# A STUDY ON COST VOLUME PROFIT ANALYSIS OF UNILEVER NEPAL LIMITED AND DABUR NEPAL PRIVATE LIMITED

**A THESIS**

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# RECOMMENDATION

This is to certify that the thesis

**Submitted by:**

**MANISH PRADHAN**

**Entitled:**

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

| …… | ..... | ..... |
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VIVA-VOCE SHEET

We have conducted the viva-voce of the thesis presented

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

**Master of Business Studies (MBS)**

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# DECLARATION

I hereby declare that the work reported in this thesis entitled "**A Study on cost Volume Profit Analysis of Unilever Nepal Limited and Dabur Nepal Private Limited**" submitted to office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the degree of Master of Business Studies (MBS) course under the guidance of respected teacher supervisor of **Prakash Singh Pradhan of Shanker Dev Campus.**

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**MANISH PRADHAN**

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## ABBREVIATION

| | | |
|---|---|---|
| CVP | : | Cost Volume Analysis |
| PPL | : | Profit Planning and Control |
| UNL | : | Unilever Nepal Limited |
| DNPL | : | Dabur Nepal Pvt. Ltd |
| P/V | : | Profit volume Ratio |
| Fc | : | Fixed Cost |
| DPAT | : | Desired profit after tax |
| CM Ratio | : | Contribution margin ratio |
| CMPU | : | Contribution margin per unit |
| DP | : | Desired profit |
| SPPU | : | Selling price per unit |
| VCPU | : | Variable cost per unit |
| MOS | : | Margin of safety |
| C.V | : | Coefficient of Variation |
| S.D | : | Standard deviation |
| P.E | : | Probable error |

# INTRODUCTION

## 1.13 Background of the Study

Cost Volume Profit (CVP) is one of the more important approaches that have been developed to facilitate effective performance of the management process. PPC is an advance decision of expected achievement based on the most efficient operating standard in effect or in prospect at the time it is established against which actual accomplishment is regularly compared. In the word of Nine Meier Jack C. & Scimigal Raymond S. “profit planning is an estimation and predetermination of revenues and expressed that estimation how much income will be generated and how would be in order to meet investment and profit requirement. In the case of institutional operation it presents a plan for spending income in manager that does not result in loss.”

Industrialization in developing country like Nepal is an effective means of achieving desired economic growth. Industry in Nepal is still in its infancy stage with many major areas under public sector management. Also most of the private sector organizations are family owned and managed. In this condition, the private sector needs to be encouraged for the industrialization. The manufacturing sector is very small. The last decade tended to be a bit satisfactory but in recent years due to political instability and security problems the growth rate has declined in all business sectors. If this political instability continues for more years, this will be creating many problems in business operation and this is green signal for close business. For example recently Surya Nepal Garment, KFC and Pizza hot faced that problems and finally close this multinational business. To speed up the process of industrialization, government of Nepal has started several policies and programs which solve all problems in business sector. Economic liberalization and privatization policies have been introduced.

In developing country like ours Industrialization is inevitable but the challenges that our country is facing closure of more and more industries. Among them government companies or government backed companies are in front line. Public and private companies are also

vulnerable. The causes have been cited from various aspects like external factors i.e political and legal, cost of living, consumer purchasing power, government rules, custom rates, access to international market and so forth.

Yes of course everyone has their consensus for it, Researcher do agree that all these above factors are likely to pay the main role for the development of industrial sector. Like we can see in last decade instead of expansion of industrial sector it is conforming is high pace due to insurgency as attributed by many. But we are forgetting that centralized industries having virtually no effect of insurgency are also being closed or privatized; to name a few Bhaktapur Brick Factory, Harisiddhi Brick Factory, Gharelu Slipakala Bhandar,Timber Corporation etc. This significant point one should be familiar with about all of theme is, they are not out because the product offered are also not in demand or they are not fetting resources for production, in fact the demand is in peak and seems ever increasing the required factor of production is also easily available as ever but they couldn't blend it in right approach. The products offered by them are in high demand, but also they are not being able to survive, why? The answer could be either they are not for making profit and just for fixed duration of time to operate or they don't know how to make profit.

But one has to admit that government owned industries that were either liquidated or privatized were not closed because of external and international factors as presumed rampantly. They are mainly due to the policy adopted by the governments which were outdated and didn't address the real problem because of which profit making was declining and end up negating. Proper planning of profitability were lacking; management were concern about their positions and personal benefit and hence gave no regards to the factor of production like labor, raw material, capital. Most of the companies were overstaffed incurring huge but unnecessary labor cost. Raw material utilization was below efficiency level as plant and machinery were not maintained in good condition. Getting cheap factor of production like raw material is almost impossible because of commission scams widespread everywhere.

Had the proper cost volume profit analysis been done in those companies which were closed just due to continuous loss out of mismanagement of resources which could have been

manipulated in short run too for the benefit of the company like best level of staffing; use of better and competitive priced raw material; introduction of provisions like extra production in seasons and below capacity in off seasons; shift working etc., they would have revived to higher extend if not returned to profitability.

In this highly competitive era mere use of simple management tool won't guarantee success, however it is sure it will reduce the risk of getting into hazardous condition in the situation where we can see companies are ignoring basic philosophy of production which tells them how much to produce at what cost to say in the business.

Nepal has a very slow pace of industrialization. The performance of existing industries is not satisfactory. The main objective of business is to increase the profit. The chance of making profit can be improved by proper planning and following a definite strategy. The industrialization sector has not been able to contribute adequately in GDP of the nation. They are not able to make good profit. What are the reasons behind this? What can be done to increase the level of profit and thus industrial development? To find the solution to these questions we have undergone this research.

**This study focus on:-**

- Whether or not cost, volume, profit is properly analyzed?
- How well the profit has been planned?
- What would be the impact on profit, break-even point, and contribution margin due to the changes in different factors like selling price, variable cost, fixed cost etc.
- How the profit can be planned by the application of cost-volume-profit analysis.

## 1.2 Cost

Cost is the amount of expenditure (actual or notional) incurred on or attributable to a given thing. Cost as a verb can be the process of ascertaining cost of a given thing. It is the key players of every management decision.

## 1.3 Volume

Volume is the level of production or scale of production. Although the maximum a manufacturing firm can produce is almost predetermined and fixed the level of production below it can be decided by the management based on the requirement. Parameter of volume selection could be capacity of the plan i.e how much a plant installed can be produce, availability of raw material i.e are sufficient amount of raw material available for the production of given level of output of finished product, presence of manpower i.e skilled manpower required to perform various skilled jobs like machine chandelling, raw material mixing, processing, managing, marketing etc and non skilled manpower for the purpose of loading unloading, carrying, lifting and dropping, guarding, helping the skilled ones etc. Other important requirements are power and fuel, infrastructure for automation and high technology implementation, government quota, demand and supply in the market etc.

## 1.4 Profit

It is the premium for the producers for the cat of producing the required goods to the consumer. In other words it's the incentive to produce. The difference between the sales proceed and cost of production for that goods sold is the profit i.e Profit = Sales-Cost. Every producer produces to earn and he selects the best possible way to produce in least cost and earn best profit out of it.

## 1.5 Cost-Volume-Profit interrelation

CVP analysis is the process of examining the relationships among revenues, cost and profit for a relevant range of activity and for a particular time frame which explore the relationship existing amongst costs, revenue, activity levels and the resulting profit. Profit, as a variable, is the reflection of a number of internal and external conditions, which exert their influence on sales revenue and costs. Revenue depends upon selling prices, costs, volume of sales, demand, competition, etc. Although none of these can be singled out as the most important, the volume is considered to be a dominant factor. This is probably because changes in volume are more frequent, takes place rapidly and is outside the preview of management control. Further costs rarely vary in direct proportionate effect on profits than the other factors outlined above. It is thus, the volume which is perhaps the largest single factor which influences costs. As such, an intimate relationship exists amongst costs, volume and profit.

This Cost-Volume-Profit analysis is an extension of marginal costing. It makes use of the principles of marginal costing. It is an important tool of shot term planning and is more relevant where the proposed changes in the level of activity are relatively small. It is useful in making short-run decision.

## 1.6 Objectives Cost-Volume-Profit analysis

1. it aims at measuring variation in cost with volume
2. it enable business managers to fulfill the objectives of profit planning
3. It facilitates in making short run tactical decisions such as acceptance of special order; shift working; choice of sale mix etc.

## 1.2 Brief Overview of Unilever Nepal Limited and Dabur Nepal private Ltd.

**Unilever Nepal Limited**

Nepal Lever Limited is one of the biggest manufacturing industries in Nepal. It was established in 1994 as joint venture Company between Hindustan Lever Limited. India and Nepali promoters under the company act 2021. The factory's registered office is situated at Basamadi Village Development Committee-5 of Makwanpur district, which is about six kilometer far from Hetauda Municipality and its corporate office is situated at Heritage Plaza, Kamaladi, Kathmandu. Few months ago, a notice was issued dated on 18th Februarey, 2005 (2061/11/07) in the "Kathmandu Post" to inform all concerned about the change in the name of the company from Nepal Lever Limited, to Unilever general meeting held on 13th Dec. 2004 (2061/08/28) under the special resolution. The change in name has been approved by the company register office/HMG of Nepal with effect from 9th Feb. 2005 {2061/10/27) binding Unilever Nepal Limited to bear assume all the tax and other payable liabilities towards all the movable and immovable assets existing in the company's former name.

Ownership

Unilever Nepal Limited is the first subsidiary company of Hindustan Lever Limited Outside of India with holding 80% ownership and has invested Rs. 73.7 million in equity authorized capital of the company is Rs. 30,00,00,000 divided in to 30,00,000 an ordinary share of Rs.100 each and paid up capital is Rs. 920,70,000 divided in to 9,20,700 of Rs.100 each. The same holdings are as follows:

| Name of shareholders | No. of share | % of share |
|---|---|---|

| | | |
|---|---|---|
| Hindustan Lever Limited | 7,36,500 | 80% |
| Sibkrim Land & Industrial (Pvt.) Ltd | 46,035 | 5% |
| Public shareholders | 1,38,105 | 15% |

**Dabur Nepal Pvt. Ltd:-**

Dabur Nepal Pvt.Ltd.(DNPL) was established in 1989 as joint venture Company with Dabur India Ltd. for the production of ayurvedic-based personal care, health care, and food products and started manufacturing Dabur products in 1992. The Company's factory & registered office in Rampur, kakani at Bara District, and the Corporate Office is in TNT building at Tinkune, Kathmandu.

The company is the first of its kind in the country to harness ecological resources and manufacture commercially viable and value added top of line products locally, to be sold at prevalent rates for domestic use and export to India, Bangladesh, and other neighboring countries. In the span of fifteen years, there has been vertical growth in all spheres of business and operations in addition to lateral expansion in the area of research and development. In order to enable effective utilization of resources, company has set up 'plant for life' 90 million rupees green house projects at Banepa in 1996. The application of this project has spurred a steady supply of rare, endangered medicinal herb saplings in a state of the art green house equipped with modern climate controls. The saplings are sold at cost to farmers in remote areas to grow and harvest with 'buy bulki' guarantee. Steps have been taken to subsidize the cost of saplings in order to enable broader participation of the local people.

The company's various community initiatives, generations of employment and additional income from the local people have resulted in improved socio-economic condition. Besides, it has earned several auolades including the highest Export Award from the Ministry of Commerce, FNCCI Award for Excellence, and CIP Award for outstanding contribution to the country.

## 1.8 Statement of the Problem

The study is more concerned with the cost-volume-profit analysis by considering all benefits and cost components, management skill of KD. Cost-volume-profit analysis is the vital technique that provides supplementary information for profit planning. Every business starts with the target of break-even and then it aims to earn profit over its life. But the business firm passes through many ups and downs. CVP analysis helps to plan for every set of goals in the short-run. The modern business organization's motive is to make more profit or being the condition of at least break-even though there may occur the situation of fluctuation due to different factors affecting things. CVP analysis supports and guides through prescribed techniques thereby helps to make plan and decision making setting of goals in short as well as long-run time frame.

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

However the success of organization largely depends upon the planning for future operation. CVP is one of the most important managerial devices for the effective profit planning and control. In this context the study tries to answer the following research questions:

- How much sales revenue is needed to achieve break even and to earn desired profit?
- What steps should be taken to increase and manage profit in DNL and UNL?
  - What should be the sales volume to earn a desired profit?
  - How will profit be affected when sales mix is changed?
  - Which product or product mix is profitable?
- What are the main problems in implementing CVP practices in DNL and UNL?
  - What will be the profit or loss to the specified level of sales?
  - What will be the relationship between cost, volume and profit?
  - Which product or operation of a plant should be discontinued?

- Should the firm be shutdown the unprofitable product line/(s) temporarily or not?
- How effective is the CPV analysis of DNL and UNL?

## 1.9 Objectives of the Study

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

- To evaluate desired profit with specified sales volume of manufacturing companies,
- To analyze different components of cost as per their behaviors.
- To study and calculate the sales volume to break-even of the Unilver Nepal Limited and Dabur Nepal Limited
- To evaluate the impact of profit of Unilver Nepal Limited and Dabur Nepal Limited
- To show the relationship of cost, volume and profit between multi products.
- To provide recommendations based on various findings of the study.

## 1.10 Significance of the Study

Cost-volume-profit analysis is one of the powerful management tools to show relationship between the element of profit planning & use for decision making in certain situation .cost-volume-profit analysis is one of the tools of profit planning & controlling so this study will be significant is the following ways;-

- It highlights the relationship between cost - volume & profit as an applicable tool of profit planning.
- This study would be very useful to the potential Managers Accountants Policy maker & Researcher because of its deals with practice of cost-volume-analysis of carpet industry as an important tool of profit planning & controlling.
- This study is helpful to the related department of carpet industry by providing necessary recommendations.
- It is also useful for interested parties, investor, shareholders & other stake holder.

## 1.11 Limitations of the Study

This study has been made for the partial fulfillment of the requirement for the Master's Degree in Business Studies (M.B.S.) but not a comprehensive study. The study has been conducted with certain limitations. The time is the one factor of limitations. Besides it, the scope of the study is limited within the bank. Some more limitations are follows:

- The comprehensive and the accuracy of the study are based on the data available from the management of UNL and DNL.
- Financial constraint and time are also the major limitation of the study.
- The focuses limit over the availability of data and sufficient literature.
- Findings and suggestion may not be applicable to other unrelated sectors.
- This study is based on the secondary data. Reliability of the finding depends up on these data.
- Periodical data of the fiscal year 2005/06 to 2009/10 were used.

## 1.7 Organization of the study

The study report is planned to organized into the following five chapters, they are:

**I. Introduction:**

This first chapter included the introduction and background of the study, statement of the problem, objectives of the study, significance of the study and limitations of the study.

**II. Review of Literature:**

This second chapter included literature review. In this chapter the researcher has reviewed books, journals, and thesis.

**III. Research Methodology:**

This research methodology included the research design, sources of data collection, techniques of data collection, tools for analysis of data and methods of presentation and analysis.

**IV. Presentation and Analysis of Data:**

This fourth chapter included presentation and analysis of data. It is the main body of the study. It included data presentation, interpretation and analysis of collected data and major findings of the study.

**V. Summary, Conclusion and Recommendations:**

This fifth chapter included the summary and conclusion of the research and finally suggestions and recommendations included.

# CHAPETR TWO
# REVIEW OF LITERATURE

## 2.1 Concept of Profit

Generally profit is known as the part of income of the firms. Profit is the motivating force in the business. Success of business depends on profit. Profit promises to provide satisfaction to consumer we can simply define the word profit as the primary measurement of success of management effectiveness in business enterprise. In other words profit means the excess of total revenue over total cost of production. Usually profits don't happen they are managed or produce.

Thus it is quit obvious that profit is obtained by subtracting the cost from the revenues & it is also the reward for tacking risk. Profit plays a vital role not only in managerial decision but also in the general life standard of human beings. Therefore management should continuously evaluate efficiency of the company in term of profit.

## 2.2 Concept of Planning

The word planning stats thinking & deciding what ought to be done in advance. It is also a process of developing enterprises. Objective & selecting future courses of action to accomplish them.

Planning is the process of developing enterprises objectives & selecting future course of action to accomplish them. It includes (Welsch,1992:3)

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

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

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

### 2.2.1 Concept of Control

Once the planning is determined, it must be carried out under control. Controlling shares management actively and for this managers compare actual performance against the planned performance and find out the deviations taking remedial steps to remove the deviations to make an improvement in the performance because promptness is the essence of an effective control.

