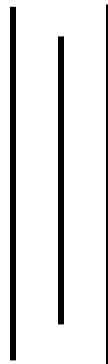


**A STUDY ON COST VOLUME AND PROFIT ANALYSIS
OF SOALTEE HOTEL LIMITED**

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



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

**Kathmandu, Nepal
July, 2009**

RECOMMENDATION

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Master Degree of Business Studies (M.B.S.)

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DECLARATION

I hereby declare that the work reported in this thesis entitled “**A STUDY ON COST VOLUME AND PROFIT ANALYSIS OF SOALTEE HOTEL 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 **Dhurba Subedi** of Shanker Dev Campus.

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Deena Shakya
Researcher

ABBREVIATIONS

A.D	=	Amino Domine
A/C	=	Account
Adm. Exp.	=	Administrative Expenses
B.S.	=	Bikram Sambat
BC	=	Before Christ
BEP	=	Break Even Point
C.V	=	Coefficient Variation
CFPB	=	Consumption of Food, Provision and Beverages
CM	=	Contribution Margin
CVP	=	Cost-Volume-profit
DE.	=	Deferred Expenditure
DEP.	=	Depreciation
FC	=	Fixed Cost
FY	=	Fiscal Year
GDP	=	Gross Domestic Product
IMF	=	International Monetary Fund
LTD.	=	Limited
MOS	=	Margin of Safety
P.E	=	Probable Error
P/V ratio	=	Profit Volume Ratio
PPC	=	Profit Planning and Control
ROI	=	Return on Investment
Rs.	=	Rupees
S.D	=	Standard Deviation
SHL	=	Soaltee Hotel Limited
TC	=	Total Cost

TU = Tribhuvan University
VC = Variable Cost
VCPU = Variable Cost Per Unit
WTO = World Trade Organization

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CHAPTER - I

INTRODUCTION

1.1 Background of the Study

Nepal is a developing country where majority of the population is still much below the poverty line due to the consequence of the several factors like the agro-economy, the complex geography, the landlocked situation, poor resources mobilization, lack of entrepreneurship policies, unstable government policies, political instability etc. The idea of planned economic development in Nepal, initiated with first plan, in 1956A.D. Ninth economic plans have been completed so far gave mixed achievement. The government initiated some corrective measure to stabilize the economy with the assistance of International Monetary Fund (IMF) understand by arrangement. In the FY1985, it subsequently embarked upon the structural adjustment program encompassing measures as to increase domestic resources mobilization, strengthen financial sectors and unconventional industrial and trade policies.

A great leap towards financial liberalization was undertaken by the then Nepal Government with a view to expedite the pace of economic development under structural adjustment program since the FY1987/1988. This gave freedom in fixing interest rate, strengthening of banking operation and shift to indirect from direct monetary control instruments. As a result, many tourism industries are growing in Nepal. The tourism sector plays an important role in the economic development of a country. Tourism sector contributes in total GDP by 38 percent and earns foreign currency by 24 percent. Tourism industry is a service industry. It consists of many components comprising Hotel, Motel, Restaurant, Bar, Travel agents, Jungle safari, Trekking Agents, Rafting Agents etc. Tourism industry basically provides accommodation, entertainment and relaxation service. It is also

known as individual service industry. In Nepal the scope of tourism is bright as the country is full of natural attraction as well as artificial construction.

The tourism industry is rapidly developing in the competitive way around the world. To maintain the large number of tourism a large number of Hotels must be available. So far to maintain the rapid development of economy the tourism sector have significant role. Although Nepal had a lot of attraction for tourist, it was closed till 1950. After 1956, Nepal focused on the development of tourism industry in a planned manner. In the FY 1951/1952 the first Hotel was established in Jawalakhali, but it was remained passive due to several factors. Hotel Coronation was the first commercial Hotel of Nepal and now it has been changed into Snow Line Hotel. With the passage of the time many hotels have been established in Nepal. Stars Hotel has been established gradually because of the liberal market and friendly economic policy of the Nepal Government, and then the Ministry of Culture, Tourism and Civil Aviation are also helping in this regard.

The Hotel industry is perhaps one of the oldest commercial endeavors of an urge to travel spurred by the invention of the “Wheel”. The earliest Inns were ventures by husband and wife teams who provided large halls for travelers to make their own beds and sleep on the floor. They also provided food, wine, Ale, etc and stabling facilities. These conditions prevailed for several hundred years. The industrial revolution brought business ideas and also changed travel mode.

The idea in Hotel keeping was taken by the emerging nations of Europe especially Switzerland. The word “Hotel” was used in England in about 1760 after a passage of over 80 years. The American lodging houses were called Inn. The real growth of the modern Hotel industry took place in U.S.A with the opening of city Hotel in New York in 1794 A.D. This was the first building specially erected for Hotel purpose. Some of the Hotels built at that time but the real boom in hotel building

came in early Twentieth century. The depression in 1930 had a disastrous effect on the Hotel industry. It was felt that the Hotel would never recover, but the out break of world war 2nd brought a tremendous upsurge. In the earlier 1950, two new concepts emerged; one was Motels, which was restricted to the North American Continent. International chain could provide the expertise technology and marketing trust that individual owners could not provide. Some international chains are Sheratons, Hyatt, Holiday Inn, and Ramada Inn etc. Today's Hotel to all the needs and wishes of a guest and the future holds promise for a future mushrooming of modern.

“Hotel” or “Inn” is defined by British law as a “place where a bonfire traveler can received food and shelter provided them in the position to pay for it and is in a fit condition to be received”. Hence, a hotel must provide food (and Beverages) and lodging to travelers on payment and has in turn the right to refuse if the travelers is drunk, disorderly, or is not in a position to pay for the service.

The hotel is classified to suit the standard of the guest. Hotel may be classified according to the following basic factors.

2. Categorization by Location

Downtown Hotel: It is located in the heart of the city. Rates in these Hotels are normally high due to the rate of return on investment (ROI) computed on these capital intensive hotels is substantially high. Normally business clientele prefer such Hotels.

Sub-Urban Hotel: Located in the suburbs, it has the advantage of quiet surroundings. Rates quoted are low. Such Hotel is quiet setting ideal for conferences, seminars, educational program etc.

Resort Hotel: This type of hotel is located in the hills or at beaches. It is mainly patronized by vacationers. Basic facilities are provided and the rates offered are on American plan, i.e. room plus all means included.

Airport Hotel: As the name suggests, these Hotels are situated at the airport and are ideal for transit passengers who have only a few hours in the city making it impossible for them to stay in a Downtown Hotel. Rate charges for room only i.e. European plan.

Motel: This type of hotel is located in highways. They provide modest board and lodging to highway travelers. Rates quoted are on European plan i.e. room only.

Inns: They are similar in size with modest board and lodging facilities. They may be located any where within or outside the city.

2. Categorization by Number of Rooms

Hotel with 25 rooms and less may be termed “small”, those with 25 to 100 may be called “Medium”, and those with 101 to 300 are called “Large”. Hotels with over 300 rooms are called “Very Large”.

3. Categorization by Type Plan

Hotels are classified according to the type plan they offer. Nepal has Hotels on European plan, American plan or continental plan. Those plans are decided by the hotel on a variety of factors including type of clientele.

4. Categorization by Type of Clientele

This categorization is based on the type of patronage. Rates are European plan for business and American plan for groups and family. Such Hotels are normally situated in resort cities.

5. Categorization by Length of Guest Stay

It differs from hotels to hotels i.e. transient hotels, Residential Hotels and semi-residential hotel.

6. Categorization by Facilities that the Hotel Offers

Facilities offered by hotels may be the most important criteria for classifying Hotels. Some countries adopt the star rating system as follows,

Five Star Hotel -----	Luxury Hotel
Four Star Hotel -----	First Class Hotel
Three Star Hotel -----	Middle Class Hotel
Two Star Hotel -----	Lower Middle Class Hotel
One Star Hotel -----	Moderate Class Hotel

In the contest of Nepal, there are Eight Five Star Hotels in Nepal. They are Yak and Yeti Hotel, Soaltee Hotel, Del' Annapurna Hotel, Taragaon Regency Hyatt Hotel, Raddison Hotel, Sangri-la Hotel, The Malla Hotel and Hotel Everest. Among them Soaltee hotel is chosen for the study by the researchers. Since Soaltee Hotel is not only the second largest hotel but also an oldest five star hotel of Nepal and also it is quite popular among baronial tourist.

2.2 Soaltee Hotel Limited at a Glance

Soaltee Hotel Limited was established in 1968 under the Company Act 1964 as a private limited company. Later on in 1975 it was converted into public limited company and admitted International Finance Corporation, Washington D.C and Oberoi Hotel, India as shareholders. The Hotel was operating in collaboration with Oberoi hotel under the name of Soaltee Oberoi till May, 1994. The management of the hotel has been changed from Oberoi Hotel to Hotel Inn Crown Plaza since 1st June 1994 and then onwards the hotel is in operation under the name of Hotel Soaltee Holiday Inn Crown Plaza.

The main objective of the company is to provide Hotel facilities like Business center, Swimming Pool, Health Club, Beauty Parlor, Conference Hall, and Banquet Facilities. It provides same day laundry, Dry Cleaning, Free Transport Service. The facilities offered are Barber shop, Beauty Salon, Currency Exchange, Travel Agency, Car Rental, News Stand, Gift, Arts and Crafts shop etc. Some of the attraction are Casino Nepal (Black Jack, Roulette, Pontoon, Flush Table) a modern swimming pool surrounded by green lawns. It provides Nepalese, Indian, Chinese cuisine. Traditional Nepalese music and dance are also attractive. All rooms over look the mountains and are fully air conditioned with shower, Telephone and four channel Music.

The Soaltee Hotel Limited, Kathmandu is the premier Hotel of the Kingdom and is located in the green suburbs of Tahachal. It is fifteen minutes away from the Airport and ten minutes away from the city center. Spread over eleven acres of space and surrounded by offers a Resort atmosphere for both the business and Leisure Travelers. Soaltee Hotel Limited provides the following facilities:

Soaltee Crown Plaza offers 283 Superior, Deluxe and Crown plaza Club rooms including 183 single bedrooms and 10 double bedrooms, Eight Executive Suites, Eight Meeting rooms, One Rollaway, Seven Regal Suites and five Gosainkund Suites. The Regal suites have accommodated numerous Head of States and other dignitaries over the years. For the need of the business traveler, there is fully equipped business center with on-line facilities. On-line connectivity with personal email identification can also be provided in the rooms.

The health club features a fully equipped Gymnasium, Sauna and Turkish Bath, Beauty Parlor, Barbershop, Tennis court and Swimming pool. The hotel shopping arcade offers excellent shopping opportunities. The travel desk can organize Car Rental, International and Domestic flight ticket booking and reconfirmation, tour

arrangements for leisure and adventure activities in Nepal, airport transfer the city shuttle services at regular interval; are complementary to all the guest. The hotel also offers helicopter-landing pad.

Hotel Facilities:

Restaurant and bar
24 hours Room Service
Parking
Hairdresser
Handicapped equipment
Ball room
Banquet Facilities
Bank
Hair Dryer etc.
Elevators etc.

Room Facilities:

Mini bar
Air Conditioning
Cable and Satellite
Direct dial telephone
Internet Access
Voice Mail
Data Port
Smoke Detector

Leisure/Sports:

Tennis Court
Swimming Pool
Fitness room, Massage
Sauna, Spa
Health Centre
Squash Court
Golf Course
Jogging Track
Night Club, Disco, Casino,

Business Services:

Conference Room
Business Centre
Audio Visual Equipment
Computers
Cellular Phone Rental
Copy Machine
Courier etc.

Credit Card Services:

American Express
Visa Card
Master Card
Diners
Japan Credit Bureau

2009 Individual Tariff

	Single	Double	
Superior	US\$ 190	US\$ 200	
Deluxe	US\$ 210	US\$ 220	
Crowne Plaza Club		US\$ 280	
Executive Suites		US\$ 440	
Regal Suites		US\$ 850	
Gosainkund		US\$ 950	
Extra Bed		US\$ 40	
Group Tariff (for a group of 15 persons or more)			
	European plan	Modified American Plan	American Plan
	US\$	US\$	US\$
Single	150	178	196
Double	160	216	252
Meal Rates	US\$		
American Breakfast	10		
Lunch	18		
Dinner	18		
N.B: All the above rates are subject to 2% Tourism Service Fees and 13% Value Added Tax. Rates and government taxes are subject to change without prior notice.			

1.3 Statement of the Problem

Economy prosperity of a country depends upon its sustainable economic development. For the attainment of accelerated economic development in the country, Hotel industry is equally as important as that of agriculture and other primary sectors. The Hotel industry, in the process of value added contributes to the creation of new employment opportunities and economic integration. As long as this sector cannot be expanded on a promotional basis, proper economic development of a country cannot be possible. However, low incomes of the people, political instability, and undesirable other problems have not been able to make the desire head way by Hotel industry.

The role of the government owned enterprises becomes very important especially in terms of developing the infrastructure, extending social services and increasing Hotel industry. Giving this fact, more prominence and greater recognition was given in the various plans of the Nepal Government to the role of Government Corporation.

Success is not a matter of chance, profit doesn't just happen it is to be planned and managed. Cost volume profit analysis provides the technique of profit planning frame work. Based on the annual report published, performance of the Nepalese Hotel industry cannot be considered as satisfactory. Poor performance is the outcome of poor planning, controlling and decision-making. Sufficient studies have not been conducted so far in Nepalese context. Thus, an attempt has been made to find Cost Volume relationship of Soaltee Hotel Limited. In addition, this study attempts to answer the following questions:

- What is the relationship between Cost Volume and Profit in the context of Hotel industry?
- What is the relation between Cost and Volume and Profit and Volume?
- What are the components of cost of Hotel industry?
- What will be the nature cost if least square is used to segregate cost?
- How Hotel industries are classifying their costs?
- Which factor is the major factor to determine total cost?
- Is there significant relationship between revenue of SHL, profit of SHL and total revenue of Hotel industry?

1.4 Objectives of the Study

The main objective of the study is to examine “Cost-Volume-Profit-relationship of Soaltee Hotel Limited”. The other specific objectives are:

- To study the relationship of cost volume and profit.

- To study the nature of direct and indirect cost and components of cost of Hotel.
- To evaluate the profitability, financial position and sensitivity of Soltee Hotel's activities.
- To provide suggestions and recommendation to the concerned authorities for the further implement.

1.5 Significance of the Study

The present research work is the study of the practice of Cost-Volume-Profit Analysis in Soaltee Hotel Limited. This study will be significant because it examines the application of CVP analysis in the hotel. It explores the problems and potentialities of the selected hotel. It will be useful to the potential managers, accountants, policy makers and planners etc. It provides information on the application of the tools under profit planning in the different circumstances. This study also directed towards providing necessary recommendations to the related department of the hotel. It provides literature to the researcher, who wants to carry on further research in this field.

1.6 Limitations of the Study

This study is confined only to Cost-Volume-Profit-Analysis as tools of profit planning and control of cost of Soaltee Hotel Limited. The following factors have limited the scope of the study:

- Cost-Volume-Profit-Analysis covers a period of last five years only ranging from the F/Y 2060/61 to 2064/65.
- The study is based on primary as well as secondary data (i.e. Questionnaire, Interview, and financial statement were collected from the hotel)
- The accuracy of this study is based on true response and the data provided by the management of the hotel.

- The study mainly focuses to keep sensitivity analysis of costs.
- Due to limited time and resources constraint much emphasis is given to make this study comprehensive.

1.7 Organization of the Study

The study has been classified into five major chapters. The chapters were outlined below.

Chapter - I	Introduction
Chapter - II	Review of Literature
Chapter – III	Research Methodology
Chapter – IV	Data Presentations and Analysis
Chapter – V	Summary, Conclusion and Recommendations

CHAPTER – I INTRODUCTION

The first chapter covered background of the study, introduction of the hotel, statement of the problem, objectives of the study, significance of the study, limitations of the study. Therefore, this chapter made an attempt to provide introduction of the topic and highlights the fundamental objectives.

CHAPTER – II REVIEW OF LITERATURE

The second chapter made an offer of the fundamental concepts of Hotel. It also provided the meaning of CVP, its issues and objectives. This chapter provided pertinent literature and studies. This chapter can be taken as the backbone of study, where relevant studies were reviewed.

CHAPTER - III RESEARCH METHODOLOGY

The third chapter presented the research methodology used in the study. It encompassed research design, nature and sources of data, method of data analysis, statistical / groups of data.

CHAPTER – IV DATA PRESENTATIONS AND ANALYSIS

The fourth chapter being the main chapter of the research that dealt with the presentation, analysis and interpretation of data. Different types of tools and technique ware used to analyze the available data in order to achieve the objectives.

CHAPTER – V SUMMARY, CONCLUSION AND RECOMMENDATIONS

The last chapter presented the summary and conclusion of the study based on the analysis of the data and also provided recommendation.

CHAPTER - II

REVIEW OF LITERATURE

2.1 Conceptual Framework

An organization is established to achieve some goals. it has its own objectives. To achieve goals of organization objective should clearly mention. In this competitive globalize business age an organization whether is it public or private profit is essential. Profit is not chance, it is result of successful management. The management of an enterprise requires continuing performance of certain managerial responsibilities. These responsibilities collectively are of ten called the function of management. Planning, organizing, staffing and human resource management, leading and interpersonal influence and controlling are major functions of management. Planning is process of developing enterprises objectives and selecting future course of action in advance. Controlling means evaluating the firm's activities against the plan and deciding what should be done if the plan is not being followed (Lynch William, 1995, P18). In business organization employees and trade union, Government community representative, investment analysts, suppliers, lender/Banker, managers, owners, customers etc. These all parties require various information of decision making their own purpose. Actual position of the enterprises can be found from financial statement. It shows the clear picture of enterprises profit and loss position, balance sheet etc. These are not sufficient to measure the firm's performance and plan. There are various tools and technique to measure and analyze the financial performance and determining various plan in management accounting. Cost Volume Profit Analysis (CVPA) 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.

2.1.1 Concept of 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 profit for the relevant range of activity and for a particular time frame. Basically, CVP analysis involves finding the most favorable combination of variable cost, fixed cost, selling price, sales volume and mix of products sold. CVP analysis provides the managers with a powerful tool for identifying that course of the action that will improve profitability.

CVP analysis is a management accounting tools to show the relationship between the ingredients of profit planning. Profit planning is the function of the selling price of product and units sold. The entire gamut of profit planning is associated with CVP inter relationships. CVP analysis is the technique that explores the relationships, which exist, between cost, revenue, output level and resulting profit. Cost volume profit analysis can be extended to cover the effects on profit of change in selling prices or service fees, cost, estimate of total cost, total revenue and profit at various sales volumes. CPV analysis provides the management with a comprehensive overview of the effects on revenue and cost of all kinds of short-run financial changes. It is related to profit, sales volume and cost.

Generally cost-volume-profit analysis provides information regarding (Munakurmi, 2003:124).

