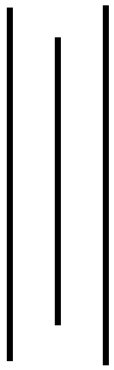
Cost Volume Profit Analysis of
Annapurna Vegetable Products Private Limited

By
Devendra Shrestha

Shanker Dev Campus
T.U. Regd. No: 7-2-39-242-2003
Campus Roll No: 1417/063
Exam Roll No. (2nd Year): 2366/065

A Thesis
Submitted to**:**
Office of the Dean
Faculty of Management
Tribhuvan University



In partial fulfillment of the requirement for the Degree of
Master's of Business Studies (M.B.S)

Kathmandu, Nepal
January 2011

DECLARATION

I hereby declare that the work reported in this thesis entitled "**Cost Volume Profit Analysis of Annapurna Vegetable Products 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 Master's Degree in Business Study (M.B.S.) under the supervision of**, Joginder Goet**, lecturer of Shanker Dev Campus.

…….

Devendra Shrestha
Researcher
Campus Roll No. 1417/063
Faculty of Management
Shanker Dev Campus
Putalisadak, Kathmandu

ACKNOWLEDGEMENTS

I'm heartily indebted to my respectable Supervisor **Joginder Goet**, Lecturer of Shanker Dev Campus, who despite their heavy schedule provided valuable and insightful suggestions and comments towards the preparation of this thesis.

I would like to pay my sincere to Prof. Dr. Kamal Deep Dhakal, Campus Chief; Prof. Bisheshor Man Shrestha, Chairman of Research Committee; others respected teachers of the Shankar Dev Campus and all the staffs of this campus for their helped me by providing various kind of suggestion, information and comments.

I hope, I have attempted to bring this report errorless but the possible errors would be covered by the future researchers.

…….

Devendra Shrestha
Researcher
Campus Roll No. 1417/063
Faculty of Management
Shanker Dev Campus
Putalisadak, Kathmandu

ABBERVIATIONS

&	And
$	US Dollar
A/C	Account
AVPL	Annapurna Vegetable Product Pvt. Ltd.
BCP Ltd.	Bhaktapur Craft Private Limited
BEP	Break Even Point
C.V.	Co-efficient of Variation
CM Ratio	Contribution Margin Ratio
CMPU	Contribution Margin per Unit
CVP	Cost Volume and Profit
CVPA	Cost Volume Profit Analysis
F.Y	Financial Year
FC	Fixed Cost
GDP	Gross Domestic Product
Govt.	Government
i.e.	That is
MOS	Margin of safety
NAL	Nepal Aushadhi Limited
No.	Number
P/L	Profit And Loss
P/V Ratio	Profit Volume Ratio
PPC	Profit Planning and Control
Pvt. Co.	Private Company
Q	Quantity
r	Correlation
Rs.	Rupees
S.D.	Standard Deviation
S.N.	Serial Number
SDC	Shanker Dev Campus
SEBON	Securities Board of Nepal
SPPU	Selling Price per Unit
SR	Sales Revenue
SVC	Semi Variable Cost
SWOT	Strength, Weakness, Opportunity & Threats
T.U	Tribhuvan University
TFC	Total Fixed Cost
TVC	Total Variable Cost
VC	Variable Cost
VCPU	Variable Cost per Unit

LIST OF TABLE

LIST OF FIGURES AND CHART

TABLE OF CONTENTS

CHAPTER - 1

Introduction

1.1 Background of the Study

Though Agriculture remains Nepal's principal economic activity employing 80% of the total population and providing 32% of GDP, the productive of this sector is very low. Only about 20% of the total area is cultivable; another 33% is forested; most of the rest is mountainous. Agricultural production continued to be influenced by weather conditions and the lack of arable land and has not always kept pace with population growth.

The economy of Nepal is least-developed. This is due to low infrastructure, education and agricultural development. Without the development of agricultural sector, the development of other sector is impossible. Most peoples on Nepal are poor and they depend upon agriculture. The distribution of land is not efficient. The Country situated between two large countries china and India. It has a lot of problems as well as prospectus too. The main causes of being 80% of the population poor are lack of industry and lack of established enterprises. Unemployment is said to be the biggest problem of the country. Almost half Nepalese population of 25.8 million live below the poverty line as it is ranked as one of the world’s poorest.

Nepal's economy is irrevocably tied to India. Trade and transit rights affected the movement of goods and increased transportation costs, although Nepal also engaged in unrecorded border trade with India.

Nepalese economy is based on mixed economy. Public and private enterprises have been working for the development of its economy. In Nepal public enterprises are felt essential to create infrastructure because the public enterprises help many areas as balanced regional development, public welfare, generated employment opportunities and export promotion etc. Likewise public enterprises are established for the sake of mobilization of internal resources and for the economic development of the country. Public enterprises have contributed through various means in the development process of the country. In the

manufacturing sector, some of the largest industries with substantial share in total industrial activities are in public sector. They have contributed through import substitution, export promotion and strengthening the revenue generation of Nepal Government of Nepal. Public enterprises in manufacturing sector should run in a commercial way along with meeting other expectations from them. They cannot run only with the service motive.

A weak economy in one country may be offset by a strong economy in another. To overcome weak economy of Nepal, it is very essential to develop the infrastructure and facilities for establishment of manufacture and processing industries. For the overall development of the country industrialization is must. It is only way to remove unemployment problem is the development of industrial sector. Industrialization helps the unemployed and underemployed persons especially from the agriculture sector to find alternative mode of productive activities and move into much more productive activities. Thus, industrialization helps reducing the pressure of land, gives a guidelines for diversification into a new area and helps to create a country economics infrastructure.

Industrialization in Nepal is in crawling stage. All the industries of the country are suffering from problems of production, finance, manpower, dashing entrepreneurs and many other more. Most of the industries established used agricultural products such as jute, sugar, and tea as raw materials. Other industries were dependent on various inputs imported from other countries, mainly India. We can trace the industrial development process in Nepal mainly after establishment of Biratnagar Jute Mill and Udyog Parishad in 1936. People hesitate to invest due to the lack of appropriate knowledge and the lack of sufficient investing capital. Unstable political environment is another reason for it. States should effort to encourage people for investment and create new investment opportunities with the minimum required facilities.

Some important changes took place in the field of industry after the restoration of democracy in 2046 B.S. Some industries we established from the private sector

thereafter. Among the modern industries were large manufacturing plants, including many public sector operations. The major manufacturing industries produced jute, sugar, cigarettes, beer, matches, shoes, chemicals, cement, and bricks. The garment and carpet industries, targeted at export production, have grown rapidly since the mid1980s whereas jute production has declined. Industrial estates were located in Patan (also called Lalitpur), Balaju, Hetauda, Pokhara, Dharan, Butawal, and Nepalganj. The government provided the land and buildings for the industrial estates, but the industries themselves were mostly privately owned.

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

Profit doesn't happen by chance. It is to be managed. CVP is a supplementary tool of planning for profit cost volume profit analysis is immensely helpful for developing alternative strategies in sales planning and the cost estimation. A certain relationship exists between the variables like selling price, sales volume, expenses and taxes. Cost volume profit analysis is an accounting technique showing the relationship between these variables. This technique is applicable in all economic sectors (manufacturing, whole selling, retailing, and service industries), because the same types of managerial functions are performed in each type of organization.

Profit planning is nearly a tool of management. Profit planning involves two aspects; profit and planning. Profit is the primary objective of business. It is necessary for survival and growth of any business entity but profit does not just happen or improve. They are managed. Profit is the primary measurement of business success in any economy, if firm is not able to earn profit than it fails to hold the capital for long period. When business firm can't hold capital, it can't secure and retain other sources, such as manpower, materials and machine etc. In other words the more profitable firms/enterprises are more

attractive to the holders of the available capital. These firms can attract capital, which they need to buy the other resources. Here key is that capital and other resources are scarce they are allocated to the profit makers in roughly descending order of their profit potential.

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

Similarly Planning is the first essence of management and all other functions are performed with in the framework of planning, planning means deciding in advance what is to be done in future? Planning starts from forecasting and predetermination of future event. Planning is the whole concept of any business organization. No firm can achieve its predetermined goal and objectives in the absence of proper plan. Hence, it is life blood of any organization which makes efficiently run towards the competitive environment. It is a method of thinking out acts beforehand. Planning is the foundation of profit realization and a plan is a projected course of action. Management is the process of planning, organizing, directing, decision-making and controlling. In modern day profit planning is taken as an important technique of decision-making. It is also regarded as a way of management and is given the name profit planning programmers; profit planning is a part of overall planning process of an organization.

Cost-volume-profit (CVP) analysis is a technique that examines changes in profits in response to changes in sales volumes, costs, and prices. It is the analysis that deals with

how profits and costs change with a change in volume. More specifically, it looks at the effects on profits of changes in such factors as variable costs, fixed costs, selling prices, volume, and mix of products sold. By studying the relationships of costs, sales, and net income, management is better able to cope with many planning decisions.

Accountants often perform CVP analysis to plan future levels of operating activity and provide information about:

- What sales volume is required to break even?
- What sales volume is necessary in order to earn a desired (target) profit?
- What profit can be expected on a given sales volume?
- How would changes in selling price, variable costs, fixed costs, and output affect profits?
- How would a change in the mix of products sold affect the break-even and target volume and profit
- The amount of revenue required to avoid losses
- Whether to increase fixed costs
- How much to budget for discretionary expenditures
- Whether fixed costs expose the organization to an unacceptable level of risk

Mainly there are three elements in CVP analysis.

They are

Cost: Fixed Cost and Variable Cost

Volume: Sales in Rs. and Sales or Production units

Profit: Difference between volume and cost

CVP analysis begins with the basic profit equation.

Profit = Total revenue - Total costs

Separating costs into variable and fixed categories, we express profit as:

Profit = Total revenue - Total variable costs - Total fixed costs

By analyzing the above equation all these terms are interconnected and dependent each other. For instance, profit per unit of a product depends on its selling price and cost per sales. The selling price to a greater extent will depend upon the cost and cost depends upon the volume of production.

Cost volume profit analysis is one of the most powerful tools that managers have at their command. CVP concepts can be used in planning and decision making. It is highly essential for the management to have the complete knowledge about the interrelationship among the cost, volume and profit. A study concerning this interconnection is under taken through cost-volume-profit analysis. Cost-volume-profit analysis is extremely helpful in profit planning and control, management decision, cost control, budgeting etc. CVP analysis is an important way to look into effects on profit from variations in cost and sales and to take appropriation decisions, especially in cost control and profit planning. Profit planning is the fundamentals part of the overall management functions. Therefore CVP is also known as complementary to PPC.

CVP simplifies the computation of breakeven in break-even analysis, a popular technique to study cost-volume-profit relationship. Break-even analysis is concerned with the study of revenues and costs in relation to sales at which the firm’s revenues and total costs will be exactly equal or the net income will be zero. Break-even is the level of sales at which the profit is zero. Cost volume profit analysis is some time referred to simply as break

even analysis. This is unfortunate because break even analysis is only one element of cost volume profit analysis. Break even analysis is designed to answer questions such as "How far sales could drop before the company begins to lose money." It is a “no profit no loss” situation. This point is a corner-stone of profit planning.

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

In Nepalese context, private manufacturing organizations are facing so many problems. There are need for a large number of good managers and managerial decisions in a developing country like Nepal. Most of organizations are in loss, profit earning is necessary to serve organization. Achieving objectives of the business organization, profit motive being the most dominant. For this application, profit planning tools are necessary.

CVP plays significant role in profit planning so AVPL, the manufacturing enterprise is taken for this study about the application of CVP in Nepalese manufacturing company.

1.2. Annapurna Vegetable Products Pvt. Limited

1.2.1 Profile of Annapurna Vegetable Products Pvt. Limited

Annapurna Vegetable Products Pvt. Limited is one of the manufacturing and processing companies. It is established in 2045/04/24 under the company act 1964 and the registration number of the company is 3187/045/046. The Company is located at Lipanimal, Bara, Narayani, in an area of the 10157 square meter of land. The area of Annapurna Vegetable Products Pvt. Limited is divided in two heads:

a. ***Production Area***
b. ***Non Production Area***

Non-production area consists of offices, parking facility, and a big lawn. In non-production area they have their own nursery. Annapurna Vegetable Products Pvt. Limited has a very attractive outlook because they have wide variety of plants and flowers in the lawn and nursery. The office interior of Annapurna Vegetable Products Pvt. Limited is very good because the offices are fully air-conditioned and heaters are also available in cold weather.

In production area there are different sections related to productions, stores, printing, and packaging of Ghee and Oil in different sizes.

Annapurna Vegetable Products Pvt. Limited not incorporated in Stock Exchange.

The principal activity of the company is to manufacture and sell refined vegetable oil, sunflower oil, soybean oil, cotton seed oil, mustard oil, palmolein oil, refine rep seed oil and vegetable ghee under the registered trademarks of the company.

The company continues to maintain its leadership in the vegetable product market because of its strong market infrastructure backed up by their effective sales and promotional plans and consumers preferences in their products. The company has already started distributing the products through the Manual Distribution Center ("MDC") directly through its wholly owned company Troika Traders (P) Ltd since 1 Jan 2006. The result of this distribution through the MDCs is very productive. We were able to increase the market share and numeric distribution by serving the markets more effectively due to the implementation of the MDC distribution model.

The company is committed to deliver the quality product to its consumers at all times. To comply with the vegetable product standards of raw materials, the company has started using the high quality raw materials produced inside the country. Hence it is the real productive sector which utilizes national resources.

1.2.2 Share Capital

The AVPL was started with an authorized capital of Rs. 250,000,000. In the initial period its paid up capital was Rs. 200,000,000. Now, the company has authorized and issued capital of Rs. 250,000,000 and paid up capital of Rs. 200,000,000 which was 154,000,000 last year. The AVPL has 6 shareholders and par value of share is Rs. 100.

1.2.3 Profit Position

AVPL is one of the top company in terms of national raw resource utilization. The company produces vegetable product named Amrit Vanaspati Ghee, Amrit Soybean Oil and it's by-product is Lahar soap, Rachana soap and Jhilke soap.

Though there was high competition and disturbances in the market, sales of the company are in increasing trend. This year the sales volume has increased by 10.30% compared to previous year. However, the profit after tax of the company has decreased by 254.37% due to high cost of production. The main cause of high production cost is high electricity cost and costly material.

1.2.4 Distribution Policy

The company doesn't have direct distribution to the consumer. The strategic long term plan is used in the company. As mentioned above, the company uses two types of distribution channel, i.e. through the dealer and retailer to the consumers. Since the company doesn't sell from company itself, it uses some kinds of commission system. But there is not any policy of discounts and incentives. Like, 8% commission on sales price is given to distributor whereas nearly 13.30% commission on sales price is provided for retailer.

In order to stay ahead of the competition, the company had launched several programs with financial and technical support from the coca cola company. The objectives of those programs are to increase the per capita consumption of its beverages in the market. This company will continue to promote all its products as before.

1.2.5 List of Raw materials

The company uses some raw materials to produce finished products. Some raw materials like rectified spirits and E.N.A are produced and re-used, others are taken from Nepalese supplier's and special materials are imported from abroad. The list of raw materials are shown in the table below:

Table 1.1 List of Raw Materials

Rectified spirits	Starch
Pure Natural alcohol	Strachable materials
E.N.A	Corns
Vaded Malt spirit	Potatoes
Malt spirit	Different kinds of fruits
Other spirit	Grains
Vegetables	Herbs
Natural oils	Yeast
Sugar	Juniper barriers (from Italy)
Sugar base materials (SAKKHARGUDD)	Coriender seeds (from Romanis, Russia, and Bulgeria)
Vaded malt	Flavour
Malts (from Scotland)	Orange and lemon peels (from spain)
Molasses	

1.2.6 Technology of the company

"Quality know no pinioned, no saturation point. It is a journey that's internal."

"The above line of thought has been company's guiding principle since inception. A philosophy that runs through every stage. Be it customer interface, technology application processing or the production phase.

Firmly believing in the ethics of total quality management, the company makes their products go through a series of stringent quality control test to enhance their appeal among their esteemed and highly valued customers. Since inception, it's been their Endeavour to render high quality products and services to customers. To achieve quality objectives, each one is always on the look out to tap the latest technology doing rounds worldwide. Keeping a close watch on the winds of changes and insuring products innovations, the company has achieved an enviable reputation in a very short period of time. All the while carrying forward the rich and tremendous legacy of sister company Jawalakhel Distillery Private Limited, of excellent, commitment and perfection.

1.2.7 Product lines of the company

The company manufactures multiple products. The main product of the company is Arun Vanaspati Ghee. Vegetable (Vanaspati) ghee is an all-purpose cooking fat, widely used in Nepal. Ghee is made from butter oil, but demand has exceeded supply, raising its price. Hence the emergence of ghee substitutes – vegetable ghee or vanaspati.

Originally, vegetable ghee was made from a blend of vegetable oils which was hydrogenated to make it solid, and processed to mimic ghee in texture and flavor. For decades, hydrogenation was essential in the production process. However, trans fatty acids result from hydrogenation, posing a health risk to coronary heart disease. Palm oil and its products with a wide range in its natural solid content can impart the required

solid fats content and texture without the need for hydrogenated. At present, palm, soybean, rapeseed and cottonseed oils are most commonly used oil for vegetable ghee.

AVPL is also use the palm, soybean, rapeseed and cottonseed oils for producing Amrit Vegetable Ghee. And as a By-Product company produces Amrit Soybean Oil, Lahar soap, Rachana soap and Jhilke soap.

The product lines of the company are shown in the following table:

Table 1.2 Product lines of AVPL

1. Amrit Vegetable Ghee	5. Jhilke Detergent Soap
2. Amrit Soybean Oil	6. Lahar Detergent Soap
3. Amrit Mustard Oil	7. Rachana Detergent Soap

Source: Annual Reports of AVPL (FY 2002/03 to FY 2008/09)

1.2.8 Organizational Structure of the Company

Every company need to understand precisely the organizational structures to facilitate the accomplishment of organizational objectives.

The company is a public limited company. So company followed the centralized power to perform better. There are seven persons in board of directors. All persons are elected from promoter-share holders. And the directly supervise and regulate the three units Manufacturing Department, Accounting and Finance Department and Marketing Department. The organizational structure of the company is shown in the figure below:

Figure 1.1

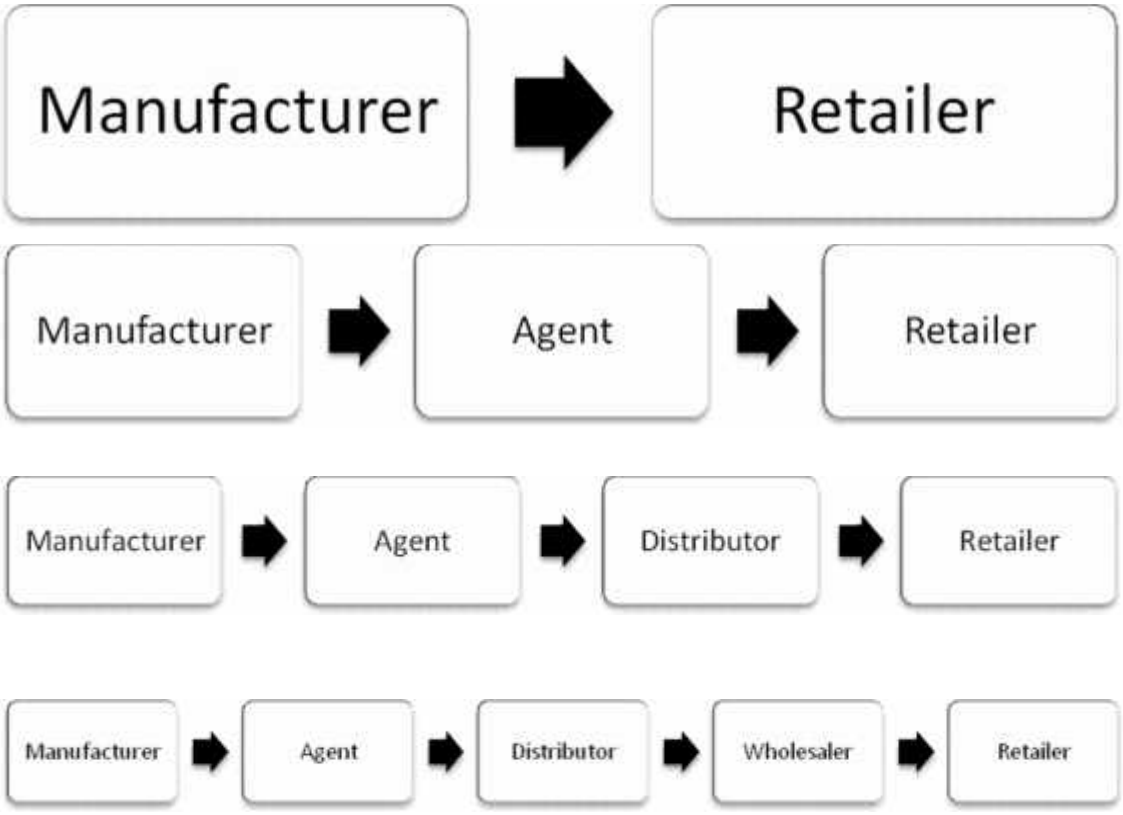
Organizational Structure of AVPL

1.2.9 Distribution Channels of AVPL

The company has adopted various types of distribution channels. The retailer includes all kinds of selling stalls. Departmental stores sell more than other retailers. The channel of distribution is shown in figure below:

Figure 1.2

Channel of Distributions



1.3 Statement of the Problem

Industrialization is an effective means of achieving economic development. It is the major hope, which can raise the living standards and provide better quality of life in the country. In the absence of industrialization, Nepal's problems like poverty, insecurity and overpopulation cannot be solved *(Pradhan, 1984:14)*. The center problem of economic development of the background countries is industrialization. It is one of the major tools with the aid of which the vicious circle of background and poverty can be broken *(Cuker, 1974:9)*. It's also a major instrument of progress, modernization and social change in developing countries *(UNDP, 1974:1)*.