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

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

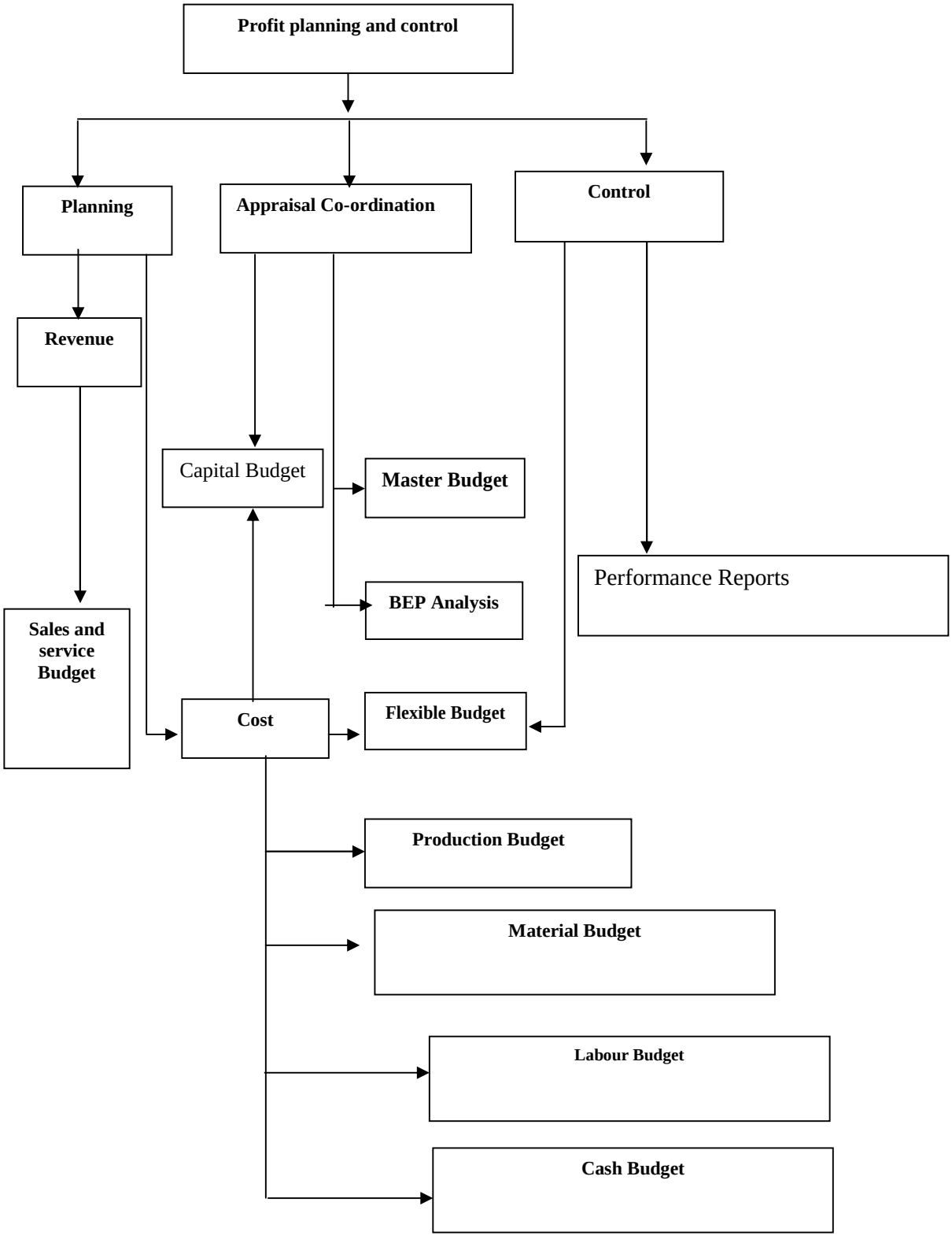
- According to Welsch, controlling involves
- Establishing goals and standards.
- Comparing measured performance against the established goals and standards.
- Reinforcing successes and correcting shortcomings
- Control provides timely information that may prompt the revision of goals.

The purpose of control is achieved with setting standards, comparing predicted and actual results against these standards and taking corrective actions.

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

**Structure of Profit Planning and Control:**

Figure 2.1 Simple structure of PPC



( Sources:Adhikari, 2010:21)

## 2.3 MEANING AND DEFINITION OF PROFIT PLANNING

Profit planning is one of the most important managerial functions, profit planning is merely a tool of management, which is used to plan and control business operation and inter action.

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

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

Profit planning is the process of determining the required amount of profit from each principle unit of business. A profit plan is an advance decision of expected achievement based on the most efficient operating standards of time. It is established against which actual accomplishment is regularly compared.

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

Profit planning or budgeting is a forward planning and involves the preparation in advance of the quantitative as well as financial statement to include the intention of management in respect of the various aspects of the business. Profit planning, in fact is a managerial technique and it is

a written plan in which all aspects of business operation with respect of definite future period are included. It is a formal statement of policy, plan, objective and goal established by the top management in respect of some future period. Profit planning is a predetermined detailed plan of action developed and distributed as a guide to current operations and as a partial basis for the subsequent evaluation of performance. Thus, we can say that profit planning is a tool, which may be used by the management in planning the future course of action and in controlling actual performance (Gupta, 1997:521).

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

Provides a disciplined approach to the solution of business problems

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

Coordinates the operating plans of the diverse segments of the business into a single, comprehensive plan. Encourage a high standard of performance by stimulating competition, providing a sense of urgency and serving as an incentive to perform more effectively

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

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

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

According to Welsch, the three most relevant aspect of PPC concept are:

PPC requires major planning decision by management.

PPC entails pervasive management control activities.

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

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

- The volume of out put in terms of numbers of product or other units.
- The verity to be produced (the product mix)
- The cost to be incurred.
- The prices to be charged.

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

A profit plan is a comprehensive statement of intentions, expressed in financial terms, for the operations of the firm or a short period. It is a plan of the firm's expectations and is used as a basis for measuring and controlling the actual performance of managers and their units (Panday, 1999:257).

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

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

## 2.4 Use of CVP Analysis in Profit Planning & Control

Planning, controlling and de3cision-making are the essential managerial functions. Const-volume-profit analysis helps the managers to plan for profit, to control cost and make decision. As such it helps (Munakurmi, 2002:123)

- To estimate profits or losses at various level of output.
- To help management to fine the most profitable combination of costs and volume (units).
- To determine the break-even point in terms of unit or sales value

- To ascertain the margin of safety.
- 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 fro change in fixed or variable cost.
- To assess the likely effect of management decisions such as an increase or a decrease in selling price adoptions of new method of production to reduce direct labor and increase output.

## 2.5 APPLICATION OF CVP ANALYSIS IN PROFIT PLANNING & CONTROL

Profit planning is the fundamental part of the overall management faction and cost-volume-profit analysis is major tools of profit planning therefore, cost-volume-profit analysis use for following respects (Dangol, 2058:235).

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

## 2.6. Cost-volume-profit Analysis as a tool of Profit Planning and Control

Cost volume profit analysis examines the behavior of total revenues, total costs and operating income as changes occur in the output level, the selling prices, the variable cost per unit and/or fixed costs of a product (Horngren, et. all, 2003).

Cost volume profit analysis is a systematic method of examining the relationship between change in activity (i.e. output) and changes in total sales revenue, express and net profit. As a model of their relationship CVP analysis simplifies the real world condition that a firm will

face. Like most models, which are abstractions from reality, CVP analysis is subject to a number of underlying assumptions and limitations. Nevertheless, it is a powerful too for decision making in certain situations (Drury, 2000).

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

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

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

Cost-volume-profit analysis is a management accounting tool to show the relationship between the ingredients of profit planning. Profit planning is the function of selling price of the product, the variable costs and volume to be sold. The entire scope of profit planning associated with CVP interrelationship. A widely used technique to study CVP relationship is break even analysis. Bread even analysis is concerned with the study of revenues and costs in relation to sales at which the firm's revenue and total costs will be exactly equal (or net income is zero). Thus the BEP may be defined an point at which the firm’s total revenues are exactly equal to total costs, yielding zero income, the 'no profit' 'no loss' is an break even point or a point at which losses and profit begins (Khan and Jain, 1993:235)

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

## 2.7 CONCEPT OF COST VOLUME PROFIT ANALYSIS

CVP analysis is an analytical tool for analyzing the relationship among cost, price, profit, sales and production volume. Mainly, there are three elements in CVP analysis. They are cost, sales of production volume, and profit. All these terms are interconnected and dependent on one another. For instant, profit per unit of a product depends on its selling pries and cost of sales. The selling price to a greater extent will depend on the cost and costs depend on the volume production. It is highly essential for the management to have the completed knowledge about the interrelationship among the cost, volume and profit. A study concerning this interconnection is undertaken through cost-volume-profit analysis.

CVP analysis is a supplementary tool of profit planning. It tells many things about the relationship between the business variable. Total variables costs are proportionate to the sales volume; where as the total fixed costs remain unchanged within the relevant range of the output levels. That is why; net incomes are not in proportion to sales knowing the relationships, one can assess the profit at forecasted sales volume; likewise, required sales can be ascertained for he minimum level of profit. If a company sales more than one product, called the product mix, each product many not be equally profitable. So the company's profit will depend up on the ration of each products sale on the total sales revenues. Profit will be greater if high margin items make up a relatively large proportion of total sales than if sales consist mostly of low margin items. Changes in sales mix can cause great variations in a company's profit. A shift to low margin items can cause the total profit to decrease even though total sales increase. On the contrary, a shift in the sales mix form low-items to high margin items can cause the reverse effect; total profit may increase even though total sales decrease. (Adhikari, 2009:23)

Thus, CVP analysis is t he techniques of summarizing the effects of changes in a organization volume of activity on its cost, revenue and profit. Cost volume profit analysis applies marginal or variable costing principles while establishing the effect of the future course of activities on the financial results of the firm. Knowledge of how cost behaves in response to change in volume and how profit beaver in response to change cost and volume helps management to make numerous short terms optimal decisions relating cost control and profit maximization.

## 2.8 COST AND ITS CLASSIFICATION

### 2.8.1 Concepts of Cost

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

### 2.8.2 Classification of Costs

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

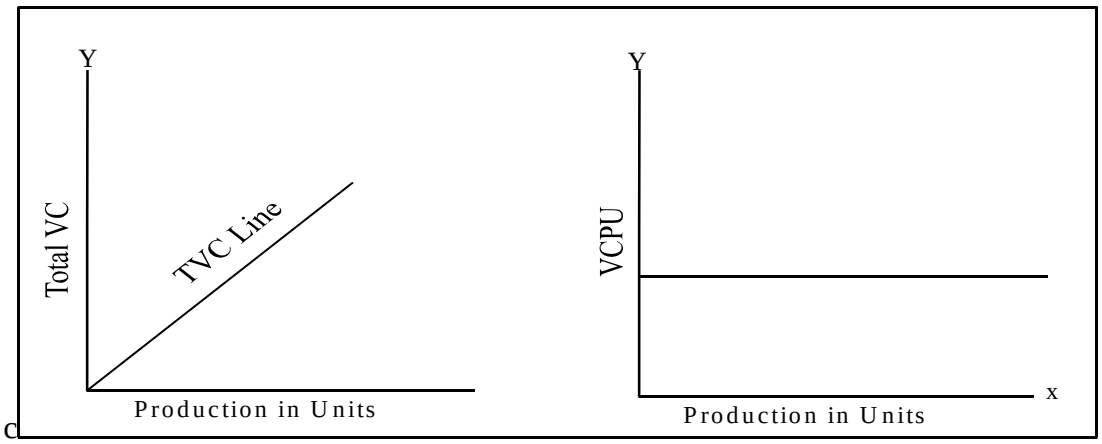
#### 2.8.2.1 Behavior Wise Classification of Cost

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

**Variable cost:** These costs tend to very in direct proportion to the volume of output. In other words, when volume of output increases, total variable cost also increases. But the variable cost per unit remains fixed. Its include direct materials, direct wages, power, royalties, normal spoilage, small tools, and commission of salesman, etc. It is shown in the figure below.

Figure 2.2

Variable Cost

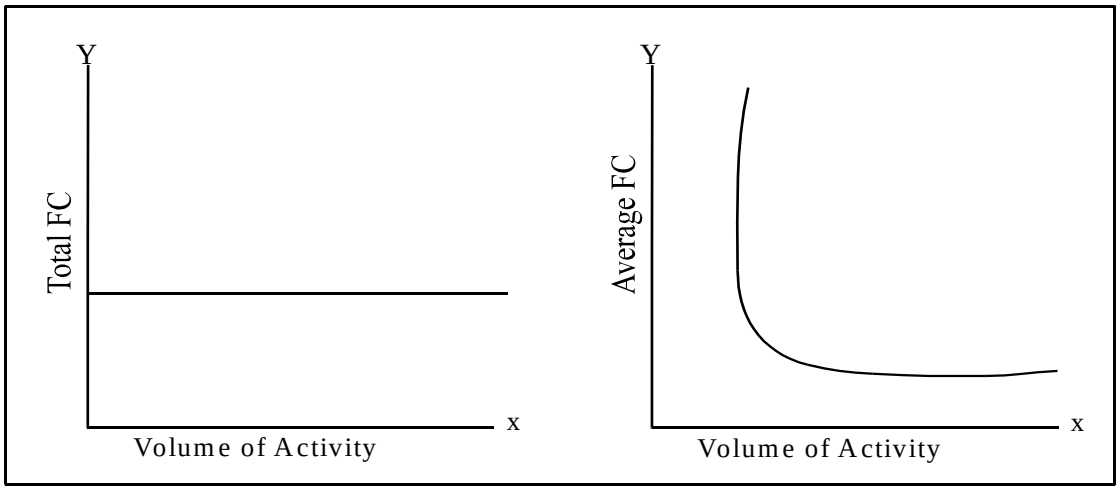



(Source;- Munakarmi,2002:21,24)

Fixed Cost: These costs remain fixed in "total" amount and do not increase or decrease when the volume of production changes. But the fixed cost per unit increases when volume of production decreases and vice versa. Fixed cost per unit decreases when the volume of production increases. It includes rent and leaser, municipal tax, managerial salaries; building insurance, salaries and wages of permanent staffs etc. it can be shown in the figure below.

Figure 2.3:

Fixed costs

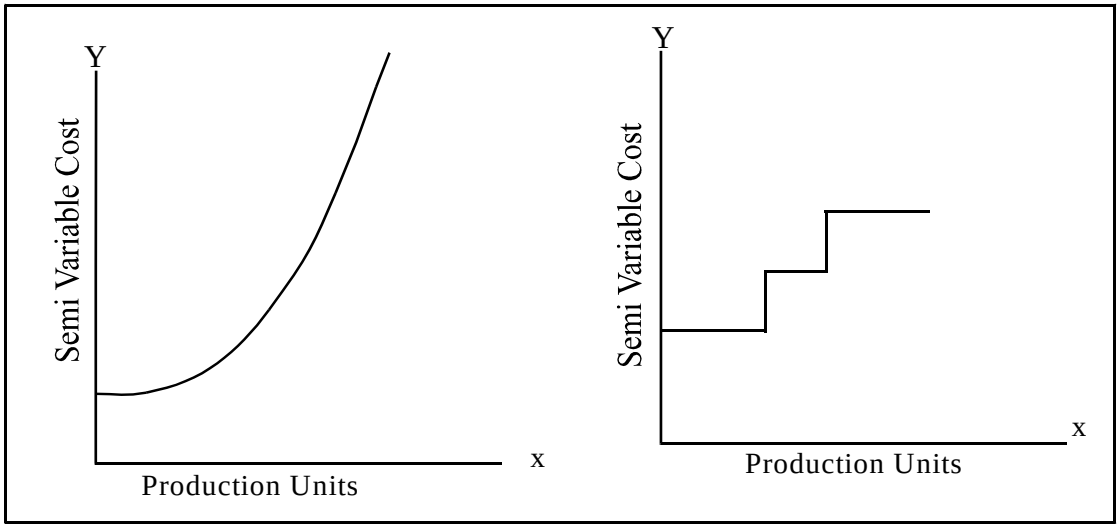



(Source;-Munakarmi, 2002:24)

Mixed Costs: these are partly fixed and partly semi variable costs has often a fixed element below which it will not fall at any level of output. The variable elements in semi variable costs changes either at a constant rate or in lumps. For example, interlocution of an additional shift in the factory will require additional supervisor and certain cost will increase in lumps. In the case of telephone, this is a minimum charge and after a specified number of causes, the charges are made according to the number of calls made. Thus, there is not fixed pattern of behavior of semi variable cost. It includes supervision, light and power, telephone expenses, maintenance and repairs, depreciation, compensation for accidents etc. Semi variable cost can be shown in the figure below.

