bear the fixed cost. Total sales revenue curve originates from the origin because sales revenue is zero when sales volume is zero. And service or sales volume increase sales revenue also increases. The equilibrium point where sales revenue and total cost line is crossed this point is line called break even level or volume. Below this point the company cannot cover its cost as a result is suffers loss. And above this point sales revenue exceeds the total cost which provides the profit to the company. In the figure NTC has higher sales revenue than cost.

Total sales revenue is Rs. 5487 million whereas total costs is Rs. 2886 million. As a result the NTC is able to earn Rs. 2601 million profit.

Table No. 4.11

Computation of Various Ratios of NEA

Amount Rs. in million

Particulars	2003/04	2004/05	2005/06	2006/07	2007/08
1. Sales revenue	8161	9476	11013	11875	12605
2. contribution margin	2698	2415	4356	3733	3664
3. P/V ratio (CM/ sales)	0.33	0.25	0.40	0.31	0.29
4. Fixed cost	3584	4047	5577	5546	6075
5. BEP (fixed cost/ PV ratio)	10861	16188	13943	17890	20948
6. BEP % on sales	133.08	170.83	126.60	150.65	163.36
7. Margin of safety (AS-BE)	2700	4712	2930	6015	8125
8. MOS as percentage of sales	33.08	70.83		50.65	
BEP (Rest.) considering other income and expenses					
9. Other income	593	460	513	671	566
10. FC after deducing other income (4-9	2991	3587	5064	4875	5509
11. BEP (Rs.) 10/PV ratio	9064	14348	12660	15726	18997
12. Margin of Safety (1-11)	(03)	(871)	(647)	(851)	(174)
13. MOS% (MOS/ Sales revenue)	(1.06)	(1.41)	(4.96)	(2.43)	(8.15)

Above tables 4.11 shows the contribution margin C/M (P/V) ratio, break even sales, margin of safety and its percentage as well as BEP and margin of safety is calculated again considering other

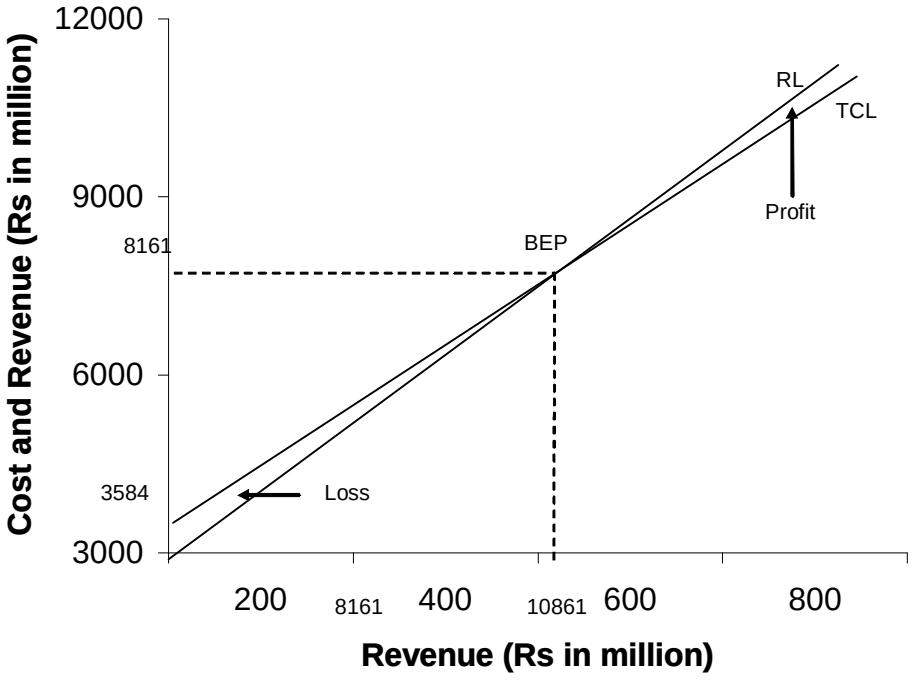
income of NEA. In cost volume profit analysis calculation of these ratios are compulsory. Contribution margin of NEA is not satisfactory. Contribution margin ratio of NEA in FY 2003/04 is 0.33. In this year NEA's break even sales is higher than actual sales revenue so safety margin is in negative and less by 33.08%. Similarly the NEA's P/V ratio is very less in year 2004/05 by 0.25% and break even sales is higher than actual sales NEA is suffering from loss so its financial position is not good. BEP sales are excess than actual sales and margin of safety has incurred very high loss than previous years. Contribution margin of NEA is very low as well as fixed cost is high. It increases BEP and margin of safety becomes negative.