- Minimum level of sales to avoid losses.
- Sales level to earn target profit.
- Effect of changes in price, 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 Profit Volume Analysis is the process of examining the relationships among revenues cost and profits for a relevant range of an activity and a particular time frame. It is one of the most important and powerful tools that manager have at their command in short term planning. It helps managers understand inter relationship between cost volume of profit in an organization by focusing on interaction between the following five elements

- Prices of Products
- Volume or level of activity
- Per unit variable cost
- Total fixed costs
- Mix of products.

In other words, CVP analysis applies the variable costing approach to analyze the built in relationship between cost, volume and profit. It analyses the short term static relationship between cost, volume and profit. It assumes that under constant underlying condition, CVP analysis can be used for the analysis of break even volume-break even analysis and contribution margin analysis- profit planning. This assumption of constant underlying conditions and the short term relationship however have been criticized by many authors.

The assumptions over emphasize the market sovereignty of producer (i.e. seller) rather than that of consumer. Therefore, to assume that seller has choice to sell as many as of his product in the market, at the given price fixed by him is neither true nor possible. Competitive market with a wide range of substitute products in the market has minimized the role of the seller and has over focused on the sovereignty of the management for profit planning. The contribution margin analysis provides the best possible answers of many 'what if' questions of management. Most management decisions require a careful analysis of cost behavior in relationship to output volume. This is possible only through CVP analysis. Besides, CVP analysis deals with how profit and cost change with change in volume.

Cost volume profit analysis can be extended to cover the effects on profits of changes in selling price/service fees, cost, income, tax rate, product mix etc. It estimate total cost, total revenue and profit at various sales volume. It provides only an overview of the profit planning process. Cost volume profit analysis provides management with comprehensive overview of the effects of revenue and costs of all kinds of short run financial changes. It is related to profit, sales volume and cost (Munakarmi, 2034:4.01).

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

The key motive of business, enterprises is to make and maximize profit. Profit does not happen by chance. It is to be managed. CVP analysis is supplementary tool of planning for profit. CVP is immensely helpful for developing alternative strategies in sales planning and cost estimation CVP analysis is an accounting

technique showing the relationship between variables. It is equally applicable for non profit making organization to allocate for scare economic resources most effectively among the completion alternative. Allocation of scare resource among the various demanding sectors is the most important part of national planning.

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

2.1.2 Use of CVP Analysis in Profit Planning

Planning, controlling and decision-making are the essential managerial functions. Cost- Volume-Profit analysis helps the managers to plan for profit, to control cost and make decisions. As such it helps (Munakurmi, 2003:123-124).

- To determine the break-even point in terms of unit or sales value.
- To ascertain the margin of safety.
- To estimate profit or losses at various level of output.
- To help management to find the most profitable combination of cost and volume (units).
- 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.

- To assess the likely effect of management decision such as an increase or decrease in selling price on adoption of new method of production to reduce direct labour and increase output.

2.1.3 Application of Cost- Volume-Profit Analysis

Cost volume profit analysis is applied specially for break even analysis and profit planning. Business organizations are 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. The cost volume profit relationship will be established by break even analysis. Therefore, cost volume profit analysis uses for (Maheshwari, 2000:P174).

- i. Contribution Margin analysis
- ii. Break Even Analysis.
- iii. Profit Volume Analysis.

2.1.3.1 Contribution Margin Analysis

Contribution analysis involves a series of analytical techniques used to determine and evaluate the effects on profit of changes in sales volume (i.e. units sold), sales prices, fixed cost and variable cost. It focus on contribution margin. The term 'profit' used in CVP analysis is the amount of contribution margin available from the sales revenue to absorb fixed cost and also to contribute towards company's profit goal after deducting all variable costs of sales. Therefore, CVP analysis requires distribution of cost into variable cost and fixed cost. All semi variable costs need to be clearly segregated into variable and fixed component. The difference between selling price and variable cost (i.e. the marginal cost) is known as contribution margin. In other words, Fixed cost plus the amount of profit is equivalent to contribution margin. It can be expressed by the following formula:

$$\text{Contribution Margin} = \text{Selling Price} - \text{Variable Cost}$$

$$= \text{Fixed Cost} + \text{Profit}$$

It can be concluded 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:P.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 profit will also be high. Contribution margin usually is expressed as a percentage of sales or contribution margin ratio i.e.

$$\begin{aligned} \text{Contribution Margin Ratio} &= \left[\frac{\text{Contribution Margin}}{\text{Sales}} \right] \\ &= \left[1 - \frac{\text{Variable Cost per unit}}{\text{Selling Price per unit}} \right] \end{aligned}$$

The variable usually uses in cost-volume-profit analysis are:

a. Sales Value

A firm or a company may have different product, services etc. The sales value is actually includes the quantity of total sales multiply by selling price per unit or sales rupees. Sales rupee is calculated sales units multiply by selling price per unit.

b. Variable Cost

Variable cost is that cost which is directly affected by change in the activity level. The per unit variable cost always remain constant. If the activity level decreases, the variable cost also decreases. If the activity level or production level increase, than the variable cost also increase. Change of variable cost effects P/V ratio,

BEP and net income. When variable cost increases: Net income, P/V ratio and margin of safety will decrease but it increases BEP.

c. 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 affects BEP and Net income. Increase in fixed cost, increases the volume of BEP and decrease the Net income or vice-versa. Fixed cost is also called capacity cost.

d. Mixed Cost

Expenditures that cannot be categorized as purely fixed or variables is termed as mixed cost or semi-variable cost. Mixed costs contain both variable and fixed cost elements. Repair and maintenance, supervision, telephone cost, electricity charges are some example of mixed costs. It should be separated into the variable and fixed cost elements for profit planning, cost control and decision making.

e. Jumping Cost

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

2.1.3.2 Break-Even Analysis

Break-even analysis is widely used technique to study cost-volume-profit relationship. The narrower interpretation of the term break-even analysis refers to a system 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. It portrays the relationship between cost of production, volume of production and the sales value. CVP analysis includes the entire gamut of profit planning, while break- even analysis is also one of the

techniques used in this process. However it is so popular for studying CVP analysis that the two terms are used as synonymous terms (Maheshwari, 2000: PP175-181).

i. 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 point can be determined by the two methods (Maheshwari, 2000:PP175-181).

a. The Equation Method: - Break-even point can be calculated by using following algebraic equations:

$$\text{BE Sales Value} = \text{FC} + \text{VC} \pm \text{Profit}$$

$$\text{Or, } (\text{BE Sales Unit} \times \text{SPPU}) = \text{FC} + (\text{BE Sales Units} \times \text{VCPU}) \pm 0$$

b. The Unit Contribution Method: - BEP can also be ascertained through unit contribution margin approach. In this approach, BEP can be calculated by using following formula:

$$\text{BEP in units} = \left[\frac{\text{Fixed Cost}}{\text{CMPU}} \right] = \left[\frac{\text{Fixed Cost}}{\text{SPPU} - \text{VCPU}} \right]$$

$$\text{BEP in amount} = \left[\frac{\text{Fixed Cost}}{\text{P/V ratio}} \right] = \left[\frac{\text{FC}}{\text{CMPU}} \times \text{SPPU} \right] \text{ etc.}$$

At break even point, the desired profit would be zero. In this 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.

❖ **Cash Break Even Point**

It is the output 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.) are considered. This point helps the management in determining the level of activity below which there are chances of insolvency on account of the firm's inability to meet cash obligation unless alternative arrangement are made (Maheshwari, 2000:P.178) :-

Cash BEP

$$\text{in units} = \left[\frac{\text{Cash Fixed Cost}}{\text{Cash Contribution per unit}} \right]$$

❖ **Composite Break- Even Point**

The concern dealing in several products can compute a composite break- even- point according to the following formula (Maheshwari,2000:P.179).

$$\text{Composite BEP in amount} = \left[\frac{\text{Total Fixed Cost}}{\text{Composite P/V ratio}} \right] = \left[\frac{\text{TFC}}{\text{TCM}} \times \text{TS} \right]$$

❖ **Cost Break Even Point**

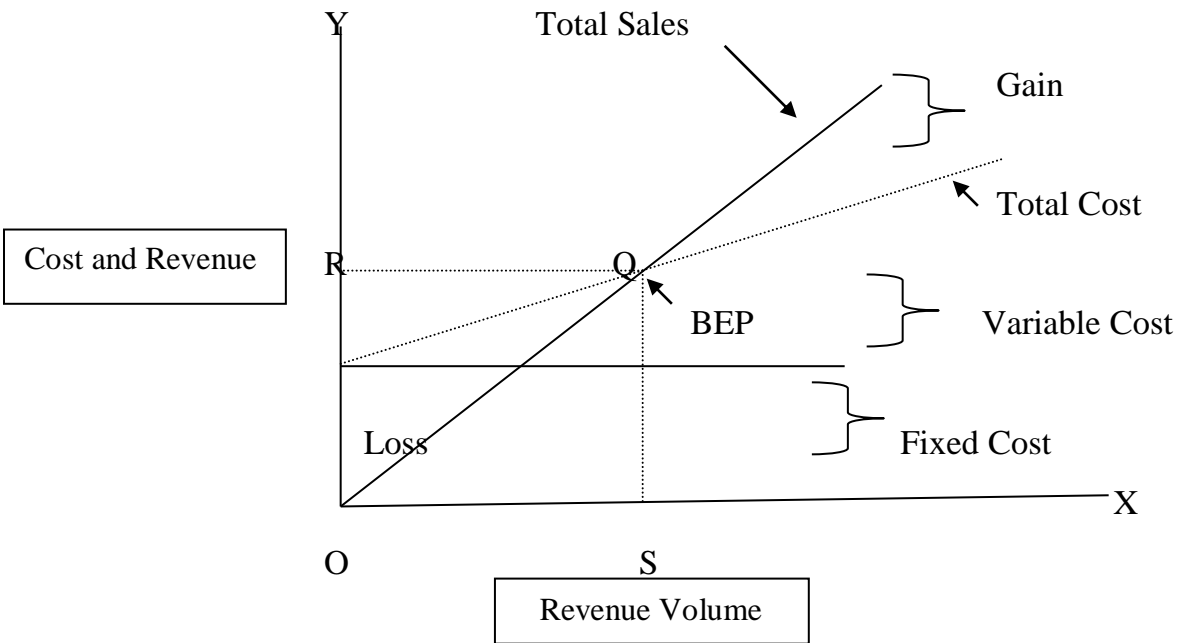
Cost Break Even Point refers to a situation where the costs of operating two alternative plants would remain equal. The point enables the firm to identify which plant is the best to operate at or a given level of output assuming that sales price per unit is the same (Maheshwari,2000: PP179-180).

ii. **Break Even Chart**

The relationship between the costs, sales and profit can be shown in the form of a chart. Such a chart not only depicts the level of activity where there will be neither loss nor profit but also shows the profit or loss at various level of activity:

Figure 2.1

Break Even Chart



In the above Break-Even Chart, an equilibrium point between sales or revenue curve and total cost curve is “Q” and it is known as BEP. Therefore “OS” is the break even sales volume and “OR” is the break even sales in amount. If the actual sales amount is more than break even sales, the organization will earn profit and if the actual sales amount is less than the break even sales, the organization will suffer from loss.

2.1.3.2.1 Application of Break-Even Analysis

- Break-even concept can be used to formulate different policies in a business enterprise. Some of these applications are (Maheshwari,2000:P182).
- Determine of profit at different levels and margin of safety.
- To find the level of output to get the desired profit.

- Effect of price reduction on sales volume and changes in sales mix.
- Selection of most profitable alternative and make or buy decision and drop and/or add decisions.

2.1.3.2.2 Assumptions of Break-Even-Analysis

Contribution analysis and break even analysis are based on a specific set of assumption that should be clearly understood. These underlying assumptions are (Maheshwari, 2000:P182-183).

- All cost can classify into two parts, fixed cost and variable cost. There is not cost other than fixed and variable.
- There is a relevant range of validity (activity) for using the results of the analysis and sales price does not change as units of sales change.
- There is only one product or in case of multiple products, the sales mix among the products remain constant.
- Basic management policy about operation will not change materially in short run.
- The general price level (inflation/deflation) will remains essentially stable in the short run.
- Sales and production levels are synchronized, that is inventory remains essentially constant or zero.
- Efficiency and productivity per person will remains essentially unchanged in the short run.

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

2.1.3.2.3 Limitations of Break-Even Analysis

Break-even analysis in many business situations can be used for effective decision making, but there are many short coming (limitations) in its analysis and interpretations. Some of these can be listed as (Maheshwari, 2000:PP183-184).

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

2.1.3.3 Profit-Volume Analysis

The analysis of relationship between profit and volume is known as profit-volume analysis. The two factors profit and volume are interconnected and dependent with each other. Profit depends upon sales; selling price to a greater extent will depend upon the volume of production. Thus, the entire gamut of profit planning is associated with cost-volume-profit inter-relationship.

Profit/Volume Ratio

- This term is important for studying the profitability of operations of a business. Profit/volume ratio (i.e. P/V ratio) establishes a relationship between the contribution and the sales value. The ratio can be shown in the form of a percentage also. The formula can be expressed by (Maheshwari, 2000:P184).

$$\text{P/V Ratio} = \frac{\text{Contribution Margin}}{\text{Sales}} = \left[\frac{S - VC}{S} \right] = \left[1 - \frac{VC}{S} \right]$$

- This ratio can also be called as contribution margin ratio. This ratio can also be known by comparing the change in contribution to change in sales or change in profit to change in sales. Any increase in contribution would mean increase in profit only because fixed costs are assumed to be constant at all level of production. Thus, (Maheshwari,2000:P185):-

$$\text{P/V Ratio} = \left[\frac{\text{Changes in contribution}}{\text{Changes in Sales}} \right] = \left[\frac{\text{Changes in profit}}{\text{Changes in Sales}} \right]$$

- This ratio would remain constant at different levels of production since variable costs as a proportion to sales remain constant at various levels. The ratio is useful for determination of the desired level of output or profit and for the calculation of variable costs for any value sales. The variable cost can be expressed as under:

$$\text{VC} = \text{Sales} (1 - \text{P/V ratio})$$

Comparison of different P/V ratios 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 cost or by increasing the selling prices.

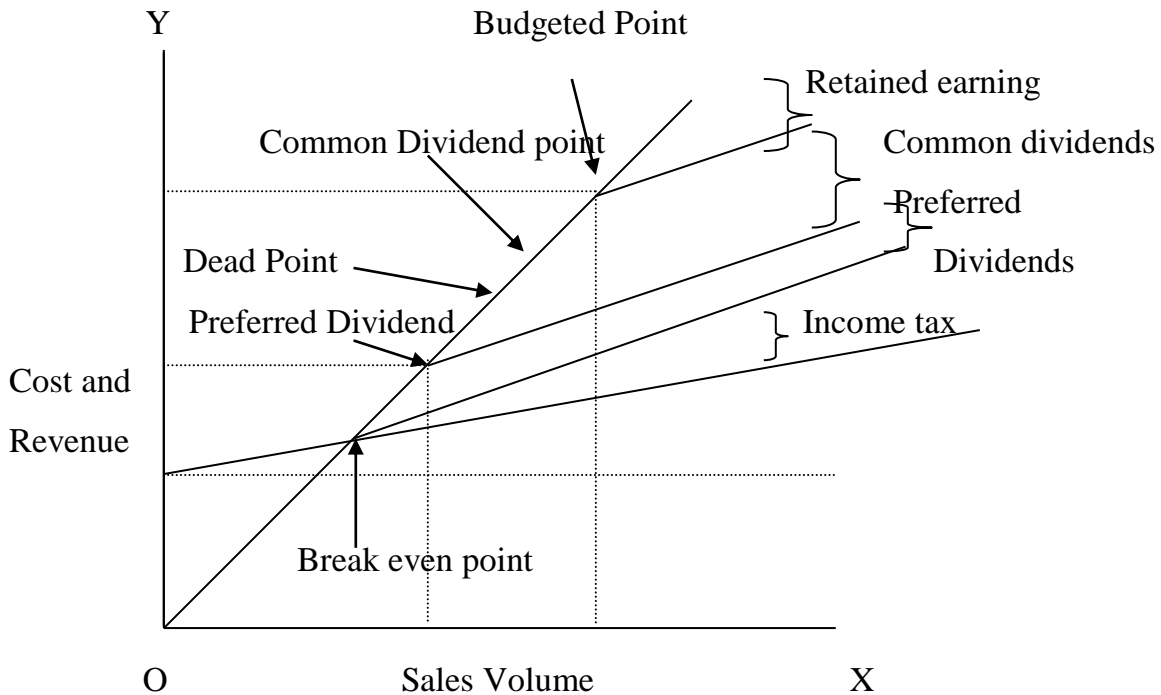
2.1.4 Economic Characteristics of Cost-Volume-Profit Analysis

Where cost-volume profit analysis is reasonably accurate, they can help management decision- making. Essentially, CVP analysis offers greater insight into the economic characteristics of the company and may be used to determine the approximate effect of various alternatives. CVP analysis is based on estimates, however, and the arithmetical manipulations generally involve averages, hence the results should never be interpreted as precise. Rather, the analysis may be

cauterized appropriately as a 'slide-rule' approach that may be used to develop and test, with the minimum of effort, the approximate effect on costs and profits of several types of management decisions (Welsch, 1979:PP467-468).

Figure 2.3

Economic Characteristics of Cost-Volume-Profit Analysis



Break Even Chart with Economic Characteristics

The above Break even chart with economic characteristics indicates few of the economic characteristics of a business, which are (Welsch, 1979: 468).

- Fixed costs, variable costs and total costs at varying volumes.
- The profit and loss potential, before and after income taxes, at varying volumes.
- The margin of safety- the relationship of budget volume to break even volume.
- The breakeven point.

- The preferred dividend or danger point- the point below which preferred dividends are not earned.
- The dead point- the point where management earns only the 'going' rate on the investment.
- The common dividend or unhealthy point – the point below which earnings are insufficient to pay the preferred dividends and the expected dividend on the common stock.

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

2.1.5 Margin of Safety

Margin of safety is the excess of budgeted or actual sales over the break-even sales volume. In other words, it is the different between the budgeted or actual sales revenue and the break-even sales revenue. It is a position above the break even point. It gives management a feel for how close projected operations are to be organization's break-even point. Managers often consider the size of the company's margin of safety when making decision about various business opportunities. The larger is the safety of margin, the greater is the chances for the company to earn profit (i.e. Larger the margin of safety, safer the company). A high margin of safety is particularly significant in times of depression when the demand for the company's or the firm's product is falling. A low margin of safety may result for a firm which has a low contribution ratio. When both the margin of safety and the P/V ratio are low, management should think of the possibilities of increasing the selling price, provided it does not adversely affect the sales volume or reducing variables costs by bringing improvement in the manufacturing process. Margin of safety can be ascertained by using the following formula (Munankarmi, 2003:127).

Margin of Safety = (Actual Sales Value – Break-Even Sales Value)

$$\text{In amount} = \frac{\text{Profit}}{\text{Profit Volume Ratio}}$$

$$\text{In Units} = \frac{\text{Profit}}{\text{Unit Contribution Margin}}$$

The relation between margin of safety and the actual sales is known as margin of safety ratio, which is determined as follows:

$$\text{Margin of Safety Ratio} = \frac{\text{Actual Sales} - \text{Break even sales}}{\text{Actual sales}}$$

The following steps are needed to rectify margin of safety.