Nepal is in infancy period of industrialization. The manufacturing sector is very small. In recent years the growth rate is relatively more satisfactory. The manufacturing sector has to face numerous problems which have acted as constraints in the growth of manufacturing industries. Mainly such problems are caused by the land locked situation of the country, undeveloped situation of the country, undeveloped situation of physical human, financial and administrative infrastructure and energy at reasonable rates, non availability of trained and skilled manpower, shortage of capital, small size of market unawareness of the industrial potential, higher cost of production, low productivity of inputs, manpower and technology, instabilities in government policy etc.

The industrialization process in Nepal is being developed very slowly. In spite of various attractive policies of the government in respect of industrialization, new investment made on industrial sector is not satisfactory. The financial performance of established manufacturing industries is also not good. Most of the industries are operating in losses and such condition of the established industries discourages the new investment both in manufacturing and non-manufacturing sector. There may be various and different reasons for the poor performance of manufacturing industries. Such reasons should be investigated and should be taken corrective measures for the improvement of their performance.

How the business is being operated largely depends on how the business operation is planned. 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 profit planning. CVP analysis is hugely helpful for developing alternative strategies in sales planning and cost estimation.

Nepalese forms are still being run with primitive management. They lack modern management culture there is a lot of difference between the theory and practice in the

business form. In Nepal, the practice of using CVP analysis tools for different management decision is rare.

CVP analysis provides the technique of profit planning framework. Based on annual published annual report, performance of the Nepalese industry is not satisfactory. Poor performance is the outcomes of poor planning controlling, decision making. The question has risen whether Nepalese managers are enough competent? Do they use CVP analysis tools and technique to carryout planning, decision making and controlling function? The research question posed mainly in this research will be following:

- Whether or not Nepalese manufacturing companies are practicing CVP analysis?
- What are the major difficulties in application of CVP analysis?
- Why are the Nepalese companies suffering from loss?
- Which part (i.e. CM, BEP, and MOS etc.) Of CVP analysis is mostly practice and which are not practice till now?
- What sales volume is needed to achieve break even?
- What should be the sales volume to earn a desired profit?
- What will be the profit or loss to the specified level of sales?
- What will be the relationship between cost, volume and profit?

1.4 Objective of the Study

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

- To analyze different components of cost as per cost behavior.

- To study the present application of CVP analysis in AVPL.
- To analyze the CVP and its impact in profitability of AVPL.
- To provides suggestion and recommendation on the basis of major finding

1.5 Significance of the Study

This study will be significance in the following ways:-

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

1.6 Limitation of the Study

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

- The study will cover the data of five years only from AVPL.
- The study will base in the secondary data mostly.
- The accuracy of this study will depend upon the true response and the data available from the management.

- The time and the availability of resource is the main limitation of the study.
- This study would only concern with fulfilling the partial requirement in Master in Business studies (MBS).

1.7 Organization of the Study

The entire study has been divided into the following five chapters:-

Chapter 1:- Introduction

The chapter is introduction framework that includes background of the study, profile of the concern company, statement of the problem, objective of the study, significance of the study, limitation of the study and organization of the study.

Chapter 2:- Review of the Literature

This chapter concerned with review of literature. It focuses on the theoretical part of the study including conceptual review and review of previous related studies.

Chapter3:- Research Methodology

These chapters deals with methodology that includes research design, source of data, data collection procurers and data analysis tools.

Chapter 4:- Presentation and Analysis of Data

This is the most important and most extensive chapter as it includes the main theme of the study. This chapter deals with the presentation and analysis of collected data and information. For this purpose various analytical tools will be used.

Chapter 5:- Summary, Conclusion and Recommendation

This chapter is the final chapter of the study which includes summary of the study, major finding, conclusion and recommendation.

The Bibliography, Appendix includes in the last of the thesis.

CHAPTER - 2

Review of Literature

In order to make a research on the subject some other literature should also be reviewed. Review of the literature is supported to revise the eminent literature related to the study. Main purpose of literature review is to find out the works done in the subject on the areas of research. Some possible study and conceptual prospective available in this respect have been reviewed. Various books, articles, journals, bulletins, reports, news statement, research study published by various institutions and some thesis etc. are the bases for preparing it. Some philosophers, writers or researchers have given the contribution for preparing it.

2.1 Conceptual Review

2.1.1 Introduction of Profit Planning

Profit planning and control is an important approach, mainly in profit-oriented enterprises. Profit Planning is a tool of management. It is not an end of management or substitute of management. It facilitates the managers to accomplish managerial goal in a systematic way. Profit means excess of company's revenue over the expenses of producing revenues in a given fiscal period. It is a primary measure of every success of the company. According to Groy, Jack and Jock and Johnston, Kenneths, "Profit is the primary measure of business success in an economy if a firm cannot make profit, it cannot obtain capital, it cannot secure and retain other resources such as, manpower, materials, and machines etc. In other word, more profitable enterprises are more attractive to the holders of the available capital. Since, these enterprises can attract capital; they have the money needed to buy other resources. The key here is that capital

and other resources are scare, they are allocated to the profit makers in roughly descending order of their profit potential", (Groy and Kenneths, 1973: 2).

"Planning is a technique, a means to an end, the end being the realization of certain pre-determined and well-defined aims and objectives lay down by a central planning authority. Planning is a cornerstone of effective management. It begins from the objectives and ends with preparation of budget. Profit does not just happen; it has to be managed by the management. That is management plans and manages its profits. The quality and ability of the management are often judged by the size of the profit figures at the end of the accounting period. So, profit is a part of overall planning process of an organization. When management plans its profit, it is termed as profit planning", (Munankarmi, 2003: 6.01).

"A comprehensive profit planning and control program facilitates control in many ways. It involves reporting (i) actual results, (ii) budgeted or planned results, and (iii) the differences (performance variations) between the two. This type of reporting represents an effective application of the well-recognized management exception principle. The exception principle holds that the manager should concentrate primarily on the exceptional or unusual items that appear in daily, weekly, and monthly reports, thereby leaving sufficient managerial time for overall policy and planning considerations. It is the "out of out" items that need immediate managerial attention to determine the causes and to take corrective action", (Welsch, et al., 2004: 45).

"The management will be efficient if it is able to accomplish the objective of the enterprise. It will be effective, when it accomplishes the objectives with minimum effort and cost. In order to attain long-range efficiency and effectiveness, management must chart out its course of action in advance. A systematic approach that facilitates effective management performance is profit planning and control, or budgeting. Budgeting is therefore an integral part of management. In a way, a budgetary control system has been

described as a historical combination of a goal-setting machine for increasing an enterprises profit, and "goal – achieving, machine for facilitating organizational co-ordination and planning while achieving the budgeted targets", (Goit, et al., 2062: 1).

Comprehensive profit planning and control (Profit planning and control) is a new term in the literature of business. Though it is a new term, it is not a new concept in management. The order term, the profit planning and control can be defined as process or technique of management that enhances the efficiency of management. "Comprehensive profit planning and control is viewed as a process designed to help management effectively perform significant phases of the planning and control functions. The PPC model involves (1) development and application of broad and long-range objectives of the enterprise; (2) specification of enterprise goals; (3) development of a strategic long-range profit plan in broad terms; (4) specification of a tactical short-range profit plan detailed by assigned responsibilities (divisions, departments, projects); (5) establishment of a system of periodic performance reports detailed by assigned responsibilities; and (6) development of follow-up procedures", (Welsch, et al., 2004: 30).

"Comprehensive view of PPC rather than the narrow, traditional view of a budget as a clerically derived set of quantitative schedules prepared by an accountant, because PPC overlooks the three most relevant aspects of: (i) requires major planning decisions by management, (ii) entails pervasive management control activities, and (iii) recognizes many of the critical behavioral implications throughout the organization. Viewed comprehensively, PPC is one of the more important approaches that have been developed to facilitate effective performance of the management process. The concepts and techniques of profit planning and control have wide application in individual business enterprises, governmental units, charitable organizations and virtually all group endeavors." (Welsch, et al., 2004: 31).

“In modern-day businesses except in very small companies, it is virtually impossible for the top manager to have firsthand knowledge of all the relevant factors operating throughout a business. Nor can a single lower-level manager be excepted to have the range of knowledge, experience, and competence to make all the decisions for the large segments of a company, either as a source of reliable information or as a participant in decision making. The quality of the judgments of the total management effort will continue to distinguish the better-managed and more successful companies. It is unlikely that clerical techniques, mathematical models, and simulations will substitute in major respects for managerial judgment in complex endeavors. These important tools, on the other hand, can use to increase significantly the effectiveness of a management and to place managerial judgments on a more objective and informed foundation.” (Welsch, et al., 2004: 31).

Profit planning and control can be adapted to any organization (profit or non-profit, service companies, financial institutions, hospitals, certain retail business, construction companies, and real-estate enterprises etc.). However, a single profit planning and control system that is appropriate for all enterprises cannot be designed. A profit planning and control system must be tailored to fit the particular enterprise, and it must be continually adapted as the enterprise and its environmental change.

2.1.1.1 Profit

An organization is established to achieve some goals. It has its own objectives. To achieve the goals of organization objectives should clearly mention. In this competitive globalize business age, an organization whether it is public or private profit is essential. Profit isn’t change; it is result of successful management.

Profit is the primary measure of successful business of a firm or a company. It is the main test of the business enterprises performance. Simply, profit is the excess of income over cost of product or services.

The basic objective of running any business organization is to earn profit. Profit is taken to measure the competency and efficiency of the management. Profit isn't just happened but it is managed. If a firm cannot make profit it cannot generate capital of future. Profit is the primary measurement of successful business in any economy. Profit is a residual income left after the payment to other factor of production. The difference between the outflows of expenses (i.e. cost of production, selling and distribution of that products etc.) and inflow of income (i.e. sales price) is called profit. It is a reward for business activities. Profit is obtained by subtracting the cost from revenue. Profit determines the financial position, liquidity and solvency of the business.

Generally profit is controversial terms and many authors define its in different ways.

The basic objectives of running any business organization are to earn profit. Profit serves as a yardstick for judging the competence and efficiency of the management (*Maheshwari, 2000:171).*

The word "profit" implies a comparison of the operation of the business between to specific date which is usually separated by an interval of one year. In order to optimize those corporate source of wealth in which national prosperity depends on those corporate financial objectives of the company is to maximize within socially acceptable limits profit from the use of funds employed by them. The maximization of profit within socially acceptable limit implies that a proper regard to public interest has been paid. No company can survive long without profit; profit is the ultimate measure of its effectiveness and in a capitalized society. There is no future for a private enterprise which always increased loses. The survival measure of the effective performance of a business

is a profit which really is a measure of how well a business performs economically. Profit is a signal for the allocation of resources and a yardstick for judging managerial efficiency. Profit is a primary objective of a business in view of the heavy investment which is necessary for the success of most enterprise. Profit in the accounting sense tends to become a long term objective which measures not only the success of product but also the development of market of it *(Kulkarni,1985:245).*

According to the *economist perception*, some economist says that profit is a rent of ability. Some says profit as reward for risk bearing of business. It is also said that profit is return to uncertainty bearing and it is also reward for innovation. Innovations are those new products or process which increases national income more than they increases national cost *(Reeki & Jonathon, 1988:380-381).*

In the opinion of *Myers john N*, Profit is the dominant goal in business and profit making should be the main objectives in terms of which the general effectiveness of organization is measured. In other words, profit is obtained by subtracting the cost from revenue. Profit is the reward of the entrepreneur rather of the entrepreneurial functions.

Profit differs from the return on other factors in three respects *(Dewelt,1981:299)*.

- Profit is residual income and not contractual or certain income as in the case of others factors.
- There is much greater fluctuation in profit than the reward of the other factors.
- Profit may be negative but rent, wages and interest must be always being positive.

Dean Joel clearly distinguishes the views of accountant and economist about profit as following point. The most important point of different between economist and accountant approaches is:

- The business of cost i.e. what should be subtracted from revenue to get profit.
- The meaning of depreciation.
- The price level basis for valuation of assets.
- The treatment of capital gains and losses and perhaps most important.

The term profit in views from management as follows:

- An intangible expression of the goals it has set for the firm.
- A measure of the performance towards the achievement of its goals.
- A means of maintaining the health growth and continuity of the company *(Lynch & Williams, 1988:245).*

2.1.1.2 Planning

Planning is the first essence of management and all other function is performing within the framework of planning. Planning means deciding in advance, what is to be done in future? Planning starts from forecasting and pre-determination of future events. Planning is the whole concept of any business organization. No firm can achieved its pre-determined goals and objectives in the absence of proper plan. Hence, it is life blood of any organization which makes efficiently run towards the competitive environment.

Planning is also aimed at giving shape to the future. It is a basic function of management. It may be defined as the selection from among the alternative of courses for future actions. It is functioned by the managers decided what goes out to be accomplished and how they are to be reached.

The planning process which involves both short and long term is the most crucial components of the whole system. It is both foundation and the bond for the other elements because it is through the planning process that we determine what we are going

to do, how we are going to do it and who is going to do it. It operates as the brain centre of an organization.

Profit don't just fall, it should be properly planned. In other words, profit isn't a matter of changes. It comes from effective and realistic plan. Planning is the process of developing enterprises objectives and selecting future course of action to accomplish them. It is the methods thinking about acts and purpose before planning starts comes forecasting and determination of future events. It is the first essence of management and all other functions are performs within the framework of planning. So, planning is the basic foundation of profit plans.

Planning assesses the future makes provision for it and assumes the achievements of pre-defined goals. Simply, the planning means the determination of any works in advance of actions. Basically, it is a decision making process that provides a base for economic and effective future course of action.

Planning means a assessing the future making provision for it and assuring that establishing goal can be met with acceptable home frame. Define the planning it simplest term as determination of anything in advance of action. It is essentially a decision making process that provides a basis for economical and effective action in the future. Effective planning sets the stage for integrated action to take place, reduce the number of enforceable crisis, promotes to use of more efficient methods and provides the basis for the managerial function of control.

Glenn A Welsch defines management planning as the design of a desired future state for an entity and effective ways of bringing in about. He further explains that a fundamental purpose of management is to provide for a feed forward process. The concept of feed forward planning is generally recognized as the most difficult task facing the manager

and it is one on which it is very easy to procrastinate. It clearly indicated that panning is a decision making process of the highest order, it requires management time and dedication and a systematic approach. The decisions made in the planning process are;

- Anticipatory, since they are made something in advance of action and
- Interrelated, since they comprise broad groups of interdependent choice from alternatives of the government, *(Welsch, et al. 1979:11).*

Planning is the basic foundation of profit planning and a plan is a projected course of action. Planning is a technique whereby the use pattern of resources is carried out, *(Agrawal, et al., 1989:348).*

A planning process includes goal setting, resource evaluating, forecasting by different methods and formulating a master plan. Planning depends upon the organized objectives. For the planning purpose, a firm's objective can distinguish mainly three types: prime, instrumental and specific. The prime objective is to complete the action. Instrumental objectives are for accomplishment of divisional and individual goal. Specific objectives are those objectives that have been specified as to time and magnitude, which are known as organizational goals. Therefore, company's objectives provide the ultimate criteria for resolving difficulties of company and company objectives are the base for long range profit planning.

Planning is the conscious recognition of the future of present decision. Planning is the feed forward process to reduce uncertainty about future. So planning is an intellectual process, rational way, a systematic way and the goal oriented task. Primary function of management and planning provides all managerial activities and it is directed towards efficiency, *(Welsch, et al., 1992:3).*

Objectives

The first stage in the planning and control system is setting the objectives which are deigned as the broad and long range desired sate or position in the future. They are motivational or directional in nature and expressed in qualitative terms.

Goals

The second stage in the planning process is specifying the goals. The term goals as an element in planning represent targets, specified in quantitative terms to be achieved in a specific period of time.

Strategies

The next step involves laying down the strategies. Strategies denote specific methods or course of actions to achieve the goals. Strategies are the basic thrusts ways and tactics that will be used to attain planned objectives and goals. A particular strategy may be short term and long term strategies focus.

Budgets/Plans

The final step is the preparation of budgets/plans. Basically budgeting is the periodic planning to implement the alternative during a particular fiscal period, usually one year. It converts goals and strategies into annual operating plan.

2.1.1.3 Profit Planning

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

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

Profit planning is, therefore a fundamental part of the overall management functions and is a vital part of the total budgeting process. The management determines the profits goals and prepares budgets that will lead them to the realization of these goals. Profit planning can be done only when the management has the information about the cost of the products both fixed and variables and the selling price at which it will be in a position to sell the products of the company, *(Maheshwari, 2000:171).*

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

Profit planning is a comprehensive statement of intentions expressed in financial terms for both short and long term operation of the firm. It is a plan for the accomplishment of organizational expectations. It is a base for measuring the variation between planned and

actual performances. The success of each organization will be determined by reaching or exceeding those targeted plans.

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

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

The main aim of profit planning is to forecast about future. So it plays the vital role in the development of organization. It is the most important tool in the field of managerial decision making in the enterprises. Main purposes of profit planning and control are as follows *(Welsch et al.,1992:44):*

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

Profit planning is a part of an overall planning process and is an area in which finance function play a major roles. The success of each enterprise in realizing its optimum profit

in each year will be determined by the extent to which it establishes, develops, co-coordinate plans to meet those objectives and exercise control of all facts of its activity so as to have actual results reach or exceed those planned. This entire process constitutes the further stated that profit planning & control has the ultimate objectives of attaining the optimum profits *(Kellen, et al.,:388).*

Neil W. Chambrlin describes in his research report that “profit planning & control refer to the organization techniques & procedures whereby long & short range plans are formulated, considered & approved. A profit plan is an advance decision of expected achievement based on the most efficient operating standards in effect or in prospect at the time it is established against which actual accomplishment is regularly compared. In short, it provides a tool for more effective supervision of individual operations and practical administration of the business as a whole.

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

Ninemeier, Jack D and Sctimidgall, Rayrall defines the topic profit plan "as an estimation and pre-determination of revenues and expenses that estimates how much income will be generated and how it should be spent in order to meet investment and profit requirements."

2.2 Fundamental Concepts of Profit Planning and Control

"Profit planning and control involves development and application of broad and long objectives for the enterprises, specification of goals, long range profit in broad term, tactical short range profit plan detailed by assigned responsibilities (division, department, project), a system of periodic performance reports detailed by assigned responsibilities, control system and follow up procedures. Hence, profit planning and control represents an overall plan of operations, providing guidelines to management and acting as single light for the management. It enables the management to correct its policy. Profit planning and control covers a definite period of time and formulates the planning decision of management. It consists of three main budgets: (i) Operational Budget related with revenue and expenses; (ii) Financial Budget concerned with financial statements; (iii) Appropriation Budget related with advertising and ultimately succumbs to the swirl of current events. PPC performance measurement extends from the top to the lowest organizational level in the enterprises. Some significant behavioral implications of PPC, with emphasis on developing positive reinforcement, improving motivation, developing goals, coping with the effects of budgetary pressure, resolving budget-padding problems, and using budgets for control." (Goit, et al., 2062: 1.2).