When, other income is considered and deducted from total fixed cost. This is because, income reduces the cost as a result; BEP sales level of NEA is decreased than previous time. Margin of safety is also reduced than prior time.

Graphical presentation of BEP (Rs.) for the FY 2003/04 (From appendix III)

Figure No. 4.6

Break Even Sales of NEA



Here,

Fixed cost= Rs. 3584 on

Variable cost= Rs. 5463 million

Total cost= Rs. 9047 million

Sales revenue= Rs. 8161 million

BEP sales= Rs. 10861 million

Loss= Rs. 886 million

Above graph shows the sales, cost and break been level of the NEA. Fixed cost and variable cost total amount is total cost of NEA and break even level of sales and actual sales are shown. Y-axis shows the cost and x-axis shows the sales revenue. Break even sales of authority is higher than actual sales. So, the NEA is not earning profit and suffering from losses.

4.8 Sensitivity Analysis: Assessing the Impacts of Changes in Cost Volume Profit Variables

It is another popular technique of testing the cost volume profit variables. When, there is any change in variables, the impact on the other factors is sure. Sensitivity analysis measures the elasticity of the change in CVP factors on break even point or given profit. Sensitivity analysis measures the elasticity of the change in CVP factors on break even point or given profit. To measure the sensitivity of CVP factors we can see the impact of certain percentage or amount change in volume, price or cost factors on net profit. For measurement of sensitivity we have various variables but these all are not possible to test. So, the main factors like sales, fixed cost and variable cost change impact are shown below for both enterprises.

4.8.1 Assessing the Impact When Sales Revenue or Operating Income is changed

Break even level of enterprises will change when total sales revenues are changed. Because change in sales revenue impact on contribution margin and its ratio. When PV ratio is changed definitely the break even level changes and margin of safety also change.

Table No. 4.12

Sensitivity Analysis of NTC

Income Statement by 10% Change in Operating Income

FY 2007/08

Amount Rs in million

Particulars	Original operating income	10% increase in operating income	10% decrease in operating income
Sales	8584	9442	7726
Less: variable cost	572	572	572
Contribution Margin	8012	8870	7154
Less: fixed cost	3194	3194	3194
Net income	4818	5676	3960
Change in net income/ loss	-	858	(858)
P/V ratio	0.93	0.94	0.93
BEP in Rupees	3434	3398	3434
% change in BEP	-	(1.05)	-

The above table shows that when operating income of NTC is increased by 10%, Net income is increased by Rs. 858 million. Profit volume ratio is increased by 1%. And break even amount is decreased Rs. 3398 million by 1.05%. When the operating income is reduced by Rs. 858 million P/V ratios is same .93 and BEP is Rs. 3434 million.

Table No. 4.13

Sensitivity Analysis of NEA

Income Statement by 10% Change Sales Revenue

FY 2007/08

Amount Rs. in million

Particulars	Original operating	10% increase in	10% decrease in

	income	operating income	operating income
Sales	12823	11541	11541
Less: variable cost	9159	9159	9159
Contribution Margin	3664	5956	2382
Less: fixed cost	6075	6075	6075
Net income	(2411)	(1129)	(3693)
Change in net income/ loss	-	1282	1282
P/V ratio	0.29	0.35	0.21
BEP in Rupees	20948	17357	28929
% change in BEP	-	17.14	38.10

Table 4.13 shows that when sales revenue of NEA is increased by 10%, net loss is reduced by Rs. 1282 million. P/V ratio is increased up to 0.35 from 0.29 break even sales is reduced Rs. 20948 million to Rs. 17357 million which is 17.14% when sales revenue is reduced by 10% net loss of the authority is increased by Rs. 1282 million. PV ratio is reduced 0.21 from 0.29 and the break even sales is increased Rs. 20948 million to Rs. 28929 million.

4.8.2 Assessing the Impact when Variable Cost is changed

When the variable cost is changed without changing the sales revenue and fixed cost we can find the change result in PV ratio profit, BEP and its percentage also. When variable cost increases CM ratio will decrease as a result BEP will high. It decreases the profit of the organization.