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

2.1.6 Cost-Volume-Profit Analysis for Multi Product Firm

The relative production or 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 firm's 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 product's 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 the firm's break-even point and profit if each product has the same P/V ratio. However, a change in the product mix will change in the break even point and profit when products have unequal P/V ratios (Maheshwari, 2000:P.182).

2.1.7 Break-Even Point for Multi-Product Company/Firm

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

Following procedures are followed to calculate BEP for sales mix or multi product
Calculate contribution margin or Profit-volume ratio for each product
(Munankarmi, 2003: 137).

Calculate proportion of sales mix in Units or Values as follows:

$$\text{Sales Mix} = \left[\frac{\text{Individual Product's Sales Units or value}}{\text{Total of all Product's Sales Units or Value}} \right]$$

Calculate Weighted average contribution for all Products as follows:

$$\text{Weighted average} = (\text{sales mix (units)} \times \text{Unit Contribution Margin})$$

$$\text{Or,} \quad = (\text{Sales Mix (Value)} \times \text{P/V Ratio}).$$

Calculate Break-Even point (BEP):

$$\text{Break Even Point} = \frac{\text{Fixed Cost}}{\text{Weighted Average Contribution Margin}}$$

2.1.8 Cost-Volume-Profit Analysis and Limiting Factors

CVP analysis is helpful in profit planning and a company will be able to produce any number of outputs of its choice (desires). But in the real world it is not possible, because of some critical factors like finishing machine or raw material or labour. These critical factors in the CVP analysis are known as constraint.

2.1.8.1 CVP Analysis with a Single Constraint

Scarce resource should be efficiently allocated in order to maximize the contribution margin. A particular simple and instructive situation arises when there is only one constraining resource. This can occur if the firm's products are all produced on a single machine and output is limited by hours available on this machine. In the same way, single resource constraint arise, if the firm's products are all produced with only one material and output is limited by quantity available for that materials. When there is a constraint for a scarce resource to have alternatives uses, the contribution per unit should be calculated for each of these uses, the contribution per unit should be calculated for each of these uses. Than, the available capacity for such scarce resource should be allocated to the alternative uses on the basis of contribution per scarce resource (Munankarmi, 2003: P146).

2.1.8.2 CVP Analysis with Multiple Constraints

Where more than one scarce resource exists, the optimum production program 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 resources may be different for different scarce resources for the ranking of product; because production processes are affected by many constraints factors rather than single constraint. In such situation, linear programming technique may be used to optimize product mix. The linear programming formulation is required to determine a production plan that maximizes contribution

from the product mix. Linear programming is a mathematical technique which shows how to arrive at the optimum results, allocating available resources in a meaningful manner. It is basically concerned with the problem of allocating limited resources among competitive activities in an optimal 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 (Munankarmi, 2003: P148).

2.1.9 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 significantly fixing up of selling price. Management has used this as a convenient tool of profit planning without giving consideration of risk and uncertainty involved in it. Although, margin of safety ratio explains the degree of sensitivity of the project and product in general but it fails to explain among of certainty in the product and also between the alternatives. To overcome such a difficulty, risk and uncertainty analysis like in any other management decision making can also be used in CVP analysis.

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

subjective probability based in, personal judgment of the man making such analysis (Pandey, 2003:17).

2.1.10 Step (Jumping) Fixed Cost and Multiple BEP

Break-even point is determined by dividing the fixed costs by the contribution margin per unit. If the fixed cost is jumping like a ladder (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 computed BEP may not be feasible because they may violate the limits imposed by the relevant range corresponding to the level of fixed costs considered in their computation. As a result real or actual BEP is determined through Trial and Error approach (Munankarmi, 2003:P136).

2.1.11 Special Problems in Cost-Volume-Profit Analysis

Cost-Volume-Profit analyses are applied to individual products or parts of a business and all the products or activities combined. In the later case, three special problems may be encountered (Welsch, Hilton &Gordon, 2001:513-518).

❖ The Activity Base

When two or more products 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. Therefore, for the company as a whole, net sales amount are usually the satisfactory common denominator because manufacturing, selling and administrative activities are expressed in combination.

❖ The Change in Inventory

Usually the budgeted changes in inventories (i.e. finished goods and work-in-process) are immaterial in amount and thus may be disregarded in cost-volume-

profit analysis. On the other hand, when the change in budgeted inventory is significant, it should be included in the analysis. Including the effect of inventory changes in cost in cost volume profit analysis requires subjective judgments about what management might do (about making inventory changes) at different volumes levels and the conceptual precision that is desired. Management considers two practical approaches or policies in the inventory changes often used: (a) Disregard the inventory changes (b) Include the inventory changes.

❖ **The Non- Operating Incomes and Expenses**

Non-operating incomes (gains) and expenses (losses) and the extraordinary gains and losses, if material in amount, cause another problem in CVP analysis. The basic issue is whether they should be included or excluded. Extra-ordinary gains and losses are non recurring and unusual, therefore, they should be excluded. Non-operating incomes and expenses are recurring but they are not related to ongoing operations. Management considers the policy may be to:

- (a) Include the non-operating incomes and expenses.
- (b) Exclude the non-operating incomes and expenses.

2.1.12 Cost Structure and Operating Leverage

2.1.12.1 Cost Structure

Cost structure refers to the relative proportion of fixed and variable cost in the organization. The relationship of a company's variable and fixed cost is reflected in its operating leverage. The highly labour intensive organizations have high variable cost and low fixed cost and thus have low operating leverage and a relative low break-even point. Conversely, organizations that are highly capital-intensive have a cost structure that includes low variable and high fixed costs. Such a structure reflects high operating leverage and relatively high break even point. Company with lower fixed costs and higher variable costs will enjoy greater

stability in net income and will be more protected from losses during bad years but at the cost of lower net income in good years (Munankarmi 2003:P145).

2.1.12.2 Operating Leverage

Operating leverage is a measure of the extent to which fixed costs are being used in organization. The relationship of a company's variable and fixed cost is reflected in its operating leverage. Generally highly labour intensive organizations have high variable costs and low fixed costs and thus low operating leverage and relatively low break-even point. Conversely, organizations that are highly capital intensive have a cost structure that includes low variable and high fixed costs which reflects high operating leverage with high break-even point. It shows that fixed cost 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 firm's break-even point will be relatively high. The degree of operating leverage is determined as under (Munankarmi 2003:P145).

$$\text{Degree of Operating Leverage} = \frac{\text{Contribution Margin}}{\text{Net income}}$$

2.1.13 Segregation of Semi-Variable (Mixed) Costs

Cost-volume-profit analysis requires segregation of all costs into two portions: 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 (Maheshwari, 2000:PP162-165).

i. Levels of Output Compared to Levels of Expenses Method

According to this method, the output at two different levels is 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;

$$\text{Variable Elements} = \frac{\text{Change in Amounts of Expenses}}{\text{Change in Activity or Quantity}}$$

ii. Range Method

This method is similar to output compared to levels of expenses method except that only the highest and lowest points of output are compared out of various levels. This method is also designated as 'High and low' method. The high low method is explained, step-by-step, as follows:

- (a) Select the highest pair and the lowest pair.
- (b) Compute the variable rate 'b' using the formula:

$$\text{Variable rate} = \frac{\text{Difference in Cost 'y'}}{\text{Difference in Activity 'x'}}$$

- (C) Compute the fixed cost portion as

$$\text{Fixed Cost Portion} = \text{Total Semi-Variable Cost} - \text{Variable Cost}$$

iii. 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.

iv. 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 the activity measures is plotted on the horizontal axis (X-axis). The method is explained below: -

- a. The volume of production is plotted on the horizontal axis and the costs are plotted on the vertical axis.

- b. Corresponding to each volume of production costs are then plotted on the paper, thus, several points are shown on it.
- c. 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 the amount of fixed element.
- d. 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.
- e. The variable cost at any level can be known as noting difference between fixed cost and total cost lines.

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

v. **Method of Least Squares**

One popularly used method for estimating the cost-volume formula is regression analysis. Regression analysis is a statistical procedure for estimating mathematically, the average relationship between the dependent variable (y) and the independent variable (x). The regression method does include all the observe data and attempts to find a line of best fit. To find the line of best fit, a technique called the method of least squares is used. Method of least squares is based on the mathematical technique of fitting an equation with the help of a number of observations. The linear equation, (i.e. a straight line equation) can be assumed as:

$Y = a + bx$ and the various sub-equations shall be;

$$\sum y = a + b \sum x$$

$$\sum xy = a \sum x + b \sum x^2$$

An equation of second order, (i.e., a curvilinear equation) can be drawn as:

$Y = a + bx + cx^2$ and the various sub-equations to solve it. i.e., to find out the values of constants a, b, and c shall be:

$$\sum y = nab \sum x^2$$

$$\sum xy = a \sum x + b \sum x^2 + C \sum x^3$$

$$\sum x^2 y = a \sum x^2 + b \sum x^3 + C \sum x^4$$

Similarly the equations can be fitted for any number of order or degree depending upon the number of observation available and the accuracy desired.

Compute the variable cost per unit (b) and the fixed cost (a) by using the following formula:

$$b = \left\{ \frac{N \sum xy - \sum x \cdot \sum y}{N \sum x^2 - (\sum x)^2} \right\}$$

$$a = \left\{ \frac{\sum y - b(\sum x)}{N} \right\}$$

Where;

Y = total cost,

N = No. of series.

x = production unit

b = variable cost per unit

a = Fixed cost

\sum = sum of

2.1.14 Impact of Changes on Profits

Profit is the function of a variety of factors: it is affected by changes in volumes, cost and prices. Profits may be affected by the changes, (increase or decrease), in the following factors (Pandey, 1999:203-208).

- **Effect of Price Changes:** An increase in the selling price will increase the P/V ratio and, as a result, will lower the break even point. On the contrary, a decrease in selling price will reduce the P/V ratio and therefore, result in the higher break even point.

- **Effect on Volume Changes:** A changes in volume, not accompanied with the changes in the selling price and / or costs, will not affect P/V ratio. As a result, the break even point remains unchanged. Profit will increase with an increase in volume and will reduce with a decrease in volume.
- **Effect of Price and Volume Changes:** A change in price invariably affects volume. A price reduction may increase demand of the product and consequently, may result in increased volume. On the other hand, increase in price may adversely affect the demand and thus, reduce volume. The impact on profits under these circumstances is not obvious. Profit may increase with a price reduction if volume increases substantially. Similarly, a price raise may reduce profits if there is material fall in volume.
- **Effect of Changes in Variables Costs:** The effect of the changes in variable costs on profits is straight forward if it does not cause any change in selling price and or volume. An increase in variable costs will lower the P/V ratio, push up the BEP and reduce profits. On the other hand, if the variable costs decline, P/V ratio will increase, BEP will be lowered and profit would rise.
- **Effect of Changes in Fixed Costs:** A change in fixed cost does not influence P/V ratio. Other factors remaining unchanged, a fall in the fixed cost will, however lower the BEP and raise profits. An increase in fixed cost caused either due to some external factors or due to some changes in the management policy, will raise the BEP. Increase in factory rent or insurance and taxes are example of external factors, while increase in depreciation or salaries of managers may be the result of management decisions.
- **Effects of Changes in a Combination of Factors:** The financial manager or the management accountant, evaluating the profit plans or budgets, must realize that a change in one factors leads to a change in another factors.

Therefore, all such changes should be carefully visualized and their net impact on profit must be seen.

2.2 Review of Related Studies

Researches in the area of ‘cost-volume-profit’ analysis as a tool to measure effectiveness of cost volume profit relation of a company in Nepalese context are not made. But many researches have been made in the area of profit planning and control and management accounting in Nepalese context. As profit planning and control and management accounting covers major of the aspects of Cost-Volume-Profit analysis, researches made on these areas are taken into consideration for the sake of review to examine how profit planning and control and management accounting practices in Nepalese companies. Many of the researches have been made on manufacturing concerns and except a few most of them are not profound. An attempt is made here to review some of the researchers, which have been submitted on profit planning and control and management accounting in the context of Nepalese public enterprises.

Sharma, Sagar (2002), had conducted a research entitled “Management Accounting Practices in the listed Companies of Nepal”. This study concerned to examine and study the practice of management accounting tools in the listed companies in Nepal. This study is based on primary data only. Stratified random sampling with proportionate allocation of percentage is followed to draw the sample. No secondary data has been used for his study. Some remarkable findings were as follows:

- Different types of management accounting tools, which are taught in the colleges, are not found applied by the listed companies of Nepal.
- Management accounting is to help managers in overall managerial activities by providing information and helping in planning, controlling and decision making.

- Nepalese listed companies are in infant stage in practicing of management accounting tools such as capital budgeting, annual budgeting, cash flow, ratio analysis, zero based budgeting; activity based budgeting, activity costing, target costing and value engineering.
- Lack of information and extra cost burden are the main reason behind not practicing such tools.
- As Nepal is proceeding towards globalization and net membership of WTO, companies are recommended to apply management accounting tools to fit with the global environment.

Dhakal, Dipendra Raj (2005), had conducted research work on "Cost Volume Profit Analysis of Dairy Development Corporation. This study concerned to examine the practice of CVP analysis & its effectiveness in DDC. The time period covered by this research was five years. The limitation and findings of the research are:

Limitations

- Study is based on primary and secondary data (inclusive of discussion and financial statements collected from the company)
- Date of Fiscal year 2060/61 were not available as it was in the auditing process.
- This report has been confined to the data provided by the personnel of the company.

Findings

- DDC hasn't been segregating fixed and variable cost, care has been taken in this research to differentiate fixed cost and variable cost with help of degree of variability method.

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

Rijal, Madhav (2005), had conducted a research on "cost volume profit analysis tools to measure effectiveness of profit planning and control; A case study of NEBICO Private Limited." He has centered his study to examine CVP analysis as a toll in manufacturing industry and to analyze the CVP and its impact in profit planning. It covers five years financial statement. The major finding are as follows:

- The company's variable cost is in proportion than fixed cost in total cost amount, which contribute for lower contribution margin.
- The company has high fixed cost (i.e. salary and wages, technical and computer fees, depreciation, interest, provident fund and subsidies)
- Company has no any plan to reduce cost. There is lack of effective cost control programs or techniques.
- The company has no effective inventory policy. The inventory management, raw material handling and controlling system are not efficient an effective.
- The board of directors is the main authority in price fixing and it directly interferes to price of biscuit and confectionary products.
- Nebico Pvt. Ltd. has not proper practice of segregating the costs into fixed and variable or controllable and non controllable.
- There is no proper co-ordination among production, administration, distribution, inventory and sales department.

- Nebico has not utilized its capacity.

Shrestha, Dharma R. (2006), had conducted a research entitled “Cost, Volume And Profit Analysis Of Commercial Bank: A Case Study Of Himalayan Bank Limited”. This study concerned to examine the practice of CVP analysis & its effectiveness in Commercial Bank ,in this study the secondary data had been used mostly and related other information had collected by informal interview for segregating cost, Cost analysis, contribution margin analysis, P/V ratio analysis & Break Even analysis. The time period Covered by this Research was six years from FY 2061/62. The major findings are as follows:

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

Pradhan, Rajendra (2006), Had conducted a research entitled " Cost Volume Profit Analysis of Public Enterprises of Nepal (A comparative analysis between Nepal Telecom and Nepal Electricity Authority). The limitation and Findings are as follows:

Limitations

- This study covers the data of only five fiscal years of NTC and NEA from 2057/58 to 2061/62.
- The analysis is based on the secondary and primary data which are provided by NTC and NEA.
- The accuracy of comprehensibility of the study will base on data available from management of NTC and NEA.
- This study is only concerned with fulfilling the requirement in Master of Business Studies.

Findings

- Segregation of fixed and variable cost is ignored by both enterprises. Cost volume profit analysis is not plasticizing by these enterprises no any method has been adopted to segregate to segregate cost into fixed or variable.
- Actual operating income of the NTC is increasing in fluctuation of trend.
- Variable cost of NTC is very less compare to its fixed cost and contribution margin ratio of NTC is very high. But NEA has variable cost and its contribution margin ratio is less.
- NTC is running in profit but NEA is suffering from less. No any systematic plans have been implemented for preventing the loss and improve profit of these enterprises.
- Fixed cost of NTC is high in the comparison to variable cost. Employee cost and administration expenses are high. In NEA fixed cost like interest and depreciation are high. Long term loan in NEA are the main cause in increase interest.

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

Adhikari, Bijaya Raj (2007), Had conducted a research entitled “Cost - Volume - Profit Analysis of "Nepal Lube Oil Limited”. This study concerned to examine the practice of CVP analysis & its effectiveness in company, in this study the secondary data had been used mostly and related other information had collected by informal interview for segregating cost, Cost analysis, contribution margin analysis, P/V ratio analysis & Break Even analysis. The time period Covered by this Research was seven years from FY 2056/57. The Limitation and findings are as follows:

Limitations

- The study has covered secondary data of last seven years i.e. from F/Y 2056/57 to 2062/63
- The study is mostly based on secondary data. Therefore the findings of the study solely depend on the reliability of such data.
- The accuracy of this study is based on true response and the data available from the management of the company.
- This study is only made for the presentative study of CVP analysis and mainly focus to keep sensitivity analysis cost of Nepal Lube Oil Limited.

Findings

- CVP analysis has not practiced yet.
- There is no Practice of segregating cost into fixed and variable. The costs are roughly classified and that classification is not scientific and appropriate.
- There is no complete and comprehensive budgeting system.

- As Nepal is proceeding towards globalization and net membership of WTO, companies are recommended to apply management accounting tools to fit with the global environment.

Sijakhwo, Krishna Ram (2008), Had conducted a research entitled “Study on Application of Cost-Volume-Profit Analysis as a Management Tool in Bhaktapur Craft Paper Ltd”. This study concerned to examine and study the practice of management accounting tools in the Company. This study is based on secondary data only and accuracy of this study is based on true response and the data available from the company. The time period Covered by this Research was seven years from FY 2056/57. Some limitation and remarkable findings were as follows:

Limitations

- The study is mainly based on secondary data.
- This study is confined only to cost volume profit analysis as a tool of profit planning and control of BCP ltd.
- Only seven years financial data has been used covering 2056/57 to 2062/63
- The accuracy of this study is based on true response and the data available from the company.

Findings

- Different types of management accounting tools, which are taught in the colleges, are not found applied by the Company.
- There is no Practice of segregating cost into fixed and variable by using statistical technique i.e. least square method.
- Proper estimation is not used while making projected or budgeted costs, profit and volume of the company

- Mixed costs or semi-variable costs were segregated by using least square method.