The fundamental concepts of PPC include the underlying activities or tasks that must generally be carried out to attain maximum usefulness from PPC and these fundamentals have never been fully codified. An outline of the fundamental concepts profit planning and control usually identified is as follows:

- A managerial process that includes planning, organizing, staffing, leading, and controlling.
- A managerial commitment to effective management participation by all levels in the entity.

- An organization structure that clearly specifies assignments of management hority and responsibility at all organization levels.
- A management planning process consistent with the functions, decision making roles.
- A management control process consistent with preliminary control, concurrent control, feedback control.
- A continuous and consistent coordination of all the management functions.
- Continuous feed forward, feedback, follow-up, and replanning through defined communication channels (both downward and upward)
- A strategic (long-range) profit plan.
- A tactical (short-range) profit plan.
- A responsibility accounting system.
- A continuous use of the exception principle.
- A behavioral management program.

2.3 CVP Analysis as a Powerful tool of Profit Planning and Budgeting

Cost- Volume-Profit analysis is a supplementary tool of profit planning. It tells many things about the relationships between the business variables. It is an analytical technique for studying the relationship between volume, cost, prices, and profits. It is used to determine the profit planning process of the firm. In fact, entire field of profit planning has become associated with cost-volume-profit relationship. Total cost represents the fixed and variable cost for desired volume of output required for anticipated amount of profit. An extensive market research is to be conducted in advance for forecasting the volume of sales which is required for attainment of desired level of profit. Thus, total cost incurred for the volume of sales is calculated.

At the beginning point of the profit planning, it helps to determine the minimum sales to avoid losses and sales volume at which the profit goal of the firm will be achieved. As an ultimate objective, it helps the management to find out the most profitable combination of cost and volume. A management, therefore, uses cost volume profit analysis to product and calculates the implications of its short run decisions about fixed cost, variable cost, volume and selling price for its profit plan on a continuous basis.

Moreover, 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 the bottom line. Cost volume profit is a management accounting tool to show the relationship between the elements of profit planning. Profit planning is the function of the selling price of product, demand, variable costs, fixed costs, taxes, etc. The whole picture of profit planning is associated with cost volume profit inter relationships. A popular technique to study cost volume profit relationships is break even analysis which is a cornerstone of profit planning. So, CVP analysis is an important tool for management to take the important managerial decision which effects the profit planning. In fact, CVP analysis supplies answers to questions such as:

• What is the minimum level of sales to avoid the losses?
• What should be the sales level to earn the desired profit?
• What will be the effect of changes in prices, costs, volume or profit?
• What will be the effect on the profit, where sales mix is change?
• What will be the new break-even point when there is change in prices, costs, volume and sales mix? (Munankarmi, 2003: 373)

2.4 Cost Volume Profit Analysis

The dictionary meaning of cost is the price paid to acquire, produce, accomplish or maintain any things. Volume is a mass or quantity of something or amount. Profit is the

ratio of such pecuniary gain to the amount of capital invested and analysis is resolution, separation or breaking into parts. But actually cost volume profit analysis is the process of examining the relationship among revenues, cost and profits for a relevant range of activity and for a particular time frame. Basically, CVP analysis involves finding the most favorable combination of variable costs, fixed cost, selling price, sales volume and mix of products sold. CVP analysis provides the managers with a powerful tool for identifying those curses of action that will and will not improve profitability.

Cost volume profit analysis is important tool of profit planning because it provides the information about the behaviors of cost in relation to volume, volume of production or sales where the business will break even, sensitivity of profit due to variation of output, amount of profit for a projected sales volume and quantity of production and sales for a target profit level etc. CVP analysis may therefore be defined as a managerial tool showing the relationship between various ingredients of profit planning, (cost, selling price and volume of activity). CVP analysis is an important media through which the management can have an insight into effects in profit on account of variations in cost and sales and take appropriate decisions. Cost volume profit analysis is great helpful in managerial decision making. Specially, cost control and profit planning is possible with the help of CVP analysis. Profit planning is the fundamental part of the overall management functions. Profit planning can be done only when the management has the information about the cost of production and selling price of the product.

CVP analysis is an analytical tool for analyzing the relationships among cost, price, profit, sales and production volume. Mainly, there are three elements in CVP analysis. They are cost, sales or production volume and profit. All these terms are interconnected and dependent on one another. For instant, profit per unit of a product depends on its selling price and cost of sales. The selling price to a greater extent will depend in the cost and cost depends on the volume of production. It is highly essential for the management to have the complete knowledge about the interrelationship among the cost, volume and

profit. A study concerning this inter connection is undertaken through cost volume profit analysis. CVP analysis is extremely helpful in profit planning and control, management decision and cost control etc.

CVP analysis can be regarded as a sophisticated method or analytical tool used in management. The use of this method helps in determining the different levels of product of sales to avoid losses to earn a desired net profit and so on.

Cost volume profit analysis is one of the major and popular tools to analyze the financial statement of the firms. It is one of the important part of profit planning and control or budgeting.

CVP analysis is one of the most important and powerful tools that manager have at their command in short term planning. It helps managers understand inter relationship between cost volume of profit in an organization by focusing on interaction between the following five elements.

1. Price of product
2. Volume or level of activity
3. Per unit variables costs
4. Total fixed costs
5. Mix product sold

Generally cost volume profit analysis provides information regarding *(Munakarmi, 2003:124):*

- Minimum level of sales to avoid losses.
- Sales levels to earn target profit.
- Effects of changes in process, costs and volume on profits.

- Effect of changes in sales mix on profit.
- New break even point for changes.
- Impact of expansion plan on CVP relationship.
- Products those are most profitable and least profitable.
- Whether to continue or discontinue the sales of product or operation of plant.
- Whether to close or not the firm for a short term.
- Effect on operating profit with the increase in fixed cost etc.

Cost volume profit analysis provides information for the management decisions about effective budgeting of a company. It is an organized approach for planning, appraisal or coordination and control.

Cost volume profit analysis examines the behavior of total revenues, total cost and operating income as changes occur in the output level, the selling price, the variables cost per unit and or fixed cost of a product *(Datar & Foster, 2003:136).*

Cost volume profit analysis is a systematic method of examining the relationship between changes in activity (i.e. output) and changes in total sales revenue, expenses and net profit. CVP analysis is subject to number of underlying assumptions and limitations. Nevertheless it is powerful tool for decision making in certain situations *(Drury, 2000:17).*

Most of the business fails after a few years sometimes months of starting because they tend to do anything for volume without thinking how it's going to affect the bottom line. CVP analysis is a management accounting tool to show the relationship between the elements of profit planning. Profit planning is a function of the selling price of product demand, variable costs, fixed costs, taxes etc. *(Bajracharya, et al., 2004:225).*

Cost volume profit analysis is the analysis of three variables i.e. cost, volume and profit. Such an analysis explores the relationship existing among cost, revenue, activity levels and the resulting profit. It aims at measuring variations of cost with volume. In the profit planning of a business, cost volume profit relationships is the most significant factor. The CVP analysis is an extension of marginal costing. It makes use of principles of marginal costing. It is an important tool of planning. It is quite useful in making short run decisions *(I C A 2004:2.16).*

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

2.4.1 Basic Features of CVP Analysis

a) Sales revenue: Total sales revenue fluctuates in direct proportion to the units sold. Revenue per unit is assumed to remain constant.

b) Variable costs: Total variable costs change in the same proportion and in the same direction at the volume of output changes, and as per unit variable costs remain fixed.

c) Fixed costs: Total fixed costs remain unchanged for the same period of time whatever may be the level of output within the relevant range. Per unit fixed costs are variable.

d) Semi variable costs: Those costs, which are neither constant in total amounts nor constant per unit, are mixed or semi-variables cost.

2.4.2 Basic Assumptions of CVP Analysis

Cost-volume-profit analysis is a 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. Cost-volume-profit analysis helps to plan for every set of goals in the short-run. CVP analysis is based on a specific set of assumptions that are following:

a) The concept of cost variability is valid; therefore, costs can be classified and measured realistically as fixed and variable.

b) There is a relevant range of validity (i.e., activity) for using the results of the analysis.

c) The sale price does not change as units of sales change.

d) There is only one product, or in the case of multiple products, that sales mix among the products remains constant.

e) Those basic management policies about operations will not change materially in the short run.

f) The general price level (i.e., inflation and deflation) will remain essentially stable in the short run.

g) The sale and production levels are synchronized; that is, inventory remains essentially constant or is zero.

h) The efficiency and productivity per person will remain essentially unchanged in the short run.

2.4.3 Significance of CVP Analysis

CVP analysis provides management with a comprehensive overview of the effects on revenue and costs of all kinds of short-run financial change. Planning, controlling and decision making are the essential managerial functions. Cost-volume-profit analysis helps managers to plan for profit, to control cost and make decision. It helps:

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

It provides information regarding:

- Minimum level of sales to avoid losses.
- Sales level to earn target profit.
- Effects of changes on prices, costs and volume on profits.
- Effects of changes in sales mix on profit.
- New break-even point for changes.
- Impact of expansion plan on CVP relationship.
- Products those are most profitable and least profitable.
- Whether to continue or discontinue the sales of product or operation of plan.
- Whether to close or not the firm for a short-term.
- Effect on operating profit with the increase in fixed cost.

2.4.4 Use of CVP Analysis in Profit Planning

Planning, controlling and decision making are the essential managerial function. Cost volume profit analysis helps the managers to plan for profit to control cost and make decision. As such it helps *(Bhattarai, 2060:101-102);*

- To determine the break even point in rupees and units.
- To determine profit and loss at different level of activity.
- To determine the margin of safety in units and rupees.
- To determine new break even points in rupees and units after change on variable cost or fixed cost or selling price.
- To determine the sales volume in rupees and units at which the profit goal of organization will be achieved.
- To determine the most profitable and least profitable product or project.
- To determine the maximum sales volume in units and rupees to avoid losses.
- To determine the optimum selling price.
- To help management to find the most profitable combination of cost and volume.
- To find out effect on profit after increase in or decrease in selling price, variable cost and fixed cost.

1.1.1

2.4.5 Applications of CVP Analysis

Cost volume profit analysis is applied specially for break even analysis and profit planning. Business organization is run to earn profit. Profit planning is the fundamental part of the overall management function. Profit planning can be done only when the

management has the information about the cost of the product, both fixed and variable cost and the selling price of the product.

CVP analysis can be applied in the following respects *(Dangol, 2004:36);*

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

2.4.6 Approaches to CVP Analysis

There are three approaches to CVP analysis. They are:

- Contribution margin (CM) approach
- Cost and revenue equation approach
- Graphic approach

2.4.6.1 Contribution Margin Approach

In general sense, contribution is to leave something for some purpose. One very important concept in cost volume profit and break even analysis is contribution margin. Cm reflects the revenue remaining after covering all variable costs.

The profit potential of a business enterprise is indicated by contribution margin approach. It highlights the relationship among cost, sales and profit.

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

The difference between selling price and variable cost (i.e. the marginal cost) is known as 'contribution margin' or 'gross margin'. In other words, fixed cost plus the amount of profit is equivalent to contribution margin. It can be expressed by the following formula;

Contribution Margin = Sales Revenue – Variable Cost = Fixed Cost + Profit

Contribution Margin per Unit = Selling Price per Unit – Variable Cost per Unit

We can derive from it that profit cannot result unless contribution exceeds fixed cost. In other words, the point of no profit no loss shall be arrived at where contribution is equal to fixed costs *(Maheshwari, 2000:176).*

CVP analysis is the amount of contribution margin available from the sales volume of absorbs fixed cost and also contributes towards company's profit goal after deducting all variable cost of sales. When the contribution margin is high, then also profit is high.

Companies that separately identify and measure the fixed and variable components of cost often use a contribution margin approach on their periodic income statement prepared for internal management uses. These income statements provide financial data that are uniquely useful for management planning purpose because of the emphasis on

fixed and variable costs. Most of the managerial decisions that relate to operations (either directly or indirectly) are based in some way to knowledge of the fixed and variable components of cost *(Welsch, et al.,1995:498-499).*

The variables usually used in cost volume profit analysis are:

1. Sales Value

Any firm or company may have different products, services etc. the sales value or rupees includes the quantity of total sales multiplied by selling price per unit.

2. Variable Cost

Variable cost is that cost which is directly affected by changes in the activity level. The per unit variable cost always remain constant. If the activity level is decreased, the variable cost also decreases. If the activity level or production level increase, then the variable cost also increase. Change in variable cost affects CM ratio, BEP and net income. When variable cost increase, net income, cm ratio and margin of safety will be decreased and it helps to increase BEP.

3. Fixed Cost

Fixed cost remains constant in total amount despite the changes in the level of activities. That is the fixed cost remains unchanged in total as the activity levels vary. When other factors remain unchanged, the change in fixed cost effects to BEP and net income. Increase in the fixed cost, increase the volume of BEP and decrease the net income or vice versa. Fixed cost is also called capacity cost.

4. Mixed Cost

Expenditures that cannot be categorized as purely fixed or variables are termed as mixed cost or semi variable cost. Mixed cost contains both variable and fixed cost elements. Repair and maintenance, supervision, telephone cost, electricity charge are some

examples of mixed costs. It should be separated into the variable and fixed cost elements for profit planning, cost control and decision making.

5. Jumping Cost

Some cost remains fixed over a wide range of activity, but some jump to a different amount for activity level within that range. Such costs are called jumping costs or step fixed cost or moving fixed cost or ladder fixed costs.

Contribution Margin Ratio (CM Ratio)

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

$$\text{CM Ratio X} \frac{\text{Sales Revenue - Variable Costs}}{\text{Sales Revenue}}$$

Or

$$\text{CM Ratio X} \frac{\text{Contribution Margin}}{\text{Sales Revenue}}$$

Or

$$\text{CM Ratio X} \frac{\text{SPPU - VCPU}}{\text{SPPU}}$$

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

CM Ratio = 1 – Variable Cost Ratio Or $\text{CM Ratio X1 Z} \frac{\text{Variable Cost}}{\text{Sales Revenue}}$

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

$$\text{CM Ratio} \times \frac{\text{Changes in Contribution Margin}}{\text{Changes in Sales Revenue}}$$

Or

$$\text{CM Ratio} \times \frac{\text{Changes in Net Profit}}{\text{Changes in Sales Revenue}}$$

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

$$VC = \text{Sales}\ (1 - \text{CM Ratio})$$

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

A business enterprise can improve its profit by improving a profit volume ratio. The management can eliminate the unprofitable lines which are having either a lower profit volume ratio or low volume. A lower ratio means less profitability and vice versa. The profit volume ratio can be increased by:

- Increased sales price per unit.
- Decreasing variable cost.
- Increasing the production of products having high P/V Ratio and vice versa.

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

The P/V Ratio is used to determine the following facts:

- For the analysis of break even point.
- For ascertaining of profit at a budgeted sales volume.
- For calculation of sales amount required to earn a target profit.
- For ascertaining sales amount needed to keep up with previous profit while decreasing selling price.
- For ascertaining profit on margin of safety.
- For determination of selling price.

2.4.6.2 Cost and Revenue Equation Approach

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

Profit = Total Revenue – Total Cost

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

Profit = Total Revenue – Total Variable Cost – Fixed Cost

Or,

Profit = (Unit Selling Price x Sales Unit) – (Unit Variable Cost X Sales Units) – Fixed Cost

Or,

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

Or,

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

Where,

P = Profits

Q = Sales Units

S = Unit Selling Price

V = Unit Variable Cost

FC = Fixed Cost

$$Q \text{ X} \frac{\text{FC } \Gamma \text{ Profit}}{\text{CMPU}}$$

Where, SPPU – VCPU = CMPU

$$\text{BEP in units X} \frac{\text{Fixed Cost}}{\text{CMPU}}$$

$$\text{BEP in Rs. X} \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$$

There is no profit no loss at BEP. In case the volume of output or sales is to be computed for a desired profit, the amount of desired profit should be added to fixed cost in the formula given above.

$$\text{Required Sales for Desire Profit (in Units) X} \frac{\text{Fixed Cost } \Gamma \text{ DP}}{\text{CMPU}}$$

$$\text{Required Sales for Desire Profit (in Rs.) X} \frac{\text{Fixed Cost } \Gamma \text{ DP}}{\text{P/V Ratio}}$$

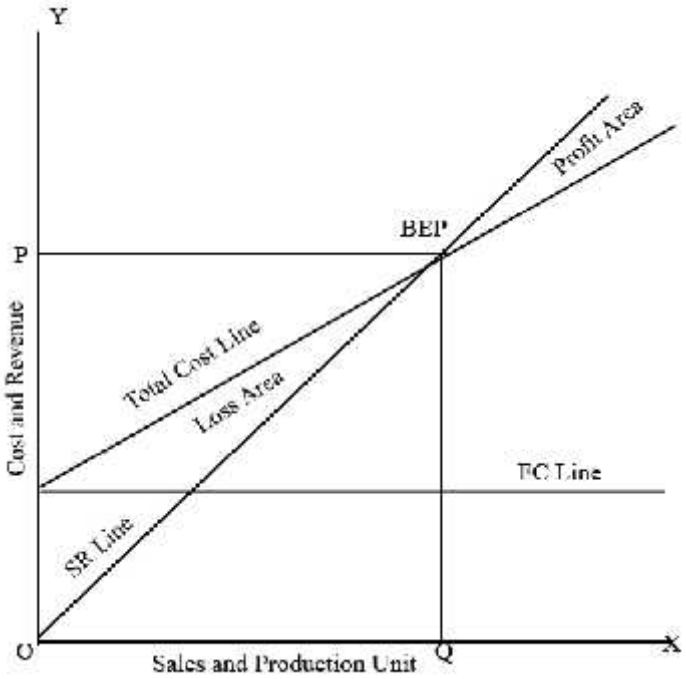
$$\text{Required Sales for Desire Profit After Tax (in Units) X} \frac{\text{Fixed Cost } \Gamma \frac{\text{DPAT}}{1 - \text{T}}}{\text{CMPU}}$$

$$\text{Required Sales for Desire Profit After Tax (in Rs.) X} \frac{\text{Fixed Cost } \Gamma \frac{\text{DPAT}}{1 - \text{T}}}{\text{P/V Ratio}}$$

2.4.6.3 The Graphic Approach

A break even chart is used to graphically depict the relationships among revenues, variable costs, fixed costs and profit or losses. The no profit no loss point (BEP) is located at the point where the total cost and total revenue line cross. Below this point the firm bears losses and above this point, the firm earns profit.

Figure 2.1 Graphic Approach of BEP Analysis



In the above chart, sales and production unit is plotted on horizontal or x-axis and vertical or y- axis represents cost and revenue. In graph the fixed costs remain constant with relevant range; the fixed cost curve is parallel to 'ox' axis. Variable cost slope upward from the origin to right but depends on variable cost ratio. The total costs curve parallels the variable cost curve. BEP is located where the total cost line crosses the sales revenue line.

The above graph clearly states that if the company can reach the point BEP, it can generate sufficient revenues to cover all its operating expenses. At this point total revenues equal the total cost. Here, the revenue curve break up (intersects) the total cost curve, that's why this point is called 'break even point'. At BEP, total sales revenues = total cost *(Bajracharya,et al.,2004:230*).

If the actual sales are more than the break even sales, the organization will earn profit and if the actual sales are less than the break even sales, the organization will suffer from loss.

2.5 Break Even Analysis

Break even analysis is the term used to study of the relationship between cost, volume and profit at various level of activity. It is the most widely known from of the CVP analysis. Break even analysis is a special case of CVP analysis.

Break even analysis is used to determine the level of sales of products required to just recover all cost incurred during the period *(Hammer, et al., 1994:592).*

Break even analysis is widely used technique to study cost volume profit relationship. The narrow interpretation of the term break even analysis refers to a system of determination of that level of activity where total cost equals total selling price. The broader interpretation refers to that system of analysis, which determines probable profit at any level of activity *(Maheshwari, 2000:175).*

Cost volume profit analysis is sometimes referred to simply as a break even analysis. This may be misleading because break even analysis is just one part of the entire CVP concept. It is always taken as an important part of profit planning as it gives the planner many insights into the data with which he or she is working. Profit planning of each firm begins from break even analysis.