Table No. 4.14

Sensitivity Analysis of NTC

Income Statement by 10% Change in Variable Cost

FY 2007/08

Amount in Rs million

Particulars	Original operating income	10% increase in operating income	10% decrease in operating income
Sales	8584	8584	8584
Less: variable cost	572	629	515
Contribution Margin	8012	7955	8069
Less: fixed cost	3194	3194	3194
Net income	4818	4761	4875
Change in net income/ loss	-	(57)	57
P/V ratio	0.93	0.93	0.94
BEP in Rupees	3434	3434	3398
% change in BEP	-	-	(1.05)

Table No. 4.15

Sensitivity Analysis of NEA

Income Statement by 10% Change in Variable Cost

FY 2007/08

Amount in Rs (million)

Particulars	Original operating income	10% increase in operating income	10% decrease in operating income
Sales	12823	12823	12823
Less: variable cost	9159	10075	8243
Contribution Margin	3664	2748	4580
Less: fixed cost	6067	6067	6075
Net income	(2441)	(3327)	(1495)
Change in net income/ loss	-	916	916
P/V ratio	0.29	0.21	0.36
BEP in Rupees	20948	28929	16875
% change in BEP	-	38.09	(19.44)

Table No. 4.14 shows that when variable cost of NTC is in increased by 10%, net income of the company is decreased by Rs. 4818 million to Rs. 4761 million. PV ratio and BEP are same. When the variable cost is decreased by 10% net income of the company is increased Rs. 4818 million to 4875 million. Where P/V ratio is 0.94 and break even sales is become Rs. 3398 million from Rs. 3434 million. BEP is decreased by 1.05%

In table no. 4.15, variable cost of NEA is changed by 10%. When variable cost is increased by 10%, net loss of NEA is increased by Rs. 916 million which is 37.99%. PV ratio is decreased up to 0.21. Break even sales is increased up to Rs. 28929 million from Rs. 20948 million. When variable cost of NEA is reduced by 10%, net loss is decreased by Rs. 916 million. Where PV ratio is increased up to .036 so break even, sales reduced Rs. 16875 million, nearly which is 19.44%.

4.8.3 Assessing Impact when Fixed Cost is changed

Fixed cost is constant cost, which don't change for certain level. Fixed cost is uncontrollable cost because it should bear whether there is operate or not operate any task. In CVP analysis, when fixed cost is changed it does not bring any change in contribution margin and P/V ratio. But only when fixed cost is changed net income and BEP amount also changed. Here, the 10% changes on fixed cost of NTC and NEA are measured as follows:

Table No. 4.16

Sensitivity Analysis of NTC

Income Statement by 10% Change in Fixed Cost

FY 2007/08

Amount Rs. (million)

Particulars	Original operating income	10% increase in operating income	10% decrease in operating income
Sales	8584	8584	8584
Less: variable cost	572	629	515
Contribution Margin	8012	8012	8012
Less: fixed cost	3194	3194	2876
Net income	4818	4499	5136
Change in net income/ loss	-	319	318
P/V ratio	0.93	0.93	0.93
BEP in Rupees	3434	3777	3092
% change in BEP	-	9.99	9.96

Table No. 4.16 shows that when fixed cost of NTC is increased by 10%, Net income of the company is decreased from Rs. 6.62% of original profit. These are no any effect on PV ratio while fixed cost is changed. So PV ratio is same but break even revenue of the company is increased up to Rs. 3777 million from Rs. 3434 this is because fixed cost of the company is more than 10%. When the fixed cost of the company is reduced by 10% net profit is increased by Rs. 318 million and reduced up to Rs. 5136 million. PV ratio is not change but fixed cost is reduced. Break even revenue decreased 9.96% or Rs. 3092 million from Rs. 3434 million.

Table No. 4.17

Sensitivity Analysis of NEA

Income statement by 10% change in fixed cost

FY 2007/08

Amount Rs. (million)

Particulars	Original operating income	10% increase in operating income	10% decrease in operating income
Sales	12823	12823	12823
Less: variable cost	9159	9159	9159
Contribution Margin	3664	3664	3664
Less: fixed cost	6075	6083	5468
Net income	(2441)	(3019)	(11804)
Change in et income/ loss	-	(608)	607
P/V ratio	0.29	0.39	0.29
BEP in Rupees	20948	23045	18855
% change in BEP		10	(9.99)

In table No. 4.17 fixed cost of NEA is changed by 10%. When fixed cost is increased by 10% net loss of the authority is increased by Rs. 608 million. It is 25.22% loss on original loss. Break even sales is increased up to Rs. 23045 million from Rs. 20948 million which is 10% more than original break even sales. But P/V ratio is same because there no any effect on contribution margin while fixed cost is changed. When the fixed cost of NEA is reduced by 10% net loss of the authority is decreased by Rs. 607 million. It is 25.22% reduction in original loss. PV ratio is not changed but break even sales is decreased due to reduction in fixed cost and break even sales is become Rs. 188555 million from Rs. 20948 million. When increase profit of the company cost decreases. When sales is increased profit of the company also increase. There is positive relation between sales and profit and negative relation between cost and profit.