Figure 2.4:

Semi Variable/Mixed cost




(Source;-Munakarmi,2002:24)

### 2.8.2.2 Segregation of Semi Variable Cost

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

a. High-low method

b. Least square method

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

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

- Step 1 to elect highest and lowest level of activity
- Step 2 to take the corresponding cost of highest and lowest level of activity.
- Step 3 to find out the different between highest and lowest points and ascertains the variable cost per unit by using following formula.

$$\text{Variable Cost per unit (b)} = \frac{\text{High cost} - \text{low cost}}{\text{High Activity lable} - \text{low activity lable}}$$

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

Fixed cost=Total cost - (Variable cost per unit × activity level) (Adhikari, 2009:27).

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

- Step 1 Assume the activity level or production units as 'x' find out the summation of x i.e. $\sum X$.
- Step 2 Assume the mixex cost as 'y' and find out $\sum y$.

- Step 3 multiply X and Y, and sum the product i.e. find out ∑Xy
- Step 4 convert x in to x2 and find out the sum of x2 i.e. ∑X2
- Step 5 using the following given below, find out unit variable cost (b).

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

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

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

2. For finding out the value of 'a' the following formula could be used:

$$\mathrm{b} = \frac{\mathrm{N}\sum \mathrm{X}^2\ \sum \mathrm{Y} - \sum \mathrm{X}.\sum \mathrm{Y}}{\mathrm{N}\sum \mathrm{x}^2 - \left(\sum \mathrm{x}\right)^2}$$

## 2.9 APPROACHES TO COST VOLUME PROFIT ANALYSIYS

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

I. Contribution margin approach

II. Cost and revenue equation approach

III. The graphic (break even chart) approach

### 2.9.1 Contribution Margin Approach

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

I. Contribution Margin=Sales - Variable cost

II. Contribution margin= Fixed cost + Profit

III. Profit = Contribution Margin - Fixed Cost

### 2.9.2 Contribution Margin Ratio:

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

P/V ration=C/S

Where, C = Contribution margin and S= sales

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

I. $$P/VRatio = \frac{Fixed\ Cost + Profit}{Sales}$$

II. $$P/VRatio = \frac{Fixed\ Cost - Profit}{Sales}$$

III. $$P/VRatio\ 1 = \frac{Varaible\ Cost}{Sales}$$

IV. $$P/VRatio = \frac{Different\ in\ profit\ of\ two\ periods}{Different\ in\ sales\ two\ periods}$$

### 2.9.3 Uses of profit volume ratio

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

The profit volume ration is used to determine the following facts;

I. **Determination of selling price**: selling price can be determined with the help of profit volume ration. In order to fix the selling price, it is essential to know about the fixed cost, variable cost and budgeted profit. Besides production volume is

also required to be fixed. The selling price can be determined by using following formula

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

$$\text{Selling price per unit} = \frac{\text{Varaiable cost per unit}}{1 - \text{P/V Ratio}}$$

**II. Ascertainment of profit a budget sales volume:** The profit can be determined with the help of margin ration. For this purpose, the following elements should be determined before hand:

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

The following formula used to ascertain the profit:

Profit=sales P/V ratio) - Fixed cost

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

Profit= sales units after break -even × unit selling price XP/V ratio

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

$$\text{Profit} = \frac{\text{Varaible cost x P/V Ratio}}{\text{Variable cost ratio}}$$

Where, variable cost ratio =1-P/V ratio

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

### 2.9.4 Cost and Revenue Equation Approach

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

Profit= Total revenue - Total cost

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

Profit= Total revenue -Total variable cost- Fixed cost

Or,

Profit= (unit selling price × sales unit) - (Unit variable cost × sales Units) - Fixed cost

Or,

$P = (SxQ) - (VxQ) - FC$

Or,

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

Where,

P = Profits

Q = Sales Units

S = Units Selling Price

V = Unit variable cost

FC = Fixed cost

### 2.9.5 Break Even Analysis

The relation among cost, volume and profit can be found out clearly through break-even analysis. Break-even analysis is regarded as a sophisticated method or tool used in management.

It is the most widely known form of cost-volume analysis. So these two terms are used interchangeably.

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

### 2.9.6 COMPUTATION OF BREAK EVEN POINT

Break-even point can be determined by following method

#### A) Algebraic or Formula Method

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

Sales Revenue = Total Cost

Or,

Sales Revenue = Fixed Cost + Variable Cost

For finding out sales Revenue, we have,

Sales Revenue = Selling price per unit × sales unit

Symbolically,

Sales Revenue = S × Q

For finding out, total cost, we have

Total Cost = Fixed Cost + (Variable Cost Per Unit × Sales Unit)

Symbolically,

Total Cost = FC + (V + Q)

From the early definition, we have,

Sales revenue = total cost

I.e. S x Q = FC+ (V x Q)

Or,

(S x Q) - (V x Q) = FC

Or,

Q (S - V) = FC

Q = FC/(S-V)

Where,

Q = Break-even point in units

FC = Fixed cost

S = Selling price per unit

V = Variable cost per unit

**B) Graphic or Chart method**

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

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

Total costs = TFC+QXVCPU

At, volume 'Q+N'

Total costs = TFC+ (Q + n) X - VCPU

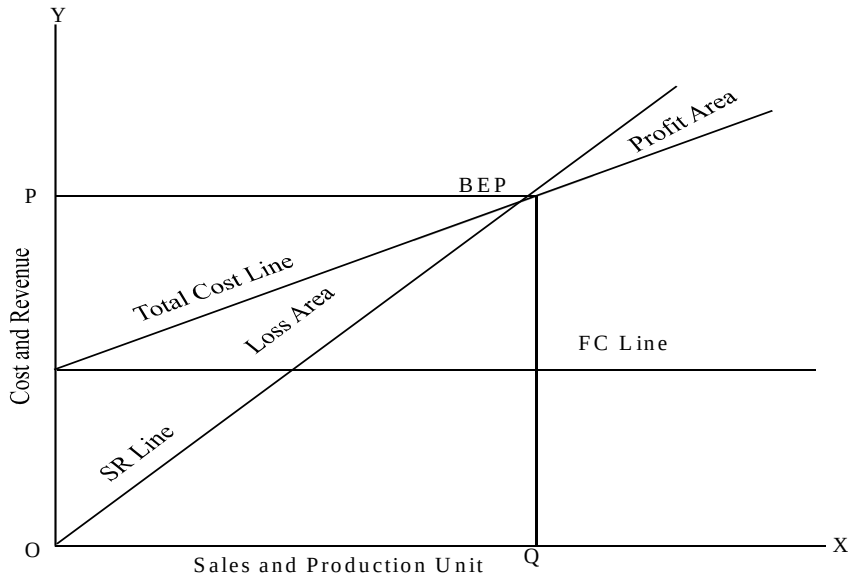
ΔTotal cost = O+N×VCPU

ΔTotal costs = ΔVariable costs

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

Figure 2.5:

Graphic approach to BEP




(Source;-Munakarmi, 2002:145)

The above graph clearly shows that if the company can reach the pint of BEP it can generate sufficient revenues to cover all its operating expenses. At this point, the total revenues equal the total cost. Here, the revenue breaks up (intersect) the total cost curve that's why this point is called break even point. In short, Break Even point is that pint where,

Total sales revenues = total costs

### 2.9.7 MAJOR TOOLS USED IN PROFIT PLANNING AND CONTROL.

Profit Planning and control consists of there main budget which are:

**a. Operating Budget.**

**b. Financial Budget.**

**c. Appropriation Budget.**

a. **Operating Budget; -** It is relates to the physical activities or operations of a firm such as sales, production, purchased, labor and other different expenses budgets. In specific term an operating budget has the following term:-

   i. **Sales Budget: -** Sales budget is prepared from sales forecast where as a sales forecast encompass potential sales for the entire industry as well as potential sales for the firm preparing the forecast. Sales results from prior year are used as a starting point in preparing a sales forecast (Welsch, 1922:173).

   ii. **Production Budget: -** Production budget is the initial step in budgeting of manufacturing operations. The production budget is an estimation of planned quantity of goods to be manufactured during budget period. After the sales budget has been prepared, the production requirement for the for the-coming budget period are detrained and organized in the form of a production budget. Sufficient goods will have to be available to meet sales needs and for the desired ending inventory. A portion of these goods will have already existed in the form of beginning inventory. The remainder will have to be produced. Thus, the expected volume of production is determined by subtracting the estimated inventory at the beginning of the period from the sum of the units expected to be sold and the desired inventory at the end of the period (Adhikari, 2009:36).

The production budget is an estimate of the quantity of goods to be manufactured during the budget period. The production budget is developed in three steps. They are:

- Formulate policies relation to inventory levels, and/or production levels.
- Determine the total quantity of each product that is to be manufactured during the budget period.
- Schedule this production by interim periods.
- The budgeted production having been developed for the budget period, interim production must be planned so as to:

- Have sufficient goods to meet interim sales requirements.
- Keep interim inventory levels within reasonable limits.
- Manufacture the goods as economically as possible.

**iii. Purchase Budget:**-Non-manufacturing enterprises are the merchandise goods. Instead of preparing the production budget they prepare a merchandise purchase budget showing the amount of goods to be purchased from suppliers during the periods. The merchandise purchase budget is in the same basic format as the production budget; expect that, it show goods to be purchased rather than good to be produced (Adhikari, 2009: 36).

**iv. Direct Material Budget: -** The material budget specifies the quantities and timing of each raw material needed. Direct materials are essential for production and must be purchased in each period in sufficient quantities to meet6 production needs and to confirm to the company's ending inventory policies. Sufficient raw materials will have to be available to meet production needs and to provide for the desired ending raw material inventory for the budget period. Part of this raw materials requirement will already exist in the form of a beginning raw material inventory. The remainder will have to be purchased from supplier.

**v. Direct Labor Budget: -** The direct labor budget is also developed from the production budget. Firstly, direct labor requirements must be computed so that the company will know whether sufficient labor is available to meet production needs. By knowing in advance, the company can develop a plan to adjust the labor force as the situation may require. Direct labor requirements can be computed by multiplying product to be each period by the number of direct labor-hours required to produces a unit. Many different types of labor may be involved. If so, then computation labor resulting from these computations can then be multiplied by the direct labor cost per hour to obtain the budgeted total direct labor costs (Adhikari, 2009:36).

**vi. Manufacturing Overhead Budget: -** Manufacturing overheads are the part of the total production cost, which is not directly identifiable with specific products

or jobs. The manufacturing overheads budget provides a schedule of all costs of production other than direct material and direct labor. These costs should be broken down by cost behavior for budgeting purposes and a predetermined overhead rate developed. This rate will be used to apply manufacturing overheads to units of product through the budget period (Adhikari, 2009:37).

vii. **Selling and Administrative Overhead Budget: -** The selling and administrative expenses overhead budget contains a listing of anticipated expenses for the budget period that will be incurred in areas other than manufacturing. The budget will be made up of many smaller, individual budgets submitted by various persons having responsibility for cost control in selling and administrative matters. If the number of expenses item is very large, separate budgets may be needed for the selling and administrative functions (Adhikari, 2009:37).

**b. Financial Budgets: -** Financial budget is important because it is useful min predicting claim on future cash activities financial position and result of operations. The components of financial budget are (Adhikari,2009:38)

i. **Cash Budget: -** A cash budget is developed after all the operational budgets and capital expenditure outlay has been accomplished. A cash budget shows the planned cash inflows, outflows and ending position by interim period for a specific time span. The cash budget is composed of four major sections; the receipts section, the disbursements section, the cash excess or deficiency section and the financing section. The receipt section consists of the opening balance of cash added to what ever is expected in the way of cash receipt during the budget period. The disbursement section consists of cash payments that are planned for the budget period. The cash excess or deficiency section total and the cash disbursement section total. He financial section provides a details account of the borrowing and repayments projected to take place during the budget period (Adhikari, 2009:38).

ii. **Budgeted Income Statement: -** The budgeted income statement is one of the key schedules in the budge process. It is the documents that tell how profitable operations are anticipated to be in the forth coming period. After it has been

prepared, it stands as a benchmark against which subsequent company performance can be measured. The income statement will be completed after addition of the interest expenses, which is computed after the cash budget, has been prepared. It can be developed by time period, sales district and product by assembling appropriate budget amounts form schedules already developed (Adhikari, 2009:38).

iii. **Budgeted balance Sheet: -** The budgeted balance sheet is developed by beginning with the current balance sheet data and by adjusting it for the data contained in the other budgets. It is based on functional of operating budgets, cash budget, projected income statement and the previous year's assets and liabilities. In other word budgeted balance sheet is a statement of assets and liabilities prepared after the preparation of operating budgets and financial budgets (Adhikari, 2009:39).

iv. **Appropriation Budget: -** All types of expenditure on advertising and research sectors are coverts in appropriation budget. A part from above (operation and financial) budgets, PPC also has relationship with following additional budgets, CVP analysis and completion of profit plan and performance reports (Adhikari, 2009:39).

v. **Capital Expenditure Budget :-** Capital budgeting involves t he entire process of planning and controlling the expenditures for expansion and contraction of investment in operating (Fixed) assets with returns that are expected to extend beyond one year. Capital expenditures includes such fixed (i.e. operation) assets as property, plant, equipment, major innovations and patents. The major elements of a capital expenditure budget are cash out flow and cash inflow. Cash outflow includes the cost of the project as cash outlays at different times during the life of a project the cash outflows are affected by the provision of residual value of old equipment, tax position, additional working capital needed etc. cash inflows are expected cash revenue during the life of a project. The non-cash expenses like depreciation and tax position can affect the cash inflows (Adhikari, 2009:39).

vi. **Flexible Budget: -** Flexible budgets directly relate only to expenses of cost. Flexible budgets are also called variable, dynamic, activity and output adjusted expenses budgets, the fundamental concept of flexible budgets for expenses is that all expenses are incurred because of (a) the passage of time (b) output or productive activity (c) a combination of time and output or activity. Flexible expenses budget concept is complementary to tactical profit plan, its help to provides expenses plans adjusted to actual output for comparisons with actual expenses in periodic performance report (Adhikari, 2009:40).

vii. **Activity Based Budgeted Budgeting**: - Activity based budgeting recognizes that it is which cause costs and is a more focused method of budgeting. It is activities, which drive costs, and the aim is to control the causes (drives) of costs directly rather than the cost themselves. Activity based budgeting focuses on thesis costs of activities to produce and sell products and services. It separates indirect costs into separate homogeneous activity cost pools. Management uses the causes and effect criterion to identify to cost drivers for each of these indirect cost pools (Adhikari, 2009:40).

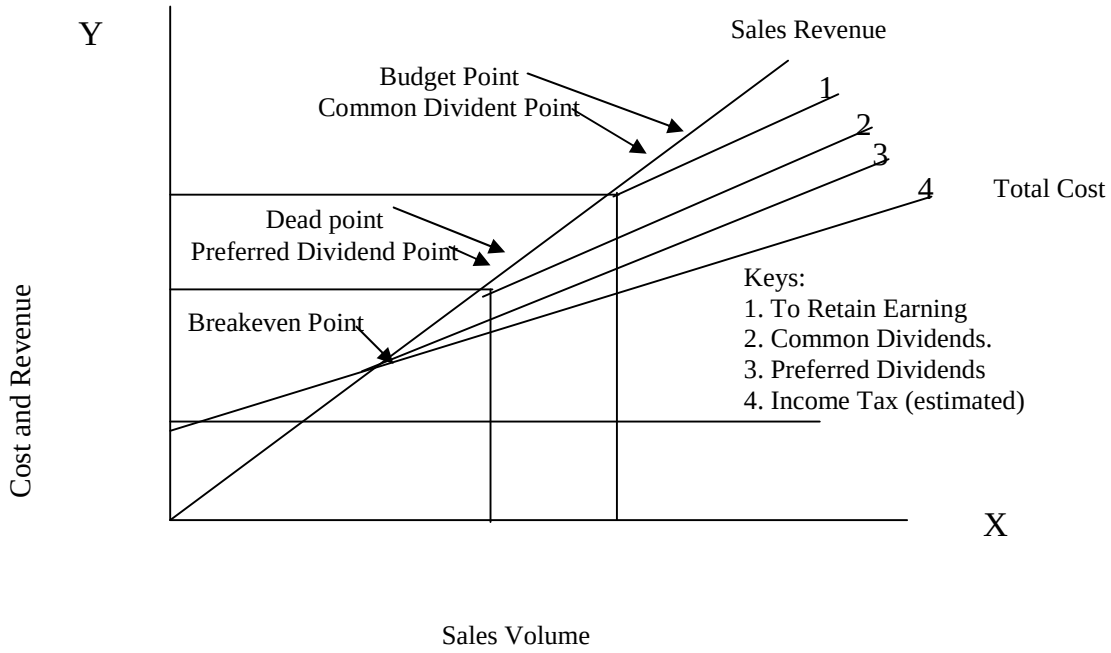
viii. **Zero Based Budgeting: -** Zero base budgeting a new approach to the budgeting process. It is a method of budgeting in which managers are required to start zero budget level every year and to justify all costs as if the programs involved were being ongoing in nature: the manager must start at the ground level each year and present justification for all costs in the proposed budget regardless of the type of cost involved. This is done in a series of “decision package” in which manager rank all the activities in the department according to relative importance, going from essential to least importance. Presumably, this allows top management to evaluate each decision package independently and to and to pare back in those areas that appear less critical or that do not appear to be justified in terms of cost involved (Adhikari, 2009:40).