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

2.5.1 Break Even Point

The point, which breaks the total cost and the selling price evenly to show the level of output or sales at which there shall be neither profit nor loss, is regarded as break even point. At this point, the income of the business exactly equals its expenditure.

Break even analysis, more precisely the break even point tells what quantity of output sold at which total revenues equal total costs. Break even point is that quantity of output sold at which the operating income is zero. Break even point is the bridge between the loss area and the profit area. Profit begins from the break even point. It is survival point where all firms must at least remain to sustain or continue the business *(Bajracharya, et al., 2004:23)* .

The break-even point can be computed by the following formula.

$$\text{BEP in units } X \frac{\text{Fixed Cost}}{\text{CMPU}}$$

$$\text{BEP in Rs. } X \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$$

The contribution margin and equation approaches are two equivalents for finding the BEP. Both methods reach the same conclusion, so personal preference dictates which approach should be used.

2.5.2 Cash Break Even Point

Some of the firms fixed costs are non cash outlays, and for a period, some of its revenue may be in receivable. It may be therefore important to find BEP on a cash basis for accounting and financial decision making. If non cash items are eliminated from revenues and costs, the BEP analysis on cash basis can easily be computed.

It is the point where cash break even (i.e. the value of sales where cash realization on account of sales will be just sufficient to meet immediate cash liabilities). While calculating this point cash fixed cost (i.e. excluding depreciation and deferred expenses) and cash contribution (i.e. selling price less the cash variable costs) is considered. The point helps the management in determining the level of activity below which there are

chances of insolvency on account of the firms inability to meet cash obligations unless alternative arrangement are made *(Maheshwari, 2000:178)* .

The cash break-even point can be computed by the following formula.

$$\text{Cash BEP (in Unit)} = \frac{\text{FC - Non Cash Expenses}}{\text{CMPU}}$$

$$\text{Cash BEP (in Rs.)} = \frac{\text{FC - Non Cash Expenses}}{\text{P/V Ratio}}$$

2.5.3 Composite Break Even Point

In case a concern is dealing in several products, a composite break even point can be computed according to the following formula *(Maheshwari, 2000:179).*

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

$$\text{Composite BEP (in Rs)} = \frac{\text{Total Fixed Cost}}{\text{Composite P/V Ratio}}$$

2.5.4 Applications of Break Even Analysis

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

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

2.5.5 Assumption and Limitation of Break Even Analysis

\The assumptions and limitation underlying the construction of break even points are as follows *(Maheshwari, 2000:168)*;

- All costs can be classified into fixed and variable cost. There is no other cost than fixed cost and variable cost.
- Selling price per unit remains constant. It is not affected by sales volume.
- Fixed cost will remain constant and variable cost varies proportionately with activity.
- Either the firm produces only one product or the product mix is constant at all level of output.
- General Price level will remain essentially stable in the short run.
- Changes in the opening and closing inventories are not significant.
- That the level of production and sales remain unchanged during the period.

2.6 Margin of Safety (How safe is Business?)

Margin of safety is the excess of 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 a position above the break even point. It serves as a cushion or spring plate that enables a business firm to absorb the shocks of adverse business conditions. It indicates the extent to which sales may fall before suffering any loss i.e. greater the margin, safer the firm.

The soundness of business is indicated by margin of safety. The difference between total sales and break even sales is identified by margin of safety. The high margin of safety is good for business. It indicates that there can be substantial falling of sale and yet profit can still be made. On the other hand, if the margin of safety is small, it indicates the weak position of business. The small margin of safety shows that even a small reduction in sale or production will adversely affect the profit position of business.

The margin of safety indicates the extent to which sales may fall before the firm suffers a loss. Larger the margin of safety, safer is the firm. A high margin of safety is particularly significant in times of depression when the demand for the firm's product is falling. A low margin of safety may result for a firm which has a low contribution margin ratio. When the both the margin of safety and the cm ratio low, management should think of the possibilities of increasing the selling price, provided it does not adversely affect the sales volume, or reducing variable costs by bringing improvement in the manufacturing process *(Maheshwari, 2000:240)*.

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 chances for the company to earn profit (i.e. larger the margin of safety, safer the company) (*Munakarmi,2003:127).*

Margin of safety can be ascertained by using the following formula:

Margin of Safety (in Units) = Actual Sales (in units) – Break Even Sales (in units)

Margin of Safety (in Rs.) = Actual Sales (in Rs.) – Break Even Sales (in Rs.)

$$\text{Margin of Safety (in Units)} \; X \frac{\text{Profit}}{\text{CMPU}}$$

$$\text{Margin of Safety (in Rs.)} \; X \frac{\text{Profit}}{\text{P/V Ratio}}$$

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

$$\text{Margin of Safety Ratio} \; X \frac{\text{Actual Sales - BE Sales}}{\text{Actual Sales}}$$

If margin of safety is unsatisfactory, it can be improved through the following steps:

- By increasing the sales and production volume.

- By increasing the selling price.
- By decreasing the fixed costs.
- By reducing the variable costs.
- By changing the sales or production mix ratio.

2.7 CVP Analysis for a Multi Product Firm

Sales mix can be defined as the relative combination of two or more products represented in total. It is not only the sales revenue that makes profit. The proportion of the sales contributed by different products greatly changes the amount of profit. Managers try to achieve that combination, or mix, that will yield the greatest amount of profit. If a company sells more than one product, these may not be equally profitable. So the company's profit will depend upon the ratio of each products sale to total sales revenues. Profit will be greater if high margin items make up a relatively large proportion of total sales than if sales consist mostly of low margin items. Changes in sales mix can cause great variations in a company's profit. A shift to low margin items can cause the total profit to decrease even through total sales increase. In the contrary, a shift in the sales mix from low margin items to high margin items can cause the reverse effect; total profit may increase even though total sales decreases *(Bajracharya, et al., 2005:260).*

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 deducting its variable costs from 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 point can be calculated by dividing the total fixed costs by the contribution ratio for the firm. The multi-product firm's P/V Ratio will be the weighted average of the P/V Ratios for all the products, the weights being the relative proportion of each products sale. The p/v ratio for the multi product

firm can also be calculated by dividing the total contribution from all products by total sales. A change in the product mix will not affect he firms break even point and profit if each product has the same P/V Ratio. However, a charge in the product mix will change the break even point and profit when products have unequal P/V Ratio *(Maheshwari, 2000:187).*

In case of single product, the solution of a problem required is much simple. But if the company has more than one product the solution for the problem required may be a little complex.

The term product mix and sales mix are used interchangeably. When a firm produces or sells more than one type of commodity, it is described as product or sales mix. In such a situation deferent selling price, variable cost result in different unit contribution margin and contribution margin ratio. As a result, break even points vary with the relative proportion of the commodities produced or sold. However, the assumption has to be made that sales mix remains constant. It does not change for a specified period.

2.8 Break Even Point for Multi Product Firm

The different products may have their own different production facilities and fixed cost separately. In that case cost volume profit analysis can be dine for each product separately. But if common facilities and common fixed costs are being used by different products, CVP analysis is performed by averaging data using sales mix as weight. In that case, break even point is calculated as follows;-

Table: 2.1

For determination of break even point in terms of unit

Step – 1	To find out sales mix ratio in units
Step – 2	To find out unit contribution margin for each product
Step – 3	To multiply the sales mix ratio and unit contribution margin of each product separately
Step – 4	To find out weighted average contribution margin by adding product of step-3
Step – 5	To find out overall break even units by using following formula: $\text{Overall BEP (in unit)} \; X \frac{\text{Total Fixed Cost}}{\text{Weighted CMPU}}$

Table 2.2

For determination of break even point in terms of Rs

Step – 1	To find out sales mix ratio in sales amount
Step – 2	To find out P/V Ratio for each product
Step – 3	To multiply the sales mix ratio and P/V Ratio of each product separately
Step – 4	To find out overall P/V Ratio by adding product of Step - 3
Step – 5	To find out overall BEP by using following formula: $\text{Overall BEP in Rs} \; X \frac{\text{Total Fixed Xost}}{\text{Weighted P/V ratio}}$

Some Important Formula;

$$\text{Overall BEP (in unit)} \; X \frac{\text{Total Fixed Cost}}{\text{Weighted CMPU}}$$

$$\text{Overall BEP (in Rs.)} \; X \frac{\text{Total Fixed Cost}}{\text{Weighted P/V Ratio}}$$

Product wise BEP (in Unit) = Overall BEP (in Unit) x Respective Proportion

(from Sales Unit)

Product wise BEP (in Rs.) = Overall BEP (in Rs.) x Respective Proportion

(from Sales Rs.)

$$\text{Required Sales for Desire Profit (in Unit)} \; X \frac{\text{Total Fixed Cost} \; \Gamma \; \text{Desire Profit}}{\text{Weighted CMPU}}$$

$$\text{Required Sales for Desire Profit (in Rs.)} \; X \frac{\text{Total Fixed Cost} \; \Gamma \; \text{Desire Profit}}{\text{Weighted P/V Ratio}}$$

$$\text{Required Sales for Desire Profit After Tax (in Unit)} \; X \; \frac{\text{Total Fixed Cost} \; \Gamma \; \frac{\text{DPAT}}{1 - t}}{\text{Weighted CMPU}}$$

$$\text{Required Sales for Desire Profit After Tax (in Rs.)} \; X \; X \frac{\text{Total Fixed Cost} \; \Gamma \; \frac{\text{DPAT}}{1 - t}}{\text{Weighted P/V Ratio}}$$

2.9 Cost Volume Profit Analysis and Limiting Factors

CVP analysis is more helpful in profit planning if a company is able to produce any number of outputs of its choice (desires). But in real word, it is not possible because of some critical factors like shortage of finishing machine time or raw material or labor. These critical factors in the CVP analysis are known as constraints.

2.10 CVP Analysis with a Single Constraint

Single production constraint exists when the production is constrained by only one resource or bottleneck resource. For example, if all the firms' products require the same basic raw materials, then the firms output will be limited by the available quantity of raw materials. Likewise if the firm's products require the same labor, then the firms output will be limited by the available labor hours.

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 products are all produced on a single machine and output is limited by hours available on this machine. In same way, single resource constraint arises, if the firm's products are all produced with only one material and output is limited by availability for that material. When there is a constraint for a scarce resource to have alternative uses, the contribution per unit should be calculated for each of these uses. Then the available capacity for such scarce resource should be allocated to the alternative uses on the basis of contribution per scarce resource *(Munakarmi, 2003:146)*

2.11 CVP Analysis with Multiple Constraints

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

Multiple production constraints exists when more than one resources limits the quantity that can be produced any time in an aggregate manner. In situation of multiple production

constraints, contribution margin per unit of scarce resource approach used in single production constraints does not work, as ranking of products across different constraining resources will generally differ. Instead, linear programming helps us to make an optimal allocation or to determine an optimal product mix.

Linear programming is a mathematical technique for finding the best uses of firm's limited resources. The basic requirements of a linear programming problem that fits to multiple production constraints problem also can be enumerated as:

- There must be an objective the firm wants to achieve i.e. criterion in which alternatives are assessed e. g. profit maximization (which is our concern at present) or cost minimization. As profits are not linearly related to sales volume, contribution is the appropriate term to be used instead of profit.
- There must be alternative courses of action; one of which will assist in achieving the objective.
- Resources or facilities must be in limited supply
- The variables in the problem must be interrelated
- Objectives and constraints must be able to be expressed as mathematical equations or inequalities and these must be linear equations or inequalities.

2.12 CVP Analysis under Condition of Uncertainty

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

Our discussion of cost volume profit so far was based on the very assumptions that all costs and revenues were known with certainty. This assumption of single value estimate, which is far from reality naturally, limits the usefulness of CVP analysis for profit planning and other decision purposes. To prove it-self a better tool in the hands of manager, CVP analysis should incorporate risk and uncertainty in its parameters.

The fundamental variables used in the CVP analysis are (1) the selling price per unit, (2) the variable cost per unit, (3) the total fixed cost and (4) the expected sales volume of each product. In any given decision problem, all four of these factors can be uncertain. To simplify the problem, however, we can first start with the uncertainties in sales volume assuming other factors are equivalent to certainty. Moreover, relative to the expected sales quantity, the costs and selling prices are quite certain; that is, for analytical purpose, the decision maker may be justified in treating several factors as certainty equivalents.

A possible approach to incorporate risk and uncertainty in CVP analysis is to apply normal distribution theory. A normal distribution theory normally estimates the likelihood than the random variable will take in various possible values. Such an estimate is more or less based on personal judgment and id called subjective probability distribution.

The normal probability distribution approach can be used to further analysis the element of risk in cost volume profit analysis. The use of the normal probability distribution will enable the decision maker to have an idea of the probability of different expected values of sales or cost or profit, that is the probability of sales or cost or profit having the value of zero or less, greater than zero and within the range of two values and so on. Thus, the normal provability distribution is an important statistical technique in the hand of decision maker for evaluating the riskiness of a firm.

The parameters of the normal probability distribution are mean and standard deviation. A particular normal probability distribution can be completely determined, if it's mean and standard deviations are known. The standard deviation is a measure of dispersion of the distribution about its mean. The larger the standard deviation, the more spread out is the distribution.

The Use of Normal Distribution in CVP Analysis

Now the issue is how the information provided by the normal probability distribution can be used in managerial planning and decision making. The manager, in choosing between this product and other products or projects, can probably improve his decision by considering the risk involved.

Though all the variables of the CVP analysis may be uncertain and random, still the sales volume is the most uncertain variables. In most of the cases in businesses the demand is uncertain. Assuming that sales quantity is random variables, we can apply the concepts of the normal distribution in CVP analysis problems.

Managers know their firms expected sales, the break even sales and expected profit. Surely, they would benefit from knowing that:

- The probability of at least reaching the break even sales.
- The probability of making at least the required amount of profit.
- The probability of incurring losses, i.e. not achieving the BE sales volume etc.

2.13 Steps (Jumping) Fixed Cost and Multiple BEP

Break-even point is determined by dividing the fixed cost by the contribution margin per unit. If the fixed cost is jumping one (i.e. step fixed) then it is required to consider a different amount of fixed cost corresponding to each step. As such BEP is computed for

each level of fixed cost. Some of these compute BEP may not be feasible because they may violate the limit imposed by the relevant range corresponding to the level of fixed cost considered in their computation. As a result real or actual BEP is determined through trial and error approach *(Munakarmi, 2003:136).*

2.14 Assumptions Underlying CVP Analysis

Break even analysis is the most useful technique of profit planning and control. It is a device to explain the relationship between cost, volume and profit. The discussion of the CVP analysis (or break even analysis) so far is based on the following assumptions *(Pandey, 1994:241).*

A. Cost Segregation

The total costs can be separated into fixed and variable components. Constant fixed cost is the total fixed cost that remains unchanged with changes in sales volume. Constant unit variable cost is the variable cost per unit is constant and total variable cost changes in direct proportion to the sales volume.

B. Constant Selling Price

The selling price per unit remains the constant; that, it does not change with volume or because of other factors.

C. Constant Sales Mix

The firm manufactures only one product or if there are multiple products the sales mix does not change.

D. Coordinated Production and Sales

Production and sales are coordinated, that is inventories remain the same.

2.15 CVP Analysis in Computer Application

"The output from a CVP model is only as good as the input. The analysis will include assumptions about sales mix, production efficiency price levels, total fixed costs, variable costs and selling price per unit. Nowadays, the widespread use of spreadsheet packages has enabled management accountants to develop CVP computerized models in the business organization and non business organization too. Managers can now consider alternative plans by keying the information into a computer, which can quickly show changes both graphically and numerically. In addition to speed and convenience, computers allow a more sophisticated approach to CVP analysis. Thus managers can study various combinations of changes in selling prices, fixed costs, variable costs and product mix, and can react quickly without waiting for formal reports from the management accountant. The wide spread availability of personal computers and electronic spread sheet software has made sensitivity analysis relatively easy to do" (Drury, 2000: 253).

2.16 Limitations of CVP Analysis

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

- It is difficult to separate costs into fixed and variable components.
- It is not correct to assume that total fixed cost would remain unchanged over the entire range of volume.
- The assumption of constant selling price and unit variable cost is not valid.
- It id difficult to use the break even analysis for a multi product 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.

2.17 Special Problems in CVP Analysis

There are three special problems in CVP analysis that are as follows*: (Fago, 2003: 235-236)*

A. The Activity Base

When two or more production or activities are combined for break even analysis, the activity base is usually in amount. Product unit is used for single product. The activity base must be in additive units using a common denominator of volume or output in multiple products. For the company as a whole, net sale amount are usually the only satisfactory common denominators because manufacturing. Selling and administrative activities are expressed in combination.

B. The Change in Inventory

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

Management policy in inventory change is;

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

C. The Non-Operating Incomes and Expenses

The non-operating income and expenses (extra ordinary gains and losses) cause another problem in CVP analysis.

The main problem is that whether they should be included or excluded in the analysis.

Management policy may be to;

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

2.18 Sensitivity Analysis

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

Profit = Total Sales – Total Cost

Or

Profit = Sales Units x SPPU – Sales Units x VCPU – Fixed Cost – Taxes

So that, Profit = f_x {sales volume, variable costs, fixed costs, taxes etc.}

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

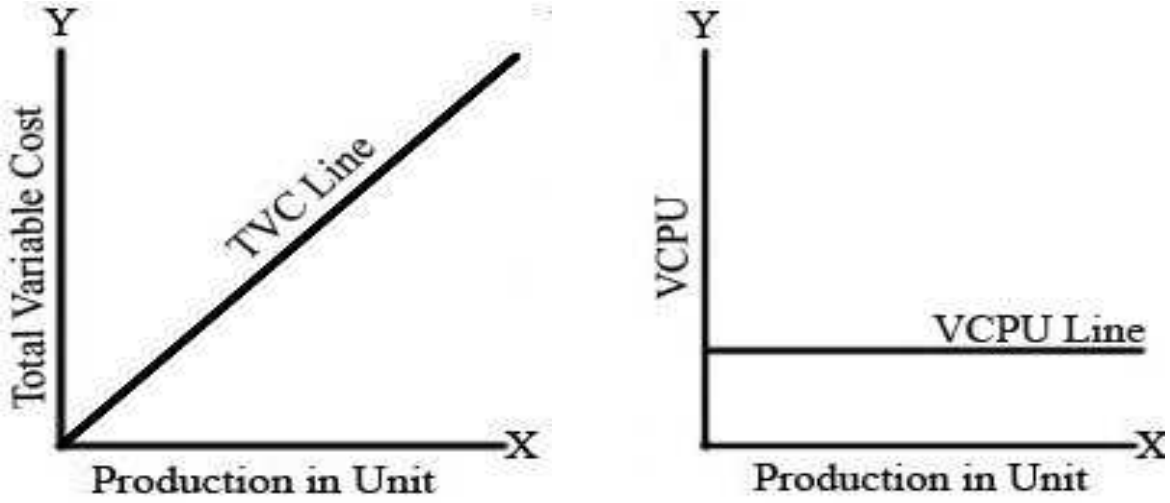
2.19 Cost Structure

There are three types of costs from their nature of variability. They are:

1. Variable Costs

Variable cost varies in direct proportion to change in activity level. If the level of activity increases by 50% the amount of the variable cost also increases by 50% as well. Variable cost in total increases or decreases if the activity level increase or decrease but remain constant if expressed on a per unit basis. Change of variable cost effects to p/v ratio, BEP and net income. When variable cost increase, net income, p/v ratio and margin of safety will be decreased but it helps to increase BEP. It will more be more understood clearly with the help of the diagram presented below:

Figure 2.2 Variable Costs

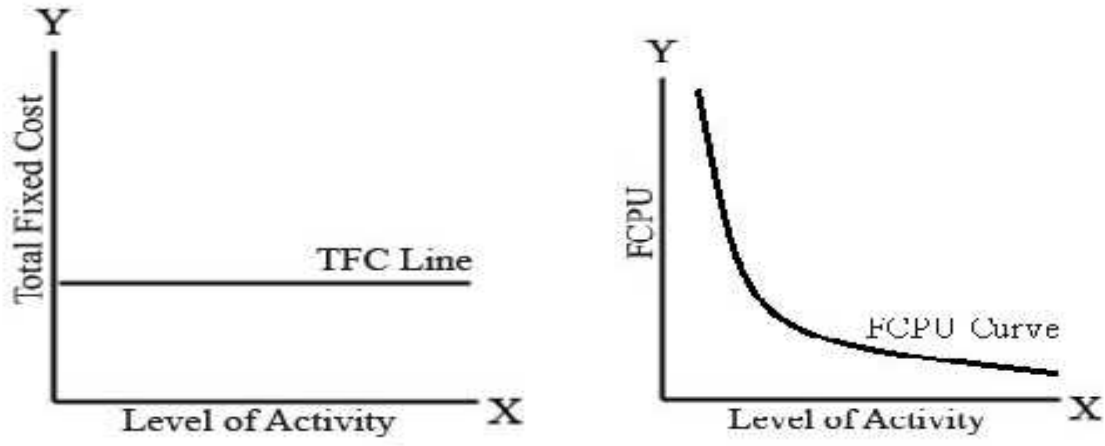


2. Fixed Cost

Fixed costs remain constant in total amount despite the changes in the level of activity. That is, the fixed cost remains unchanged in total as the activity varies. But the fixed cost per unit does changes as activity varies. Fixed cost per unit basis decrease as the level of activity increases and vice versa. When other factors remain unchanged, the change in fixed cost effects to BEP and net income. When the fixed cost is increased, the volume of

BEP increases but the net income decreases or vice versa. Fixed cost is also called capacity cost. The concept of fixed cost may be more understood with the help of the following diagram.