4.9 Net Profit Position of NTC and NEA

Profit is excess amount over the total cost. Every organization needs profit. Without profit organization cannot run smoothly and fail to achieve its goal. Profit earning is compulsory to every company or firm. Here the profit/ loss position of NTC and NEA is shown in table as follows:

Table No. 4.18

Profit and Loss Position of NTC and NEA

Amount Rs. (Million)

Year	NTC			NEA		
	Profit/ loss Rs.	Rs. change	% change	Profit/ loss Rs.	Rs. change	% change
2003/04	2601	-	-	(886)	-	-
2004/05	2924	323	12.42	(1632)	746	84.20
2005/06	3635	711	24.32	(1221)	411	25.18
2006/07	4023	388	10.67	(1812)	592	48.49
2007/08	4818	795	19.76	(2411)	598	32.98

Table 4.18 shows the profit trend of NTC and NEA. Profit position of NTC is increasing in fluctuating trend. NTC is able to earn profit all the year. In fiscal year 2003/04 NTC's net profit is Rs. 2601 million, it is increased by 12.42% and earns the net profit Rs. 2924 million in 2003/04. In this year company has increased its profit by 24.32% and net profit is Rs. 3635 million. In year 2005/06 profit is Rs. 4023 million which is more than previous year. It is 10.67% increased on previous year profit. In year 2007/08 company has Rs. 4818 million profits which are 19.76% more than fiscal year 2006/07.

In other hand, NEA is suffering from loss since FY 2004/05 to FY 2007/08. NEA is not earning profit because of high fixed cost and variable cost. NEA has loss Rs. 886 million in FY 2004/05. It is increased by 84.20% in this year and the net loss is Rs. 1632 million. In FY 2005/06 net loss is Rs. 1221 million which is 25.18% less than FY 2004/05. In FY 2005/06 NEA has Rs. 1813 million loss which is 48.49% more than FY 2004/05. NEA has Rs. 2411 million losses on 2007/08 which is 32.98% of FY 2006/07. In this year NEA has bear very high amount loss than previous year.

4.10 Major Findings of the Study.

Every research work is done to find something new, based on the objective of the study. From analysis of various data collected by primary and secondary sources, the major findings of the study are as follows:

i) Actual operating income of the NTC is increasing in fluctuating trend. Its forecasted sales are Rs. 9654 million for fiscal years 2005/06. Sales plan of NTC is not systematic. So, it has not achieved its target to increase operating income. In NEA as sales revenue is increasingly constantly by two years gap. Sales revenue of NEA is not sufficient to cover the cost. Forecasted sales revenue of NEA is Rs. 14186.16 million for the fiscal year 2007/08.

ii) Segregation of fixed and variable cost is ignored by both enterprises. CVP analysis is not practicing by these enterprises no any method has been adopted to segregate cost into fixed or variable.

iii) Variable cost of NTC is very less compare to its fixed cost and contribution margin ratio of NTC is very high. But NEA has high variable cost and its contribution margin ratio is less.

iv) NTC is running in profit but NEA is suffering from loss. No any systematic plans have been implemented for preventing the loss and improve profit of these enterprises.

v) Fixed cost of NTC is high in the comparison to variable cost. Employee cost and administration expenses are high. In NEA fixed cost like interest and depreciation are high. Long term loan of NEA are the main cause to increase interest.

vi) High PV ratio of NTC is reduced the break even level of the company whereas NEA has less PV ratio and BEP sales are more. As a result NTC is earning profit but NEA is suffering loss.

vii) Margin of safety in NTC is near about 55% in average but NEA margin of safety is negative because break even sales is higher than actual sales. There is safety margin in NEA.

viii) NTC has launched various services to its customers to increase revenue but in rural area it is not able to fulfill demand of customer for communication services. NEA also plans various projects but not complete in time and cost of production are increased and services are not satisfactory.