### 2.9.8 ECONOMICS CHARACTERISTICS OF COST VOLUME PROFIT ANALYSIS

Where cost volume profit analysis is reasonably accurate, the can help management decision making. Essentially, CVP analysis offers 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, and the arithmetical manipulations generally involve average; hence the results should never be interpreted as precise. Rather than analysis may be characterized appropriately as "Slide rule" approach that may be used to developed and test with a minimum of effort, the approximate effect of cost and profits of several types of management decision.

Figure 2.6

Economic Characteristics of CVP Analysis




(Sources;Welsch,1992:467 )

Above break even chart with economic characteristics indicates few of the economics characteristics of a business, which are (Welsch, 1992:468)

Fixed costs, variable costs and total costs at varying volumes.

The profit and loss potential, before and after income taxes, at varying volumes.

The margin of safety the relationship of budget volume to break even volume

The break even point

The preferred dividend or danger point the point below that 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 the points below which earning are insufficient to pay the preferred dividends and the expected dividend on the common stock.

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

### 2.9.9 APPLICATION OF BREAK EVEN ANALYSIS

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

- Determination of at different level of sales and margin of safety
- To find the level of output to get the desired profit.
- Effect of price reduction on sales volume and changes in sales mix.

Selection of most profitable alternative, make or buy decision and drop or add decisions.

### 2.9.10 ASSUMPTIONS 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 parts fixed cost and variable cost. There is no cost other than fixed and variable.

- There is a range of validity (activity) for using the results of the analysis and sales price doesn't change as units of sales change.
- There is only one product or in case of multiple products, the sales mix among the products remain constant.
- Basic management policy about operation will not change materially in short run.
- The general price level (inflation deflation) will remain essentially stable in the short run.
- Efficiency and productivity per person will remains essentially unchanged in the short run.
- If any of the above assumptions were changed, revised budget would be needed for a new analysis.

### 2.9.11 LIMITATIONS OF BREAK EVEN ANALYSIS

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

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

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

With variation of the prices of the items or services, which also depend on the factors affecting it, 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 many not be perfectly variable with level of sales output.

### 2.9.12 OTHER USE OF BREAK EVEN ANALYSIS

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

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

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

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

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

Required sales volume change on selling price

$$\text{Revised BEP in Units} = \frac{\text{Fixed Cost}}{\text{RevisedUnit Contribution Margin}}$$

$$\text{Revised Break- Even point in Rs.} = \frac{\text{Fixed Cost}}{\text{Revised PV Ratio}}$$

Required sales volume for changes in selling price:

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

$$\text{Revised Break even point in units} = \frac{\text{Fixed Cost}}{\text{RevisedUnit Contribution Margin}}$$

Required sales volume for changes in fixed cost:

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

### 2.9.13 CASH BREAK –EVEN POINT

To find out the volume sales that will equalize the cash out flow during a particular period. Cash break even point is used. It is a modification of the traditional accrued basis break even analysis. The fixed costs are divided in to two groups for finding out the cash break even point.

Those are:

Fixed costs requiring cash e.g. salary rent, wage, insurance etc.

Fixed cost not requiring cash e.g. deprecation, deferred expenditure etc.

The following formula is used for finding out cash break even point.

The following formula is used for finding out cash break even- even

$$\text{Cash Break even point} = \frac{\text{Cash Fixed Cost}}{\text{Unit Contribution Margin or P/V Ratio}}$$

### 2.9.14 BREAK-EVEN SALES VOLUME IN THE PRESENCE OF STEP OR MOVING FIXED COST.

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

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

### 2.9.15 COST- VOLUME- PROFIT ANALYSIS FOR A MULTI PRODUCT FIRM

The relative proportion of sales of product is called the sales mix or the product mix. In the case of a multi- product firm, the contribution for each product can be found out by deduction its variable costs firm sales revenue. The break- even point for each product can be calculated only if the total fixed costs of the firm are distributed and fixed cost for each product is known. The firms overall break- even can be calculated by dividing the total fixed costs by the contribution ratio for the firm. The multi- product firms PV ratio will not affect the firm's break even point and profit if each product has the same PV ratio. However a change in the product mix will change the break even point and profit when products have unequal PV rations.

#### 2.9.15.1 Break Even Point of Multi- Product Company/ Firm)

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

Following procedures are followed to calculate BEP for sales mix or multi- Product

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

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

Calculate weighted average for all products as follows:

Weighted average = $\sum$ Sales Mix x CMPU

Weighted average = $\sum$ sales mix (value) × P/V ratio

Calculate break even point (BEP):

$$\text{Break – even point} = \frac{\text{Fixed cost}}{\text{Weighted average}}$$

Some Important Formulas

$$\text{Overall BEP (in Units)} = \frac{\text{Total Fixed Cost}}{\text{Weighted CMPU}}$$

$$\text{Overall BEP in Rs} = \frac{\text{Total Fixed Cost}}{\text{Weighted CM Ratio}}$$

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

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

$$\text{Required Sales for DP after tax (in Units)} = \frac{\text{FC} + \frac{\text{DPAT}}{(\text{I} - \text{T})}}{\text{Weighted CMPU}}$$

$$\text{Required sales for DP after tax (in Rs)} = \frac{\text{FC} + \frac{\text{DPAT}}{(\text{I} - \text{T})}}{\text{Weighted CM Ratio}}$$

## 2.9.16 MARGIN OF SAFETY (MOS)

Margin of safety is the excess of the budgeted or actual sales over the break even sales volume. In other words, it is the difference between the budgeted or actual sales revenue and the break even sales revenue. It is the position above the break even points. It gives management a feel for how close projected operations are to be organizations break even point. Managers often consider the size of the company's margin of safety when making decisions about various business opportunities. The larger is the safety margin, the greater is the chance for the company to earn profit (i.e larger the margin of safety, safer the company). A high margin of safety is particularly significant in times of depression when the demand if the company's or

firm's product is falling. A low margin of Safety Company's or firms firm which has a low contribution ratio. When both the margin of safety and the PV ratio re low, management should think of the possibilities of increasing the selling price, provided it does not adversely affect the sales volume or reducing variables costs by bringing improvement in the manufacturing process, Margin of safety can be ascertained by using the following formula (Munankarmi, 2002: 127).

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

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

$$\frac{\text{Profit}}{\text{Unit contribution margin}} \text{ in units}$$

The relationship between safety and actual sales in known as margin of safety ratio which is determined as follows (Munakarmi, 2002:127).

$$\text{Margin of Safety Ratio} = \frac{\text{Acual Sales} - \text{Breakeven sales}}{\text{Actual sales}} \text{ in units}$$

The following steps are needed to rectify margin of safety.

With increasing selling price.

With increasing sales volume, if the capacity of fixed cost is not fully utilized.

With reducing fixed cost if possible.

With reducing variable cost (redacting the cost of raw materials, wages and other direct cost)

With substituting product line by more profitable one.

### 2.9.17 COST–VOLUME PROFIT ANALYSIS AND LIMITING FACTORS

CVP analysis is helpful in profit planning and a company will be able to produce any number of output, numbers of output of choice (desires). But in real world it is not possible, become of

some critical factors like finishing machine or raw material or labor. These critical factors in the CVP analysis are known as constraint.

#### 2.9.17.1 CVP Analysis with a Single Constraint

Scarce resource should be efficiently allocated in order to maximize the contribution margin. A particular simple and instructive situation arises when there is only one constraining resource. This can occur if the firm's products are all produced on a single maintained and outer is imagery hours available on this machine. In the same way , single resource constraint arise, if the firms product are all produced with only one material and output is limited by quantity available for that to have alternative uses, the contribution per unit should be calculated for each of these uses. Then, the available capacity for such scare resource should be allocated to the alternative uses on the basis of contribution per resource (Munakarmi, 2002:146).

#### 2.9.17.2 CVP Analysis with a Multiple Constraints

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

### 2.9.18 ASSUMPTIONS UNDERLYING CVP ANALYSIS

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

a. **Cost Segregation** – The total cost can be separate in to fixed an variable components. Constant fixed cost is the total fixed cost that remains unchanged with changes in sales volume. Constant unit variable cost is the variable cost per unit is constant and total variable cost changes in directive proportion to the sales volume.

b. **Constant Selling Price –** The selling per unit remains the constant; that is it done notchange with volume or because of other factors.

c. **Constant Sales Mix** - The firms manufacture only one product or if there are multiple precut the sales mix does not change.

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

### 2.9.19 LIMITATION OF CVP ANALYSIS

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

It is difficult to separate costs in to fixed and variable components

It is not correct to assume that total fixed cost would remain unchanged over the entire range of volume.

If is difficult to use the break even analysis for a multiple produced firm.

The break even analysis is a short run concept and has a limited use in long range planning.

The break even analysis is a static tool.

### 2.9.20 PURPOSE OF CVP ANALYSIS

Cost- Volume- Profit Analysis helps management in a number of ways. The following purposes are served by it (Dangol, 2058:160).

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

### 2.9.21 SENSITIVITY ANALYSIS

Sensitivity analysis is the measurement of elasticity if the change in cost, volume and profit factors or break even point or give profit. The strategist should focus more on the factor, which is more on the factor, which is more sensitive or responsive for profit. To measure the sensitivity of cost volume profit factors one can see the impact of certain percentage or amount change in volume, price or cost factors one on net profit. In other words, sensitivity analysis in the measurement of responsiveness in outcome with the changes in determination variable. We

know that the goal of business enterprises is to maximize profit. Is the excess of revenues over the total cost?

Net profit = Total Sales Revenues - Total Cost

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

So that, profit = F (Sales volume, selling price, VC, FC, Taxes etc. means, profit are function, price, VC, FC taxed and son on.

But one of the factors remain unchanged sometime the manger can internationally change the price and cost factors as a part of strategic decision. But the strategy should focus more one the favor, which is more sensitive or responsive for profit. Therefore, to measures the sensitivity of cost volume profit factors, we can see the impact of certain percentage or a out change in volume price or cost factors on net profit (Bajracharya, 2004:245).

### 2.9.22 MANAGERIAL APPLICATION OF CVP ANALYSIS

CVP analysis helps the managers to plan for profit to control cost and make long term and short term decision. It is necessary to decision in grater details its usefulness to management. These are:

**a. Management use CVP Analysis to analyze past performance**

Management should determine the reason for difference between budget and actual result. CVP analysis can make an important contribution to each activities planning, organizing and controlling. It provides a framework for planning future operation and mean for determining the likely effects of various ways of organizing those operations. CVP can be used to control current operation by company actual results with planned result.

**b. To know how much business safe**

The higher safety margin indicates that the business is more safety and lower safety margin shows that the business is more risky. So margin of safety (MOS) is used by manager to know business safety and risk.

**c. To determine selling price**

Selling price is sensitive elements of demand, profit, and break even, selling price of a product covers all costs and profit margin. Sometime, a small percentage change in sales may cause greater change in operating and managing result. Therefore management uses CVP to determine selling price for covering costs and requires profit margin which helps business to sustain in the competitive market.

**d. Profit picks up Incremental sales**

In a break-even level, the firm is in no gain and no loss position. After this firm earn profit. Each unit sold beyond the BEP contribution towards profit. Beyond BEP fixed costs don't increase. Therefore, each unit sold beyond BEP gives profit equal to CMPU.

**e. Estimation of sales for target profit**

Management uses CVP analysis to estimate of sales for target profit. If management should make decision to earn target profit then management estimated sufficient sales volume to meet the targeted. Therefore firm get easily to earn desired gain.

**f. Management uses the budgeted amounts to control operations through the certain period**

During the period of operations, sales and cost figures should incur with those budgeted amounts. Therefore, management uses CVP analysis to separate those budgeted amount into their behavior and to determine the probable effects of various alternatives which may be considered.

## 2.10 Review of the Related Studies.

Adhikari (2004) has done the research on "profit planning in manufacturing enterprises: A case study of DDC" with the objectives of:

- To analyze the functional budgets on sales and production sector of DDC.
- To analyze various accounting ratios, major the profitability and efficiency of DDC, analyze the budget target and its achievement along with reason of deviation (if any), provide valuable recommendations and suggestions based on analysis.

Adhikari has summarized his remarkable findings are:

- DDC has practice short term planning rather than long term planning; the time is covered by interim period any by product.
- Production and sales of DDC is increasing annually although the growth rate is fluctuated, the correlation between actual and targeted sales is positive.
- The corporation has no proper practice in suggestion cost into fixed and variables.
- There is positive correlation between target actual productions of milk.
- Most of the budget figures are higher than actual figure.
- DDC has applied stable inventory policy with opening stock of inventory but this policy is not applied in practices. It has 1% store losses and 0.5% distribution losses of milk.
- DDC has prepared direct labour budget only based on technical and administration; it is not prepared according to the time and rate.
- Capacity utilization is very high but production ratio is very low.
- The CVP analysis shows that DDC is operating below the break-even point and flexible budget of DDC shows 90% variable cost of sales revenue.
- DDC utilized corporate fund as long-term loan and from international agencies like US aid.
- DDC has not clear attainable objectives, policies and strategies, timely accounting and auditing work are not maintained, financial statements accounting are out of the financial rules.
- The present management doesn't have any program of perfect profit planning.

Dhakal (2005) has submitted a thesis on the topic of "Cost-Volume-Profit analysis as a Tool to Measure the Effectiveness of Profit Planning and Control: A Case Study of Gorkhkali Rubber Industry Limited." He has focused his study to examine CVP as a tool to measure the effectiveness of profit planning and control by using both primary and secondary data. Dhakal had point out some remarkable findings of research and are:

- Sales plan are not properly maintained by GRIL
- Appropriated cost classification technique are not practices in GRIL
- There is very low contribution margin of GIRL
- GIRL is in very high interest bracket.
- GIRL does not have a detailed and systematic practice of planning.
- Goals and objectives are not communicated to the lower level of management.
- GRIL produces very high quality and exportable product but the production cost is high.
- The profitability of the industry is very poor and suffering a high degree of losses.
- GRIL is utilizing only 35% capacity.
- The industry is in risk where operating leverage is high.

Rijal (2006) has conducted a research "Cost- Volume-Profit Analysis as a Tool to Measure Effectiveness of Profit Planning and Control: A Case Study of Nebiko Private Limited." He has centered his study to examine CVP analysis as a tool in manufacturing industry and to analyze the CVP and its impact in profit planning. Rijal had point out some remarkable findings of research and which are:

- Nabiko's variable cost is high in portion than fixed cost, which contributes for lower contribution margin.
- Lack of effective cost control and program or technique
- The profit proportion of the company is very low.
- There is no effective inventory policy in the company.
- The company has no detailed of any systematic plan.
- The board of director is the main body of price determination and he interferes directly in the price decision.
- Nebiko has not proper practice of segregation of cost.

- There is not proper co-ordination among production, administration, distribution, inventory and sales department.

Neupane (2007) has made research on A Study of Cash Management in Nepalese Public Enterprises, a case study of Salt Trading Corporation Ltd.; In this study Mr. Neupane has pointed out following objectives and major findings.

Objectives:-

1. To avail the daily necessary things to the general people in the reasonable price;
2. To carry out the export and import business;
3. To act as an agent for domestic as well as foreign companies;
4. To make investments in new as well as old industries;
5. To import and distribute chemical goods and fertilizer;

Major Findings:-

- Cash Management in the STCL is primary based on the traditional practices lacking in scientific approach. A more serious aspect of cash management has been the absence of any formalized system of cash planning and cash budgeting in STCL.
- The STCL could not make the best use of available cash balance prudently.
- The average cash turnover time in a year is found 40 times which is in fluctuating trend over the study period.
- Management has taken liberal credit policy to sales of goods. Hence, the cash and bank balance of the study period is minimal of account receivable.
- Modern practices with respect to debt collection, monitoring the payment behavior of customers and relevant banking arrangements in connection with collection of receivables have been virtually ignored in STCL.

- No optimum cash balance is maintained. The cash & bank balance with respect to current assets has been fluctuating trend similar is the case with respect to the total assets.

Thapa (2008) has conducted a research on the topic " Profit planning and control: A case study of Nepal Telecom. Mr. Thapa has pointed out the following objectives and major finding.