2.3 Research Gap

There is the gap between the present research and the previous researches. Previous researches conducted on accounting on profit planning and control and management covered only the budgeting practices in the manufacturing companies especially in public enterprises. The previous researcher did not disclose which of the profit planning and control tools were in practice which was not why. Some research conducted on practice of management accounting in listed companies of Nepal that covered the overall aspect of management accounting not specific tools like CVP. This is the age of specialization not generalization. It is realized that specific tool becomes more effective other than using overall tools as a whole at once. This is the main weak point of the previous researches. Few researches on CVP analysis have found but these also fail to utilize CVP tool in depth. Thus to fill up cost-volume-profit analysis gap, the current research is conducted. It examined the current practices of CVP analysis, a tool of PPC, in the Soaltee Hotel Limited. Probably this might be the first research study carried on one private company of Nepal of Hospitality Industry.

CHAPTER - III

RESEARCH METHODOLOGY

3.1 Research Design

The present work is mainly related with the quantitative plans and accounts of Soaltee Hotel Limited. So, analytical approach has been considerably adopted to present the data. But the qualitative aspects of the research such as effectiveness of profit planning in the Hotel, problem and formulating and implementing the profit plans, and the theoretical prescription were explained where ever necessary. Therefore, analytical as well as descriptive researches were applied as the research design for this study.

3.2 Populations and Sample Size

At present there are many five star hotels operating in Nepal. Among them, Soaltee Hotel Limited has been taken as a sample of the study. This study covers the time of last five years historical data ranging from 2060/61 to 2064/65, and on the basis the strength and weakness of managerial planning and financial aspects of Soaltee Hotel Limited were identified.

3.3 Nature and Sources of Data

This study was mainly based on the secondary data. The required data have been extracted from the annual reports of Soaltee Hotel Limited. The supplementary data and information have been acquired from the various sources like Newspaper, Magazines, Brochures, Booklets, periodicals and bulletins, published and unpublished reports of other organization like Nepal Stock Exchange and official website of the company.

3.4 Method of Data Analysis

To analyze the data, different cost related tools under Cost-Volume-profit Analysis has been used. The various technique that have been used are as follows,

- 1 Statistical Tools
- 2 Accounting Tools

3.4.1 Statistical Tools

Under the statistical tools various technique were used

3.4.1.1 Mean

Mean is the given set of observation is their sum divided by the number of observation.

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

Where, X is the variable that is understudy like Fixed cost, Total cost, sales or profit. Mean defines the average of the historical data presented and the expected value for the next future period.

3.4.1.2 Segregation of Cost Under Least Square Method

One popularly used method for estimating the Cost volume formula is regression analysis. Regression analysis is a statistical procedure for estimating mathematically average relationship between the dependent variables and the independent variables. The regression method does include all the observe data and attempts to find a line of best fit. To find the line of best fit, a technique called the method of least square was used. Method of least square is based on the mathematical technique of fitting an equation with the help of a number of observations.

$$y = a + bx$$

Where,

y = estimated total cost

a = estimated fixed cost

b = variable rate

x = independent variable

$$a = \frac{\sum X^2 \sum Y - \sum X \sum XY}{N \sum X^2 - (\sum X)^2}$$

$$b = \frac{N \sum XY - \sum X \sum Y}{N \sum X^2 - (\sum X)^2}$$

3.4.1.3 Standard Deviation

Standard deviation shows the risk level of the organization.

$$S.D (\sigma) = \sqrt{\frac{\sum X^2}{N} - \left(\frac{\sum X}{N}\right)^2}$$

3.4.1.4 Coefficient of Variation

Coefficient of variation shows the risk level per rupee of the profit.

$$CV = \frac{\sigma}{\bar{X}}$$

3.4.1.5 Pearson's Correlation Coefficient (r)

$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{n \sum x^2 - (\sum x)^2} \sqrt{n \sum y^2 - (\sum y)^2}}$$

Where,

x and y are the variables of those correlation is being studied. The value of 'r' lies between ± 1 .

If $r > 0.5$ high degree of positive correlation is predicted.

If $r < 0.5$ low degree of positive correlation is predicted and vice versa for the Negative correlation.

3.4.1.6 Analysis of Variance Test (F- Test)

The analysis of variance is used to test whether the difference between the means of three or more populations is significant or not. So, the researcher used f- test i.e. one way ANOVA to find out differences among the sample means.

One –Way ANOVA: The calculation of SSC, SSE and degree of freedom have been made, these figures can be presented in a sample table called analysis of variance table or simply one –way ANOVA table. The one- way ANOVA table is presented below:

$$SST = SSC + SSE$$

Where,

SST: Total sum of squares of sample

SSC: Sum of squares of variation due to Column Factor

SSE: Sum of squares of variation due to Error samples

Degree of freedom between Column = $K - 1$

Degree of freedom due to Error = $N - K$

Number of Samples = N

Number of Column = K

One Way ANNOVA Table

Source of variation	Sum of Squares	Degree of Freedom	Mean Sum of Squares	F-ratio
Due to Column Factor	SSC	K- 1	MSC=SSC/K-1	F=MSC/MSE
Due to Error	SSE	N – k	MSE= SSC/N-1	F=SSC/MSE
Total	SST	N-1		

Obtain the tabulated value f (K-1, N-K) at £ Level of significance Decisions:

- If calculated $f \leq$ tabulated f, it is not significant & Ho is accepted
- If calculated $f >$ tabulated f, it is significant & Ho is rejected.

3.4.2 Accounting Tools

Under the accounting tools different types of technique should be used.

3.4.2.1 Break Even Point Analysis

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.

$$\text{BEP in Units} = \left[\frac{\text{Fixed Cost}}{\text{CMPU}} \right] = \left[\frac{\text{Fixed Cost}}{\text{SPPU} - \text{VCPU}} \right]$$

$$\text{BEP in amounts} = \left[\frac{\text{Fixed Cost}}{\text{P/V ratio}} \right] = \left[\frac{\text{FC}}{\text{CMPU}} \times \text{SPPU} \right] \text{ etc.}$$

Where contribution margin is derived by computing the deviation between selling price per unit and variable cost per unit. And the profit volume ratio is derived by dividing contribution margin per unit by selling price per unit.

Break even point identifies the sales level to be achieved to get zero profit i.e. the company will earn no profit and suffer no loss or in other words the total revenue covers the total cost of the organization.

Profit = Sales – variable Cost – fixed Cost

Sales = Profit – fixed cost – variable cost

Required sales to earn Desired Profit (in units) = $\frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{CMPU}}$

Required sales to earn Desired Profit (in amounts) = $\frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{P/V Ratio}}$

3.4.2.2 Sensitivity Analysis

Profit as measured in accounting terms is the excess of revenue over expenses. Management, however, must look the several variables which cause revenue and expenses (fixed and variable). What happen to those variables changes? This analysis improves the managerial decision making activities, known as Profit Sensitivity analysis.

CHAPTER - IV

DATA PRESENTATION AND ANALYSIS

4.1 Introductions and Purpose

Profit planning is the formal expression of the enterprises plan, goals, objective stated in financial term for specific future period of time. It is one of the most important management tools that are used to develop effective performance and systematic approach for attaining desire goals. CVP analysis, a tool of PPC, can be most important device to utilize the cost with effective and efficient way. CVP analysis has become a powerful instrument in managerial decision-making especially in cost control and profit planning. The CVP analysis is a specific way of presenting and studying the interrelation between cost, volume and profit. The most valuable and crucial tool to show the true position of any organization is its past data. By analyzing the data, one can find out the core problems and limitations of the organizations. Therefore, this chapter focuses on presenting the data related to Soaltee Hotel's cost structure and their interpretation.

The main purpose of this research paper is to examine CVP analysis as a tool to measure the effectiveness of profit planning, present practices of CVP analysis and identify the area where CVP analysis could be applied to strengthen hotel industries. For this reason, SOALTEE HOTEL LIMITED has been selected randomly for the study and data analysis purpose. To accomplish the specified objective, this chapter will present and analyze different plans and aspects of the organization.

4.2 Revenue Plan of Soaltee Hotel Limited

The revenue plan is the foundation of profit planning and control in the context of Hotel Industry. It is the first plan or budget to be prepared. All other planning is

based on it. The revenue planning process is a necessary part of PPC because it provides basic management decision about marketing and based on those decisions, it is an organized approach for developing a comprehensive revenue plan. If the revenue plan is not realistic, most of all other part of overall profit plans is also not realistic.

Table 4.1
Soaltee Hotel Limited
Total Budgeted and Actual Revenue/ Turnover

(Rs. in Millions)

Fiscal Year	Budgeted Revenue	Actual Revenue	Deviations
2060/61	432	405	6.25% (U)
2061/62	342	323	5.55% (U)
2062/63	456	440	3.51% (U)
2063/64	515	546	6.02% (U)
2064/65	562	617	9.79% (U)

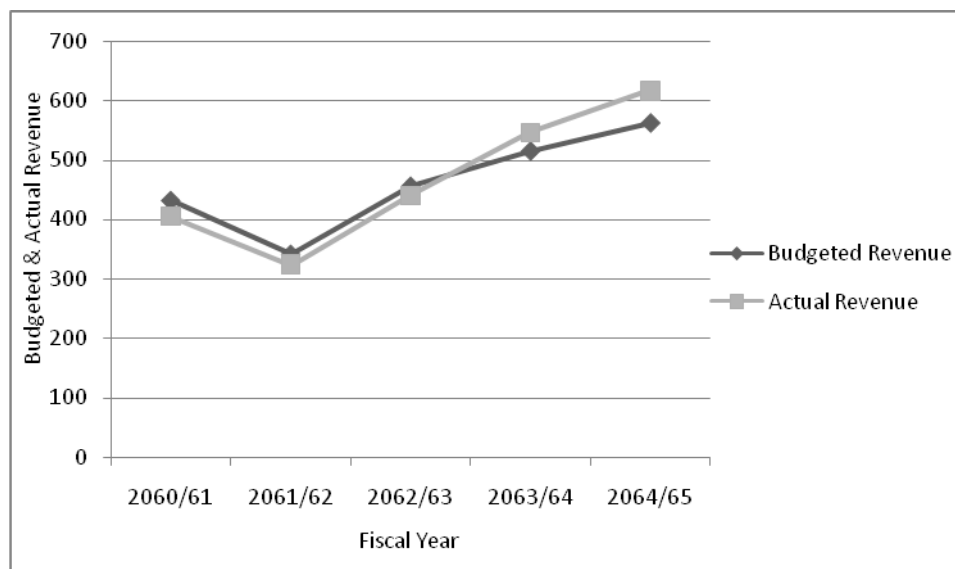
4.2.1 Revenue Plan Analysis

The attempt begins to present and analyze the Soaltee Hotel's previous budgeted revenue and actual revenue earned. The following table presents the budgeted and actual revenue and any deviations during the fiscal year 2060/61 to 2064/65.

The above table disclosed that there is acceptable level of deviations between Budgeted and Actual revenue recording not more than 10%. Generally Budgeted revenue exceeds Actual revenue except in fiscal year 2063/64 and 2064/65 because management often set the annual revenue target lower than previous year based on trade cycle of their respective industry and the nation. Also low target can generally be easily achieved by employee but it cannot be guaranteed that their maximum capacity have been utilized in achieving the target. The volatile

trend of budgeted revenue disclosed that management has prepared itself as per external environment especially political scenario and economic trend of hotel industry. In order to find how effectively management has dedicated itself on achieving the plan revenue, it can be best presented by the help of following graph. Out of the nature of variability of Budgeted revenue and Actual revenue of different years, it is necessary to calculate the Arithmetic mean, Standard Deviation with Coefficient of Variation.

Figure 4.1
Soaltee Hotel Limited
Budgeted and Actual Revenue Analysis



The above graph discloses that the deviation between budgeted and actual revenue is minimal. Generally budgeted revenue exceeds the actual revenue except in fiscal year 2063/64 and 2064/65.

To reveal the variability of budgeted revenue and actual revenue of different years, it is necessary to compute the Arithmetic mean, Standard Deviation with Coefficient of Variation, Correlation Coefficient, and Probable Error (r). The

blow-by-blow computation of Mean, Standard Deviation, C.V and P.E (r) are presented in the appendix 1 and 2.

Table 4.2
Soaltee Hotel Limited
Summary of Statistical Calculation

Details	Budgeted Revenue(X)	Actual Revenue (Y)
	(Rs. In million)	(Rs. In million)
Mean	461.4	466.2
Standard deviation	74.94	103.97
Coefficient of Variation (C.V)	16.25%	22.30%
Correlation Coefficient(r)	0.99	
Probable error of Correlation(P.E)	0.0060	

The above table 4.2 exhibits the value of statistical tools namely, the co-efficient of variation of Budgeted revenue (C.V.X) and co-efficient of variation Actual revenue (C.V.Y). A distribution with lesser C.V is considered to be more homogeneous or uniform or less variable and vice versa. The above table reveals that the Budgeted revenue are more volatile or deviated year by year because the coefficient of variation (C.V) of the Budgeted revenue exceeds the co-efficient of variation of the Actual revenue(C.V), which also indicate the over estimation of planner.

Another statistical tools correlation of coefficient was used to analyze the degree of relationship or association between the budgeted revenue and actual revenue. To find out the correlation between Budgeted revenue and Actual revenue figure, the Karl Pearson's co-efficient correlation was used. By calculating 'r' it measures the relationship between Budgeted and Actual revenue. There is close relationship (Approximately perfect positive Correlation) between Budgeted revenue and Actual revenue because the value of 'r' is 0.99.

The probable error (P.E) of the correlation co-efficient (r) is the basis of interpretation of the value of 'r'. In other words the significant is tested with the probable error of 'r'. If the value of 'r' is less than $6 \times P.E(r)$, there is no evidence of correlation i.e. the value of 'r' is not significant. Here, the value of 'r' is greater than $6 \times P.E(r)$ (i.e. $0.99 > 0.1419$). It means the value of 'r' is highly significant. So, it can be said that Actual sales will follow the trend of the budgeted sales.

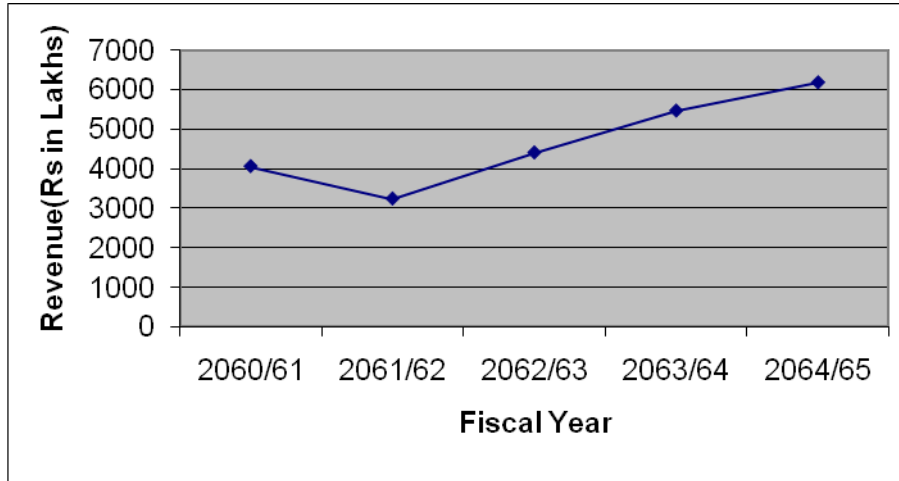
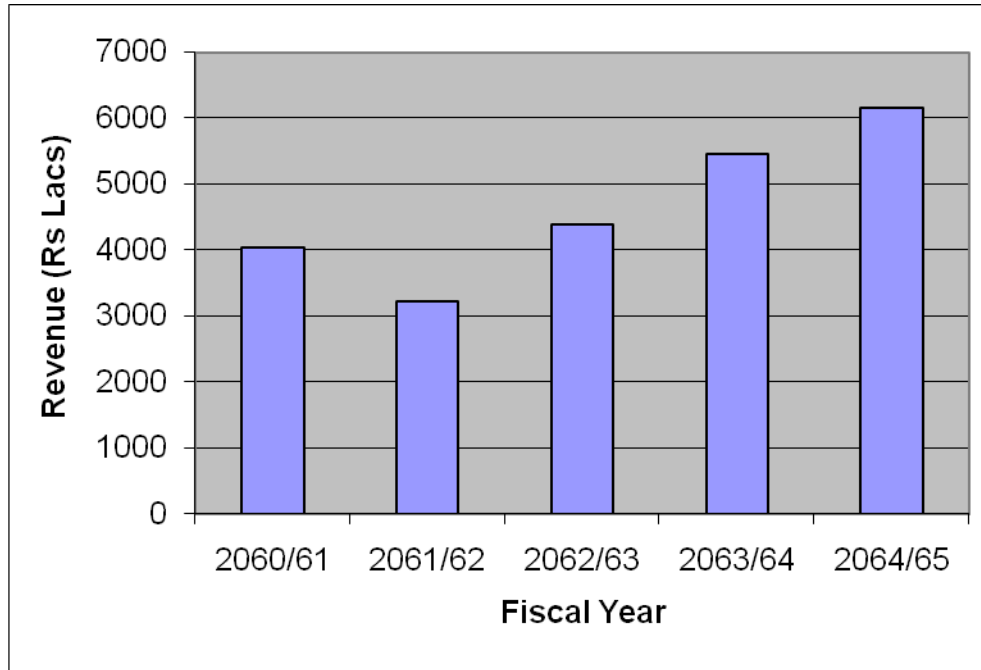
The regression line can also be fitted to show the degree of relationship between budgeted revenue and actual revenue and to estimate the possible Actual revenue with given Budgeted revenue. For this purpose the Actual revenue must be assumed to be dependent variables and budgeted revenue as independent.

Table: 4.3
Soaltee Hotel Limited
Revenue Analysis

(Rs. In Lakh)

Year	Revenue
2060/61	4050
2061/62	3228
2062/63	4397
2063/64	5457
2064/65	6172

Figure 4.2
Soaltee Hotel Limited
Revenue Analysis



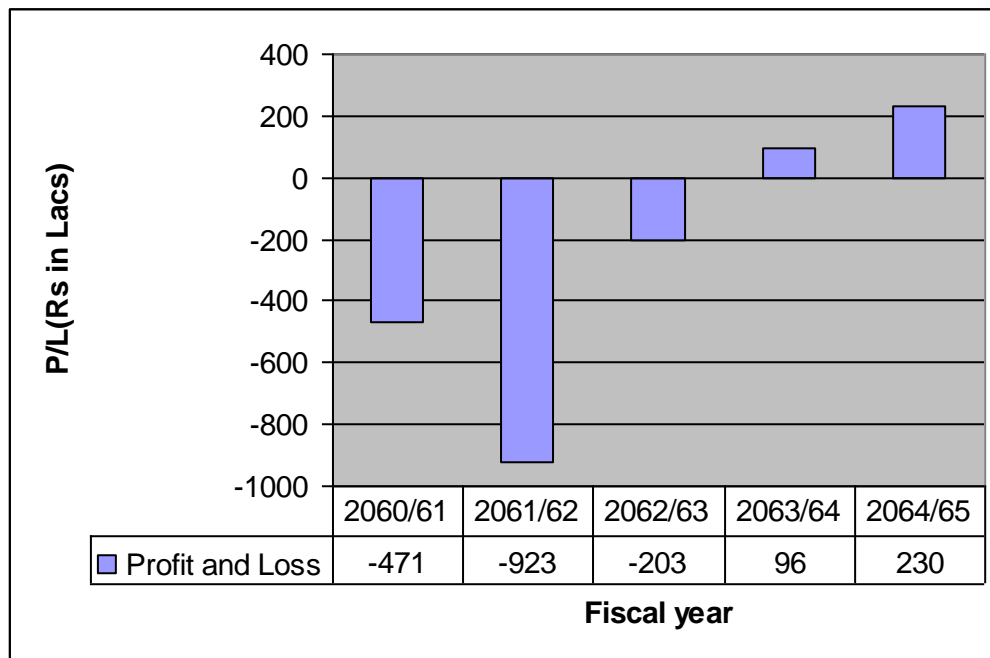
The above figure reveals that total revenue has been volatile over the five years period. In the base year 2060/61 the actual revenue was Rs.4050 (Lac). Similarly it increased by 8.57%, 34.74%, and 52.40% respectively in the fiscal year 2062/63, 2063/64 and 2064/65 except in fiscal year 2061/62 where it decreased by nearly 20.30%.