ix) Sensitivity test shows that the changes in various factors cause to increase or decrease the C/M ratio, BEP margin of safety etc. Both the enterprises have some impact on sensitivity test.

x) Profit position of NTC is good but not satisfactory as being Monopolist Company in communication services. NEA is not earning profit. Its percentage of loss has been increased in recent year. Both the enterprises have not systematic plan. Operating profits are satisfactory but net profit is not good. A popular and very reliable

accounting tool, CVP analysis is not applying to analyze the financial performance of enterprises.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Nepal is least developing country in the world. The main source of income is agriculture. For the socio-economic development of the nation industrialization is essential. Science and technological advancement plays vital role in industrialization of the nation. But it is not enough only the advancement of science and technology for development of the country. Management of all these sectors is very essential. Without good management organization cannot achieve its goal and objectives. Government of Nepal has established so many public enterprises to facilitate the people. Most of public enterprises are suffering loss, whether the government has invested huge amount of resources. There is no any concept of effective and appropriate planning system and procedure. Lack of expert, qualified and skilled manpower in the field of management, available resources, capacity and efficiency are not utilized properly. So many popular and systematic tools and technique of management are ignored. These tools are not practicing in public enterprises for measurement of financial statement.

Two large public enterprises, Nepal Telecom and Nepal Electricity authority have glorious history in the field of communications services and electricity services. Government of Nepal has invested huge amount in these enterprises. NTC is running smoothly by earning profit. NEA is suffering loss. Profit shows the good financial position of the company. Loss shows the weak financial position. Profit is necessary to every organization. Profit is excess amount over the cost. Financial position of the company can analyze in various ways like financial performance, cash flow statement, ratio analysis, profit and loss account, balance sheet, and budgeting etc. Cost volume profit analysis one of the most popular tools of management account. It is part of profit planning control. It shows the relationship among the variables like selling price, sales volume, cost, profit, break even level, safety margin etc. When the organization finds its BEP of sales it can determines the prices, volume and cost for profit earning. The main objectives of the study was to highlight the cost volume profit analysis of NTC and NEA and comparatively studied its sales revenue, profit volume ratio, BEP sales, safety margin etc. As per the objectives of the study various primary and

secondary data were collected for five years from FY 2004/05 to 2007/08. The collected data were analyzed with descriptive and analytical approach. Sales revenue, analysis, sales trend analysis, costs analysis, PV ratio analysis, BEP analysis, sensitivity analysis profitability analysis were done with the help of various financial tools. Primary data were collected by direct interview with concerned employee and senior staff of both enterprises. Secondary data were drawn from the various document like annual report, journals published by these enterprises and concerned authority. From the analysis of CVP variables, the enterprises showed the different results. NTC has high contribution margin, its operating income is increasing in fluctuating trend. Variable cost of NTC is very less in comparison to fixed cost. So, profit volume ratio is high as a result BEP is less. Operating revenue of NTC is over the BEP. So, it is able to earn profit. NEA has less contribution margin. Sales revenue of NEA is in increasing trend. Because of high variable cost contribution margin is very less, PV ratio is nearly 32% as well as fixed cost is high. So, BEP is more than sales revenue. As a result NEA is in loss since FY 2003/04. High fixed cost of NEA is interest on long-term loan and depreciation. Sensitivity analyses of the NTC and NEA have shown that some changes in contribution margin, BEP and profit volume ratio. NTC is earning profit and profit is in increasing trend for every year. But NEA is suffering loss and its loss amount is increasing every year. Both the enterprises have not practice CVP analysis techniques as a toll to measure the effectiveness of profit planning and control. In Nepal most of public enterprise as well as private companies have ignored the CVP analysis tools. Its applications and practices are very least in Nepal.

5.2 Conclusion

In Nepal, most of the theoretical knowledge is not applied in practical. There is vast gap between theory and practice. There are so many tools and technique to measure the financial performance of the company but in proactive very few tools are used. Cost volume profit analysis, its shows the relationship among the variables related to cost, sales price profit etc. but this tool is not applied or practice in Nepalese public enterprises. In cost volume profit analysis it is necessary to segregate different types of cost into variable or fixed. Two large public enterprises NTC and NEA have into practice CVP analysis. So costs are not segregate into fixed or variable in these enterprises. Here, costs of the enterprises were segregated on the basis of nature of cost and assumptions. And