The main objectives of the study were.

1) To examine the present comprehensive profit planning system applied by NTC.
2) To evaluate the targeted variable and actual variables of NTC.
3) To analyze the gap between budgeted and actual revenue.
4) To examine the financial performance the NTC.

The major findings were as follows.

1) NTC is lacking the proper System of Performance report.
2) NTC has not practices of control policy considered controllable and inconsolable variables affecting the organization.
3) The sales plan and achievement is satisfactory to some extent.
4) Financial Performance of NTC is not so good.
5) NTC does not consider the use of flexible subjective.

Ghimire (2008) has made research on Impact of Budgeting on Profitability, a case study of NEA, In this study Mr. Ghimire has pointed out following objectives and major findings.

Objectives:-

1.To analyze the various functional budget of NEA;

2.To obtain a true picture of profit planning diversification of NEA;

3.To analyze the variance between budget and actual achievements of the authority;

4.To printout the major shortcomings and recommended suggestive measures;

Major findings:-

1. Actual sales are more fluctuating than budgeted sales and budgeted sales is more fluctuating than actual production.
2. NEA has a practice of preparing both strategic and tactical budgeting but tactical short range plan is prepared for external purpose and strategic plan is prepared for internal purpose.
3. NEA has been paying huge amounts of interest on long term loan.
4. There is perfect correlation between budgeted and actual sales and budgeted and actual production.
5. Actual sales are always less than actual production due to power loss which is a main problem of NEA.

Shrestha (2009) has made research on Profit Planning in Public Utility Sector of Nepal – A case study of NEA. In this study Mr. Shrestha has pointed out following objectives and major findings.

Objectives:-

1. To examine profit planning system applied by NEA;
2. To analyze the financial performance of NEA by using various financial tools;
3. To observe the various functional budgets of NEA associated with comprehensive profit planning;
4. To evaluate budgeted and actual achievement of NEA;
5. To provide a package of recommendations and suggestions to be taken instantly and further to be encountered with identified budgeting & profit planning problems on the basis of findings;

Major Findings:-

1. Budgeted sales are more variable than actual sales.
2. Budgeted production is more fluctuating than actual production.
3. Authority formulates various functional budgets as a part of comprehensive profit plan.
4. NEA has been paying a large amount of interest on long term loan.
5. Power leakage is significantly high in NEA.

## 2.11 Research Gap

There is the gap between the present research and the previous researches. Previous researches were mainly conducted on profit planning and control and budgeting practices in the manufacturing companies especially in public enterprise.

The previous researcher did not disclose which of the profit planning and control tools are in practices, which are not and why. But few of the researches were conducted on simple cost volume profit analysis of public and private limited companies. But to fill gap, it examines the multi product cost volume profit analysis as a tool of profit planning and control in the different manufacturing Organizations.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Research Design

The study is an analytical type of study regarding the cost volume profit analysis. The research design used in the study is descriptive and evaluative. The data relative to topics are collected through financial statement of the finance and other available sources. The data for five years had been collected and various financial and statistical tools had been used to resolve the objectives.

## 3.2 Population and Sample

Nowadays a number of several public limited companies have been emerging rapidly. Some have already been established and other are in the process of establishment. It is not possible to study all of them. So, all the companies are population of the study. Among them Unilever Nepal Pvt. Ltd. and Dabur Nepal Pvt. Ltd. have been selected as samples for the present study for being among the front runners in their sector.

## 3.3 Source of Data

The sources of the data used in this study are secondary in nature. It contents mostly the annual reports, Income statement and statement of financial position of concerned companies, other publications of the concerned companies, various publication of Nepal stock exchange, various publication of Security Board of Nepal and various magazines and so on.

## 3.4 Variables of Studies

The assignment of symbol to which numbers or values are assigned under Variable studies. It can also be termed as any or may values in terms of persons, things, groups or objects and the like others. There, the research has used two types of variables i.e. independent as well as dependent variable as follows;

(a) Independent variables: The variable which is not driven (influenced) by other variable is called independent variable. It cause to changes to other variable.

(b) Dependent Variable: The variable which is guided (driven) by other variables is called dependent variable. It does not cause to changes to other variables but caused by others.

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

**Table no. 3.1: Classification of Variables**

| S.N | Independent Variable | S.N | Dependent Variable |
|---|---|---|---|
| 1. | Sales Unit | 1<br>2<br>3 | Sales Rs.<br>Cost (Variable & Fixed)<br>Profit |

## 3.5 Method of Data Collection

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

## 3.6 Method of Analysis & Presentation

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

### 3.6.1 Descriptive Techniques:

Descriptive technique is a fact-findings operation searching for adequate information. It is a type of study, which is generally conducted to assess the opinions, behaviors or characteristics

of a given population and to describe the situation and events occurring at present. Descriptive technique is a process of an accumulating fact. It does not necessary seek to explain relationships, test hypothesis, make predictions, or get at meanings and implications of a study.

### 3.6.2 Quantitative Techniques:

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

## CVP Analysis Tools

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

1. Contribution Margin (CM) = Sales – Variable Cost
2. Contribution Margin Ratio = $1 - \frac{VariableCost}{Sales}$
3. Break Even Point (BEP) in units = $\frac{TotalFixedCost}{SPPU - VCPU}$
4. Break Even Point (BEP) in Rs. = $\frac{TotalFixedCost}{CMRatio}$
5. Break Even Point ( % of capacity) = $\frac{BEPinUnits/Rs}{TotalCapacityinUnits/Rs}$
6. Cash BEP( in Rs) = $\frac{FixedCost - NonCashOutlay}{1 - \frac{VariableCost}{Sales - NonCashOutlay}}$
7. Required sales for desired profit (in units) = $\frac{FC + Desired\ Profit}{CMPU}$
8. Required sales for desired profit (in Rs) = $\frac{FC + Desired\ Profit}{CMRatio}$

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

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

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

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

13. Margin of safety Ratio = $\frac{Actual / BudgetedSales - BESales}{Actual / BudgetedSales}$

**For Multi product Firm**

14. Overall BEP (in units) = $\frac{TotalFixedCost}{WeightedCMPU}$

15. Overall BEP in Rs. = $\frac{TotalFixedCost}{WeightedCMRatio}$

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

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

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

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

## *Statistical Tools*

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

**a.) Bar Diagram:**

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

**b.) Mean:**

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

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

Where,

$\sum X$ = the sum of observations

N = no. of observation

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

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

The SD is calculated by the following formula:

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

**d.) Coefficient of Variation (CV)**:

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

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

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

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

**e.) Time series Analysis (Trend Analysis):**

The collection of readings or data regarding to different time period is called time series. There are two variables in this case one most be time and other variables may be population,

production, sales, profit etc. a widely and most commonly used method to describe the trend is the method of least square.

The straight line 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 variables (Time)

**f.) Correlation Analysis:**

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

It can be calculated by using following formula:

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

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

**g.) Coefficient of determination ($r^2$):**

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

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

OR

$r^2 = rxr$

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

**h.) Testing Hypothesis:**

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

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

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

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

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

$H_{O:}$ $\mu_1 = \mu_2 = \mu_3$ There is no significant difference between average cost, volume and profit.

$H_{1:}$ $\mu_1 \neq \mu_2 \neq \mu_3$ there is significant difference between average cost, volume and profit.

# CHAPTER FOUR
# PRESENTATION AND ANALYSIS OF DATA

## 4.1 Introduction

Profit planning is the formal expression of the enterprises plan, goals, objectives stated in financial term for the specific period of time. It is one of the most important tools that are used to develop effective performance and systematic approach for attaining desire goals. CVP analysis, a tool of PPC, can be most important device to utilize the cost with effective and efficient way. CVP analysis has become a powerful instrument in the managerial decision making especially cost control and profit planning. The CVP analysis is specific way of presenting and studying the interrelationship between cost, volume and profit.

The main purpose of this research is to examine CVP analysis as a tool to measure the effectiveness of profit planning and evaluate the present practice of CVP analysis and identify the area where CVP analysis could be applied to strengthen manufacturing industries. For the reason, UNL and DNPL are selected for the study and data analysis purpose.

To meet the said objectives, the secondary data is used for sales trend analysis, cost analysis and Cost volume profit analysis etc. the secondary data are collected from annual report of the company.

This study has tried to cover the activities of the UNL and DNPL for last five year (i.e for the fiscal year 2005/06 to 2009/10. This information, which has been collected from UNL and DNPL, are given and analyze in the coming page accordingly.

## 4.2 Profit (Loss) Pattern of UNL and DNPL

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

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

**Table No 4.1**

**Profit (loss) trend of UNL**

*(Rs. in **thousands**)*

| Year | Sales | | Profit or Loss | |
|---|---|---|---|---|
| | Rs. | % Change | Rs. | % Change |
| 2005/06 | 94,865.09 | - | (62,168.12) | - |
| 2006/07 | 2,03,585.11 | 114.61 | (44,142.23) | (28.99) |
| 2007/08 | 3,14,578.63 | 54.52 | (21,138.36) | (52.11) |
| 2008/09 | 4,53,598.95 | 44.19 | (13,676) | (35.30) |
| 2009/10 | 5,29,559.16 | 16.75 | (10,396.70) | (23.98) |

*Source: Annual Report of UNL*

**Table No 4.2**

**Profit (loss) trend of DNPL**

*(Rs. in lakhs)*

| Year | Sales | | Profit (Loss) | |
|---|---|---|---|---|
| | Rs. | % Change | Rs. | % Change |
| 2005/06 | 26,995.05 | - | 1,773.63 | - |
| 2006/07 | 30,177.02 | 11.79 | 2,033.01 | 14.62 |
| 2007/08 | 27,287.90 | -9.57 | 472.90 | -76.74 |
| 2008/09 | 32,270.23 | 18.26 | 158.53 | -66.48 |
| 2009/10 | 36,608.41 | 13.44 | 55.89 | -64.74 |

*Source: Annual Report of DNPL*

The above table shows that the profit (loss) trend is decreasing annually with fluctuation in UNL and profit (loss) is fluctuating in DNPL. The decreasing rates of losses are 28.99%, 52.11%, 35.30% and 23.98% in fiscal year 2006/07, 2007/08, 2008/09 and 2009/10 in UNL respectively. For DNPL, the changes of profit are decreasing in the fiscal year 2007/08, 2008/09 and 2009/10 by 76.74%, 66.48% and 64.74%respectively rather than the year 2006/07.

It can be expressed in bar diagram comparing the sales trend with profit (loss) trend

**Figure No 4.1**

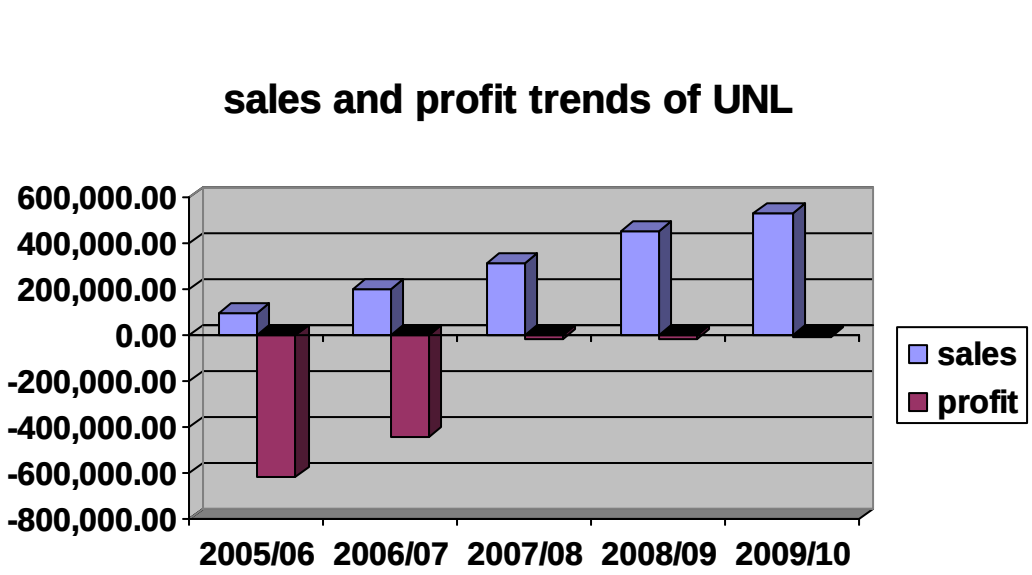
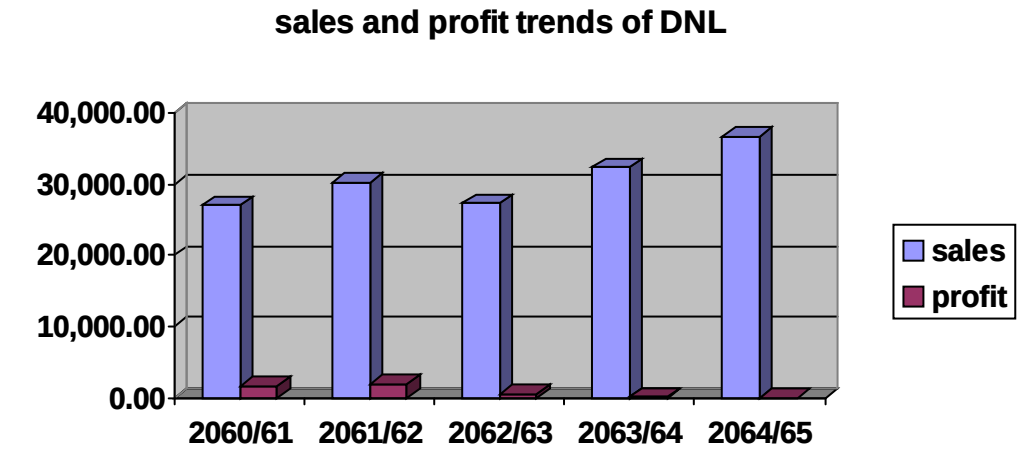



**Figure No 4.2**




**4.3 Analysis of Sales and Cost Relationship**

Cost structure refers to the relative proportion of fixed and variable cost in an organization. There is no categorical answer possible of which cost structure is best. A firm might have many fixed costs but few variable costs or mixed cost and vice versa. A firm's cost structure can have a significant impact on decision; in the matter of risk etc. Company with high fixed cost will

incur losses much more quickly than the company with lower fixed cost if the reversionary condition strikes the industry. In sum, company with high fixed cost will experiences wider movement in net income as changes take place in sales, with greater profit in good year and greater loss in bad year. Company with low fixed cost will enjoy some what greater stability in net income, but if will do so at the risk of losing substantial profit if sales trend upwards in the long run.

The cost analysis of UNL and DNPL are briefly analyzed in the below Table No 4.15 for the fiscal year from 2005/06 to 2009/10.