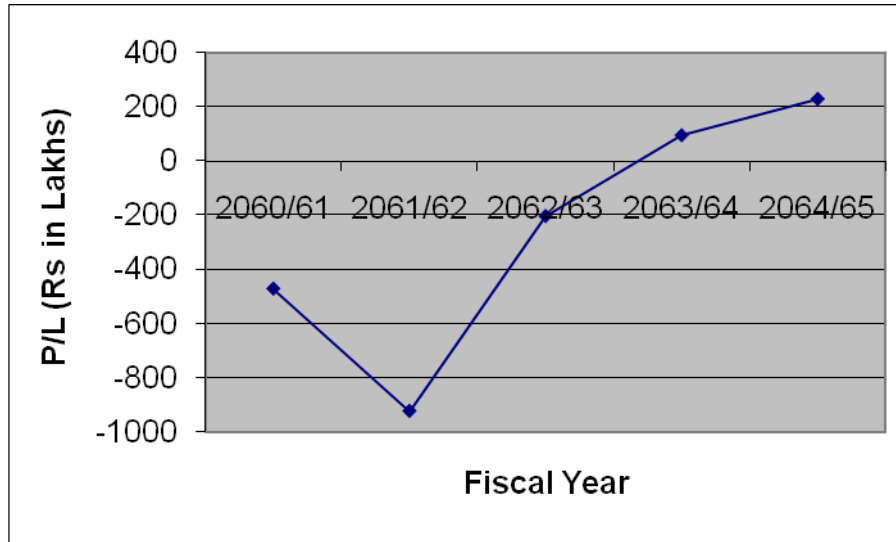
Table :4.4
Soaltee Hotel Limited
Profit and Loss Analysis

(Rs. In Lakh)

Year	Profit and Loss
2060/61	(471)
2061/62	(923)
2062/63	(203)
2063/64	96
2064/65	230

Figure 4.3
Soaltee Hotel Limited
Profit and Loss Analysis





The above figure 4.3 disclosed about the profit and loss of the Soaltee Hotel Limited. In the fiscal year 2060/61 it suffered a loss of Rs. 471 (Lakh). After the base year the loss was increased with 96% and start decreasing from the fiscal year 2061/62 by 57%. But in fiscal year 2063/64 and 2064/65 there is profit of 56 (Lakhs) and 230 (Lakhs) which shows that there is improvement in tourism sector.

Table :4.5

Soaltee Hotel Limited

Administrative and Other Expenses Analysis

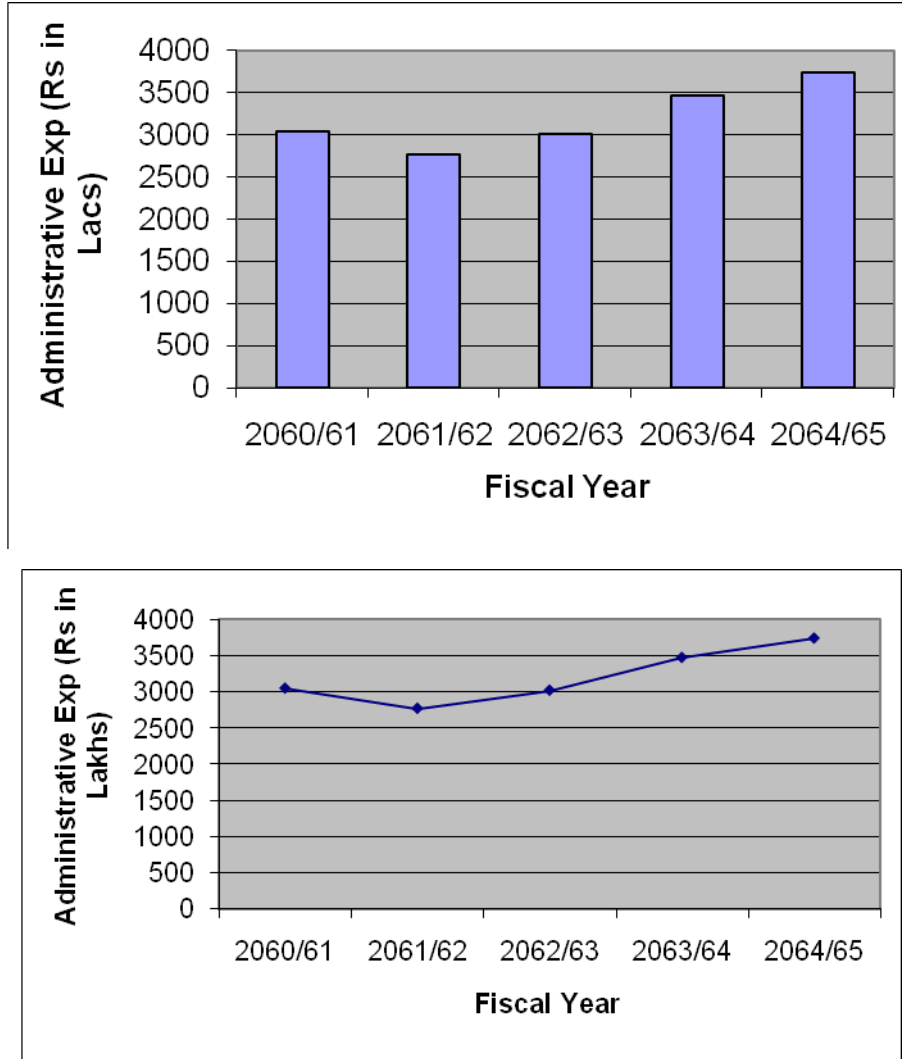
(Rs. In Lakh)

Year	Administrative expenses
2060/61	3047
2061/62	2770
2062/63	3019
2063/64	3471
2064/65	3737

Figure 4.4

Soaltee Hotel Limited

Administrative and Other Expenses Analysis



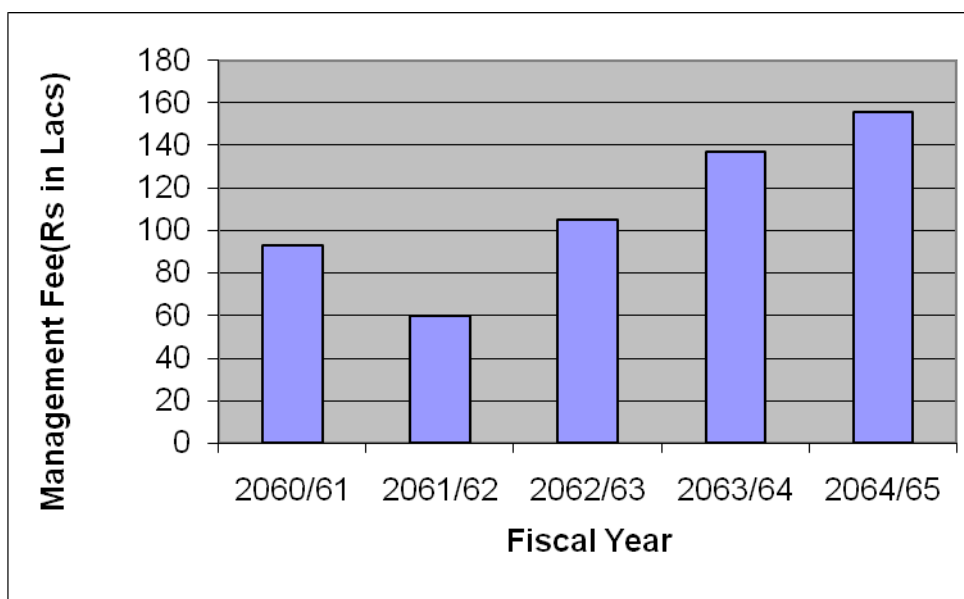
The above figure 4.4 disclosed that Administrative expenses in the base year 2060/61 were Rs.3047 (Lakh) and in the year 2061/62 and 2062/63 it decreased by 9% and 0.98%. But in fiscal year 2063/64 and 2064/65 it increased by 14% and 23%. The administrative and other expenses include salary and employee's cost, rent, repair and maintenance, fuel and power, communication expenses, miscellaneous expenses etc.

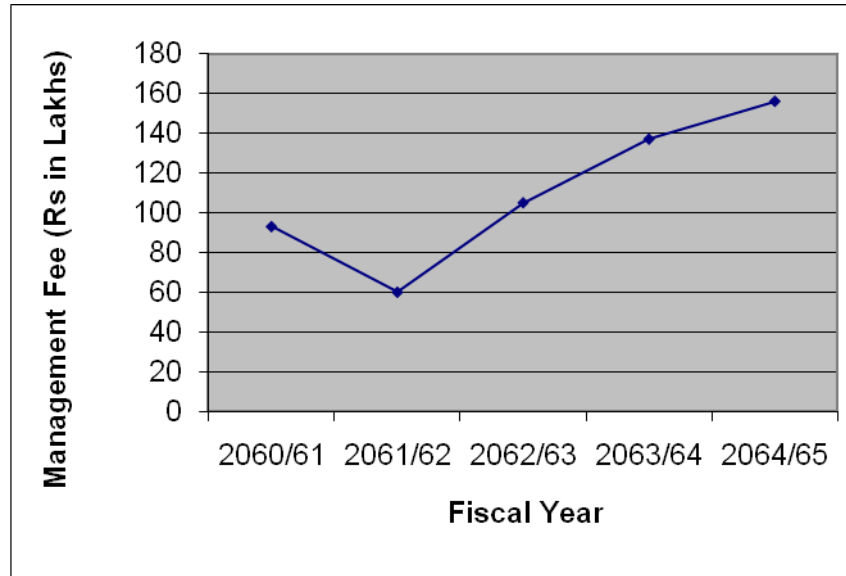
Table 4.6
Soaltee Hotel Limited
Management Fees Analysis

(Rs. In Lakh)

Year	Management fees
2060/61	93
2061/62	60
2062/63	105
2063/64	137
2064/65	156

Figure 4.5
Soaltee Hotel Limited
Management Fees Analysis





The above figure 4.5 disclosed that management fees in the base year were Rs.93 (Lakh). Management fees increased by approximately 34%, 47% and 68%, in the fiscal year 2062/63, 2063/64 and 2064/65 while it decreased by 35% in fiscal year 2061/62 with respect to the base year. Management fee is based on fixed percentage of the adjusted gross revenue and gross operating profits as specified in the Management Agreement.

Table: 4.7

Soaltee Hotel Limited

Consumption of Food, Provision and Beverages Analysis

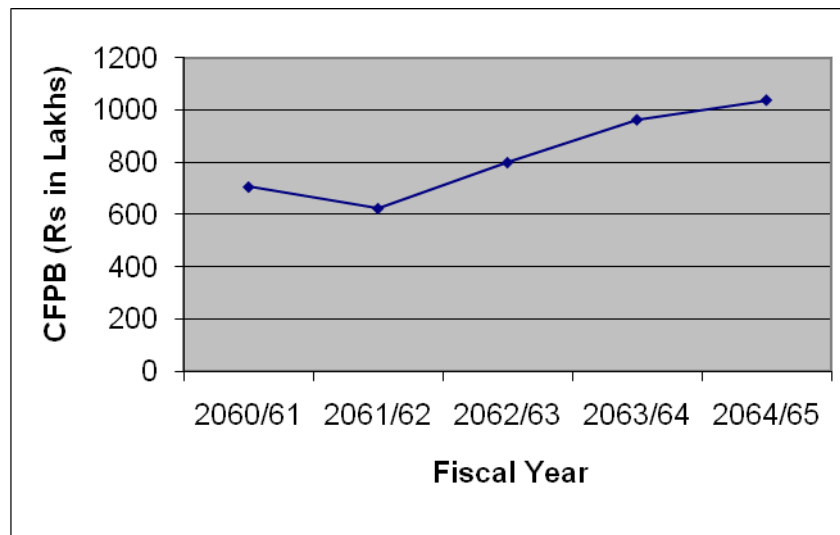
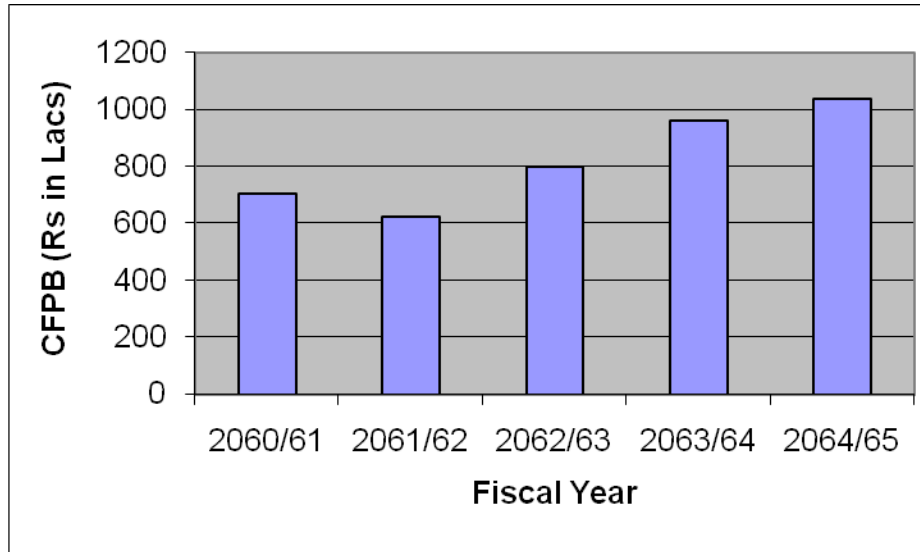
(Rs. In Lakh)

Year	CFPB
2060/61	707
2061/62	625
2062/63	800
2063/64	963
2064/65	1038

Figure 4.6

Soaltee Hotel Limited

Consumption of Food, Provision and Beverages Analysis



The above figure 4.6 disclosed that consumption of food; provision and beverages were in increasing trend. In the base year CFPB was Rs. 707 (Lakh), in the fiscal year 2062/63, 2063/64 and 2064/65 it increased by approximately 13%, 36% and 47% respectively while in fiscal year 2061/62 it was decreased by 12% according to the base year.

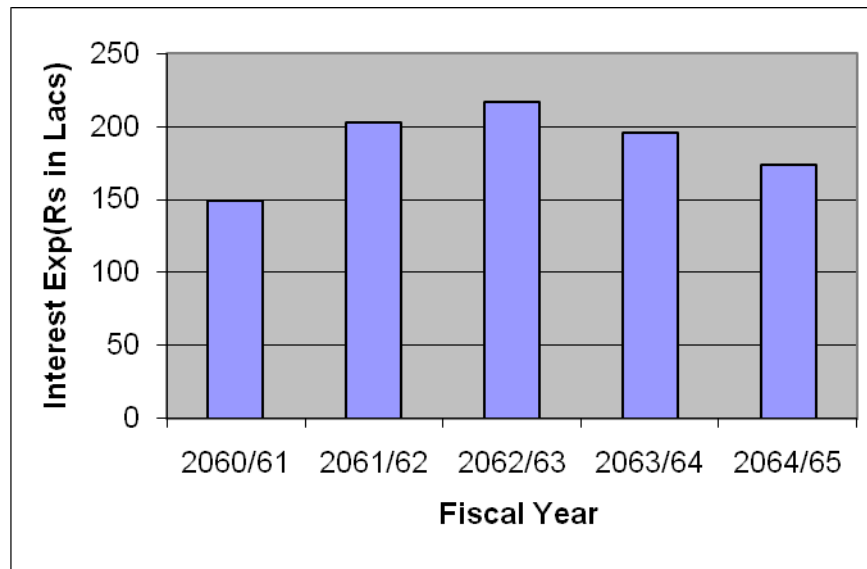
Table :4.8
Soaltee Hotel Limited
Interest Expenses Analysis

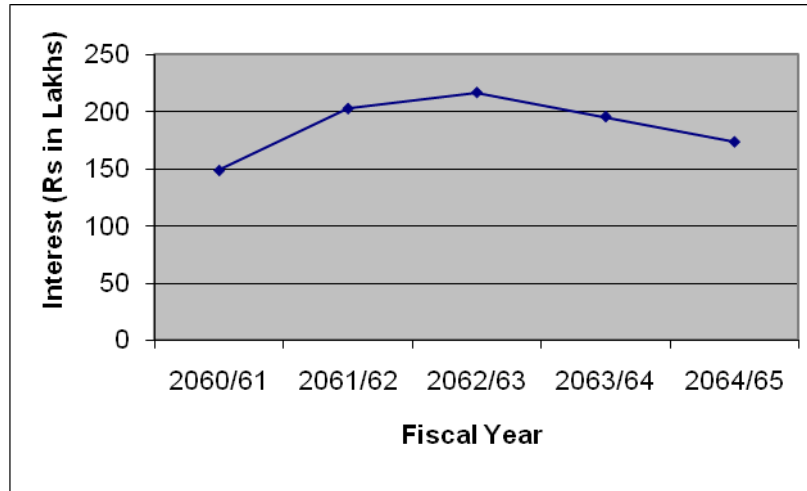
(Rs. In Lakh)

Year	Interest
2060/61	149
2061/62	203
2062/63	217
2063/64	196
2064/65	174

Figure 4.7

Soaltee Hotel Limited
Interest Expenses Analysis





The above figure 4.7 disclosed that interest expenses were in increasing trend according to the base year 2060/61. In the base year it was Rs. 149 (Lakh). In the fiscal year 2061/62, 2062/63, 2063/64 and 2064/65 the interest expenses increased by 36%, 46%, and 32% and by 17% with respect to the base year.