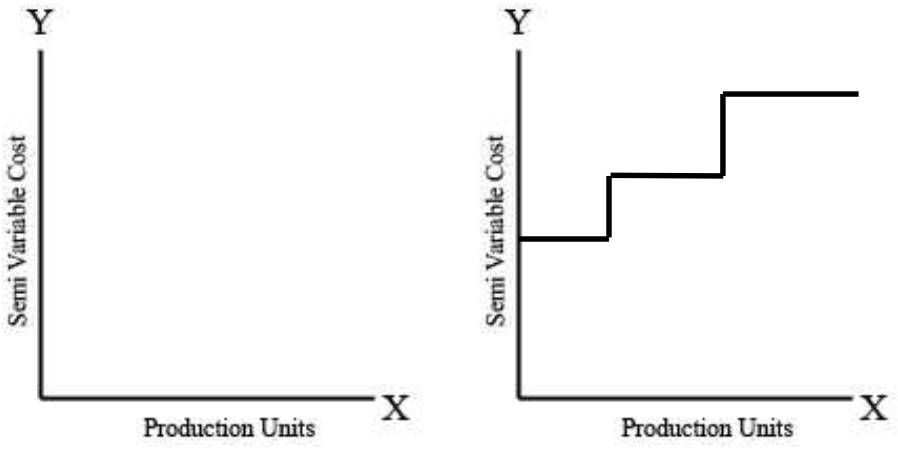
Figure 2.3 Fixed Costs



3. Semi Variable Cost

Expenditure that cannot be categorized as purely fixed or variables are termed as mixed cost or semi variable cost. Mixed cost contains both variables and fixed cost elements. Repair and maintenance, supervision, telephone, electricity charge are some examples of mixed cost. It should be separated into the variable and fixed elements for profit planning, cost control and decision making. In mixed cost, variable cost element is added to the fixed cost element as such mixed cost line slopes upward in the graphs.

Figure 2.4 Semi Variable Cost



2.20 Risk Measurement: Operating Leverage and Break Even Point

Operating leverage is a measures of the extent to which fixed costs are being used in organization. The relationship of a company's variable and fixed costs is reflected in its operating leverage. Generally highly labor intensive organizations have high variable costs and low fixed costs and this have low operating leverage and a relatively low break even point. Conversely, organizations that are highly capital intensive have a cost structures that includes low variable and high fixed costs which reflects high operating leverage with high break even point. It shows that fixed costs and operating leverage has direct relationship. Higher the amount of fixed costs higher the operating leverage and break even point and vice versa. In other words, the firm with relatively high operating leverage has proportionally high fixed expenses; the firms break even point will be relatively high *(Munakarmi, 2003:145).*

Operating leverage tells us how profit change in sales. It is evident that profit change more rapidly than sales. Why do profit change more rapidly than the sales? It is because some costs do not change say if sales decline variable costs also decline in the same ratio so that contribution margin also decline proportionately. But fixed costs do not decline so, the net operating income decline more rapidly. The some tiling applies in the case of

increase well. Sales revenues changes but some parts of costs, known as fixed costs, remain unchanged. This usually net income changes more rapidly. This change is called the operating leverage.

Operating leverage can be measured in terms of the "Degree of operating leverage" (DOL). DOL shows the times of percentage change in net operating income of the given percentage change in sales. DOL may be defined as the percentage change in net operating income or EBIT associated with a given percentage change in sales *(Pandey, 2004:245).*

$$\text{DOL } X \frac{\text{Percentage change in Net Operating Income}}{\text{Percentage change in Sales}}$$

Alternatively,

$$\text{DOL } X \frac{\text{Contributi on Margin}}{\text{Net Operating Income}}$$

$$\text{DOL } X \frac{\text{Q (SPPU - VCPU)}}{\text{Q (SPPU - VCPU) - Fixed cost}}$$

Where, Q = Total Sales in units

SPPU = Selling Price per Unit

VCPU = Variable Cost per Unit

As we know,

$$\text{BEP (in Units)} \; X \frac{\text{Fixed Cost}}{\text{SPPU - VCPU}}$$

Leverage decision is meant to substitute variables cost by the fixed costs. To create a degree of operating leverage means the employment of higher amount of fixed cost which eventually increases the break even point also. No DOL is to be said when the DOL occur '1' and in this situation BEP comes to '0'.

Higher fixed cost increases the DOL and they also increase the break even point, so there is close relationship between the degree of operating leverage and the break even point. A high DOL and high BEP both are indicators of higher risk *(Bajracharya, 2004:24).*

2.21 Segregation of Semi-Variable (Mixed) Costs

Cost volume profit analysis requires segregation of all costs between two parts; fixed and variable. This means that the semi variable cost will have to be segregated into fixed and variable elements. This may be done by any one of the following methods *(Maheshwori, 2000:162);*

A. Levels of Output Compared to Levels of Expenses Method

According to this method, the output at two different levels in compared with corresponding level of expenses. Since the fixed expenses remain constant, the variable overheads are arrived at by the ratio of change in expenses to change in output whereas:

$$\text{Variable Element } X \frac{\text{Change in amount of Expenses}}{\text{Change in Activity Level}}$$

B. Range Method

This method is similar to levels of output compared to levels of expenses method except that only the highest and lowest point of output is considered out of various levels. This method also designated as "High and Low" method. The high low method is explained step by step as follows;

Step I – The highest pair and the lowest pair are selected.

Step II – The variable rate 'b' computed by using the following formula

$$\text{Variable Rate } X \frac{\text{Difference in Cost}}{\text{Difference in Activity Level}}$$

Step III – The fixed cost portion is computed as:

Fixed cost portion = total cost – variable cost

C. Degree of Variability Method

In this method, degree of variability is noted for each item of semi variable expenses. Some semi variable items may have 30 % variability while others may have 70% variability. The method is easy to apply but difficulty is faced in determining the degree of variability.

D. Scatter – Graph Method

In this method, the given data are plotted on a graph paper and line of best fit is drawn, whereas semi variable expenses is plotted on the vertical axis (Y – axis) and activity measure is plotted on the horizontal axis (X axis). The method is explained below.

- The volume of production is plotted on the horizontal axis and the costs are plotted on the vertical axis.
- Corresponding to each volume of production and costs are then plotted on the paper, thus, several points are shown on it.
- A straight line of best fit is then drawn through the points plotted. This is the total cost line. The point, where this line intersects the vertical axis is taken to be amount of fixed element.
- A line parallel to the horizontal axis is drawn from the point where the line of best fit intersects the vertical axis. This is the fixed cost line.
- The variable cost at any level can be known by nothing difference between fixed cost and total cost line

The scatter – graph method is relatively easy to use and simple to understand. However, it should be used with extreme caution because it does not provide any objective test for assuring that the regression line drawn is the most accurate fit for the underlying observations.

E. Least square Method

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

Step 1 Assume the activity level or production units as 'x' and find out the summation of x i.e ∑X.

Step 2 Assume the Mixed cost as 'Y' and find out ∑Y

Step 3 Multiply X and Y, and sum the product i.e. find out ∑XY

Step 4 Convert x in to X^2 and find out the sum of X^2 i.e. $\sum X^2$

Step 5 Using the following given below, find out unit variable cost (b):

$$b = \frac{N \quad XY \; Z \quad X. \quad Y}{N \quad x^2 \; Z(\quad x)^2}$$

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

$$a = \frac{Y \; Z b(\quad X)}{N}$$

Notes;

N = Number of Observations

2.22 Review of Previous Research Work

The profit planning in Nepal seems to be emerging sector for research and analysis. Very few researches have been made in the areas of profit planning and control. Out of them, very limited researches are able to go in the depth and detail of PPC. An attempt is made here to review some of the researches.

Kamalesh Yadav (2010), conducted a research entitled "*Cost Volume and Profit Analysis in Nepal Aushadhi Limited*". Mr Yadav had concerned her study to examine the practice of profit planning and control in the manufacturing companies in Nepal. It was submitted to *Shankar Dev Campus*, TU, Kathmandu at May 2010.

Specific objectives:

- The study of application of CVP analysis is NAL
- To evaluate the sensitivity of profitability
- To analyze the CVP and its impact in profitability of NAL.
- To study the profitability and financial position of NAL.

His major findings:

- NAL have not applied suitable scientific method of cost classification.
- NAL couldn't put stress on effective utilization of fixed cost so it bearing higher amount of unfavorable capacity variance.
- NAL have not considered the Cost Volume Profit relationship while fixing the price of its product.

His main recommendations:

- The industry should try to reduce the fixed cost.
- The industry should follow effective advertising policy.
- A system of periodical performance reports should be strictly followed to be conscious about poor performance and take corrective action immediately.

Deena Shakya (2009), had studied on the topic "*A study on Cost Volume and Profit Analysis of Soaltee Hotel Limited*". Miss Shakya had concerned her study to examine the practice of profit planning and control in the hotel industry in Nepal. It was submitted to *Shankar Dev Campus*, TU, Kathmandu at July 2009.

Specific objectives:

- To study the nature of direct and indirect cost and component of cost of Hotel.

- To evaluate the profitability, financial position and sensitivity of Soaltee Hotel's activities.

Her major findings:-

- The main focus of hotel is to maximizing revenue but hotel hasn't focus of cost planning and controlling.
- Soaltee Hotel Limited is service providing company but it hasn't given emphasis to reduce variable cost ratio.
- Market study on demand and pricing has not be carried out.

Her main recommendations:

- Classification of cost into variable and fixed as well as controllable and non-controllable cost must be made within specific framework of responsibility centre and time.
- Soaltee Hotel Limited should consider BEP analysis while preparing revenue plan, operation plan and setting price of its services.
- Separate cost control department should be established for effective management of cost.

Kirshna Ram Sijakhwo (2008), had studied on the topic "*A study on Application of Cost-Volume-Profit Analysis as a Managerial Tool in Bhaktapur Craft Paper Limited*". Mr Sijakhwo had concerned his study to examine the practice of profit planning and control in the craft paper industry in Nepal. It was submitted to *Shankar Dev Campus*, TU, Kathmandu at August 2008.

Specific objectives:

- To study the relationship of cost, volume and profit of BCP Ltd.
- To analyze the impact of CVP of the company on productivity.
- To calculate the BEP, MOS and CM etc. and its impact on the profitability.

His major findings:

- Cost classification is not systematic. There is no practice of segregating semi variable cost.
- Aggregate total incomes were in decreasing trend because company have not improved the total income by improving and using advance marketing skills for more products sales in existing and new market.
- Company has not focused to possibility of production of more varieties of papers.

His main recommendations:

- There was high degree of positive correlation between sales revenue and profits; therefore it is necessary to analyze relationship changed between them.
- The company should separate expenses for research and development program which would help advancing BCP's function and production process with minimizing cost.
- Company's present poor performance should be improved by using management theory and principles like MBO, participating management activities etc.

Bijaya Raj Adhikari (2007), conducted a research entitled **"***Cost-Volume-Profit Analysis of Nepal Lube Oil Limited"* Mr. Adhikari had concerned his study to examine the practice of CVP practice in the Monopoly industry. It was submitted to *Shanker Dev Campus*, TU, Kathmandu at August 2007.

Specific objectives:

- Whether or not NLO Ltd. is practicing CVP analysis?

- In which areas of the business operation, CVP analysis can be applied to improve the competitiveness of the company?
- Which parts i.e. CM, BEP, MOS etc. of CVP analysis are mostly practiced and which are not practiced till now?

His major findings:

- Different types of profit planning tools, which are used in the academic field, are not found applied by NLO.
- CVP analysis is not applied by NLO as no segregation of cost in to fixed and variable, which is the hardcore of CVP analysis.
- Company has no clear-cut boundaries to separate cost into fixed and variable. The classification of cost is not scientific and systematic. So, NLO has not been able to use CVP analysis and make the realistic and smart budget.

His main recommendations:

- NLO should minimize fixed cost by reducing interest expenses. Interest expenses has been increasing due to high increase in receivable from sales, increase of loan amount to be paid to the creditors for raw materials and other supplies. Therefore, company should adopt fast collection policy to reduce receivable with discount and other special offer to the debtors.
- As NLO is multi-product company more emphasis should be provided for the product having high contribution margin to generate more profit.
- NLO has spent a large amount on salaries & wages, it should reduce that by implementing proper manpower planning and use of latest information technology (i.e. computer software etc.) should be made to reduce unnecessary paper work and improve productivity of manpower by providing training and deploying development program

2.23 Research Gap

I found most of the previous research conducted on the topic Profit planning and control on public and non-public manufacturing organizations and revenue planning. All of them didn't use CVP as a specific tool analysis of PPC. Some other researchers conducted on management accounting practices in listed companies of Nepal on which they covered overall aspect of management accounting tools not a specific. Today world is globalization in which get tough competition prevailed among domestics and international or multi-national companies. Therefore, to cope with it, every profit motive manufacturing organizations and service motive manufacturing organizations should concentrate on specific products and tools. Specific tool is more effective other than using overall aspects' tool for analysis. In the previous researcher on the area of PPC and management accounting practices of listed companies used as a whole not a specific.

Another aspect of this research area is that there were some researchers who conducted their research on the CVP analysis as tool for the analysis of the companies' effectiveness. Some of these researchers didn't completely used as tool of CVP, but some used CVP as tool of the company analysis. However, a few of who used as a tool to CVP only on the area of Nepal Lube oil Limited, Nebico Private Ltd, Salt Trading Corporation etc. While I considered on the area of Vanaspati Ghee private industries, for more manufacturing industries, there were not research conducted as CVP analysis. Most of the previous research conducted on the area of promotional aspect of export of Nepalese manufacturing sector, problem and prospect of manufacturing export etc. There was lack of research study on the private manufacturing industries as a tool of CVP analysis to measure their effectiveness, profitability and productivity. Therefore, the research was conducted to fulfill the previous research uncompleted using of CVP tool on the area of the private manufacturing Industries analysis. I think this is the first research study on the area of the private industry by using tool of CVP.

CHAPTER - 3

Research methodology

3.1 Introduction

Research is the process of a systematic and in-depth study or search of any particular topic, subject or area of investigation backed by the collection, complication, presentation and interpretation of the relevant details or data. It is a careful search or inquiry into any subject matter, which is an endeavourer to discover or find out valuable facts, which will be use full for further application or utilization. The research that involves the discovery of new techniques, a modification of old concepts or a knocking off an existing theories, concepts and techniques. It may develop a hypothesis and test it by establishing relationship between different variables and identify the means for problem solving.

Research methodology is a systematic way to solve the research problem. In other words research methodology describes the methods and process applied in the entire aspect of the study. It may be understand as a science of studying how research is dines scientifically. It help to analyze, examine and interpret various aspects of research works such as sales, cost and other aspects of CVP analysis, related to effective tools of profit planning. The objective of this study will be to analyze the CVP analysis of AVPL and thereby forward some measures to improve the situation. The major contents of research methodology followed in course of this study are;

3.2 Research Design

Research design means defining procedures and techniques which guide to study and propound ways for research work. It is an analytical as well as descriptive approach to achieve the objectives. It is the arrangement of condition for collection and analysis of data relevance to the study purpose with economy in procedure. In order to make type of research, this fulfills the objectives of the study.

The research design is an organized approach and not a collection of loose unrelated parts. It is an integrated system that guides the researcher in formatting, implementing and controlling the study. Useful research design can product the answers to the proposed research questions. The research design is thus an integrated frame that guides the researcher in planning and executing the research works.

Data and information are the lifeblood or major portion of any study. This study would be attempted to show the relationship among cost, volume, profit and various functional budgets for solving the problems that has accrued in AVPL. Cost- volume and profit analysis of ABPL presented and analyzed by descriptive research design and analytical method. A study design is the arrangement of the conditions for collection and analyze of data in manner that aims to combine relevance to the study purpose with the economy in producer. These studies will an intensive based on analysis of the past financial performance.

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

3.3 Research Population and Sample

The large group about which the generalization is made is called the population under study, or the universe and small portion on which the study is made is called the sample of the study. Research population would be all manufacturing company of Nepal. Due to various circumstances it would not be possible to attempt all the number of research population regarding in this dissertation.

3.4 Source and Type of Data

Data and information are the foundation of any study. Data may be obtained from several sources; it is not easy to list them in detail. Each research project has its own data needs and data sources. Secondary data have been taken mainly from annual reports, auditor's reports, balance sheet, P/L account, cost detail sheet, previous thesis and other unpublished documents related to AVPL. For further information informal interviews were conducted with the concern authority.

3.5 Variables of Studies

Variables are characteristics of person, things, groups, objects etc. A variable is thus a symbol to which numerals or values are assigned. In other words, a variable can take on many values. The researcher had used two types of variables, independent variables and dependent variables, which are presented as below:

a) Independent (Explanatory) Variables:

A variable is called independent variable if it is not influenced by any other variable under study. The independent variables are those, which are the basis of prediction. It is also known as explanatory variable because it explains partially or totally the estimated value of dependent variable.

b.) Dependent Variable:

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

There are three factors (i.e. cost, volume and profit) of CVP 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 3.1

Classification of Variables

S.N	Independent Variable	S.N	Dependent Variable
		1	Sales Rs.
1	Sales Unit	2	Cost (Variable & Fixed)

1.1.2

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 accumulating facts. 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:

3.6.2.1 CVP Analysis Tools

CVP Analysis was included the following techniques:

Contribution Margin (CM) = Sales – Variable Cost

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

$$\text{Break Even Point (in Units)} = \frac{\text{Total Fixed Cost}}{\text{CMPU}}$$

$$\text{Break Even Point (in Rs.)} = \frac{\text{Total Fixed Cost}}{\text{CM Ratio}}$$

$$\text{Cash BEP (in Rs.)} = \frac{\text{Total Fixed Cost} - \text{Non Cash Expenses}}{\text{CM Ratio}}$$

$$\text{Required Sales for Desire Profit (in Units)} = \frac{\text{Fixed Cost} + \text{DP}}{\text{CMPU}}$$

$$\text{Required Sales for Desire Profit (in Rs.)} = \frac{\text{Fixed Cost} + \text{DP}}{\text{P/V Ratio}}$$

$$\text{Required Sales for Desire Profit After Tax (in Units)} = \frac{\text{Fixed Cost} + \frac{\text{DPAT}}{1-t}}{\text{CMPU}}$$

$$\text{Required Sales for Desire Profit After Tax (in Rs.)} = \frac{\text{Fixed Cost} + \frac{\text{DPAT}}{1-t}}{\text{P/V Ratio}}$$

Margin of Safety (in Units) = Actual Sales (in units) – BE Sales (in units)

Margin of Safety (in Rs.) = Actual Sales (in Rs.) – Break Even Sales (in Rs.)

$$\text{Margin of Safety (in Units)} = \frac{\text{Profit}}{\text{CMPU}}$$

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

3.6.2.2 Statistical Tools

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

Bar Diagram:

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

Mean:

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

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

Where,

X = the sum of observations

N = no. of observation

Standard Deviation (S.D.):

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

The SD is calculated by the following formula:

$$SD = \sqrt{\frac{(X\ Z\overline{X})^2}{N\ Z1}}$$

Coefficient of Variation (CV):

The relative measure of dispersion based on Standard Deviation is called Coefficient of Standard Deviation. Thus,

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

100 times Coefficient of Standard Deviation is called Coefficient of Variation. It is denoted by C.V. thus,

$$CV = \frac{\Omega}{\bar{X}} \times 100\%$$

Correlation Analysis:

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

It can be calculated by using following formula:

$$\text{Co-efficient of correlation (r)} = \frac{(X - \bar{X})(Y - \bar{Y})}{\sqrt{(X - \bar{X})^2 \quad (Y - \bar{Y})^2}}$$

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

Coefficient of determination (r2):

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:

$$\text{Co-efficient of determination} \qquad (r^2) = r \times r$$

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

CHAPTER - 4

Presentation and Analysis of Data

Planning sets the proper objectives and goals for an organization and profit planning develops the specific action plans to achieve the pre-determined goals and objectives. CVP analysis can be used to plan the profit and it also measures the effectiveness of profit planning and control. CVP analysis analyses the relation among the cost, revenue and profits. It helps the management in cost control and profit planning.