**Table No 4.3**

**Cost structure analysis of UNL & DNPL**

| | UNL | | | | DNL | | | Nrs in Lakhs |
|---|---|---|---|---|---|---|---|---|
| **Fiscal Year** | **Sales Revenue** | **Total VC** | **Total FC** | **Total Cost (Rs.000)** | **Sales Revenue** | **Total VC** | **Total FC** | **Total Cost** |
| 2005/06 | 94,865.09 | 83,597.17 | 73,436.04 | 1,57,033.21 | 26,995.05 | 21,408.02 | 3,813.40 | 25,221.42 |
| 2006/07 | 2,03,585.11 | 1,68,693.04 | 79,034.30 | 2,47,727.34 | 30,177.02 | 24,495.75 | 3,648.26 | 28,144.01 |
| 2007/08 | 3,14,578.63 | 2,52,487.96 | 83,229.03 | 3,35,716.99 | 27,287.90 | 23,204.23 | 3,610.77 | 26,815.00 |
| 2008/09 | 4,53,598.95 | 3,76,276.96 | 90,997.99 | 4,67,274.95 | 32,270.23 | 28,020.16 | 4,092.21 | 32,112.37 |
| 2009/10 | 5,29,559.16 | 4,34,250.74 | 1,05,705.13 | 5,39,955.87 | 36,608.41 | 32,366.05 | 4,186.47 | 36,552.52 |

*Source: Annual Report of UNL&DNPL (F/Y 2005/06 to 2009/10)*

**Table No 4.4**

**Cost structure analysis of UNL& DNPL in Percentage**

| Particulars | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 |
|---|---|---|---|---|---|
| % Of variable cost to total cost(UNL) | 53.24 | 68.09 | 75.21 | 80.53 | 80.42 |
| % Of variable cost to total cost(DNL) | 84.88 | 87.03 | 86.53 | 87.25 | 88.55 |
| % Of variable cost to sales revenue(UNL) | 88.12 | 82.86 | 80.26 | 82.95 | 82 |
| % Of variable cost to sales revenue(DNL) | 79.30 | 81.17 | 85.03 | 86.83 | 88.41 |
| % Of variable cost increase(UNL) | - | 101.79 | 49.67 | 49.03 | 15.41 |
| % Of variable cost increase(DNL) | | 14.42 | -5.27 | 20.75 | 15.51 |
| % Of fixed cost to total cost(UNL) | 46.76 | 31.91 | 24.79 | 19.47 | 19.58 |
| % Of fixed cost to total cost(DNL) | 15.12 | 12.96 | 13.47 | 12.74 | 11.45 |

| | | | | | |
|---|---|---|---|---|---|
| % Of fixed cost to sales(UNL) | 77.41 | 38.82 | 26.46 | 20.06 | 19.97 |
| % Of fixed cost to sales(DNL) | 14.13 | 12.09 | 13.23 | 12.68 | 11.43 |
| % Of sales increase(UNL) | - | 114.6 | 54.52 | 44.19 | 16.75 |
| % Of sales increase(DNL) | - | 11.79 | -9.57 | 18.26 | 13.44 |

*Source: Annual Report of UNL &DNPL (F/Y 2005/06 to 2009/10)*

Table No 4.4 shows that the proportion of variable cost and fixed cost of UNL for fiscal year 2005/06 to 2009/10 are 53.24% & 46.76% 68.09% & 31.91%, 75.21% & 24.79% 80.53% & 19.47% and 80.42% & 19.58% respectively. And DNPL for F/Y 2005/06 to 2009/10 are 84.88, 87.03, 86.53, 87.25 and 88.55 & 15.12%, 12.96%, 13.47%, 12.74% and 11.45% respectively. Overall the proportion of variable cost is higher than the fixed cost in both companies. Similarly the proportion of variable cost and fixed cost to total sales of UNL for the F/Y 2005/06 to 2009/10 are 88.12% & 77.41%, 82.86% & 38.82%, 80.26% &26.46%, 82.95% & 20.06% and 82% & 19.97% respectively. And for DNPL, fiscal year 2005/06 to 2009/10 are 79.30 &14.13, 81.17&12.09, 85.03&13.23, 86.83 &12.68 and 88.41&11.43 respectively .Here, the proportion of variable cost to sales revenue is almost constant but the proportion of fixed cost to sales revenue is decreasing. Again, the percentage of sales increase/decrease and the percentage of variable cost increases/decrease of UNL for the F/Y 2005/06 to 2009/10 is 114.6% & 101.7%, 54.52% & 49.67%, 44.19% & 49.03% and 16.75% & 15.41% respectively. And DNPL for F/Y 2005/06 to 2009/10 is 11.79%&14.42%,-9.57%&-5.27%, 18.26%& 2.75% and 13.44% & 15.51% respectively. It shows that when sales increased then the variable cost also increased vice versa. Rate of increase in sales is less than the rate of increase in variable cost vice versa. The relationship between sales revenue, fixed cost and variable cost can be shown in the bar diagram which is presented below:

**Figure No 4.3**

**Sales, FC & VC Trend of UNL**

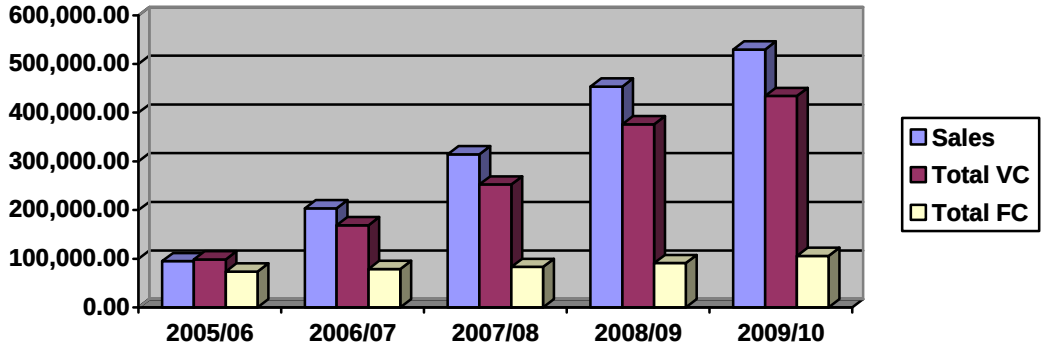
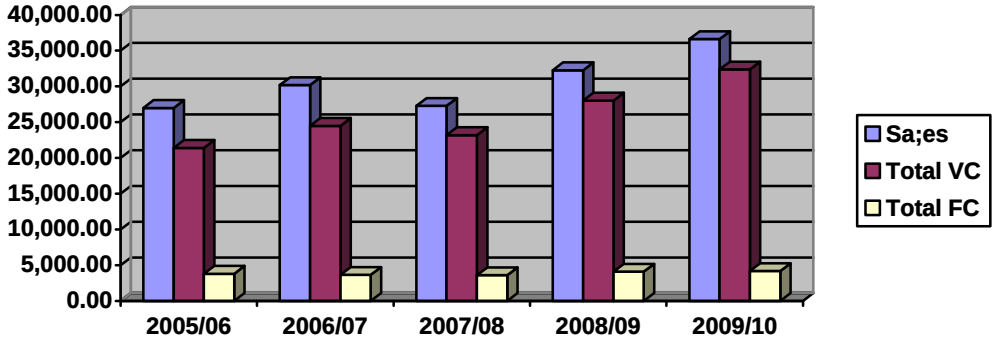



**Figure No 4.4**

**Sales, FC & VC Trend of DNPL**




## 4.4 Analysis of Budgeted and Actual Sales

UNL and DNPL are the multi-product manufacturing company producing and selling different types of products. The attempt begins to present and analyze the previous budgeted sales and actual sales performance. The following table presents the budgeted and actual sales achievement from fiscal year 2005/06 to 2009/10

**Table No 4.5**

**Total Budgeted and Actual Sales Volume of UNL (Amount in RS)**

| Year | Budgeted sales | Actual sales | Percentage |
|---|---|---|---|
| 2005/06 | 64,68,46,800 | 9,48,65,090 | 14.67 |
| 2006/07 | 54,31,48,000 | 20,35,85,108 | 37.48 |
| 2007/08 | 46,93,12,000 | 31,45,78,626 | 67.03 |
| 2008/09 | 69,44,25,821 | 45,35,98,946 | 65.32 |
| 2009/10 | 75,03,43,377 | 52,95,59,164 | 70.56 |

*Source: Annual Reports of UNL 2005/06 to 2009/10*

**Table No 4.6**

**Total Budgeted and Actual Sales Volume of DNPL (in lakhs)**

| Year | Budgeted sales | Actual sales | Percentage |
|---|---|---|---|
| 2005/06 | 27,18,067 | 26,99,505 | 99.32 |
| 2006/07 | 28,28,600 | 30,17,702 | 106.69 |
| 2007/08 | 27,35,134 | 27,28,790 | 99.77 |
| 2008/09 | 32,59,628 | 32,27,023 | 98.99 |
| 2009/10 | 38,53,516 | 36,60,841 | 95.00 |

*Source: Annual Reports of DNPL 2005/06 to 2009/10*

From the above table no 4.5 and 4.6 shows that there are differences of budgeted and actual sales. It becomes clear that the total sales revenue of UNL is fluctuating whereas DNPL less fluctuating. There are various reasons, which cause the variation on sales revenue. The significant factors responsible for the variation in sales revenue are demand conditions of the products, cost of the products, political situation of the company, political conflict, government policy, socio-cultural condition of the country, tough competition with imported products etc. a part from the above mentioned causes there are other national and international reasons such as depression in international economic activities, transportation problem due to insecurity etc. directly or indirectly cause the fluctuation of sales, Maoist insurgency etc.

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

The above table shows that there is high gap between actual sales and budgeted sales. The sales trends have unfavorable because actual sales of all fiscal years are very less than budgeted sales. But the percentages of achievement are increasing. So, it can be expected that the gap between actual sales and budgeted sales will be fulfilled in future.

We can present the sales target and achievement more effective by bar diagram and trend line as below:

**Figure No 4.5**

**Sales Achievement of UNL**

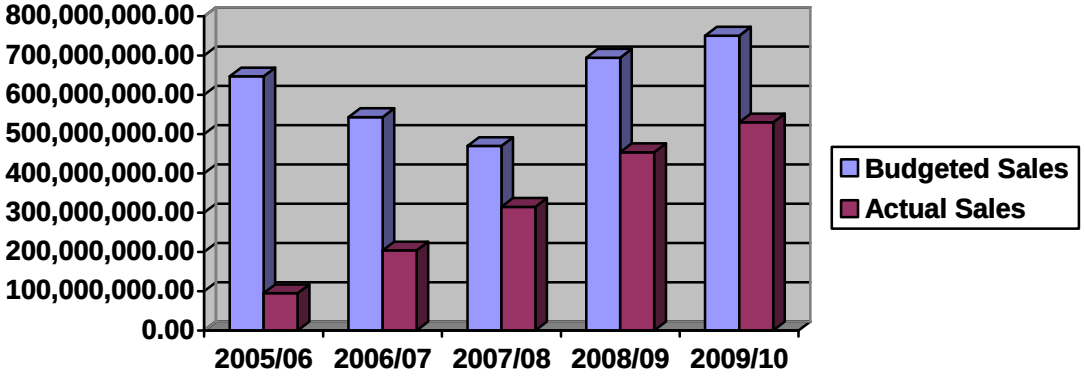
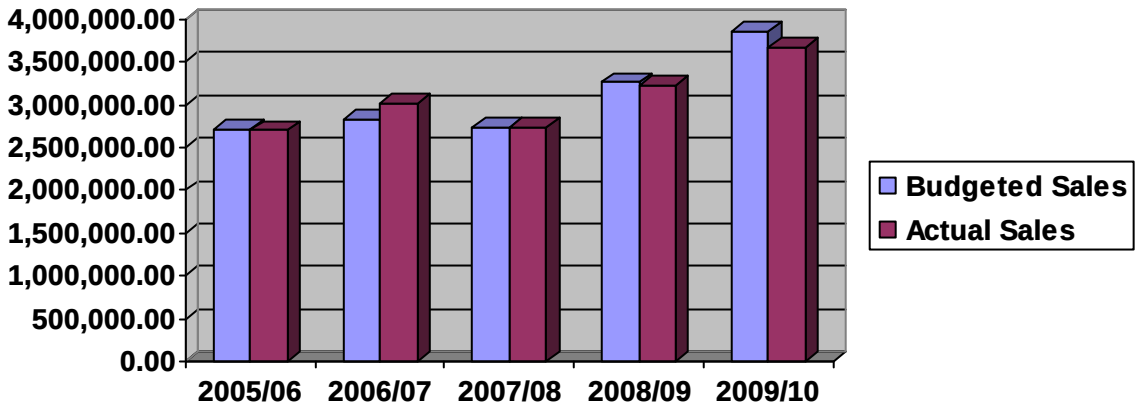



**Figure No 4.6**

Sales Achievement of DNPL




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

Here, Actual sales = X  Budgeted Sales = Y

**Table No 4.7**

**Summary of statistical calculation of UNL**

| Statistical Tools | Actual Sales (X) | Budgeted Sales (Y) |
|---|---|---|
| Mean ( $\overline{X}$ ) | 319.24 | 620.82 |
| Standard Deviation(¢ ) | 158.76 | 101.84 |
| Coefficient of Variation (C.V.) | 49.73 | 16.4 |
| Correlation Coefficient (r) | 0.51 | |
| Coefficient of determination ($r^2$) | 0.2601 | |
| Probable Error (P.E) | 0.2231 | |

*Source: Calculation from appendix - I*

**Figure No. 4.8**

**Summary of statistical calculation of DNPL**

| Statistical Tools | Actual Sales (X) | Budgeted Sales (Y) |
|---|---|---|
| Mean ( $\overline{X}$ ) | 30,667.72 | 30,789.89 |
| Standard Deviation(¢ ) | 3,549.99 | 4,344.46 |
| Coefficient of Variation (C.V.) | 11.57 | 14.11 |
| Correlation Coefficient (r) | 0.97 | |
| Coefficient of determination ($r^2$) | 0.9409 | |
| Probable Error (P.E) | 0.0178 | |

*Source: Calculation from appendix - II*

The calculate value of different statistical tools presented above in table no 4.7 and 4.8 shows that budgeted sales mean is greater than actual sales mean in both Organizations. But standard deviation of actual sales is greater than the budgeted sales in UNL vise versa in DNPL. The coefficient of variation of actual sales is more than coefficient of variation of budgeted sales in both Organizations. This shows that the budgeted sales fluctuated less than actual sales for the companies. Having smaller C.V. budgeted sales are more homogenous or less variable or uniform or more consistent than actual sales.

Similarly, the correlation co-efficient between two variable (i.e. Budgeted sales and Actual sales) is 0.51and 0.97 in UNL and DNPL respectively. It shows that there is positive correlation between two variables of the UNL and Highly positive correlation between two variables of DNPL.

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

## Trend Analysis

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

$Y = a + bx$

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

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

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

**Table No 4.9**

**Calculation of the trend of total sales of UNL**

*(Amount in Million)*

| Year (X) | Total Sales(Y) | X = ( x-2007/08) | XY | $x^2$ |
|---|---|---|---|---|
| 2005/06 | 94.87 | -2 | -189.74 | 4 |
| 2006/07 | 203.59 | -1 | -203.59 | 1 |
| 2007/08 | 314.58 | 0 | 0 | 0 |
| 2008/09 | 453.59 | 1 | 453.59 | 1 |
| 2009/10 | 529.56 | 2 | 1059.12 | 4 |
| Total | $\sum Y = 1596.19$ | $\sum X = 0$ | $\sum XY = 1119.38$ | $\sum x^2 = 10$ |

Therefore, a = 319.24 and b = 111.94

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

By using this trend equation we can estimate the actual sales, for the F/Y 2065/66

Y = 319.24 + 111.94 x 3

= Rs. 655.06 Million

Therefore, if the trend doesn't change, the possible sales for the year 2065/66 will be Rs. 655.06 million

**Table No.4.10**

**Calculation of the trend of total sales of DNPL**

*(Amount in Million)*

| Year (X) | Total Sales(Y) | X = ( x-2007/08) | XY | $x^2$ |
|---|---|---|---|---|
| 2005/06 | 2699.5 | -2 | -5399 | 4 |
| 2006/07 | 3017.7 | -1 | -3017.7 | 1 |
| 2007/08 | 2728.7 | 0 | 0 | 0 |
| 2008/09 | 3227.0 | 1 | 3227.0 | 1 |
| 2009/10 | 3660.8 | 2 | 7321.6 | 4 |
| Total | ∑Y = 15333.7 | ∑X = 0 | ∑ XY = 2131.9 | ∑ $x^2$ = 10 |

Therefore, a = 3066.74 and b = 213.19

Thus, y = 3066.74 + 213.19x, is the trend line of sales figure which shows the positive sales revenue in the future

By using this trend equation we can estimate the actual sales, for the F/Y 2065/66

Y = 3066.74 + 213.19 x 3

= Rs3706.31 Million

Therefore, if the trend doesn't change, the possible sales for the year 2065/66 will be Rs. 3706.31 million.

### 4.4.1 Analysis of Sales by Manufacturing Companies as whole

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

***Table No.4.11 Actual sales of UNL*** *(Rs. in '000')*

| Year | Actual sales | Change % |
|---|---|---|
| 2005/06 | 94,865.09 | - |
| 2006/07 | 2,03,585.11 | 114.61 |
| 2007/08 | 3,14,578.63 | 54.52 |
| 2008/09 | 4,53,598.95 | 44.19 |
| 2009/10 | 5,29,559.16 | 16.75 |

*Source: Annual Report of UNL (Fiscal Year 2005/06 to 2009/10)*

***Table No.4.12 Actual sales of DNPL*** *(Rs. in Lakhs)*

| Year | Actual sales | % Change |
|---|---|---|
| 2005/06 | 26,995.05 | - |
| 2006/07 | 30,177.02 | 11.79 |
| 2007/08 | 27,287.90 | -9.57 |
| 2008/09 | 32,270.23 | 18.26 |
| 2009/10 | 36,608.41 | 13.44 |

*Source: Annual Report of DNPL (Fiscal Year 2005/06 to 2009/10)*

We have brought total sales for the calculation of Cost Volume and Profit rather that the specific sales either domestic or foreign. The above table shows that the sale figure is in increasing gradually for company UNL where as the sales of DNPL are fluctuating. For DNPL, in F/Y 2007/08, sales percentage change is negative; however the sales are in the positive trends. For company UNL, the sales trend is in increasing in gradual way whereas in the company DNPL, the sales increasing but fluctuating.