Table: 4.9

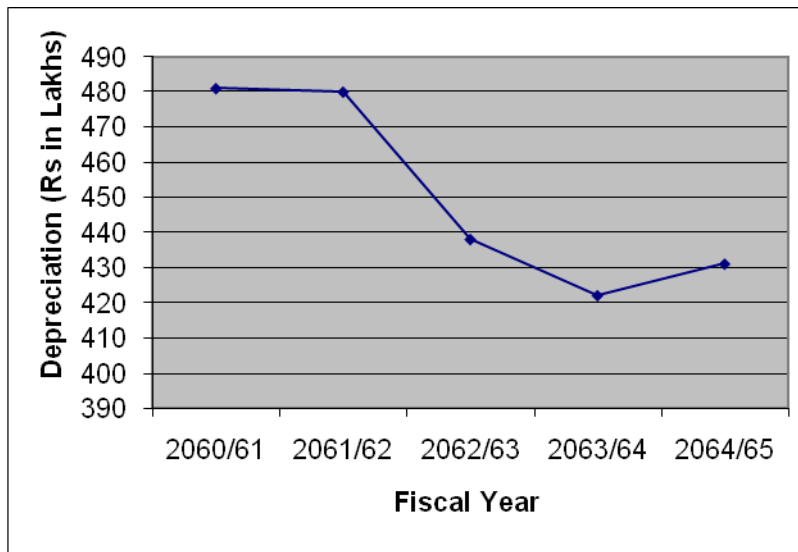
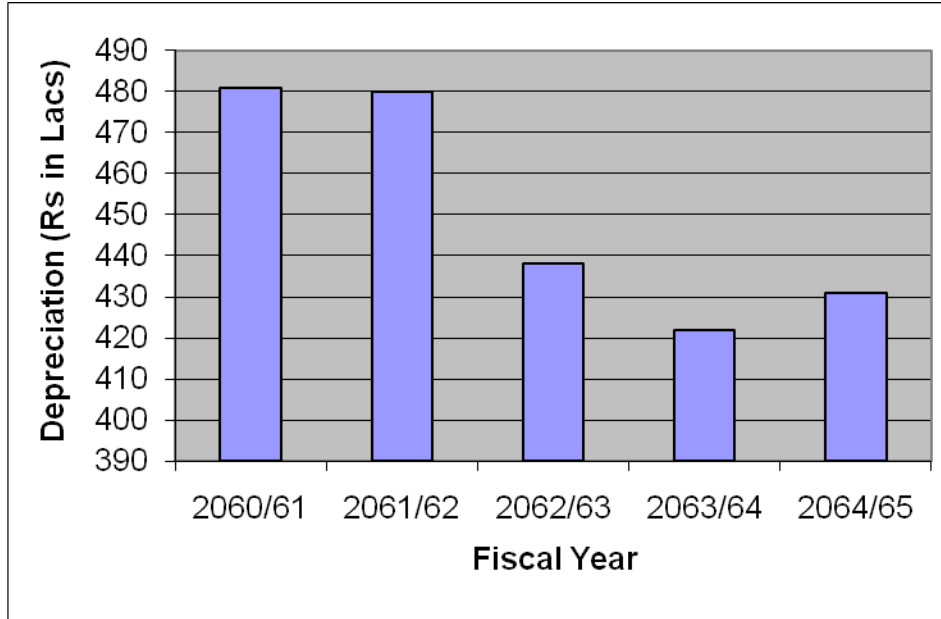
Soaltee Hotel Limited

Depreciation Expenses Analysis

(Rs. In Lakh)

Year	Depreciation
2060/61	481
2061/62	480
2062/63	438
2063/64	422
2064/65	431

Figure 4.8
Soaltee Hotel Limited
Depreciation Expenses Analysis



The above figure 4.8 exhibited that the depreciation expenses were almost same during the five fiscal depreciation study periods. In the base year it was Rs. 481(Lakh) than it slightly decreased in the fiscal year 2061/62. In the fiscal year 2062/63, 2063/64 and 2064/62 it was decreased by 9%, 12% and 10%. Depreciation expenses remained very low only in fiscal year 2063/64. The reason

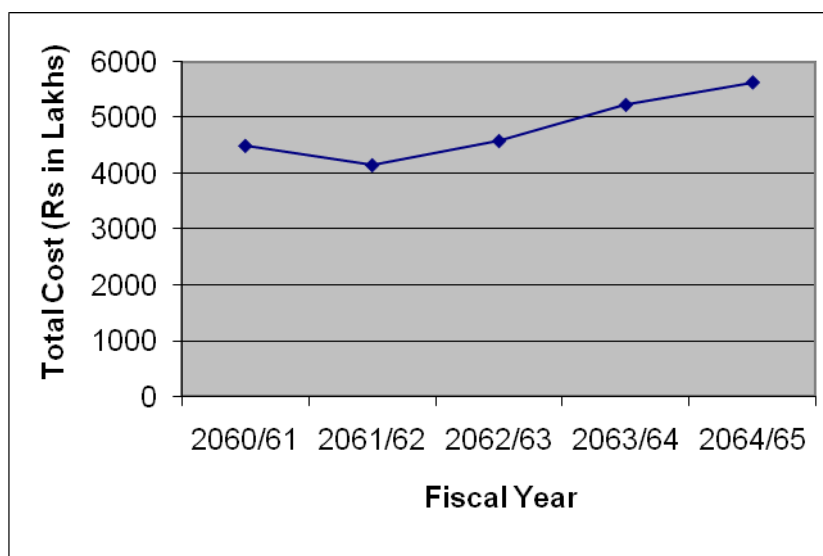
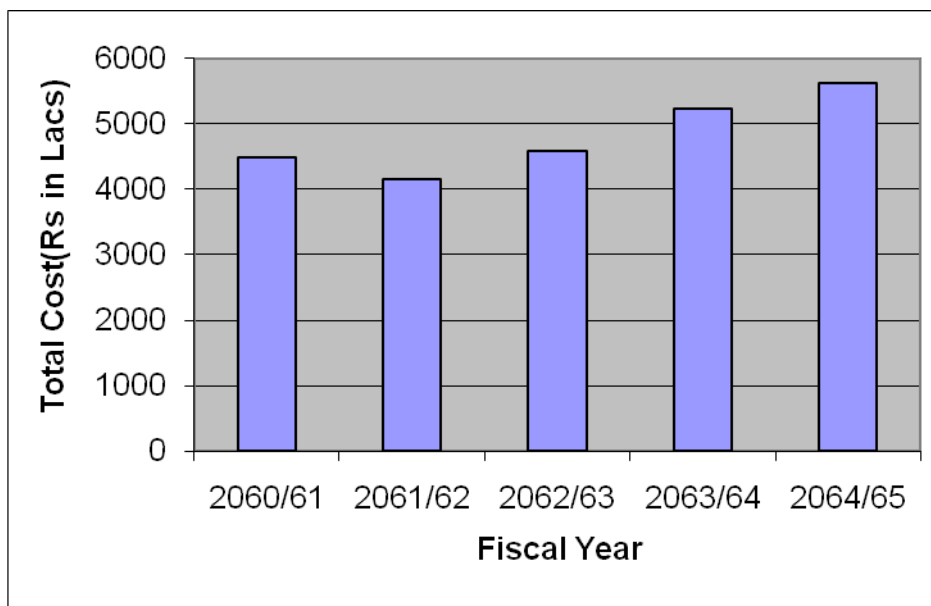
for decreased depreciation in the fiscal year 2062/63, 2063/64 and 2064/65 was due to sale of fixed assets during that year. Also depreciation on fixed assets was provided on written down value method at the rates prescribed by the Income Tax Act 2058 which is also the secondary reason for it to be on slightly decreasing trend during the study period.

Table: 4.10
Soaltee Hotel Limited
Total Cost Analysis

(Rs. In Lakh)

Year	Total Cost
2060/61	4494
2061/62	4148
2062/63	4582
2063/64	5228
2064/65	5631

Figure 4.9
Soaltee Hotel Limited
Total Cost Analysis



The above figure 4.9 disclosed that total cost of the Soaltee Hotel limited was in the base year 2030/31 was Rs.4494 (Lakh). Total cost keep on increasing in every year in compare to base year by 2%, 16%, and 25% in the fiscal year 2062/63, 2063/64 and 2064/65 except in fiscal year 2061/62 which was decreased by 8%.

4.3 Least Square Regression Analysis

A line fitted to a set of data used to estimate the relationship between two variables is called regression line. In other words, the technique used for estimating the value of one variable from the other consists of a line through the points, drawn in such a manner as to represent the average relationship between two variables. Such line is called the line of regression.

One of the best and widely used methods in estimating cost by using statistical technique is called least square regression analysis. It is a statistical procedure applied for estimating mathematically the average relationship between dependent variable and independent variable. The regression method includes all the observed data and attempts to find a line of best fit. Method of least square is based on the mathematical technique of fitting an equation with the help of a number of observations.

Table: 4.11

Segregation of Semi-Variable Cost

(Administrative and Other Expenses by Least Square Method)

(Rs in Lakh)

Year	Sales (X)	Administrative(Y)	XY	X²
2060/61	4050	3047	12340350	16402500
2061/62	3228	2770	8941560	10419984
2062/63	4397	3019	13274543	19333609
2063/64	5457	3471	18941247	29778849
2064/65	6172	3737	23064764	38093584
N=5	23304	16044	76562464	114028526

$$a = \frac{\sum X^2 \sum Y - \sum X \sum XY}{N \sum X^2 - (\sum X)^2}$$

Where,

a = Fixed Cost

$$= \frac{114028526 \times 16044 - 23304 \times 76562464}{5 \times 114028526 - (23304)^2}$$

$$= 1672.27$$

$$b = \frac{N \sum XY - \sum X \sum Y}{N \sum X^2 - (\sum X)^2}$$

Where,

b = Variable Cost

$$= \frac{5 \times 76562464 - 23304 \times 16044}{5 \times 114028526 - (23304)^2}$$

$$= \text{Rs } 0.330 \text{ per rupee sales}$$

Expenses that cannot be categorized as purely fixed or variable are termed as semi variable or mixed cost. Semi-variable costs contain both variable and fixed costs elements. Classification of costs into variable and fixed is very important to plan and control costs. It helps to determine the volume of operation required to maintain the desired profitability. In Soaltee Hotel Limited, account classification method is popular, so cost is classified on the basis of knowledge and experience of accountant of Hotel's cost and activities.

Due to the lack of information about the reliable activities level, classification of semi-variable costs by using scientific methods would be not easy. Here the Administrative and Other expenses of Soaltee Hotel were classified on the basis of information provided by the company. The administrative and other expenses

include salary and employee's cost, rent, repair and maintenance, fuel and power, communication expenses, miscellaneous etc. In the above table 4.11, the fixed cost of the year was Rs 1672.27 (in Lakh) and the variable cost was Rs. 0.330 per rupee sales.

Table :4.12
Soaltee Hotel Limited
Details of Fixed cost and Variable Cost

(Rs. in Lakh)

Year	TC	CFPB	Mgmt. fees	Interest	Dep.	DE	Adm. expenses	EH	Bonus	FC	VCPU
2060/61	4494	707	93	149	481	17	3047			2271	0.524
2061/62	4184	625	60	203	480	10	2770			2317	0.538
2062/63	4582	800	105	217	438	3	3019			2282	0.532
2063/64	5228	963	137	196	422	3	3468	13	23	2531	0.493
2064/65	5631	1038	156	174	431	10	3737	31	54	2416	0.521

Details of fixed cost and variable cost of Soaltee Hotel are presented in appendix 3,4,5,6 and 7.

Where,

TC = Total Cost

CFPB = Consumption of Food, Provisions and Beverages

Mgmt. fees = Management Fees

Dep. = Depreciation

DE = Deferred Expenditure

Adm. Expense = Administrative and other expenses

EH = Employee's Housing

FC = Fixed Cost

VCPU = Variable cost per unit

Variable costs are that cost which varies in direct proportion to change in output or activities level, but per unit is constant within one financial year. Variable costs per unit are volatile over different financial years caused by internal and external environment especially due to political instability in the country. The above table showed that there was fluctuation in VCPU. There is an increment in variable cost in the fiscal year 2061/62 and 2062/63. But it decreased marginally in the fiscal year 2063/64 and 2064/65.

Fixed cost remained constant in total amount despite the changes in the level of the activity within the fiscal year. That is fixed cost remain unchanged in total as the output level varies within the year, but fixed cost per unit decreased as the level of activity increased and vice versa. Fixed cost in total varied in the different fiscal year. The above table showed that there was fluctuation in fixed cost in the different fiscal year. The fixed cost is in increasing level due to internal and external environment of the company with respect to the fiscal year 2060/61.

4.4 Cost-Volume-Profit Analysis of Soaltee Hotel Limited

Cost volume profit analysis is applied specially to identify for break even revenue and for profit planning. Business organizations are eager to earn profit. Profit planning is the fundamental aspect 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. The cost volume profit analysis is used for

- ❖ Contribution Margin analysis
- ❖ Break Even Analysis.
- ❖ Profit Volume Analysis.
- ❖ Margin of Safety Analysis

4.4.1 Contribution Margin Analysis

The difference between selling price and variable cost (i.e. the marginal cost) is known as contribution margin. In other words, Fixed cost plus the amount of profit is equivalent to contribution margin. It can be determined by using the following formula:

$$\text{Contribution margin} = \text{Selling Price} - \text{Variable Cost}$$

$$\text{Or contribution margin} = \text{Fixed Cost} + \text{Profit}$$

4.4.2 Break Even Analysis

The point of sales which breaks the total cost is called break even sales. The break even point can be identified by using the following formula:

$$\text{Break even point in amount} = \frac{\text{Fixed cost}}{\text{P/V ratio}}$$

4.4.3 Profit Volume Ratio Analysis

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

$$\text{Profit Volume Ratio} = \frac{\text{Contribution Margin}}{\text{Sales}}$$

4.4.4 Margin of Safety Analysis

Margin of safety is the excess of budgeted or actual sales over the break-even sales volume. In other words, it is the different between the budgeted or actual sales revenue and the break-even sales revenue. It gives management a feel for how close projected operations are to be organization's break-even point. Managers often consider the size of the company's margin of safety while making

decision about various 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 will be). A high margin of safety is particularly significant in times of depression when the demand for the company's or the firm's product is falling. A low margin of safety may result for a firm which has a low contribution ratio. When both the margin of safety and the P/V ratio are low, management should think of the possibilities of increasing the selling price, provided it does not adversely affect the sales volume or reducing variables costs by bringing improvement in the manufacturing process. Margin of safety can be ascertained by using the following formula

$$\text{Margin of safety} = \text{Actual sales value} - \text{Break-even sales value}$$

$$\text{Margin of safety (in Amounts)} = \frac{\text{Profit}}{\text{Profit Volume Ratio}}$$

$$\text{Margin of safety (in Units)} = \frac{\text{Profit}}{\text{Unit Contribution Margin}}$$

The relation between margin of safety and the actual sales is known as margin of Safety ratio, which is determined as follows:

$$\text{Margin of safety ratio} = \frac{\text{Actual Sales} - \text{Break Even Sales}}{\text{Actual Sales}}$$

Table :4.13
Soaltee Hotel Limited

Year	TFC	VC ratio	CM ratio	BEP in Amt.	Actual Sales	MOS
2060/61	2271	0.524	0.476	4771	4050	(721)
2061/62	2317	0.538	0.462	5015	3228	(1787)
2062/63	2282	0.532	0.468	4876	4397	(479)
2063/64	2531	0.494	0.506	5002	5457	455
2064/65	2416	0.521	0.479	5044	6172	1128

Profitability Analysis from the F/Y 2060/61 to 2064/65

(Rs. In Lakh)

Contribution Margin or P/V ratio was increased in the fiscal year 2063/64 and 2064/65 but it was decreased in fiscal year 2061/62 and 2062/63. The C.M ratio decreased on account of increase in VC ratio except in the fiscal year 2061/62 because CM ratio and VC ratio have inverse relationship. Whenever actual sales decreased variable cost ratio had been increased in that fiscal year. So the main reason for increased variable cost ratio might be the diseconomies of scale in the operating cost of the Soaltee Hotel Limited.

Fixed cost is in increasing trend in compare in base year. Fixed cost increased from 2117 in base year 2060/61 to 2271 in 206/62 and 2317 in 2062/63 but after it decrease in fiscal year 2062/63 and again it increased and again decrease in fiscal year 2064/65. From this it reveals that fixed costs are becoming uncontrollable by the management and it has been detrimental to the firm's profitability. The main reason for decreased in fixed cost in the fiscal year 2062/63 was due to reduction

in the depreciation cost. Also, whenever actual sales increased fixed cost ratio had been improved in that fiscal year.

Simply BEP in Rs. means fixed cost divided by CM ratio. The above table disclosed that CM ratio decreased and fixed cost is increased in the fiscal year from 2060/61 to 2062/63 as a result BEP sales in revenue is increased in the fiscal year 2060/61 to 2062/63. But in the fiscal year 2063/64 and 2064/65 both fixed cost and CM ratio decreased as a result BEP decreased.

Actual sales are highly volatile during the period of study. There is negative MOS i.e. no margin of safety because in all the fiscal year the BEP sales exceed the Actual sales.

4.5 Sensitivity Analysis

Profit as measured in Accounting terms is the excess of revenue over expenses. Management, however, must look behind the summary figures to the factor which cause revenue and expenses (fixed and variable) to be what they are. What happen to them if any one of them swings? This analysis improves the managerial decision making activities, known as Profit Sensitivity analysis.

By determining the profit multiplier profile of a business it becomes possible to measure the extent of the impact (sensitivity) of changes in key factors (such as price, volume, variable cost, fixed cost and combination of factors which shows proportionate relationship, positive or inverse relationship and no relationship) on profit. With this technique the management teams are not only able to obtain a numerical expression of their business orientation, but in addition, are able to assess a range of issues relating to product and service profitability, profit improvement and the effectiveness of alternative accounting procedures, control strategies and budget preparation methods. The following table provides the insights into the “what-if analysis”.

Table 4.14
Soaltee Hotel Limited
Different Factors Affecting CVP Analysis

Factors	Effect in PV ratio	Effect in BEP	Effect in Profit
<u>Sales Revenue</u>			
Increase	No effect	No effect	Increase
Decrease	No effect	No effect	Decrease
<u>Variable cost</u>			
Increase	Decrease	Increase	Decrease
Decrease	Increase	Decrease	Increase
<u>Fixed Cost</u>			
Increase	No effect	Increase	Decrease
Decrease	No effect	Decrease	Increase
Increase in sales revenue and decrease in variable cost	Increase	Decrease	Increase
Increase in variable cost and decrease in sales revenue	Decrease	Increase	Decrease
Increase in variable cost and Increase in fixed cost	Decrease	Increase	Decrease
Decrease in variable cost and decrease in fixed cost	Increase	Decrease	Increase
Increase in Sales and decreased in fixed cost	No effect	Decrease	Increase
Decrease in sales and increase in fixed cost	No effect	Increase	Decrease

4.5.1 Effect of Changes in Sales Value

The rise and fall in sales value will have no impact in profit volume ratio as a result break even point will remain constant. The rise and fall of sales value by 20% will affect the profit which can be disclosed by using the figures of the fiscal year 2064/65 are as follows:

Table: 4.15
Soaltee Hotel Limited
Income Statement with changes in Sales Value
For the fiscal year 2064/65

(Rs in Lakh)

Details	Changes in Sales Value		
	Original	20% Increase	20% Decrease
Sales Revenue	6172	7406.4	4937.6
Less, Variable Cost	3216	3859.2	2572.8
Contribution Margin	2956	3547.2	2364.8
Less, Fixed Cost	2416	2416	2416
Profit/ Loss	540	1131.2	(51.2)
CM ratio	0.479	0.479	0.479
BEP	5044	5044	5044

The above table 4.15 shows that the rise in sales value by 20%, will make the company enjoy the profit of Rs. 1131.2 Lakh so it enhances the profit by Rs. 591.2 Lakh i.e. by 109.48%. Similarly, with the decrease in sales value by 20% the loss will increase by Rs. 591.2 Lakh i.e. by 109.48%.