Use of CVP in profit planning is the basic objective of this study. It will examine the present practice of CVP analysis and identify the area where CVP analysis can be applied in AVPL. For this purpose historical data of AVPL are used in this study taken from the internal and final audit reports.

4.1 Sales Plan of AVPL

It is the fundamental plan of overall profit planning. It provides basic management decision about marketing. It is an organized approach for developing comprehensive sales plan. Different important decisions such as production, purchase, expenses etc. are made on the basis of sales budget.

The following tables and pie charts show the sales target and achievement of AVPL (in Rs) of five years from 2004/05 to 2008/09.

Table: 4.1

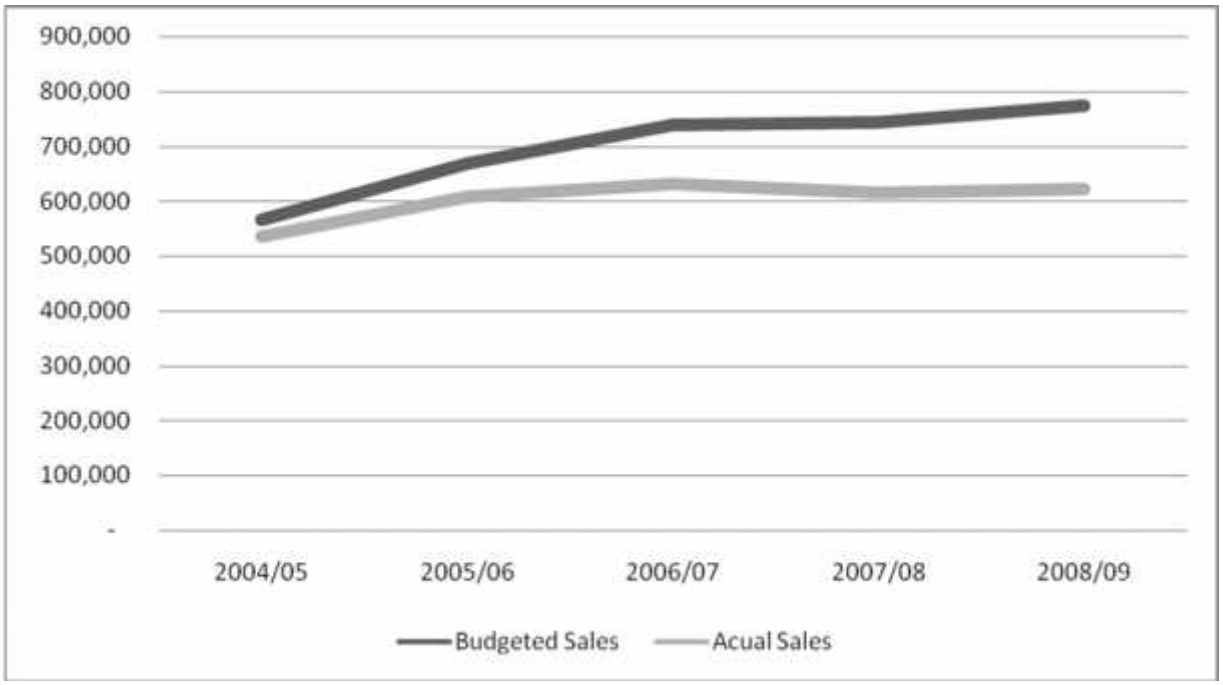
Budgeted Sales and Actual Sales of AVPL in Rs '000'

Year	Budgeted Sales (X_1)	Increase/ (Decrease) %	Actual Sales (Y_1)	Increase/ (Decrease) %	Achievement %
2004/05	567000	-	535494	-	94.44%
2005/06	670000	18.17%	609654	13.85%	90.99%
2006/07	740000	10.45%	632114	3.68%	85.42%
2007/08	745000	0.66%	614739	-2.75%	82.52%
2008/09	775000	4.03 %	621827	1.15%	80.24%

Source: Audit Reports; AVPL

Figure: 4.1

Line Diagram Representation of Budgeted and Actual Sales of AVPL



The above tables show that the budgeted sale of AVPL is in increasing trend up to fiscal year 2008/09. But actual sale is in increasing trend up to fiscal year 2006/07 and it is decrease in the fiscal year 2007/08. The highest increasing rates in budgeted and actual sales are 18.17% and 13.85% in fiscal year 2005/06.

The above table shows the sales target and sales achievement at the period of fiscal year 2004/05 to 2008/09. The table shows that the sales achievement is always less than the sales target but it is more than 80% achievement in almost years of AVPL.

In order to examine the nature of variability of actual sales and budgeted sales of different years, the arithmetic means, standard deviation, coefficient of variation, correlation coefficient, probable error, regression equation of best fit and coefficient of determination calculated in appendix one. From the result, we can conclude that sales achievements of AVPL are less fluctuated than budgeted sales since the lower CV of actual sales than budgeted sales. Similarly, mean sales and standard deviation of actual sales are less than that of budgeted sales.

Table 4.2

Summary of Statistical Calculation of Sales Data of AVPL

Particulars	**Budgeted Sales (X_1)**	**Actual Sales (Y_1)**
Mean	$\overline{X}1$=699400	$\overline{Y}1$ = 602765.6
Standard deviation ($S.D_1$)	σ_{x1} =83422.419	σ_{y1} =38538.766
Coefficient of variation ($C.V_1$)	11.92%	6.39%
Correlation coefficient(rx_1y_1)	0.9240	
Probable error ($P.E_1$.)	0.0441	
Regression equation of best fit	$Y_1 = 304219 + 0.4269X_1$	
Coefficient of determination (r_1^2)	0.8538	

The above data shows that there is not a systematic and realistic sales plan of AVPL. Budget is based on historical data only and seems that planning section of AVPL ignores all other factors that affect the budget.

Here, value of correlation coefficient of AVPL is 0.9240 which shows that there is high positive relationship between actual sales and budgeted sales. The value of probable error shows that the calculated value of correlation coefficient of AVPL is highly significant, since Correlation Coefficient 0.9240 > 0.2646 (6 × P.E)

To express the relationship between actual sales (Dependent variable) and Budgeted sales (Independent variable) regression equations are calculated. The regression equation of AVPL is '$Y_1 = 304219 + 0.4269X_1$. The estimated actual sales ($\hat{Y}$) calculated in appendix one.

Table: 4.3

Estimated Sales of AVPL (in RS '000')

Year	**Budgeted Sales(X_1)**	**Actual Sales(Y_1)**	**Estimated Actual Sales $\hat{Y}1$ = 304219 + 0.4269X_1**
2004/05	567000	535494	546271
2005/06	670000	609654	590242
2006/07	740000	632114	620125
2007/08	745000	614739	622260
2008/09	775000	621827	635067

4.2 Sales - Profit Relation of AVPL

The basic objectives of running any business organization are to earn profit. Profit is taken to measure the competency and efficiency of the management. In other words, profit is the primary measurement of business success in any economy. Profit is a residual income left after the payment for other factors of production. The difference between the outflow of expenses and inflow of incomes is called profit. It is a reward for business activities that directs and motivates entrepreneurs to conduct the business. Profit determines the strength of financial position of the company.

The uniformity or variability of net profit of AVPL is analyzed and relations between actual sales and net profit is also studied under this topic. The actual sales and net profit of the company during the five years period has presented in the table below.

Table: 4.4

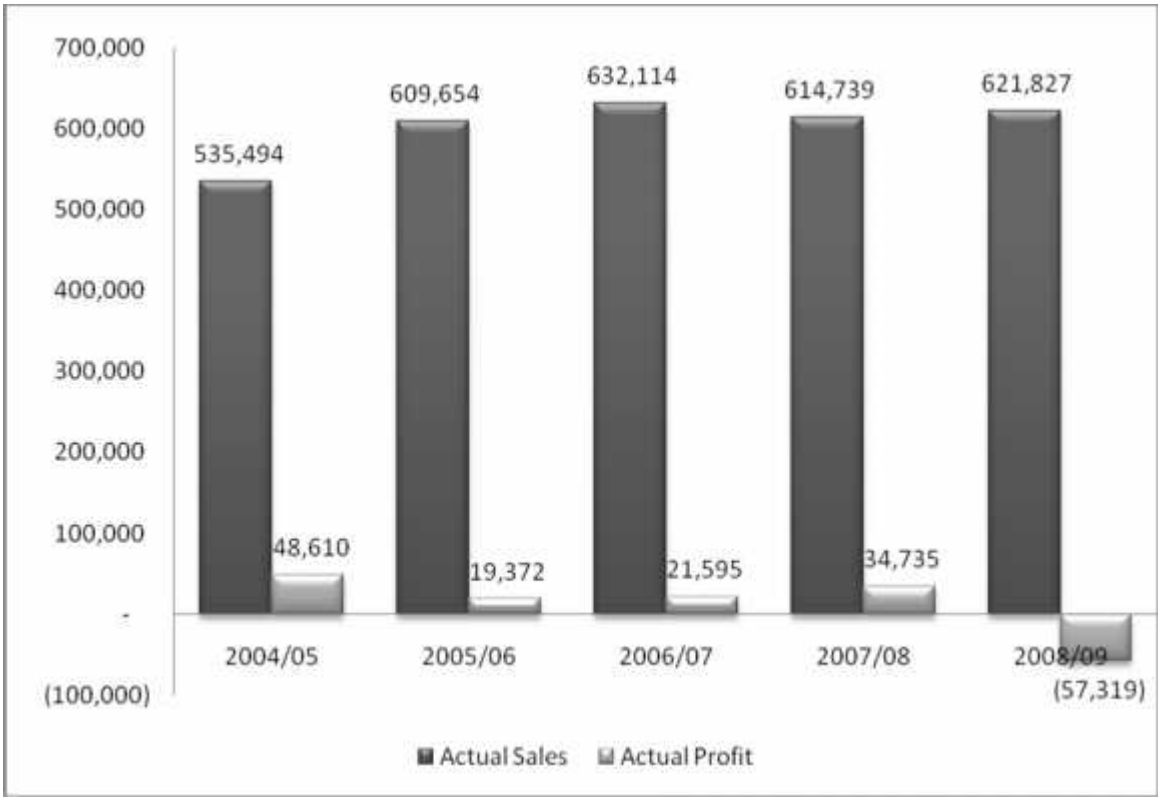
Actual Sales and Actual Profit of AVPL (in Rs. '000')

Year	Actual Sales (X_1)	Increase/ (Decrease) %	Actual Profit (Y_1)	Increase/ (Decrease) %	Achievement %
2004/05	535494		48610		9.08
2005/06	609654	13.85%	19372	-60.15%	3.18
2006/07	632114	3.68%	21595	11.48%	3.42
2007/08	614739	-2.75%	34735	60.85%	5.65
2008/09	621827	1.15%	-57319	-265.02%	-9.22

Source: Audit Reports; AVPL

Figure: 4.2

Bar diagram representation of Actual Sales and Actual Profit of AVPL



The above table shows that the actual sale of AVPL is in increasing trend up to fiscal year 2006/07 and it is decrease in the fiscal year 2007/08. But the net profit of AVPL is in fluctuating trend. The high increasing rate in actual sales is 13.85% in FY 2005/06 and the high increasing rate in actual profit is 60.85% in FY 2006/07.

In order to examine the nature of variability of actual sales and actual profit of different years, the arithmetic means, standard deviation, coefficient of variation, correlation

coefficient, probable error, regression equation of best fit and coefficient of determination calculated in appendix two. From the result, sales achievements of AVPL are less fluctuated than actual profit being the lower CV of actual sales than actual profit.

Table 4.5 Summary of Statistical Calculation of Sales and Profit of AVPL

Particulars	**Actual Sales (X_1)**	**Actual Profit (Y_1)**
Mean	$\bar{X}_1$ =602765.6	$\bar{Y}_1$ = 13398.6
Standard deviation ($S.D_1$)	σ_{x1} =38538.766	σ_{y1} =41228
Coefficient of variation ($C.V_1$)	6.39%	307.7%
Correlation coefficient (r_1)	-0.500	
Probable error ($P.E_1$.)	0.2262	
Regression equation of best fit	$Y_1 = 335812 – 0.5349X_1$	
Coefficient of determination	0.25	

Here, value of correlation coefficient of AVPL is -0.5 which shows that there is negative relationship between actual sales and actual. The value of probable error of AVPL show that the calculated value of correlation coefficient are not significant, since correlation coefficient (r) of company are less than 6 × probable error (-0.5<0.2262×6).

The value of coefficient of determination of AVPL is 0.25 which shows that 25 % variation in actual profit of AVPL is explained by the variation in actual sales, remaining 75% variation in actual profit is due to some other variables.

The regression equation '$Y_1 = 335812 – 0.5349X_1$' & $Y_2 = -20453.07 + 0.001003X_2$ show the relationship between actual profit (Dependent variable) and actual sales (Independent variable) of the company. By the use of these regression equations we can estimate the value of Actual profit from the value of actual sales as illustrated below:

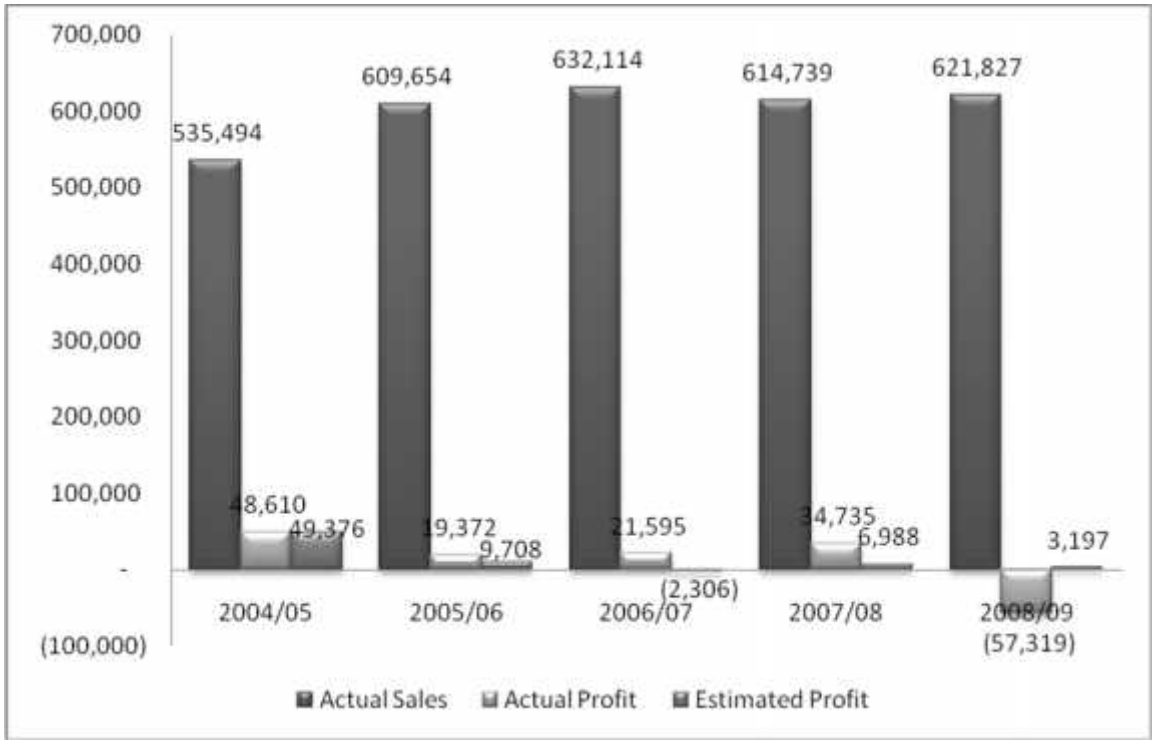
Table: 4.6

Estimated Profits of AVPL (in RS '000')

Year	Actual Sales (X_1)	Actual Profit (Y_1)	Estimated Actual Profit $\hat{Y}1$ = **335812 – 0.5349X**
2004/05	535494	48610	49376
2005/06	609654	19372	9708
2006/07	632114	21595	-2306
2007/08	614739	34735	6988
2008/09	621827	-57319	3197

Figure:.4.3

Bar diagram representation of Actual Sales, Actual Profit and Estimated Actual Profit of AVPL



4.3 Analysis of Cost

After analyzing of sales and profit of these companies, it is compulsory to analyze cost of the companies in order to draw the real relation between cost volume and profit. We know that cost is the amount of expenditure, actual (incurred) or notional (attributed), relating to a specific thing or activity the specific thing or activity may be product, job, service, process or any other activity. In the other words cost is the expenses which are given to the factors of production for their contribution in production of any goods of services.

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

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

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

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

The companies do not have a practice of classification of costs into fixed cost and variable cost. However to fulfill the objectives of the study costs are classified into fixed costs and variable cost.

4.3.1 Cost Heads and Their Variability

Identification of the variability of cost is necessary in planning and control of the cost. Thus the knowledge of cost behavior is very important. Generally, costs behave in two ways with relation to the volume of output. One is fixed cost that remains constant in total for a certain level of output and the period. Second is variable cost that changes directly in total with the change of output level but remains constant in cost per unit of output.

In the case of AVPL, there is not any applicable basis of cost classification into variable and fixed cost. To segregate the mixed cost into fixed and variable cost the company has provided the information about the degree of variability of the cost. All semi variable costs have segregated on the basis of the given information and.

1.1.3

4.3.1.1 Analysis of Fixed Costs

A fixed cost remains unchanged in total amount over a wide range of production levels. In the other words, fixed cost is that cost which doesn't volatile in total with the change of output level. For example, if the factory building is rented for, say $1000 per month, this costs remains the same whether the factory operates on a one-shift, two shift, or an around the clock basis. Likewise, the cost is the same whether one hundred units of product are produced in a month, one thousand units are produced, or any other number

up to the full production capacity of the plant. Note; however that while the total amount of a fixed cost remains constant as the level of production changes, fixed cost per unit of product decrease as volume increase.