### 4.5 Cost-Volume-Profit Analysis of UNL& DNPL

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

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

**Table No. 4.13**

**Income statement of UNL for the year 2005/06 to 2009/10**

| Particulars | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 |
|---|---|---|---|---|---|
| A. Sales Revenue | 9,48,65,090 | 61,81,48,502 | 31,45,78,626 | 45,35,98,946 | 52,95,59,164 |
| B. Variable Cost: Total Variable Cost | 8,35,97,171 | 16,86,93,043 | 25,24,87,955 | 37,62,76,956 | 43,42,50,738 |
| C. Contribution Margin (A-B) | 1,12,67,919 | 3,48,92,065 | 6,20,90,671 | 7,73,21,990 | 9,53,08,426 |
| D. Fixed Cost: Total Fixed Cost | 7,34,36,042 | 7,90,34,297 | 8,32,29,028 | 9,09,97,997 | 10,57,05,129 |
| E. Profit (Loss) (C-D) | (6,21,68,123) | (4,41,42,232) | (2,11,38,357) | (1,36,76,007) | (1,03,96,703) |
| F. P/V ratio = (CM/Sales) | 0.1188 | 0.1714 | 0.1974 | 0.1705 | 0.18 |
| G. BEP = (FC/P/V ratio) | 61,81,48,502 | 46,11,10,251 | 42,16,26,282 | 53,37,12,592 | 58,72,50,717 |
| **(A-G)** | **(52,32,83,412)** | **(25,75,25,143)** | **(10,70,47,656)** | **(8,01,13,646)** | **(5,76,91,553)** |

*Source: Annual Report of UNL (F/Y 2005/06 to 2009/10)*

**Table No. 4.14**

**Income statement of DNPL for the year 2005/06 to 2009/10 In Nrs Lakhs**

| Particulars | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 |
|---|---|---|---|---|---|
| A. Sales Revenue | 26,995.05 | 30,177.02 | 27,287.90 | 32,270.23 | 36,608.41 |

| | | | | | |
|---|---|---|---|---|---|
| B. Variable Cost:<br>Total Variable Cost | 21,408.02 | 24,495.75 | 23,204.23 | 28,020.16 | 32,366.05 |
| C. Contribution Margin (A-B) | 5,587.03 | 5,681.27 | 4,083.67 | 4,250.74 | 4,242.36 |
| D. Fixed Cost:<br>Total Fixed Cost | 3,813.40 | 3,648.26 | 3,610.77 | 4,092.21 | 4,186.47 |
| E. Profit (Loss) (C-D) | 1,773.63 | 2,033.01 | 4,72.90 | 158.53 | 55.89 |
| F. P/V ratio = (CM/Sales) | 0.21 | 0.19 | 0.15 | 0.13 | 0.12 |
| G. BEP = (FC/P/V ratio) | 18,425.34 | 19,378.35 | 24,127.89 | 31,478.54 | 36,126.12 |
| **MOS (A-G)** | **8,569.71** | **10,798.67** | **3,160.01** | **791.69** | **482.29** |

*Source: Annual Report of DNPL (F/Y 2005/06 to 2009/10)*

### 4.5.1 Contribution Margin Analysis

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

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

For UNL

CM for 2002/3= Rs (9, 48, 65,090 – 8, 35, 97,171) = 1, 12, 67,919

Or, = Rs ((6, 21, 68,123) – 7, 34, 36,042) = 1, 12, 67,919

For DNL,

CM for 2005/06 =Rs (26,995.05 – 21,408.02) = 5,587.03 in lakhs

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

The above table No. 4.17 & 4.18 shows the calculation of CM of UNL and DNPL for five fiscal years form 2005/06 to 2009/10. CM for the five years shows the fluctuation trend. High CM is the signal of high profit, low CM is the signal of Low Profit. Above table clearly shows that UNL and DNPL in F/Y 2009/10 and 2005/06 represent the high CM and F/Y 2006/07 and 2007/08 represents the low CM respectively.

### 4.5.2 Profit Volume (P/V) Ratio Analysis

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

Profit Volume (P/V) ratio = Contribution Margin/ Sales

For UNL,

Profit volume (P/V) ratio for base year 2005/06= 11267919/94865090 =0.1188

For DNL,

Profit volume (P/V) ratio for base year 2005/06= 5587.03/ 26995.05= 0.21

The above table 4.17 & 4.18 show the profit volume ratio of UNL and DNPL for the fiscal year 2005/06 to 2009/10. The P/V ratio of UNL is in increasing and stable movement in last research year and DNL is in decreasing order. It is highest in F/ Y 2007/08 i.e. 19.74% and 2006/07 i.e. 18% of UNL and DNPL respectively. An increase in CM means increase in profit only because fixed cost is assumed to be constant at certain level of activity. Management tries to increase the value of the ratio by reducing the variable cost or by increasing the selling price.

### 4.5.3 Break -Even Point (BEP) Analysis:

The point, which breaks the total cost and the sales revenue evenly to show the level or output or sales at which there shall be neither profit nor loss, is regarded as break even point. Through contribution margin approach, break even point can be expressed as:

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

For UNL,

- BEP for the base year 2005/06= 73436042/0.1188 =61,81,48,502
- BEP for the fiscal year2009/10=105705129/0.18=58,72,50,717

For DNPL,

- BEP for the base year 2005/06=3813.40/0.21=8569.71 in lakhs
- BEP for the fiscal year2009/10=4186.47/0.12=482.29 in lakhs

From above calculation, the BEP of UNL and DNPL for the base year is Rs 61,81,48,502 and 8569.71in lakhs respectively. Similarly the table 4.5 &4.6 shows the break even point for five fiscal years 2005/06 to 2009/10 of UNL and DNPL. The break even amount of UNL and DNPL for five years shows decreasing and increasing trends respectively. The break even point can be also determined with the help of a graph. A break even chart of UNL & DNPL for fiscal year 2005/06 to 2009/10 is given below, when sales revenue is shown in X-axis and cost amount is shows in Y- axis.

**Break even chart analysis of UNL**

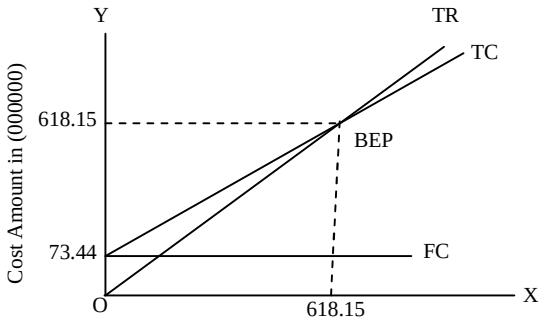



Figure No. 4.9: BEP in Graph for F/Y 2005/06

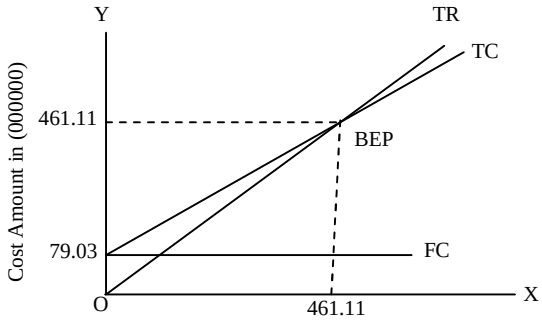
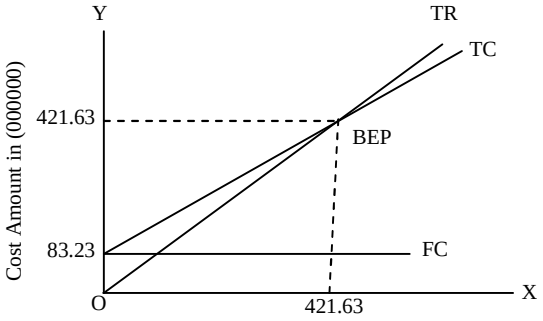
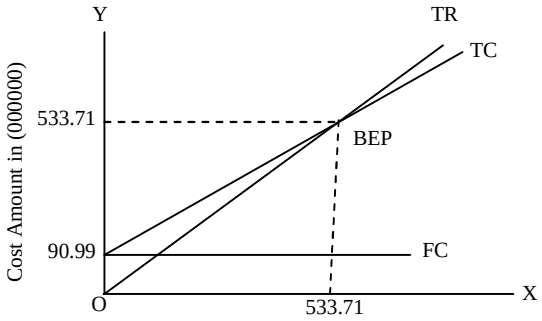


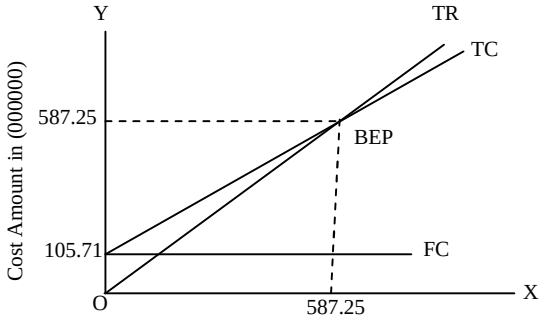

Figure No. 4.10: BEP in Graph for F/Y 2006/07




Sales revenue (000000)
Figure No. 4.11: BEP in Graph
for F/Y 2007/08

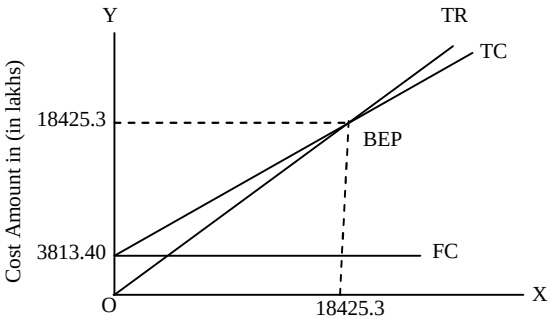



Sales revenue (000000)
Figure No. 4.12: BEP in Graph
for F/Y 2008/09

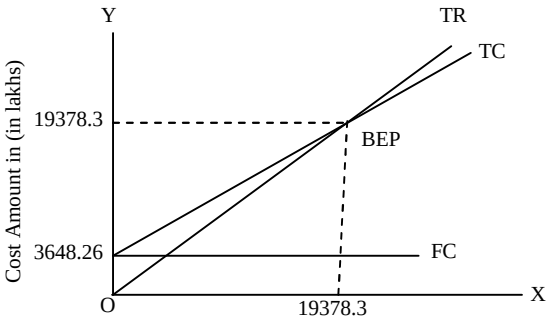



Sales revenue (000000)
Figure No. 4.13: BEP in Graph
for F/Y 2009/10

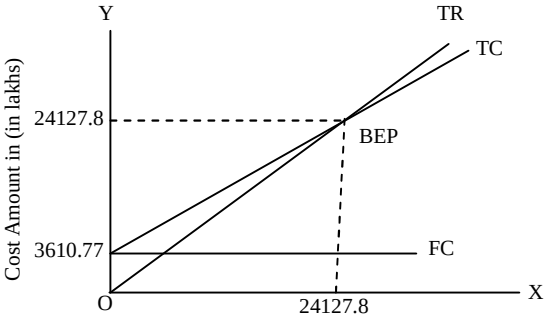
## Break even chart analysis of DNPL



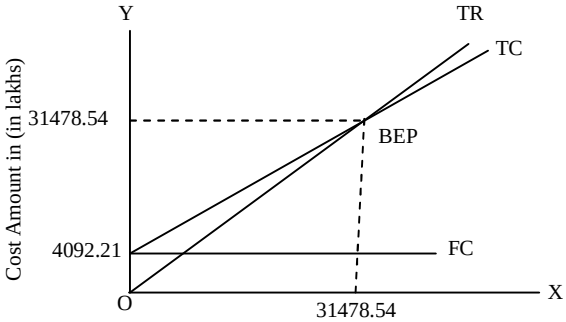

Sales revenue (in lakhs)
Figure No. 4.14: BEP in Graph
for F/Y 2005/06



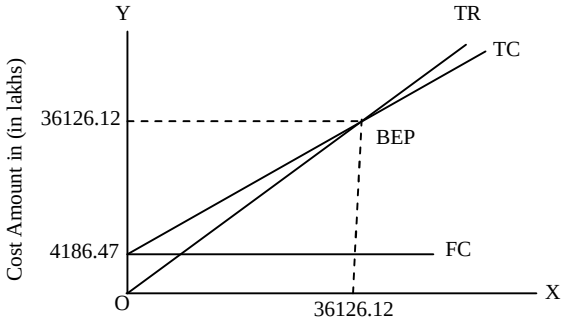

Sales revenue (in lakhs)
Figure No. 4.15: BEP in Graph
for F/Y 2006/07




Sales revenue (in lakhs)
Figure No. 4.16: BEP in Graph
for F/Y 2007/08




Sales revenue (in lakhs)
Figure No. 4.17: BEP in Graph
for F/Y 2008/09




Sales revenue (in lakhs)
Figure No. 4.18: BEP in Graph
for F/Y 2009/10

## Causes of Higher BEP

1. **Low actual sales and high variable cost**: Since actual sales of each fiscal year were low, this results the lower contribution margin course of higher variable cost.
2. **Low CM Ratio:** Since low sales and low contribution margin, the CM ratio was less than 20%. The low CM ratio recovers low portion of fixed costs, this results there were need of high sales revenue to reach at BEP.

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

### 4.5.4 Margin of Safety (MOS) Analysis:

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

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

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

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

- MOS of UNL for F/ Y 2005/06= 94865090-618148502=(52,32,83,412**)**
- MOS of UNL for F/ Y 2006/07= 618148502-461110251=(25,75,25,143)

And so on…….

- MOS of DNL for F/ Y 2005/06= 26995.05-18425.34=8,569.71 in lakhs
- MOS of DNL for F/ Y 2006/07= 30177.02-19378.35=10798.67 in lakhs

The above calculations shows that margin of safety of UNL & DNPL for the base years and similarly the table 4.5 and 4.6 shows the margin of safety for five fiscal years 2005/06 to2009/10 in fluctuating trend for DNL; the MOS of DNPL is maximum in F/Y 2006/07 and minimum in F/Y 2009/10 but where as the Margin of safety of UNL totally negative; it means sales doesn't reach the capacity or cant touch the BEP line. For UNL, MOS is low except in F/Y 2008/09. The low MOS ratio is the result of low CM ratio. Since, actual sales lower comparatively than BEP, there are not raised conditions of suffering loss regarding sales fall; because actual sales are increasing annually. When actual sales be crossed BEP and there be arise low CM ratio and MOS then the management should be think of the possibilities of

increasing the price of sales or reducing variable cost by adopting improvement in the manufacturing process.

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

% of MOS=MOS/sales *100 or

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

### 4.5.5 Break Even Analysis of Multi-Products & Sales Mix

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

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

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

For UNL,

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

= 587250.717 ('000)

For DNPL,

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

= 36126.12 (in lakhs)

The sales mix and CM ratio of each product are classified on the basis of sales. In the calculation, the break even sales of UNL & DNPL are Rs. 5, 87,250.717 thousands and Rs. 36126.12 in lakhs for the F/Y 2009/10. This is computed by dividing the fixed costs by the company's average CM ratio. The selected products are chosen for the analysis of multi product Break Even analysis. The details of selected product of UNL&DNPL are at BEP for the F/Y 2009/10 are presented below in table no 4.19 and table no. 4.20.

**Table No 4.15**

**Product wise BEP sales of UNL**

| S.N. | Products | Sales('000) | Sales mix | Product wise BEP (overall BEP x sales mix) |
|---|---|---|---|---|
| 1. | Product A | 3,54,805 | 0.5701 | 3,34,791.63 |
| 2. | Product B | 37,069 | 0.1805 | 1,05,998.75 |
| 3. | Product C | 68,843 | 0.1494 | 87,735.25 |
| **Total** | | **4,60,717** | | **5,28,525.63** |

**Table No 4.16**

**Product wise BEP sales of DNPL**

| S.N. | Products | Sales(in lakhs) | Sales mix | Product wise BEP (overall BEP x sales mix) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 1. | Product A | 5,601.83 | 0.15330 | 5,527.296 |
| 2. | Product B | 820.40 | 0.02241 | 809.590 |
| 3. | Product C | 19,229.24 | 0.5253 | 18,975.900 |
| **Total** | | **25,651.47** | | **25,312.786** |

In the above table, individual BEP of each product is less than the product wise BEP. This is due to the fixed cost. In the individual BEP, we use the separate fixed costs of the respective product. But in the overall BEP we use the total fixed cost of the company as a whole to calculate the BEP. The main cause of difference between individual BEP and product wise BEP is fixed cost. Fixed cost plays the vital role in cost-volume and profit analysis.