4.5.2 Effect of Changes in Variable Cost

The impact of change in Variable cost on profit is straight forward if it does not cause any change in sales revenue and fixed cost. An increase in variable cost will lower P/V ratio, push up the BEP and reduce profit. On the other hand, if the variable cost declines, P/V ratio will increase, BEP will be lowered and profit will rise. If the increase and decrease in variable cost by 20% with other factor assumed remain constant, it makes effect on profit by using the figures of the fiscal year 2064/65.

Table: 4.16
Soaltee Hotel Limited
Income Statement with changes in Variable Cost
For the fiscal year 2064/65

(Rs in Lakh)

Details	Changes in Variable Cost		
	Original	20% Increase	20% Decrease
Sales Revenue	6172	6172	6172
Less, Variable Cost	3216	3859.2	2573.8
Contribution Margin	2956	2312.8	3599.2
Less, Fixed Cost	2416	2531	2531
Profit/ Loss	541	(218.2)	1068.2
CM ratio	0.479	0.375	0.583
BEP	5044	6749.33	4341.34

The above table 4.16 exhibits that, with 20% increase in variable cost, will BEP increase by 33.81%. Similarly, with the decrease in variable cost by 20% the break even point will decrease by 13.93%. These instances reveal that variable cost and break even point have positive and disproportionate relationship.

4.5.3 Effect of Changes in Fixed Cost

A change in fixed cost does not influence P/V ratio if other factors remain unchanged. Fall in the fixed cost however lower the BEP and raise the profit. An increase in fixed cost will raise the BEP. If increase and decrease of fixed cost by 20% with other factor assumed to remain unchanged, the impact can be analyzed by using the figures of the fiscal year 2064/65.

Table: 4.17
Soaltee Hotel Limited
Income Statement with Changes in Fixed Cost
For The Fiscal Year 2064/65

(Rs. in Lakh)

Details	Changes in Fixed Cost		
	Original	20% Increase	20% Decrease
Sales Revenue	6172	6172	5457
Less, Variable Cost	3216	3216	2697
Contribution Margin	2956	2956	2956
Less, Fixed Cost	2416	2899.2	1932.8
Profit/ Loss	540	56.8	1023.2
CM ratio	0.479	0.479	0.479
BEP	5044	6052.61	4035.08

The above table no. 4.17 disclosed that 20% of fixed cost increase will make break even point up by 20% and creating profit to reduce by 89.48%. Similarly with 20% decrease in fixed cost, BEP amount will decrease by the same 20% and profit will go up by 89.48%. From this situation it can be concluded that fixed cost has direct and proportionate relationship with Break Even Point and inverse relationship with profit.

4.5.4 Effect of Changes in Sales Value and Fixed Cost

An increase in sales revenue and decrease in fixed cost increase the net income. If there is an increase in sales revenue by 20%, and decrease in fixed cost by Rs. 500 (Lakh), Variable cost change according to the sales revenue, and vice versa, it gets the following results by using the figure of fiscal year 2064/65.

Table :4.18
Soaltee Hotel Limited
Income Statement with changes in Sales Value and Fixed Cost
For The Fiscal Year 2064/65

(Rs. in Lakh)

Details	Changes in Sales Value and Fixed Cost		
	Original	20% Increase	20% Decrease
Sales Revenue	6172	7406.4	4937.6
Less, Variable Cost	3216	3859.2	2572.8
Contribution Margin	2956	3547.2	2364.8
Less, Fixed Cost	2416	1916	2916
Profit/ Loss	540	1631.2	(551.2)
CM ratio	0.479	0.479	0.479
BEP	5044	4000	6087.68

Above table 4.18 reveals that, 20% increase in sales revenue and Rs. 500(Lac) decrease in fixed cost will decrease the BEP 20.7%, the profit will rise by 202.07% and CM ratio remain same. Similarly, by increasing the fixed cost by Rs. 500 (Lakh) and reduce the sales by 20%, it will increase the BEP by 20.7%, increase the loss by 202.07% and CM ratio remain constant. From this it can conclude that sales value and fixed cost have no relationship with CM ratio.

4.5.5 Effect of Changes in Sales Value and Variable Cost

The impact of change in combination of variable cost, and sales value is dynamic. A decrease in variable cost and increase in sales revenue increase the P/V ratio and net income will rise. If there is decrease in variable cost by 10%, and increase in sales revenue by 10%, fixed cost remained constant and vice versa, it gets following results by experimenting on the figure of the fiscal year 2064/65.

Table: 4.19
Soaltee Hotel Limited
Income Statement with Changes in Sales Value and Variable Cost
For The Fiscal Year 2064/65

(Rs. in Lakh)

Detail	Changes in Sales Value and Variable Cost		
	Original	10% Increase	10% Decrease
Sales Revenue	6172	6789.2	5554.8
Less, Variable Cost	3216	2894.4	3537.6
Contribution Margin	2956	3894.8	2017.2
Less, Fixed Cost	2416	2416	2416
Profit/ Loss	540	1478.8	(398.8)
CM ratio	0.479	0.574	0.363
BEP	5044	4209.06	6655.65

Above table 4.19 reveals that, 10% decrease in variable cost and 10% increase in sales value and other factor remain unchanged will decrease the BEP by 16.55% and increase the CM ratio by 19.83%, and increase the profit by 173.85%. Similarly, by increasing variable cost by 10% and reduce the sales by 10% and it will increase the BEP by 31.65%, decrease CM ratio by 24.22% and increase the loss by 173.85% respectively.

4.5.6 Effect of Changes in Variable Cost and Fixed Cost

A change in fixed cost does not influence P/V ratio, but changes in the variable cost affect the P/V ratio. Increase in variable cost and decrease in fixed cost will decrease the CM ratio and similarly profit will also influence. If increase in variable cost by 10% and decrease the fixed cost by Rs. 600 (Lakh) and vice versa will have the following results on the figure of fiscal year 2064/65.

Table: 4.20
Soaltee Hotel Limited
Income Statement with Changes in Variable Cost and Fixed Cost
For The Fiscal Year 2063/64

(Rs in Lakh)

Details	Changes in Variable Cost and Fixed Cost		
	Original	10% Increase	10% Decrease
Sales Revenue	6172	6172	6172
Less, Variable Cost	3216	3537.6	2894.4
Contribution Margin	2956	2634.4	3277.6
Less, Fixed Cost	2416	1816	3016
Profit/ Loss	540	818.4	261.6
CM ratio	0.479	0.427	0.531
BEP	5044	4252.93	5679.85

Above table reveals that increase in variable cost and decrease in fixed cost will decrease the CM ratio by 10.86% as a result profit increase by 51.56% and decrease the BEP by 15.68%. But decrease in variable cost and increase in fixed cost will increase the CM ratio by 10.86%, increase the BEP by 12.65% and decrease the profit by 51.56% respectively.

4.5.7 Effect of Change in Variable Cost, Fixed Cost and Sales Value

The impact of change in combination of variable cost, fixed cost and sales value is dynamic. An increase in variable cost for improving the quality of service will raise the sales value and if the fixed cost will reduce by adopting cost control measure then P/V ratio and BEP will decrease respectively but net income will rise. If there is an increase in variable cost by 10%, sales by 20%, fixed cost decreased by Rs.400 (Lakh) and vice versa, it gets following results on the figure of fiscal year 2064/65.

Table :4.21
Soaltee Hotel Limited
Income Statement with Changes in Sales Value, Variable Cost and Fixed Cost
For the fiscal year 2064/65

(Rs in Lakh)

Details	Changes in Sales Value, Variable Cost and Fixed Cost		
	Original	Increase	Decrease
Sales Revenue	6172	7406.4	4937.6
Less, Variable Cost	3216	3537.6	2894.4
Contribution Margin	2956	3868.8	2043.2
Less, Fixed Cost	2416	2016	2816
Profit/ Loss	540	1450.7	(772.8)
CM ratio	0.479	0.522	0.414
BEP	5044	3862.07	6801.93

Above table 4.21 reveals that, 10% increase in variable cost and 20% increase in sales value but decrease in fixed cost by Rs. 400 (Lakh), will decrease the BEP by 23.43% but CM ratio and profit increase by 8.98% and 168.65%. Similarly, by reducing variable cost by 10% and increasing in fixed cost by Rs. 400 (Lakh), will reduce the sales by 20% and it will increase the BEP by 34.85% but decrease CM ratio by 13.57% and Profit by 243.11% .

4.6 CVP Analysis and Uncertainty

The organization may be failure to cover the fixed cost in the long term which can result in the demise of any organization, if much attention is given to the traditional CPV model (which ignores uncertainty). The basic CPV model is not adequate, bearing the decision making process. If one or more variable of the CVP analysis are subject to uncertainty, the management should analyze the potential impact of this uncertainty. This additional analysis is required in evaluating alternative course of action and in developing contingency plan.

4.6.1 The Normal Distribution

The most important continuous probability distribution used in the entire field of statistics is the normal distribution. The normal distribution is bell shaped curve that extends indefinitely in both directions, coming closer and closer to the horizontal axis without touching it. Most of the data relating to economic and business or even in social and physical sciences conform to this distribution. To confirm whether a distribution is normal it is usually necessary to ascertain the mean (μ) and the standard deviation (σ). If there is no dispersion, i.e. all observed values are the same, the mean, in this instance, would then be the same as the observed values. Moreover, as dispersion deviate either side of the mean, it is usually necessary to quantify the amount. To compare two distributions it is necessary to translate the observations of both distributions into Z- values. Basically, Z-values convert each distribution into a standard normal form with a mean of zero, and standard deviations of one. The formula is:

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

Where,

X = value of variable

μ = Mean value

σ = Standard Deviation

Figure 4.10

The Normal Probability Distribution Curve

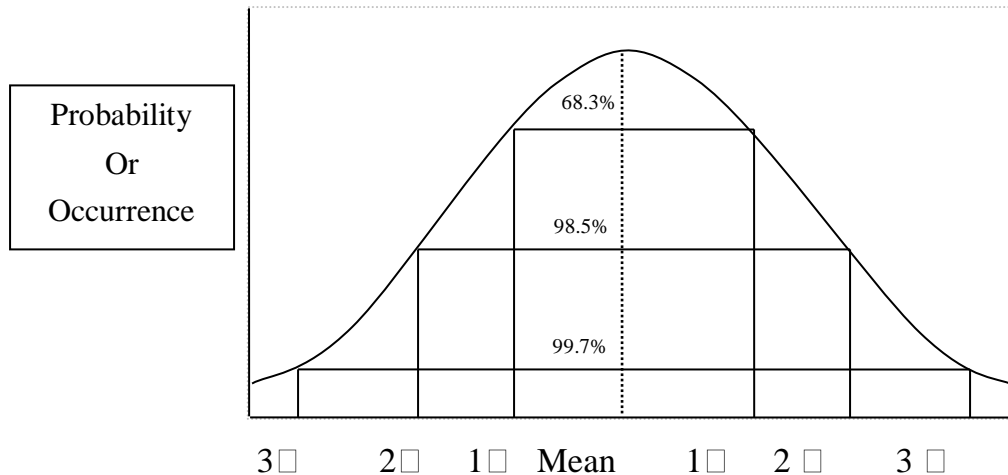


Figure 4.10 reveals that approximately 99.7 percent 95.4 percent and 68.3 percent of total observations lie within 3, 2 and 1 standard deviations respectively. The area of the curve is one.

The CVP analysis under uncertainty is to be calculated from the income statement presented in the table 4.2 and table 4.13.

Here,

BEP sales = Rs. 5044 (in Lakh)

So,

Expected mean sales (μ) = Rs. 4662 (in Lakh)

Standard deviation (σ) = Rs. 1040

It is expected that this pattern is to be continued in the future. Now that we have satisfied the requirement for a normal distribution, we are in the position to establish the probabilities of different profit level.

1. The Probability of Being Break Even

$$\begin{aligned}\text{Using z-table} &= \frac{5044 - 4662}{1040} \\ &= 0.367\end{aligned}$$

The break even point therefore lays 0.367 from the mean of our standard normal distribution curve. The figure of 0.1443 represents the probability of achieving the BEP by 14.43%.

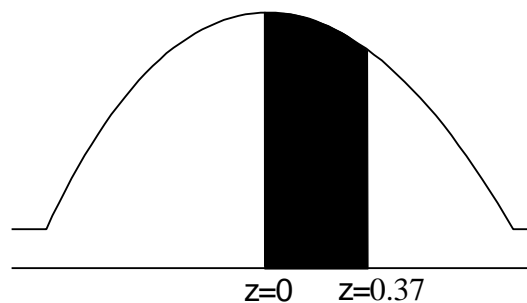
Symbolically,

$$P(X > 4662) = P(Z > 0.367)$$

$$\begin{aligned}&= P(0 < Z < 0.367) \\ &= 0.1443 \text{ i.e. } 14.43\%\end{aligned}$$

Figure 4.11

The Probability of being at Break Even



Thus,

the probability of being at Break Even is 14.43%.

2. The Probability at Least Making Rs. 100 Lakh Profit

The sales that needed to be sold to earn a contribution that would produce a net profit of at least Rs. 100 Lakh is:

$$= \frac{\text{Fixedcost} + \text{profit requirement}}{\text{contribution margin ratio}}$$

Using $= \frac{2416 + 100}{0.479}$
 $= 5252.61 (\text{Rs. in Lakh})$

When,

$$x = \text{Rs. } 5252.61 \text{ Lakh,}$$

$$Z\text{-value} = \frac{5252.61 - 4662}{1040}$$

$$= 0.568$$

Now,

Symbolically,

$$P(X > 100) = P(Z > 0.568)$$

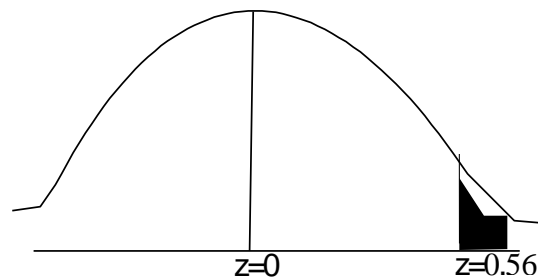
$$= P(0 < Z < \infty) - P(0 < Z < 0.568)$$

$$= 0.50 - 0.2190$$

$$= 0.281 \text{ i.e. } 28.1\%$$

Figure 4.12

Probability of Profit Being At Least Rs. 100 Lakh



Thus, the probability of profit being at least Rs. 100 Lakh is 28.1%.

3. The Probability of at least making Rs. 1000 Lakh profit

Using,

$$\begin{aligned} &= \frac{\text{Fixed Cost} + \text{Profit Requirement}}{\text{Contribution Margin}} \\ &= \frac{2416 + 1000}{0.479} \\ &= \text{Rs. } 7131.52 \text{ (in Lakh)} \end{aligned}$$

Now,

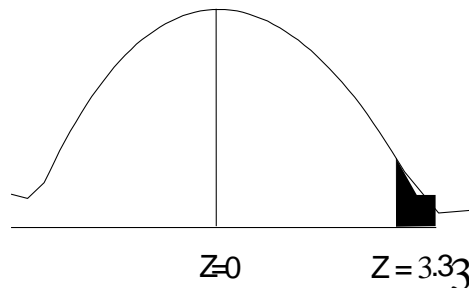
$$\begin{aligned} \text{Z- Value} &= \frac{7131.52 - 3668}{1040} \\ &= 3.33 \end{aligned}$$

Symbolically,

$$\begin{aligned} P(X > 1000) &= P(Z > 3.33) \\ &= P(0 < Z < \infty) - P(0 < Z < 3.33) \\ &= 0.50 - 0.4996 \\ &= 0.0004 \text{ i.e. } 0.04\% \end{aligned}$$

Figure 4.13

Probability of Profit Being At Least Rs. 1,000 Lakh



Thus,

the probability of profit being Rs.1000 (in Lakh) is 0.04%.

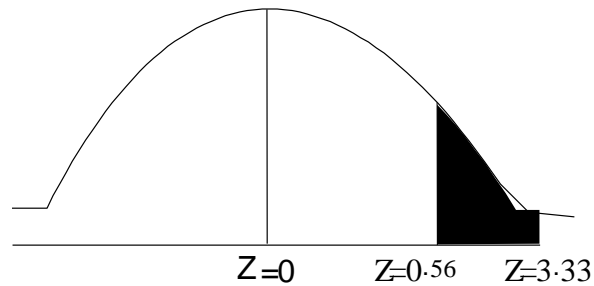
4. The Probability of Making Profit between 100 and 1000 Lakh

Symbolically,

$$\begin{aligned} P(100 < Z < 1000) &= P(0.56 < Z < 3.33) \\ &= P(0 < Z < 3.33) - P(0 < Z < 0.56) \\ &= 0.4996 - 0.2190 \\ &= 0.2806 \\ &= 28.06\% \end{aligned}$$

Figure 4.14

Probability of Profit Being between Rs. 100 Lac and Rs.1000 Lakh



Thus the probability of profit being between Rs. 100 Lakh and Rs. 1000 Lakh is 28.06%.

4.7 Analysis of Hypothesis Test

Null Hypothesis (H_0): $\mu_1 = \mu_2 = \mu_3$ i.e. there is no significant difference between Revenue of SHL, Profit of SHL & Total Revenue of Hotel industry.

Alternative Hypothesis (H_1): $\mu_1 \neq \mu_2 \neq \mu_3$ i.e. there is significant difference between Revenue of SHL, Profit of SHL & Total Revenue of Hotel industry.

Table: 4.22
One Way Anova Table

Source of Variation	Sum of Squares	Degree of Freedom	Mean Sum of Squares	F-ratio
Due to Column Factor	SSC=15166145339	K- 1	MSC=7583072670	$F = \frac{MSC}{MCE}$ $= \frac{7583072670}{27154565}$ $= 279.26$
Due to Error	SSE=325854777	N- k=15-3=12	MSE= 27154565	
Total	SST=11681147909	N-1= 15-1=14		

Source: Appendix 10

Calculated, $F(2, 12) = 279.26$

Level of Significance = 5%

Tabulated $F_{0.05}(2, 12) = 3.89$

Conclusion: Since, $F_{cab} > F_{tab}$, H_1 is accepted. It means that there is significant difference between revenue of SHL, Profit of SHL & total revenue of Hotel industry.