Table: 4.7

Statement of Detail Fixed Costs of AVPL

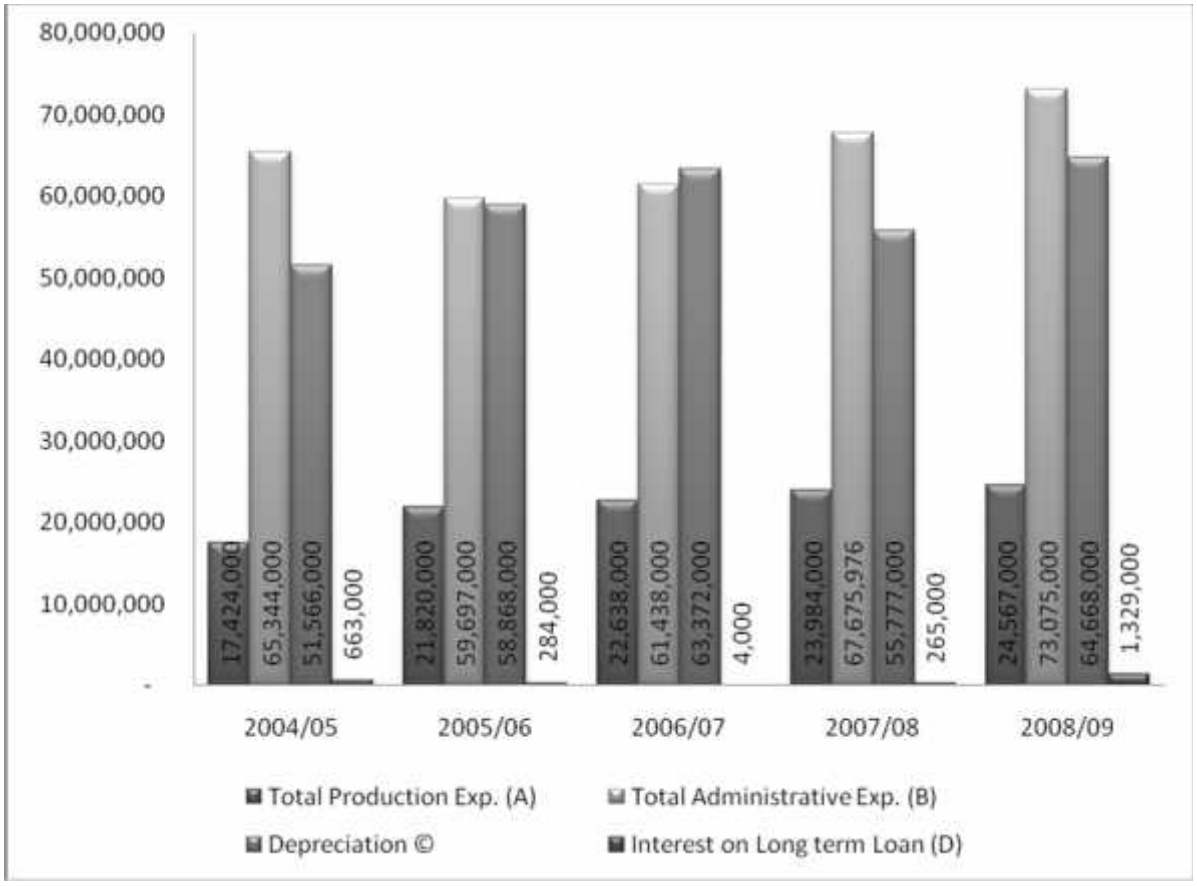
Particulars	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Production Expenses:					
Production Cost	15944000	19757000	20221000	2146000	211540
Water and Electricity	34000	31000	21000	24000	31000
Repair and Maintenance	1446000	2032000	2396000	2500000	338200
Total Production Exp. (A)	**17424000**	**21820000**	**22638000**	**2398400**	**245670**
Administrative and Selling &					
Salaries, wages and other	23156000	26691000	26560000	2788100	327430
Contribution to provident fund,	3814000	2906000	2876000	976	254300
Rent	626000	1007000	628000	402000	138100
Repair and maintenance	1446000	2032000	2396000	2500000	338200
Security expenses	1570000	32000	12000	382000	
Audit fees	220000	220000	220000	220000	220000
Legal and professional fees	266000	261000	3887000	324000	566000
Rates and taxes	492000	133000	182000	187000	352000
Bank charges	4853000	153000	672000	307000	288000
Staff Bonus	5717000	2977000	4445000	4387000	309600
General meeting expenses	25000	21000	35000	48000	52000
Insurance premium	215000	2740000	941000	87000	180000
Communication	4568000	2974000	3321000	6160000	494400
Printing and stationary	499000	476000	569000	500000	919000
Advertisement	3781000	3797000	2680000	1967000	139500
Accommodation expenses	3328000	1724000	2574000	2540000	179300
Training	8000	110000	502000	921000	567700
Uniform	505000	307000	517000	476000	613000
Obsolete stock and fixed assets	397000	556000	2655000	5805000	717000
Distribution Expenses	7515000	7247000	726000	5921000	508600
Management fees	1425000	2817000	4421000	6276000	664300
Miscellaneous expenses	918000	516000	619000	384000	485000

Total Administrative Expenses (B)	**65344000**	**59697000**	**61438000**	**6767597**	**730750**
Depreciation (C)	**51566000**	**58868000**	**63372000**	**5577700**	**646680**
Interest on Long term Loan (D)	**663000**	**284000**	**4000**	**265000**	**132900**
Total Fixed Costs (A+B+C+D)	**13499700**	**14066900**	**14745200**	**1477019**	**163639**

Sources: Compiled by the researcher based on Annual Reports of AVPL(FY 2004/05 to 2008/09).

Figure: 4.4

Bar Diagram representation of Components of Total Fixed Cost of AVPL



The items included in the fixed production expenses of the company is salary, production cost; water electricity repair and maintenance are semi variable cost. The amount shown in the table above regarding production expenses, water and electricity and repair and maintenance were segregated into fixed cost. Similarly, the items included in the fixed selling and distribution expenses and administrative expenses, all are fixed cost in nature.

Water and electricity of production department of AVPL is increasing trend up to FY 2008/09 except FY 2007/08. Whereas the Repair and maintenance costs of AVPL is in increasing.

The total fixed administrative and Selling & Distribution expenses seem to be in increasing order in aggregate. However the administrative and Selling & Distribution expenses of AVPL is more volatile since it fluctuate over the. The items of administrative expenses where salary and allowance was included salary of office staff, their allowances and allowances for directors of the company. Salary and allowance, and P/F contribution were increasing trend. Printing and stationary, and water and electricity were also increasing trend. In aggregate administrative expenses were increasing annually.

The amount of depreciation seems to be increased over the years. The amount of deprecation increased up to FY 2008/09 except FY 2007/08. And interest on long term loan of AVPL is more fluctuating over the years.

In aggregate, total fixed costs increasing annually. The Advertisement, salary and allowance, communication expenses, insurance premium, depreciation and interest on long term loan were taken higher portion of total fixed costs. The trend of increasing fixed costs highly do not indicate good signal.

1.1.4

4.3.2 Analysis of Variable Cost

A variable cost changes in total amount as production volume changes. The cost which tends to be change with the change of output level is called variable cost. However it remains to be unchanged in per unit cost. In the other words, the cost which increases with the increment of output level and vice versa. For example, the cost of the materials that enters in to a product is a variable cost. If material cost are $20 is required in the production of one unit of product is manufactured, $40 if two units are manufactured, $60

if three units are manufactured, and so on up for any number of units. In other words, the variable cost per unit of production remains constant while the total amount of variable cost changes in to direct proportion to changes in the level of production. Variable costs appear on a graph as a straight line with a positive slope; the line rises as the production volume increases.

Table: 4.8

Statement of Detail Variable Costs of AVPL

Particulars	2004/05	2005/06	2006/07	2007/08	2008/09
Production Related Expenses:					
Direct Material	25519400	31031800	29394400	28255900	28023400
Production Cost	37203000	46099000	47183000	50075000	49358000
Water and Electricity	138000	124000	82000	94000	125000
Repair and Maintenance	1446000	2031000	2397000	2500000	3382000
Total Production Exp. (A)	**29398100**	**35857200**	**34360600**	**33522800**	**33309900**
Administrative and Selling &					
Distribution Expenses	17536000	16902000	16939000	13815000	11869000
Traveling expenses	1717000	1363000	1847000	3240000	6790000
SAP related expenses					6291000
Legal and professional fees	267000	260000	3888000	324000	565000
Trade discount	18959000	44572000	52573000	51340000	56673000
Communication	507000	331000	369000	684000	549000
Printing and stationary	214000	204000	244000	215000	394000
Advertisement	3782000	3767000	2680000	1966000	1395000
Sales promotion expenses	5162000	5582000	3958000	1787000	1388000
Training	3000	47000	215000	395000	2433000
Charity and donation	33000	4 7000	94000	124000	139000
Rejection and breakages	7897000	4201000	6710000	6638000	1902000

Product transfer fees	1367000	6502000	5945000	7774000	6780000
Miscellaneous expenses	919000	515000	619000	384000	486000
Total Administrative, Selling	**58363000**	**84246000**	**96081000**	**88686000**	**97654000**
Total Variable Costs (A+B)	**35234400**	**44281800**	**43968700**	**42391400**	**43075300**

Sources: Compiled by the researcher based on Annual Reports of AVPL(FY 2004/05 to 2008/09).

Figure: 4.5

Bar Diagram representation of Components of Total Variable Cost of AVPL

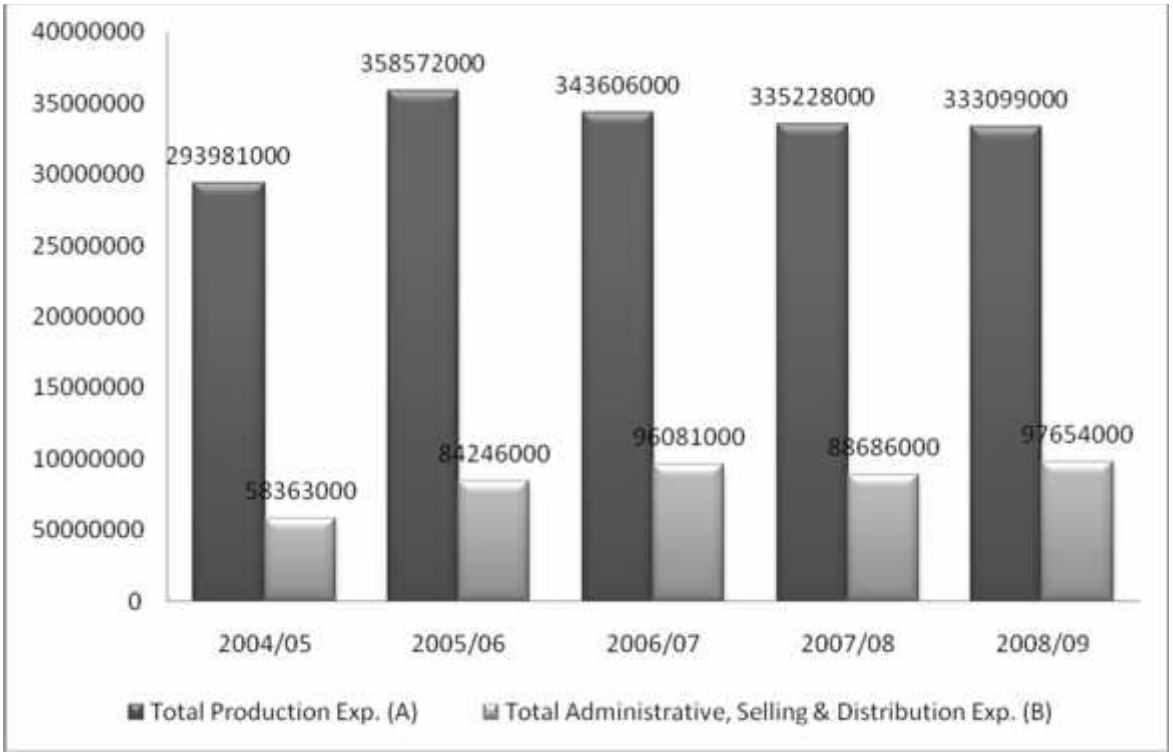
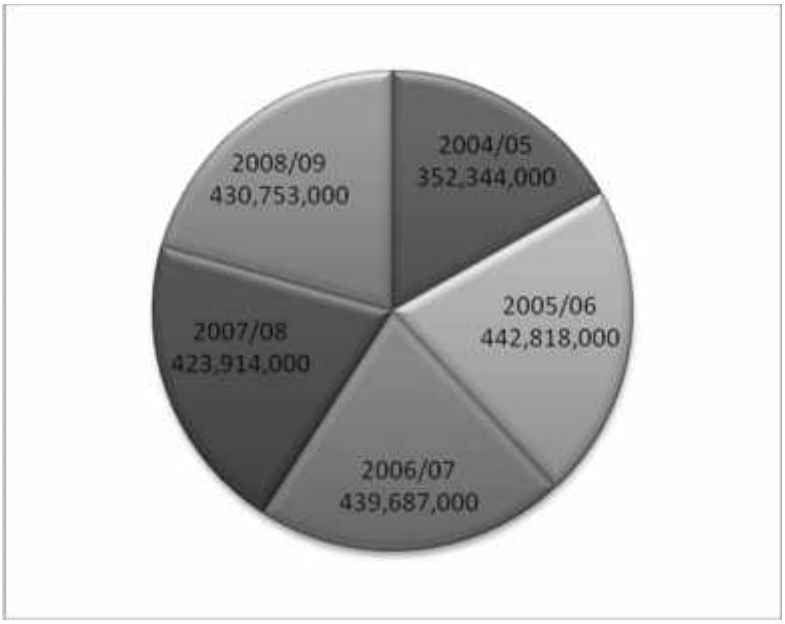


Figure: 4.6

Pie Chat representation of Total Variable Cost of AVPL



The cost of material consumed includes raw materials and packaging material. The cost of material consumed was included in direct expenses of purchase is shown separately in the FY 2007/08 & 2008/09. However the direct expenses of purchase were included clearing and forwarding, custom duty, freight, local development tax and special duty of raw material as well as packaging material. Salary and wages, water and electricity, repair and maintenance were semi-variable cost nature. It was separated as fixed and variable cost; and variable cost portion is shown in the table above. The total variable production cost AVPL is in decreasing nature in aggregate because of the cost reduction strategy.

Similarly, all items included under selling and distribution expenses were variable cost nature. The total Admin, Selling & Distribution expenses are in highly increasing trend since it is increasing year by year however the total Admin, Selling & Distribution expenses of AVPL is decreased in FY 2007/08. The trend of increasing total variable

Admin, Selling & Distribution expenses do not indicate good position. It indicates that company is falling behind to apply cost reduction policy vividly.

Material consumed salary and wages, royalty, transportation and insurance expenses, travelling expenses of sales, sales promotion expenses, leakage and breakage are increasing annually. Water and electricity are fluctuating over the year. Similarly Repair and maintenance, and complementary expenses were in fluctuation condition. Blending charges was decreased up to 2007/08 and increased at FY 2008/09. Other expenses of cost of goods, and selling and distribution expenses were increasing and decreasing respectively.

Higher portion of total variable cost was covered by material consumed, direct expenses of purchase, royalty, sales promotion activities, transportation and insurance expenses, salary and wages, leakage and breakage and complementary expenses, travelling expenses, and water and electricity items.

4.4 Cost Volume Profit Analysis of AVPL

The relationship among cost, revenue and profit is known as cost volume profit analysis. CVP analysis is a powerful instrument in management decision making especially in cost control and profit planning. It helps to determine the idle production volume to avoid losses and the production volume at which the targeted profit amount of the company will be achieved.

Profit planning can be done only when the management has information about the cost of products, both fixed and variable costs and the selling price of the product. CVP analysis is especially applied for profit planning and control. The cost volume profit relationship will be established by break even analysis.

Table 4.9

Break Even Analysis of AVPL :

Income Statement for the year 2004/05 to 2008/09

in Rs '000'

Particulars	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Production revenue	**535494**	**609654**	**632114**	**614739**	**621827**
Less; variable cost	352344	442872	439687	423915	430753
Contribution	**183150**	**166782**	**192427**	**190824**	**191074**
Less; fixed cost	145594	149166	160827	150345	163497
Earning before tax	**37556**	**17616**	**31600**	**40479**	**27577**
Profit volume ratio	0.34	0.27	0.30	0.31	0.31
Break even	428218	552467	518797	484984	527410
Percent of breakeven	80	91	82	79	85
Margin of safety	107276	57187	113317	129785	94417
Margin of safety	20%	10%	18%	21%	15%

Source: Audit Reports; AVPL

Contribution Margin

The difference between production amount and variable cost is known as the contribution margin. In other words, fixed cost plus the amount of profit is equivalent to contribution margin. Contribution margin can be expressed by

Contribution margin = production volume – variable cost

Contribution margin of AVPL for the period is in fluctuated trend since it increases/decreases year by year. It does not indicate the good position of AVPL.

Profit Volume Ratio

It establishes a relationship between the contribution and production volume. The factors profit and volume are interconnected and dependent with each other. Profit depends upon production. It can be expressed by: $\text{Profit volume ratio } X \frac{\text{contribution margin}}{\text{Production}}$

An increase in contribution margin would means increase in profit only because fixed costs are assumed to constant at all levels of production. This ratio would remain constant at different levels of production since variable costs as of proportion to production remain constant at various levels. Management should try to increase the value of the ratio by reducing the variable costs or by increasing the selling price. It is cleared that the profit volume ratio of AVPL are not good since no profit volume ratios of AVPL in any year exceeds 50%. It indicates that the operating profit of AVPL is either very nominal or negative.

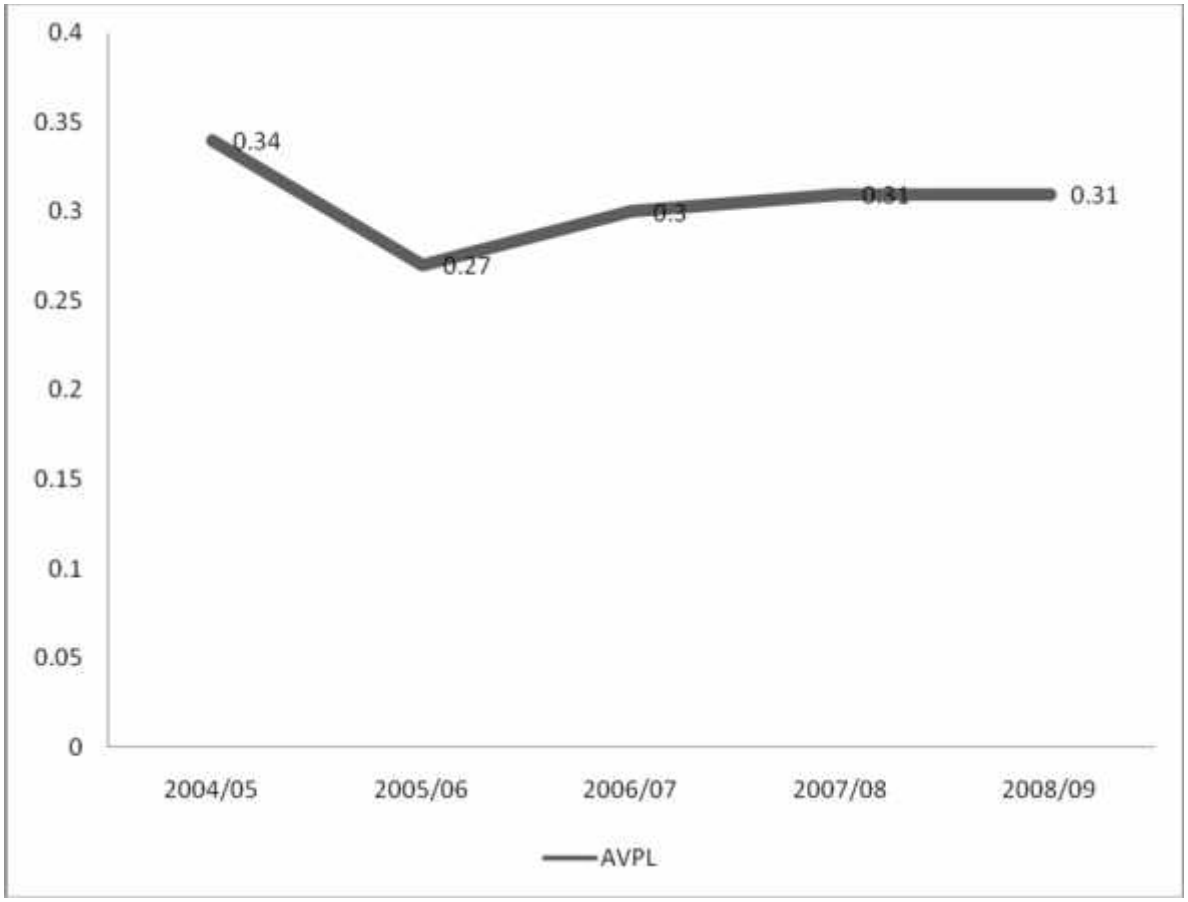
Table: 4.10

Profit Volume Ratio of AVPL

Year	PV Ratio
2004/05	0.34
2005/06	0.27
2006/07	0.30
2007/08	0.31
2008/09	0.31

Figure: 4.7

Representation of Line Diagram of Profit Volume Ratio of AVPL



Break Even Point

The point which breaks the total costs and selling price evenly to show the level of output or production, 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 by

$$\text{Break even point in Rs.} = \frac{\text{Fixed Costs}}{\text{P/V Ratio}}$$

Break even sales of AVPL is given in the above table for the five year period. Break even sales of AVPL is highest in the FY 2005/06 and lowest in the FY 2004/05. It is more in

the FY 2008/09 than FY 2007/08. The Break even sale of AVPL is highly volatile since fluctuating year by year.