## 4.6 Analysis of Hypothesis Test

Hypothesis 1

Null Hypothesis:

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

Alternative Hypothesis:

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

**Table No. 4.17**

**Two way ANOVA table of UNL**

| Sources of Variation | Sum of Square (S.S) | d.f | Mean sum of square (MSS) | F.ratio |
|---|---|---|---|---|
| Due to common factor | SSC = 44564567 | C-1 = 3-1= 2 | MSC= 22282283.5 | FC=30.96 |
| Due to Year | SSR=16804198.66 | r-1=5-1=4 | MSR=4201049.67 | Fr=5.84 |
| Due to error | SSE=5758567.02 | (c-1)(r-1)=8 | MSE=719820.88 | |

**Table No. 4.18**

**Two way ANOVA table of DNPL**

| Sources of Variation | Sum of Square (S.S) | d.f | Mean sum of square (MSS) | F.ratio |
|---|---|---|---|---|
| Due to common factor | SSC = 2196.63 | C-1 = 3-1= 2 | MSC= 1098.32 | FC=1.197 |
| Due to Year | SSR=161.44 | r-1=5-1=4 | MSR=40.36 | Fr=0.044 |
| Due to error | SSE=7337.93 | (c-1)(r-1)=8 | MSE=917.24 | |

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

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

$Fr_{\text{-}0.05}$ (4, 8) - Tab. = 3.8379

**Decision:**

Since, the calculated value of Fc is greater than tabulated value of Fc (i.e. Fc-cal>Fc-Tab.) of UNL. It is significant and null hypothesis (Ho) is rejected. It means there is significant relationship between costs, volume and profit analysis. Whereas, the calculated value of Fc is less than tabulated value of Fc (i.e. Fc-cal<Fc-Tab.) of DNPL. It isnot significant and Null Hypothisis is accepted. It means there is no significant difference between average cost, volume and profit

And the calculation value of $F_r$ is greater than tabulated value of Fr (i.e. Fr. Cal> Fr. Tab.) of UNL. It is significant and null hypothesis (Ho) is rejected. It means there is significant

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

## 4.7 Major Findings

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

- The variable costs were at increasing trend. The material costs with direct expenses on purchase, royalty, sales promotion expenses, transportation and insurance expenses, salary and wages leakage and breakage, complementary expenses, traveling expenses and water and electricity were high.
- The hypothesis test shows that there is significant relationship between cost volume and profit of UNL, where as there is no significant difference between averages cost, volume and profit of DNL.
- The total fixed costs of the companies are increasing annually. Advertisement, salary and allowance, communication expenses, insurance premium, depreciation and interest on long term are higher portion of total fixed costs and the amounts of these items were in highly incremental condition.
- There is a fluctuation between Budgeted Sales and Actual Sales in each year. Total sales revenue of UNL is fluctuating whereas DNPL is less fluctuating.
- There is high gap between actual sales and budgeted sales.
- The sales trends have unfavorable because actual sale of all fiscal year are very less than budgeted sales.
- Profit of UNL and DNPL are decreasing trend whether there is increased in actual sales volume.
- The coefficient of variation of actual sales is more than coefficient of variation of budgeted sales in both companies.
- There is positive correlation co-efficient between two variables (i.e Budgeted sales and Actual sales) of UNL and Highly Positive correlation between two variables of DNPL.
- Expenses trend of both companies is increasing year by year.

- Sales trend of both companies are increasing yearly. It shows that the net loss will decrease in the future but and profit of DNL will increase.
- The CM in about 20% which is much low to cover up its fixed costs. The actual sales of major products are more than BEP during the five fiscal years.
- CVP analysis tool was not used to forecast and evaluate cost, volume and profit in the companies.
- The companies did not segregate semi variable into variable and fixed by using scientific techniques.
- The company has no detailed and systematic expenses plan. The fixed, variable and mixed expenses plan is necessary for profit planning and control.
- Margin of safety (MOS) of DNPL is Fluctuating trend where as MOS of UNL is negative; it means sales doesn't reach the capacity or cannot touch the BEP Line. It also indicates that UNL has not enough risk bearing capacity as measured by variation in sales.

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Summary

The C-V-P analysis occupies an important place in profit planning and control. This study mainly aims to analyze the relationship between cost, volume and profit of UNL and DNPL. In Nepal, the manufacturing sector is very weak in every aspect of performance. Numbers of manufacturing industries are very few in Nepal and most of the industries are facing different kinds of problems. In this situation government should protect and support these kinds of industries. Among them only 32 manufacturing industries are listed in NEPSE. Here UNL and DNPL are taken as sample for the purpose of the study. In the study, researcher has analyzed the sales, fixed costs, variable cost and profit (loss) of the UNL and DNPL and selected product as well.

As per the need of the study, the researcher has analyzed the secondary data. The needed secondary data were collected from the period of fiscal year 2005/06 to 2009/10. The financial statement i.e. balance sheet, income statement and other related data were found from annual report of the UNL and DNPL

The main objectives of the research is to analyze different components of cost as per cost behavior to analyze the impact of fixed cost on profit and to analyze break-even-point of overall firm as well as individual product. For the purpose completion of the study, the related books, articles, journals and published thesis were studied by the researcher, which is presented in the second chapter the review of literature.

To accomplish the objectives of the research, the accounting and statistical tools and techniques have been used, which are presented in the chapter four data analysis.

Management effectively achieves organizational objectives through the efficient use of scarce resource in a changing environment. Future is uncertain which creates risk and reduce risk; the

only reliable weapon is good management. C-V-P analysis is an analytical technique for studying the relationship between volume, cost and profit which helps to manage future cost and profit. Profit planning is a management technique and it is a written plan in all aspect of business operation for specific future period. C-V-P analysis is a device used to determine the usefulness of profit planning process of the firm. In fact, the entire field of profit planning has become associated with C-V-P inter-relationship.

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

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

The C-V-P analysis tool is applied in UNL and DNPL to find out whether the tool is practicing or not. UNL and DNPL , one of the leading weaving manufacture which is the largest player in international market and for decades has been synonymous with quality product, had not practicing C-V-P analysis tools, costs are not segregated as fixed costs and variable costs where there are not proper mechanism to segregate semi-variable or semi-fixed costs into fixed and variable cost. To solve the problems regarding C-V-P analysis and not application, some objectives are formulated: cost segregation as fixed and variable cost, unit variable by adopting suitable mechanism and computation of C-V-P analysis by its extension tools. To fulfill the objectives of the study, historical as well as managerial research design is adopted.

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

## 5.2 Conclusion

- Promoter and director, and staff of the company are enjoying by achieving allowance and salary respectively. Other part, general shareholders are not achieving dividend and government couldn't claim for income tax since loss and loss recovery situation.
- Hence, avoiding C-V-P analysis tool and not utilizing full capacity, the companies are bearing loss as well as not attaining satisfactory profit.
- Since, not adopting C-V-P analysis tool for profit planning, before and after operation of venture, UNL and DNPL had incurring loss and little bit profit annually respectively.
- Different types of profit planning tools, which are used in the academic field, are not found applied by both companies. It shows the gap between the theory and practice. C-V-P analysis is not applied by both companies as any segregation of cost in to fixed and variable, which is the hardcore of CVP analysis.
- BEP of the UNL is fluctuated whereas DNPL is increased. The MOS of the DNPL is low so the percentage decrease in sales revenue can lead to the company huge losses, whereas the MOS of UNL is in negative situation. Overall BEP of the both companies are very high as the companies have not provided attention to sell more under these circumstances unless management revised their cost structure as soon as possible.
- The huge amount had invested into fixed costs. The contribution margin is very low cause of higher unit variable cost. Depreciation and interest on long-term loan is increasing annually. Other controllable cost is also increasing.
- Company has no clear-cut boundaries to separate cost into fixed and variable. The classification of cost is not scientific and systematic. So, both companies have not been able to use C-V-P analysis and make the realistic and smart budget.

## 5.3 Recommendations

- A systematic approach should be toward comprehensive profit planning. This can considerably contribute to the increase in profitability to companies. Since separate on of costs into their fixed and variable elements is at the heart of C-V-P analysis, all decision makers sought to be fully aware of, and understand, the cost structure of their operation, otherwise C-V-P analysis will provide meaningless information.
- System of periodical performance reports should be strictly followed to be conscious about poor performance and take corrective action immediately and timely.
- Both companies should consider BEP analysis which preparing sales plan, production plan and selling price of its products. Both companies should try to fulfill the gap between Budgeted sales and Actual sales.
- Classification of expenses item as variable and fixed or controllable and non-controllable must be made within specific framework of responsibility and time.
- Both companies should consider about the product line to improve its profit. Market studies on demand, supply and pricing of product should be carried out and loss oriented costs should be identified and control.
- Separate cost control dependent should be established for the effective management and reduction of cost.
- Both companies should maximum utilization of available resources and allocate for different departments as their requirement to get desired goals.
- Expenses planning and controlling should focus on the relationship between expenditure and benefits derived from those expenditure.
- Some portion of fund should be allocated to research and development program so that new technology could be found which provide more competitiveness in the market.
- Both companies should have proper **Human Resource planning** with their Competencies.
- Both companies are multi Product Company; more emphasis should be provided the product having high contribution so as have more profit.
- For overall profitability of the company, the company should analyze other profit planning tool i.e. decision making where department wise, product wise, make or buy, drop or continue, decision are provided. The companies are multiple products producer

and there is different kind of material is needed to manage the stock for future. It should be considered. Decision-making tools also can adopt for profit planning purpose

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

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## B. Previous Research Work:

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# APPENDIX-I

Let, x denotes that the Actual Sales and y denotes Budgeted sales of UNL.

## a) Calculation of Arithmetic Mean

| F.Y | $X$ | $Y$ | $x = X - \bar{X}$ | $y = Y - \bar{Y}$ | $X^2$ | $Y^2$ | $XY$ |
|---|---|---|---|---|---|---|---|
| 2005/06 | 94.87 | 646.85 | (224.37) | 26.03 | 50,341.90 | 677.67 | (5,841.25) |
| 2006/07 | 203.59 | 543.15 | (115.65) | (77.67) | 13,374.92 | 6,032.32 | 8,982.07 |
| 2007/08 | 314.58 | 469.31 | (4.66) | (151.51) | 21.72 | 22,954.67 | 706.02 |
| 2008/09 | 453.60 | 694.43 | 134.36 | 73.61 | 18,052.61 | 5,418.73 | 9,890.78 |
| 2009/10 | 529.56 | 750.34 | 210.32 | 129.52 | 44,234.50 | 16,775.95 | 27,241.49 |
| **TOTAL** | **1,596.20** | **3,104.08** | | | **126,025.65** | **51,859.33** | **40,979.11** |

Arithmetic Mean of Actual Sales

$$\bar{X} = \frac{\sum x}{n}$$
$$= \frac{3104.08}{5}$$
$$= 319.24$$

Arithmetic Mean of Budgeted Sales

$$\bar{Y} = \frac{\sum Y}{n}$$
$$= \frac{3104.08}{5}$$
$$= 620.82$$

## b) Calculation of Standard Deviation($\sigma$)

Standard Deviation of Actual Sales

$$\sigma_x = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$
$$= \sqrt{\frac{126025.65}{5}}$$
$$= 158.76$$

Standard Deviation of Actual Sales

$$\sigma_y = \sqrt{\frac{\Sigma(y-\bar{y})^2}{n}}$$

$$= \sqrt{\frac{51859.33}{5}}$$

$$= 101.84$$

C) Calculation of Co-efficient of Variation (CV)

Co-efficient of Actual Sales

$$cv_x = \frac{\sigma_x}{\bar{x}} * 100$$

$$= \frac{158.76}{319.24} * 100$$

$$= 49.73$$

Co-efficient of Budgeted Sales

$$cv_y = \frac{\sigma_y}{\bar{y}} * 100$$

$$= \frac{101.84}{620.82} * 100$$

$$= 16.40$$

d) Calculation of Correlation Co- efficient (r)

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2}\sqrt{\Sigma y^2}}$$

$$r = \frac{40975.11}{\sqrt{126025.65}\sqrt{51859.33}}$$

$$r = 0.51$$

Therefore the co-efficient of determination ($r^2$) is = 0.2601

e) Calculation of Probable error (P.E)

$$= 0.6745\frac{(1-r^2)}{\sqrt{n}}$$

$$= 0.6745\frac{(1-0.2601)}{\sqrt{5}}$$

$$= 0.2231 \text{ or } 22.31\%$$

# APPENDIX-II

Let, x denotes that the Actual Sales and y denotes Budgeted sales of DNPL.

| F.Y | $X$ | $Y$ | $X = x - \bar{x}$ | $Y = y - \bar{y}$ | $x^2$ | $Y^2$ | xy |
|---|---|---|---|---|---|---|---|
| 2005/06 | 26,995.05 | 27,180.67 | (3,672.67) | (3,609.22) | 13,488,512.27 | 13,026,469.01 | 13,255,481.24 |
| 2006/07 | 30,177.02 | 28,286.00 | (490.70) | (2,503.89) | 240,787.47 | 6,269,465.13 | 1,228,663.83 |
| 2007/08 | 27,287.90 | 27,351.34 | (3,379.82) | (3,438.55) | 11,423,189.99 | 11,823,626.10 | 11,621,686.94 |
| 2008/09 | 32,270.23 | 32,596.28 | 1,602.51 | 1,806.39 | 2,568,035.10 | 3,263,044.83 | 2,894,754.43 |
| 2009/10 | 36,608.41 | 38,535.16 | 5,940.69 | 7,745.27 | 35,291,785.79 | 59,989,207.37 | 46,012,232.55 |
| **TOTAL** | **153,338.61** | **153,949.45** | | | **63,012,310.63** | **94,371,812.45** | **75,012,818.98** |

a) Calculation of Arithmetic Mean

Arithmetic Mean of Actual Sales

$$\bar{X} = \frac{\sum x}{n}$$
$$= \frac{153338.61}{5}$$
$$= 30667.72$$

Arithmetic Mean of Budgeted Sales

$$\bar{Y} = \frac{\sum Y}{n}$$
$$= \frac{153949.45}{5}$$
$$= 30789.89$$

b) Calculation of Standard Deviation ($\sigma$)

Standard Deviation of Actual Sales

$$\sigma_x = \sqrt{\frac{\sum(x-\bar{x})^2}{n}}$$
$$= \sqrt{\frac{63012310.63}{5}}$$
$$= 3549.99$$

Standard Deviation of Actual Sales

$$\sigma_y = \sqrt{\frac{\Sigma(y-\bar{y})^2}{n}}$$
$$= \sqrt{\frac{94371812.45}{5}}$$
$$= 4344.46$$

C) Calculation of Co-efficient of Variation (CV)

Co-efficient of Actual Sales

$$CV_x = \frac{\sigma_x}{\bar{x}} * 100$$
$$= \frac{3545.59}{30667.72} * 100$$
$$= 11.57$$

Co-efficient of Budgeted Sales

$$CV_y = \frac{\sigma_y}{\bar{y}} * 100$$
$$= \frac{4344.46}{30789.85} * 100$$

$$= 14.11$$

d) Calculation of Correlation Co- efficient (r)

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2}\sqrt{\Sigma y^2}}$$
$$r = \frac{75012818.78}{\sqrt{63012310.63}\sqrt{94371812.45}}$$
$$r = 0.97$$

Therefore the co-efficient of determination ($r^2$) is = 0.9409

e) Calculation of Probable error (P.E)

$$= 0.6745\frac{(1-r^2)}{\sqrt{n}}$$
$$= 0.6745\frac{(1-0.9409)}{\sqrt{5}}$$
$$= 0.0178 \text{ or } 1.78\%$$

## APPENDIX

The main products of Unilever Nepal Limited are as following:

| | |
|---|---|
| 1. Soap | 2. Detergents |
| 3. Cosmetics | 4. Creams |
| 5. Toothpaste | 5.Fair and Lovely |
| 6. Close-up | 7.Sunsilk |
| 8. Lux | 9.Liril |
| 10. Pepsodent | 11.Wheet Rin |
| 12. Red leve tea | 13.Lifeboy |
| 14. Vim | 15.Clinic plus |

Dabur Nepal Pvt. Ltd. Produces and sales following types of products:

| | | |
|---|---|---|
| 1. | Lal dant manjan | 11. Real fruit juice |
| 2. | Binaca hair oil | 12. Glucose Product |
| 3. | Vatika hair oil | 13. Real juice |
| 4. | Vatika shampoo | 14. Babool tooth past |
| 5. | Amla hair oil | 15. Dantmukta |
| 6. | Anmol product | 16. Plastic Containers/ panchan Churan |
| 7. | Special hair oil | 17. Taxin resin |
| 8. | Baby olive oil | 18. Honey |
| 9. | Hajmola tablet | 19. Kshudhavardhak churan/ panchan churan |
| 10. | Hajmola candy | 20. Chywanprash parkshep/ dcp |