contribution margin, P/V ratio, BEP margin of safety are computed and analyzed. Being a monopolist company in communication sectors, NTC has not satisfactory operating revenue. The company has not able to expand its services to rural area. Its capacity is not effectively utilized. Though, NTC has high contribution margin. Fixed cost is higher than variable cost. BEP operating incomes is less than actual income. So, NTC is in profit position. NEA is bearing loss because of high variable and fixed cost. Leakage, outage and theft are the major problems in NEA. This leakage is reducing the NEA's profit actually. NEA is not able to facilitate its services to nation wide. Being second rich country in water resources we have not sufficient water energy. For Hydro power projects, long term plan, huge amount of capital, technology, skilled and semi skilled manpower and environmental feasibility is necessary. Lack of these factors NEA is not producing sufficient electricity. Very high cost on large projects is another problem of NEA. Most of public enterprises are being financial burned to the government. To run these enterprises smoothly there is need of cooperation among the various factors; participative management approach, expert, qualified manpower, out of from government intervention and controlling usual cost is the essential remedy.

5.3 Recommendations

Based on the above study the following suggestions are recommended to improve the cost volume profit analysis system of public enterprises mainly in NTC and NEA.

1. In Nepal most of public or private enterprises have not practiced CVP analysis in systematic manner. So, it is suggested that every public or private enterprises should apply or practice CVP analysis.

2. CVP analysis shows the relationship among the variables related to cost, revenue, profit. So, this tool is very much useful to every organization.

3. Two large public enterprises NTC and NEA, there are many expert and skilled manpower but CVP analysis is ignored to practice. Various types of costs are not segregated systematically into fixed or variable. It is essential to classify the costs.

4. Cost plan of both enterprises are not systematically maintained. So, cost of every sector should plan properly.

5. Sales revenue of both enterprises is in increasing trend but it is not sufficient to cover the cost and earn desired profit. Sales plan of these enterprises should clearly maintain and improve.

6. NTC is running smoothly by earning profit whereas NEA is suffering loss. NEA should learn the lesson from the NTCs management and its success. Though, NTC's profit is not sufficient it should control fixed cost. NEA has bearing very high cost both fixed and variable. Interest on long term loan increased the fixed cost of NEA. So, long term loan of the NEA should reduce.

7. Contribution margin ratio is near about 90% in NTC because of less variable cost whereas NEA has near about 32% contribution margin ratio because of high variable cost. It is suggested to NEA it should control variable cost and increase contribution margin.

8. Breakeven level of NTC is less than sales revenue but NEA's sales revenues are less than breakeven level. So, NTC is earning profit and NEA is bearing loss. NEA should reduce its breakeven sales by reducing variables an fixed cost as well as increasing sales revenue.

9. Margin of safety is nearly 54% in NTC but NEA has negative safety margin nearly 50%. So, NEA should improve its safety margin by maintaining BEP sales.

10. While other income and expenditure is considered to determine the BEP sales. Both the enterprises BEP is decreased because of deducing other income from fixed cost. It shows that the enterprises can determine their BEP considering other income which will provide information about BEP sales.

11. Sensitivity analysis of enterprises has shown that changes in sales revenue or variable cost are more effective than changes in fixed cost for contribution margin and BEP sales.

12. Cost control program should establish it will maintain the discipline about controlling cost.

13. Most of the Nepalese enterprises are facing the problem of government interfere and their programs are not implemented properly. NTC and NEA are facing these kinds of problem. So, it should control government interfere in decision making and planning.

14. There are many new and popular management theory like, management by objective, participative management etc. this principle can be more effective to every organization. NTC and NEA should apply this theory for better performance of the enterprises.

15. NTC and NEA are operating in monopoly situation, strength, weakness, threats and opportunity should properly analyze.

16. Regular inspection, evaluation, monitoring activities should undertaken by the central level to different department of both enterprises.

17. Most of public enterprises like NTC and NEA are facing problem of poor communication among various departments. So, the strong coordination and communication is needed.

18. Service sector is main source of income for Nepal in present globalize situation. So, NTC should adopt various high technological equipments for servicing the people and complete with other country. NEA should increase its capacity and produce electricity it will more beneficial income source for the nation.

19. To satisfy the needs of customers and facilitating quality services in reasonable price. NTC and NEA should control the costs and improve the quality of services.

20. The costs are main factors to increase price of the products. So, controllable costs should minimize if possible.

21. NTC and NEA's management performance do not show the satisfactory results about profit, BEP level contribution margin. So, management of these enterprises should perform their program and task in planning way.

22. NEA has problem of power loss by various reason. So, it should control the power loss it will help to improve the profit.

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