Margin of Safety

It is the difference between the actual sales revenue and the break even sales revenue. It can be expressed by:

Margin of safety = actual production – break even production

The above income statements show the margin of safety of AVPL is in fluctuated trend. The higher margin of safety indicates the better profitability of the company. It is highest in the FY 2007/08 and it is lowest in the FY 2008/09

Break Even Ratio

Total sales revenue consist two part: Break even sales and Margin of Safety.

Actual Sales = Break Even Sales + Margin of Safety

The proportion of Break even sales is BE Ratio.

$$\text{BE Ratio} = \frac{\text{Break even sales}}{\text{Actula Sales}}$$

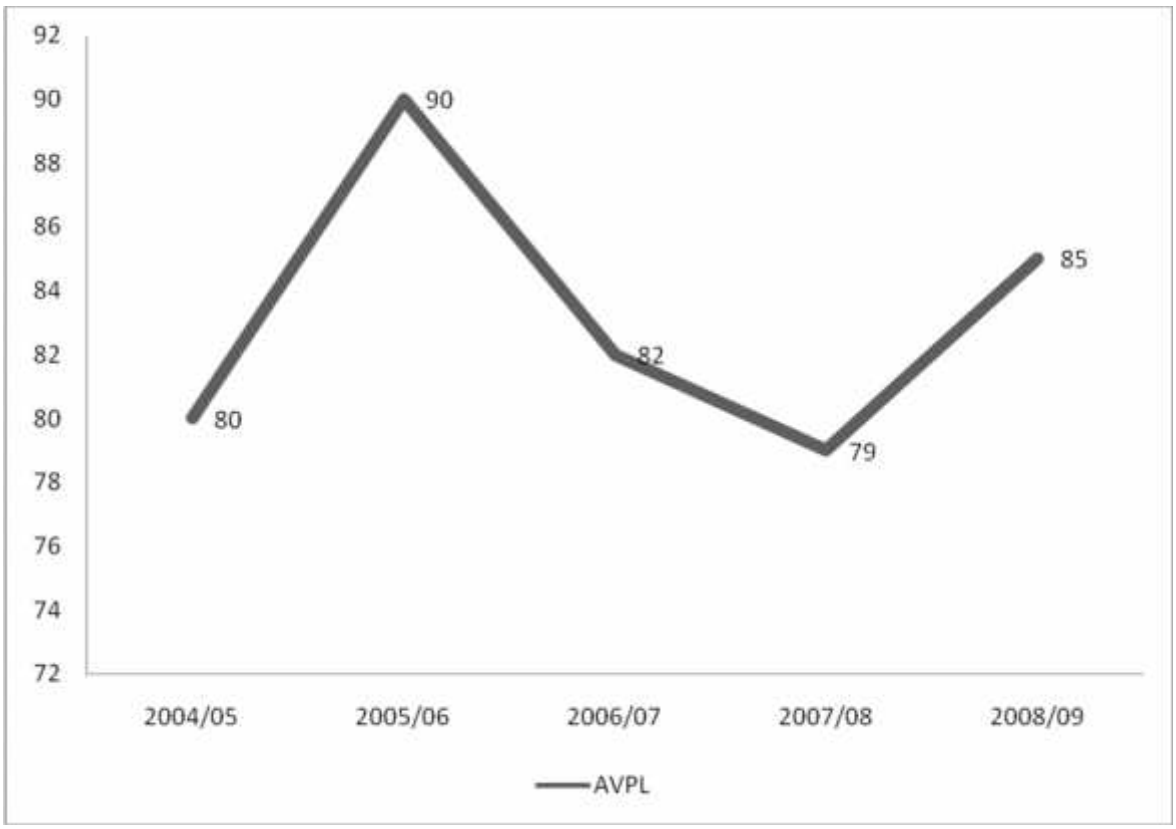
Table 4.11

Break Even Ratio of AVPL

Year	BE Ratio
2004/05	80
2005/06	90
2006/07	82
2007/08	79
2008/09	85

Figure: 4.8

Representation of Line Diagram of Break Even Ratio of AVPL



Margin of Safety Ratio

The proportion of Margin of Safety sales is MOS Ratio. The contribution margin obtained from Margin of safety is operating profit for company. MOS Ratio shows the part of profit earning sales volume of the company.

$$\text{MOS Ratio} = \frac{\text{Margin of safety sales}}{\text{Actula Sales}}$$

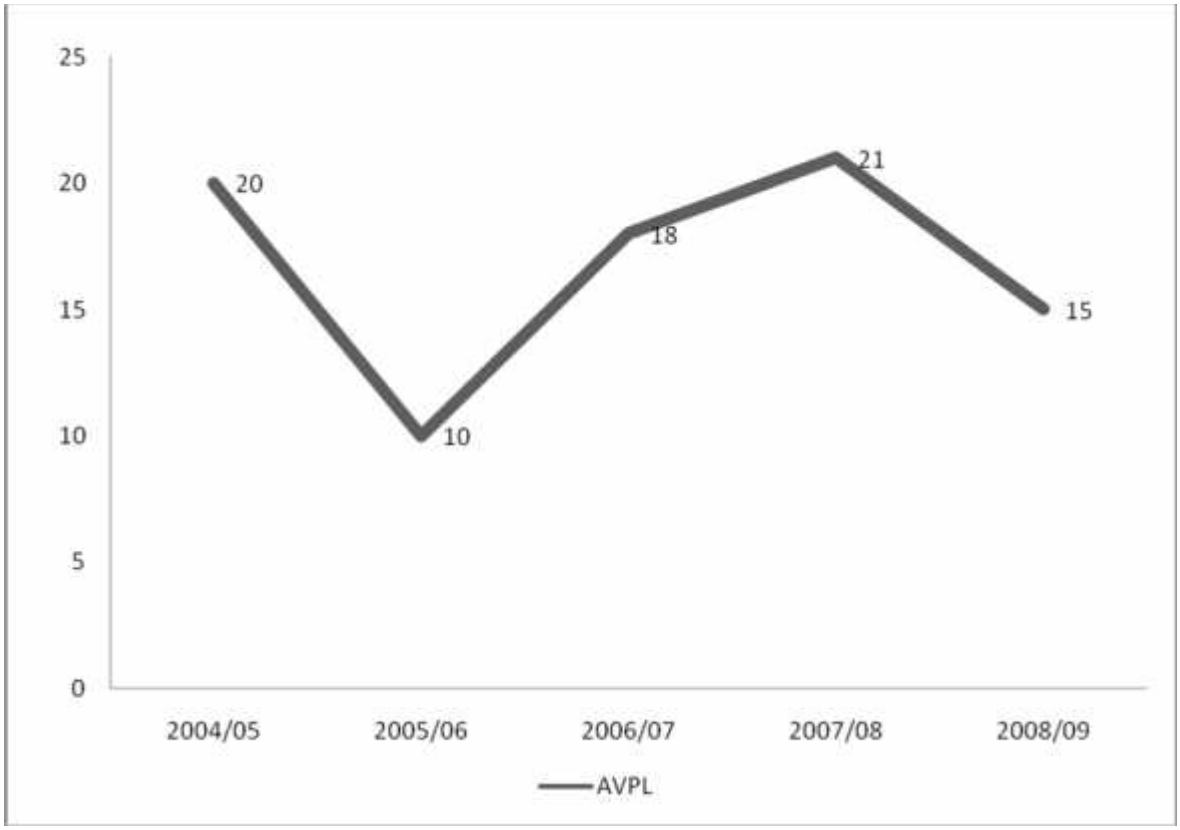
Table 4.19

Margin of Safety Ratio of AVPL

Year	MOS Ratio
2004/05	20
2005/06	10
2006/07	18
2007/08	21
2008/09	15

Figure: 4.9

Representation of Bar Diagram of Margin of Safety Ratio of AVPL



4.5 Major Finding

The major finding of this study based on the analysis of available secondary data is pointed out as follows:

- The company do not have a practice of classification of costs in to fixed costs and variable cost,
- The total fixed costs of the companies are increasing annually,
- Advertisement, salary and allowance, communication expenses, insurance premium, depreciation and interest on long term loan are higher portion of total fixed cost and the amount of these items are highly incremental condition,
- The variable costs are also at increasing trends, and vital items were material with direct expenses on purchase, royalty, sales promotion expenses, transportation and insurance expenses, salary and wages, leakage and breakage, complementary expenses, travelling expenses, and water and electricity,
- The semi-variable or semi-fixed costs are classified into fixed and variable cost on the basis of estimation or assumption,
- The actual sales of the company have not reached at BEP as a whole,
- The CM ratio of company is less than 50% which is much low to cover up its Fixed Cost,
- AVPL have not maintained the broad and long range objectives and periodic report and objectives are limited to the high ranking official only.
- Relevant internal and external market variables are not fully explored by AVPL.
- Sales and production targets of AVPL are not achieving because there is not an effective forecasting system.
- Both Enterprises have no financial plan; they have only sales and production plan in term of required target.

- The companies' production trend is in an increasing trend.
- There is no any effective plan for cost reduction and control
- There is lack of effective cost control programmed or techniques.
- The profit trend of the company is not satisfactory as compared to profit proportion is very low with fluctuated trend.
- The company has not detailed and systematic expenses plan. The fixed, variable and mixed expenses plan is the necessary elements for profit planning and control.
- In AVPL there is no effective inventory policy. The inventory management, raw material handling and controlling system are not efficient and effective.
- Management information system is not performance based.
- There are no any proper criteria for performance evaluation.
- The P/V analysis alternatives might be helpful for profit planning and corresponding sales etc.
- There is negative correlation between actual sales and budgeted sales of AVPL.

CHAPTER - 5

Summary, conclusions and recommendations

5.1 Summary

Profit planning of the companies and firms has become very important and necessary tools for both deficit and surplus units of the growing financial markets of our country Nepal. So, profit plan is the lifeblood of every organization, which not only keeps it alive but also assures the future and creates the soundness on it. PPC means the development of objectives, which motivates the organization to achieve the objectives effectively and efficiently. It is one of the most important mechanisms for planning and controlling business operations. The effective operation of a business concern resulting into the excess of income over the expenditure fully depends upon as to what extent the management follows proper planning, effective coordination and dynamic control.

Management can effectively achieve organizational objectives through the efficient use of scarce available resources in a changing environment of business. Future is uncertain which creates risk and only the good management can reduce it. CVP analysis is an analytical technique for studying the relationship between volume, costs and profit which helps manage future costs and profit. Profit planning is management technique and it is a written plan in all aspect of business operation for definite future period. CVP analysis is a technique used to determine the usefulness and effectiveness of profit planning process of the organization. In fact, the entire field of profit of profit planning has become associated with the CVP inter relationship.

The main objective of the present research was to examine the use of cost-volume-profit analysis to plan the profit. So, this study was undertaken to evaluate CVP analysis of the

company. It has observed that AVPL have succeeded in living up to the expectation of general position and main producer company of soft drinks, beverages and hard drinks for all over the country. As per the nature of the study, the secondary data have been used and related other information has collected by informal interviews for production analysis, costs analysis, inventory analysis, contribution margin analysis, P/V Ratio analysis, BEP analysis.

From the analysis, the cost-volume-profit analysis shows that the AVPL have low contribution margin, low p/v ratio, high BEP and low margin of safety. The sensitivity test of cost- volume-profit analysis shows that the increase in costs (i.e. variable and fixed), increase the BEP and the decrease in costs, decreases the BEP. But increase of selling price decreases the BEP. It indicates the relationship between selling price and BEP is negative correlate. To fulfill the company's objectives, it takes burden of all types of fixed costs but not control effectively. Companies profit condition isn't satisfactory. Lack of details information and extra cost burdens are main reasons behind not practicing profit planning and control tools like a CVP analysis.

5.2 Conclusions

Different types of theoretical tools and techniques of profit planning have not been applied by both AVPL. It shows gap between the theory and practice. The AVPL have not applied cost-volume-profit analysis and segregation of costs into fixed and variable. Increasing operating and maintenance cost in each year is another remarkable problem for AVPL. They have not adopted the cost control programmed. Company has no clear cut boundaries to separate cost into fixed and variable. The classification of cost is not scientific and systematic. Therefore, AVPL have not been able to CVP analysis and make the realistic budget.

After analyzing in detail the present practice on the field of profit planning in AVPL, the following matters can be concluded.

Lack of Clear Cut Objective

The objectives of the company are not clearly defined. There is not a long term strategic plan to achieve the unclear defined objectives. There is not complete and comprehensive budgeting system. AVPL have not prepared long term strategic profit plan but has prepared only short term profit plan in terms of budget for each year.

Lack of Skilled Planner and Budgeting Experts

There is not a scientific budgeting system. Budgets are prepared on traditional basis. There is no planning of materials and production of goods. All overhead expenses are shown in general expenditure budget.

Lack of Participatory Management

The plans are prepared from top level and later it is communicated to the lower level in terms of required target but not in the term of the action plan. There is lack of authorities to formulate various plans in lower level management.

Lack of Analyzing System of SWOT

Company has not analyzed its strength and weakness. Quality products, local manpower, latest production technology etc are the strength whereas high production costs, market competition, difficulties to import raw materials; high fixed costs etc are the weakness of the company.

Ineffective Budgetary Control System

Fixed cost and non manufacturing cost are growing high. Past year actual cost is taken as a budget for the current year and there is not any programmed to study about variation between budget and actual expenditures.

Not Optimum Utilization of Fixed Cost

There is not the optimum utilization of fixed cost because the fixed cost are growing higher with out any reason and from this situation the relation between actual sales and actual profit has become and unpredictable relation.

Lack of Systematic Accounting and Classification of Cost

There is no systematic classification of cost as fixed and variable components. There is not the system of analysis of cost and clear cut policy to separate semi variable cost into fixed and variable. The costs are roughly classified and such classification is not scientific and appropriate.

Lack of Suitable Inventory Policy

AVPL have not a good inventory policy. The finished goods inventory levels have been fluctuating each year.

Lack of Systematic and Complete Profit Planning Programmed

Total sale achievement and production of AVPL are fluctuating year after year. Similarly gross profit margin and net profit margin are in fluctuating trend. So, the rate of trend and growth is not stable. The company has not developed the alternative plan to earn profit.

There is significant correlation between sales target and sales achievement similarly productions target and production achievement. It indicates that increased in targeted sales will also increase achievement sales similarly also affected in production plan. The regression line about sales of AVPL indicates a positive trend. Coefficient of determination of sales and production shows that there are some other factors are affecting the forecasting of sales and production. But AVPL have not searched those factors to make its profit plan complete and systematic.

5.3 Recommendations

On the basis of the study of use of CVP analysis to plan the profit of AVPL, it seems necessary to develop, implement and improve the process of CVP analysis form beginning to end with PPC. Nepal is proceeding towards globalization with membership of WTO. Nepalese companies should fit with the global environment with best fitted

managerial strategies. For better utilization of the limited resources and achieve goal through strong competition, application of advance profit planning and control tools can be of great help. Thus the recommendations based on the findings of the research study are as follows;

To Formulate the Clear Objectives

The objectives are the basic guidelines of the company therefore AVPL should clearly define its broad objectives, similarly duties and responsibilities of employees should be clearly defined.

To Analyze the SWOT

For long life of the company it should analyze its strengths and weaknesses in internal environment of company and its opportunities and threats in external environment of the company.

To Apply Participatory Management System

The participative management can play the important role in implementation of decisions. Therefore the companies should try to involvement of more personnel in decision making process as far as possible. The CVP and PPC manuals should be communicated from top to lower levels of the company.

To Apply Budgetary Control System

To strengthen the competitiveness of the companies and to carry out PPC activities, the companies should use the profit planning and controlling tools. For budgeting activities tools like CVP analysis should consider for planning.

To Proper Account and Analysis of Cost

Cost control department should establish separately which will identify and analyze the variability and controllability of cost correctly that may give the right ideas to control the cost. From this uneconomical and idle costs will decrease automatically.

To Classify the Variability of Cost

Classification of expenses and cost from their nature of variability is very essential. From this application of CVP analysis and preparation of flexible budgets becomes exact and easier.

To Optimize Utility of Fixed Cost

AVPL has invested huge amount of capital in fixed cost. Therefore the companies should try to maximum and effective utilization of fixed cost to generate profit.

To Use Effective Inventory Policy

The ending inventory of the companies does not show the any inventory policy. Therefore the companies should apply the effective inventory management policy, raw material handling and controlling system for continuous production and selling of the product.

To Use Systematic and Complete Profit Planning Programmed

A systematic and complete profit planning programmed should be followed to generate more profit. From this the efficiency and profitability of the company may be improved.

To Use Performance Report

Finally, a system of periodical performance reports should be strictly followed to be conscious about poor performance and take corrective actions immediately.

BIBLIOGRAPHY

Books

Agrawal, Govind Ram. (2003). *Dynamics of business environment in Nepal.* Katmandu: M.K. Publishers and Distributors.

Bajracharya, Puskar, Ojha, Khagendra P., Goet, Joginder & Sharma, Sagar. (2005). *Managerial accounting: Nepalese prospective.* Katmandu: Asmita Books Publishers and Distributors.

Dangol, Ratnaman, Dangol, Jeetendra & Gurung, Prem. (2061). *Cost & management accounting.* Katmandu: Taleju Prakashan.

Drury, Colin. (2000). *Management & cost accounting.* London: Business Press, Thomson Learning.

Gupta, SP. (1999). *Statistical methods.* New Delhi: Himalayan Publishing House.

Hilton, Ronald W. (2002). *Managerial accounting.* New Delhi: Tata McGraw-Hill Edition.

Horngren, Charles T., Sundem, Gary L. & Stratton, William O. (2004). *Introduction to management accounting.* New Delhi: Prentice Hall of India.

Horngren, Charles T., Datar, Srikant M. & Foster, Geogre. (2004). *Cost accounting: A managerial emphasis.* New Delhi: Pearson Education.

Joshi, P.R. (2003). *Research methodology*. Katmandu: Buddha Academic Publishers and Distributors Pvt. Ltd.

Kaplan, R.S. & Anthony, A.A. (1989). *Advanced management accounting.* New Delhi: Prentice Hall of India.

Khan, M.Y. & Jain, P.K. (2002). *Management accounting.* New Delhi: Tata McGraw-Hill Edition.

Kothari, C.R. (1990). *Research methodology and techniques.* Wiley Eastern Limited.

Kothari, C.R. (1994). *Quantitative techniques and analysis.* New Delhi: Vikash Publishing House.

Lucey, T. (2003). *Management accounting.* London: D.P. Publication Ltd.

Munakarmi, Shiva Prasad. (2002). *Management accounting.* Katmandu: Buddha Academic Publishers & Distributions.

Selltiz, Claire. (1959). *Research methods in social science.* New York: The University of

Michigan Press.

Sharma, P.K. & Chaudhary, A.K. (2058). *Statistical methods.* Katmandu: Khanal Books Prakashan.

Singh, Yameshman, Ojha, Khagendra & Acharya, Chiranjibi. (2004). *Cost & management accounting.* Katmandu: Buddha Academic Publishers & Distributors.

Sthapit, Azaya Bikram, Gautam, Hiranya, Joshi, Puspa Raj & Dongol, Prakash Man. (2003). *Statistical methods.* Katmandu: Buddha Academic Publishers and Distributors Pvt. Ltd.

Wagle, Keshab Nath & Dahal, Rewan Kumar. (2006). *Management accounting.* Katmandu: Khanal Books and Stationary.

Welsch, Glenn A., Hilton, Ronald W. & Gordon, Paul N. (2000). *Budgeting: Profit planning and control.* New Delhi: Prentice Hall of India Private Limited.

Welsch, Glenn A., Hilton, Ronald W. & Gordon, Paul N. (2001). *Budgeting: Profit planning and control.* New Delhi: Prentice Hall of India Private Limited.

Web Sites

http://www.himalayandistillery.com
Error! Hyperlink reference not valid.

Previous Research Works :

Yadav, Kamalesh (2010), "*Cost Volume and Profit Analysis in Nepal Aushadhi Limited*".

Shankar Dev Campus, TU, Kathmandu

Shakya, Deena (2009), "*A study on Cost Volume and Profit Analysis of Soaltee Hotel Limited*"

Shankar Dev Campus, TU, Kathmandu

Sijakhwo, Kirshna Ram (2008), "*A study on Application of Cost-Volume-Profit Analysis as a Managerial Tool in Bhaktapur Craft Paper Limited*".

Shankar Dev Campus, TU, Kathmandu

Adhikari, Bijaya Raj (2007), "*Cost-Volume-Profit Analysis of Nepal Lube Oil Limited*"
Shanker Dev Campus, TU, Kathmandu