4.8 Major Findings

On the basis of various types of analysis, observation and informal conversation, the following major findings can be drawn,

- Soaltee Hotel's revenue achievement is higher than sales target in the fiscal year 2063/64 and 2063/64. The correlation between target and actual sales is positive. It reveals that the company is able to meet its goal as specified in annual report. The company tried to apply effective environmental focused technique. It is able to upsurge both budgeted and actual sales revenue.
- The Company's profit is in increasing level from fiscal year 2063/64 which shows that there is improvement in the company.
- Cost decreased from the base year and then again it started to increase.

- The company is experienced uncontrollable expenses. The fixed, variable and mixed expenses increased gradually.
- The cost of Soaltee Hotel limited was classified into fixed and variable. There was no practice of identifying semi-variable cost and their segregation into variable and fixed was done by using scientific method.
- The proportions of variable cost were slightly higher than fixed cost in total cost structure, which normally indicated normal risk.
- Variable cost volume of Soaltee Hotel Limited was nearly 52% on average. It means that the contribution margin of the company is about 48% of total sales.
- Using the Least Square Method for cost segregation from mixed cost, fixed cost is Rs. 2416 lakhs per year.
- In Profitability analysis; Contribution Margin or P/V ratio was increased in the fiscal year 2063/64 and 2064/65 but it was decreased in fiscal year 2061/62 and 2062/63.
- In sensitivity test shows that the changes in various factors cause the increase and decrease or not change in C/M ration, BEP, margin of safety.
- Company's CM ratio decreased. So a rupee increase in sales, made decrease in CM ratio except in the fiscal year 2062/63 where it was slightly improved.
- Break Even Points has been in increasing level except in fiscal year 2063/64 due to decrease in contribution margin and increase in fixed cost.
- The company has MOS, only after fiscal year 2063/64 as actual Sales exceeds the Break even sales during the study period.
- Since, $F_{cab} > F_{tab}$, H_1 is accessed. It means that there is significant difference bent revenue of SHL, Profit of SHL & total revenue of Hotel industry.

CHAPTER - V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Management effectively achieves organizational objectives through efficient use of scarce resources in a dynamic environment. Future is uncertain which creates risk and to reduce risk, the reliable technique is good management. CVP analysis is an analytical technique for studying the relationship between volume, costs, prices, and profit, which helps to manage future cost and profit. Profit planning is a management technique and it is a written plan that covers all aspects of the business operation for specific period. CVP analysis is a device used to determine the usefulness of profit planning process of the firm. In fact, the entire field of profit planning has become associated with the CVP inter relationship. Therefore, CVP analysis is such a tool of management accounting which helps for the profit planning and costs controlling (PPC) area that operate as a device by the managers of the company. With the help of CVP analysis Soaltee hotel limited can estimate the total costs, profits and sales volumes, not only this but it also helps risk measurement of the losses/profits by analysis the BEP sales. However entire field of the profit planning which is one of the main objectives of the every business organization has been associated with CVP analysis tool inter-related.

The main objective of the present study is to examine cost-volume-profit analysis as a tool to measure effectiveness of profit planning of Soaltee Hotel Limited. So, this study was undertaken to evaluate CVP analysis of the company. It has observed that Soaltee Hotel Limited has succeeded in living up to the expectation of VIP tourist and main hospitality service provided by the company. As per the nature of the study, the secondary data with descriptive and analytical approach for sales analysis, Cost Analysis, Profitability Analysis, Contribution Margin

Analysis, P/V Ratio Analysis, BEP Analysis and CVP Analysis under uncertainty, etc are used. And to support the study, primary data were also collected informally from the staff of the company.

From the analysis, the CVP analysis shows that the company has low contribution, low P/V ratio, high BEP and negative margin of safety which later on it was in increasing level which shows that there is improvement in company and able to meet the profit. The sensitivity test of CVP analysis shows that increase in costs (i.e. variable and fixed cost) increases the BEP and when the cost decreases the BEP also decreases. But the profit increases by more times than sales increase due to its huge fixed cost. Company's profit conditions are not good due to failure in controlling excessive fixed costing in few years but they are able to control the fixed cost due to which they are able to gain profit. Lack of detail information on scientific cost analysis and extra cost burden and loss of the company are the main reason behind not practicing effectively and efficiently profit planning tools like CVP Analysis.

5.2 Conclusion

Different types of profit planning tools, which are used in the academic field and in multinational companies of developed nation, are not found applied by Soaltee Hotel Limited. CVP analysis is not effectively applied by Soaltee Hotel Limited, because of no implementation of scientific method of segregating cost into fixed and variable, which is the hardcore of CVP Analysis. The company has not implemented costing and cost classification policy. Due to this reason the accumulation and apportionment of cost on the basis of responsibility centre (i.e. cost centre) is not done by the company. That's why it becomes practically difficult to define cost on the basis of activity and to classify it on the basis of variability. Therefore, Soaltee Hotel Limited has not been able to use efficiently and effectively CVP analysis and make the realistic budget.

As the little variation in sales target and actual sales proves that the Sales planning of the company is scientific. Profit pattern of the company shows that the company is ineffective in the profit planning and its implementation. The cost structure of Soaltee Hotel Limited discloses appropriate variable cost and fixed cost so this cost structure indicates the normal risk because its fixed cost are normal and it will bear normal loss as rapidly as sales falls off. The CVP analysis exhibits that the variable cost ratio is decreasing which means the company's CM ratio is increasing more than the sales increases. BEP of the company has decreased and its main reason is due to increase in CM ratio and fluctuation in fixed cost. As the higher BE sales, the business of the company is in high operating risk, and so further investment in this condition is not safe. The "what- if" analysis shows that the changes in either sales revenue or variable cost alter the CM, CM ratio or BEP where as response of change in fixed cost are highly stimulus. The MOS of the company is negative so a percentage decrease in sales can lead to the company to collapse but company is able to recovered that and able to maintained positive MOS which shows that actual sales is higher that BEP sales . The fixed cost of the company is rapidly increasing however, the management of the Hotel failed to control the fixed cost to survive in long run. The company's aim seems to cover the market share rather than to obtain reasonable profit and cost management. The profitability of maximizing the sales is not more possible under this circumstance unless management has revised their cost during decision making process while considering risk calculation for achieving objective. Finally, CVP analysis is useful as a framework of reference, as a vehicle for expressing overall managerial performance, and as a planning device via break even technique and what-if scenarios. Since, $F_{cab} > F_{tab}$, H_1 is accessed. It means that there is significant difference bent revenue of SHL, Profit of SHL & total revenue of Hotel industry. The company has unfavorable variance between budgeted sales and actual sales. In some case budgeted sales found lower than actual sales and vice versa. This shows that the sales plans are not made on realistic basis. There is no systematic

and scientific sales plan.

Variable cost of the company is in fluctuating and increasing trend. The slope of variable cost is upward and downward irregularly.

The fixed cost of the company is also in fluctuating and increasing trend. Major portion of the fixed cost represents administrative expenses and others are interest, depreciation, deferred expenditure, employee's housing and bonus.

The company has no details of systematic expenses plan. The fixed, variable and mixed expenses plan is the necessary elements for profit planning and control.

Margin of Safety is negative except in fiscal year 2063/64 and 2064/65 which indicates weakness of the company. Margin of safety is the sales from which the company can generate profit.

The analysis of cost behavior facilitates the use of another CVP technique to improve the decision-making activities is known as "Sensitivity analysis." If the sales and variable cost of the company decreased by 20%, the profit will decrease by 109.48% and vice-versa. But the BEP are equal in each case. If the variable cost decreased by 20%, the BEP will decrease by 13.93%. If the fixed cost increase by 20%, the BEP will also increase by 20% and vice-versa. There is direct and proportionate relationship between fixed cost and BEP.

5.3 Recommendations

On the basis of the study of CVP analysis as a tool to measure effectiveness of PPC of Soaltee Hotel Limited, it seems necessary to make CVP analysis effective. Nepal is stepping towards globalization with membership of WTO. Nepalese companies should integrate with the global environment with best fit managerial strategies. As the competition is very high in the context of liberalization, every

company should give attention on cost minimization rather than profit maximization. For this, CVP analysis tools can be great help. Thus, the following recommendations can be endorsed based on the finding of research study:

- Cost planning and controlling should focus on the relationship between cost and benefits rather than incurring cost in order to heighten revenue.
- Classification of cost into variable and fixed as well as controllable and non-controllable must be made within specific framework of responsibility centre and time.
- Expenses planning & controlling should focus on the relationship between expenditure and benefits derived from those expenditure.
- 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 the effective management of cost.
- As Soaltee Hotel Limited is service providing company, more emphasis should be given on reducing the variable cost ratio which means try to focus on cost –minimization.
- The company must increase revenue in order to generate more profit, because high fixed cost can make a huge loss and also high operating risk.
- New market channel should be identified for more profit.
- Systematic and periodicals performance reports should be strictly followed to trace poor performance and take corrective action immediately and timely.
- Profits, sales and costs should be analyzed by preparing budgeting or planning with actual performance within a periodic term such as monthly, quarterly, semi quarterly, semi yearly, yearly etc. which will help to improve the profit planning and controlling of the company.
- This can considerably contribute to increase in profitability of Soaltee Hotel

Limited. All decision makers ought to be fully aware of and understand the cost structure of their operation; otherwise CVP analysis will provide meaningless information.

- Company should add new scheme, facilities and services. Market studies on demand and pricing should be carried out and loss-oriented costs should be identified and controlled.
- A systematic approach should be made toward comprehensive profit planning tool like CVP analysis. This can considerably contribute to the increase in profitability of Soaltee Hotel Limited.

BIBLIOGRAPHY

- Adhikari, Bijaya Raj (2007): *Cost - Volume - Profit Analysis of "Nepal Lube Oil Limited*. An Unpublished Master Level Thesis Submitted to the office of Dean, Faculty of Management, T.U.
- Anderson, D.L. and D.L. Raun (1978): *Information Analysis in Management Accounting*. San Barbara: John Wiley.
- Anthony, R.N. (1970):*Management Accounting – Test & Cases*. Illinois Irwin
- Baxter, W.T. and Davidson (1977): *Studies in Accountin.*: New York: McMillan.
- Copeland, R.M. and P.E. Dascher (1978). *Management Accounting*. New York: John Wiley.
- Dearden, J. and J. Shank. (1975). *Financial accounting and Reporting*. New Jersey: Prentice-Hill.
- Dhakal, Dipendra Raj (2005). *Cost Volume Profit Analysis of Dairy Development Corporation*. An Unpublished Master Level Thesis Submitted to the office of Dean, Faculty of Management, T.U.
- Drury, Colin (2000). *Management and Cost Accounting*: UK: Business Press Thomson Learning.
- Gupta, Dr. S.P. (1997). *Management Accounting*. New Delhi: Prentice- Hall.
- Harold, Edey G. (1988). *Business Budgeting and Accounts*. Hutchism: University Library.
- Hartley, R.V. (1983). *Cost and Managerial Accounting*. Butson: Allyn and Botcon, Inc.
- Hilton, Ronald. W. (1991). *Management Accounting*. United States: McGraw Hill, Inc.
- Horngren, C.T., Foster, G., and Datar, S.M., (1998). *Cost Accounting: A Managerial Emphasis*. New Delhi: Prentice Hall of India.
- Jawahar Lal (1996). *Cost Accounting*. New Delhi: Tata McGraw Hill Publishing Co, Ltd.

- Kaplan, Robert S. and Atkinson, Anthony A., (1996). *Advanced Management Accounting*. New Delhi: Prentice Hall of India Pvt. Ltd.
- Keith, L. (1980). *Accounting: A Management Perspective*. Englewood Cliffs: Prentice Hall.
- Khan M.Y. and P.K. Jain, (1999). *Advanced Management Accounting*. New Delhi: Tata McGraw-Hill Publishing Co, Ltd.
- Lynch, R.M. and Williamson, R.W., (1993). *Accounting for Management*. New Delhi: Tata McGraw-Hill Publishing Co, Ltd.
- Mayer, J.N. (1969). *Financial Statement Analysis*: New Jersey: Prentice-Hall.
- Mohan, M. and Goyal, S.N., (1997). *Principles of Management Accounting*. Agra: Sahitaya Bavan Publications.
- Morse, D. (1997). *Managerial Accounting*: New York: McGraw- Hill.
- Munankarmi, Shiva P. (2003). *Management Accounting*. Kathmandu: Buddha Academic Enterprises Pvt. Ltd.
- Oster Young, J.S. (1979). *Capital Budgeting Long-Term Assets Selection*. Columbus: Ohio, Grid.
- Pandey, I.M. (1994). *Financial Management*. New Delhi: Vikash Publishing House Pvt. Ltd.
- Paul, S. K. (1996). *Management Accounting*. Calcutta: New Central Books Agency Pvt.
- Pradhan, Rajendra (2006). *Cost Volume Profit Analysis of Public Enterprises of Nepal (A comparative analysis between Nepal Telecom and Nepal Electricity Authority)*. An Unpublished Master Level Thesis Submitted to the office of Dean, Faculty of Management, T.U.
- Rijal, Madhav (2005). *Cost volume profit analysis tools to measure effectiveness of profit planning and control; A case study of NEBICO Private Limited*. An Unpublished Master Level Thesis Submitted to the office of Dean, Faculty of Management, T.U.

- Sharma, R.K., and Gupta, S.K., (1996). *Management Accounting: Principles and Practices*. New Delhi: Kalyani Publishers.
- Sharma, Sagar (2002). *Management Accounting Practices in the listed Companies of Nepal*. An Unpublished Master Level Thesis Submitted to the office of Dean, Faculty of Management, T.U.
- Shrestha, Dharma R. (2006). *Cost, Volume And Profit Analysis Of Commercial Bank: A Case Study Of Himalayan Bank Limited*. An Unpublished Master Level Thesis Submitted to the office of Dean, Faculty of Management, T.U.
- Sijakhwo, Krishna Ram (2008). *Study on Application of Cost-Volume-Profit Analysis as a Management Tool in Bhaktapur Craft Paper Ltd*. An Unpublished Master Level Thesis Submitted to the office of Dean, Faculty of Management, T.U.
- Tracy, J.F. (1976). *Fundamentals of Management Accounting*. New York: John Wiley.
- Welsch, G. A, Ronald, W. Hilton, and Paul, Gordon N., (1992). *Budgeting: Profit Planning and Control*. New Delhi: Prentice Hall of India.

Annual Report

Soaltee Hotel Limited (2060/61-2064/65). *Annual Report*. Kathmandu.

Websites

www.soalteecrownplaza.com

www.nepaltourismboard.com

APPENDIX- 5
Segregation of Cost of Fiscal Year 2062/63

(Rs. in Lakh)

Expenses	Total Cost	Fixed Cost	Variable Cost	Sales	VC Ratio
Consumption of food, Provisions and Beverages	800	-----	800	4397	0.134
Management Fees	105	-----	105	4397	0.031
Interest	217	217		4397	----
Charges	438	438		4397	-----
Deferred expenditure	3	3		4397	-----
Administrative and Other Expenses	3019	1624	1395	4397	0.263
Total	4582	2282	2300	4397	0.532

$$\text{CM Ratio} = 1 - \text{VC ratio}$$

$$= 1 - 0.532$$

$$= 0.468$$

$$\text{BEP} = \frac{FC}{CM \text{ ratio}}$$

$$= \frac{2282}{0.468}$$

$$= \text{Rs } 4876 \quad (\text{in Lakh})$$

$$\text{MOS} = \text{Actual Sales} - \text{BEP Sales}$$

$$= 4397 - 4876$$

$$= \text{Rs. (479) in Lakh}$$

APPENDIX -6

Segregation of Cost of Fiscal Year 2063/64

(Rs.

in Lakh)

Expenses	Total Cost	Fixed Cost	Variable Cost	Sales	V C Ratio
Consumption of food, Provisions and Beverages	963	-----	963	5457	0.176
Management Fees	137	-----	137	5457	0.025
Interest	196	196	-----	5457	----
Depreciation	422	422	-----	5457	-----
Deferred expenditure	3	3	-----	5457	-----
Administrative and Other Expenses	3471	1874	1597	5457	0.292
Employee's Housing	13	13			
Bonus	23	23			
Total	5228	2531	2697	5457	0.494

$$\text{CM Ratio} = 1 - \text{VC ratio}$$

$$= 1 - 0.494$$

$$= 0.506$$

$$\text{BEP} = \frac{FC}{\text{CM ratio}}$$

$$= \frac{2531}{0.506}$$

$$= \text{Rs. } 5002 \quad (\text{in Lakh})$$

$$\text{MOS} = \text{Actual Sales} - \text{BEP Sales}$$

$$= 5457 - 5002$$

$$= \text{Rs. } 455 \text{ in Lakh}$$

APPENDIX- 7

Segregation of Cost of Fiscal Year 2064/65

(Rs. in Lakh)

Expenses	Total Cost	Fixed Cost	Variable Cost	Sales	VC Rate
Consumption of food, Provisions and Beverages	1038	-----	1038	6172	0.168
Management Fees	156	-----	156	6172	0.025
Interest	174	174	-----	6172	----
Depreciation	431	431	-----	6172	-----
Deferred expenditure	10	10	-----	6172	-----
Administrative and Other Expenses	3737	1716	2022	6172	0.328
Employee's Housing	31	31	-----	6172	-----
Bonus	54	54	-----	6172	-----
Total	5631	2416	3216	6172	0.521

$$\text{CM Ratio} = 1 - \text{VC ratio}$$

$$= 1 - 0.521$$

$$= 0.479$$

$$\text{BEP} = \frac{FC}{\text{CM ratio}}$$

$$= \frac{2416}{0.479}$$

$$= \text{Rs } 5044 \text{ (in Lakh)}$$

$$\text{MOS} = \text{Actual Sales} - \text{BEP Sales}$$

$$= 6172 - 5044$$

$$= \text{Rs. } 1128 \text{ in Lakh}$$

APPENDIX- 3

Segregation of Cost of Fiscal Year 2060/61

(Rs. in Lakh)

Expenses	Total Cost	Fixed Cost	Variable Cost	Sales	V C Ratio
Consumption of food, Provisions and Beverages	707	-----	707	4050	0.175
Management Fees	93	-----	93	4050	0.022
Interest	149	149	-----	4050	-----
Depreciation	481	481	-----	4050	-----
Deferred expenditure	17	17	-----	4050	-----
Administrative and Other Expenses	3047	1624	1423	4050	0.327
Total	4494	2271	2223	4050	0.524

$$\text{CM Ratio} = 1 - \text{VC ratio}$$

$$= 1 - 0.524$$

$$= 0.476$$

$$\text{BEP} = \frac{FC}{\text{CM ratio}}$$

$$= \frac{2271}{0.476}$$

$$= \text{Rs } 4771 \quad (\text{in Lakh})$$

$$\text{MOS} = \text{Actual Sales} - \text{BEP Sales}$$

$$= 4050 - 4771$$

$$= \text{Rs. } (721) \text{ in Lac}$$

APPENDIX- 4

Segregation of Cost of Fiscal Year 2061/62

(Rs. in Lakh)

Expenses	Total Cost	Fixed Cost	Variable Cost	Sales	V C Ratio
Consumption of food, Provisions and Beverages	625	-----	625	3228	0.193
Management Fees	60	-----	60	3228	0.018
Interest	203	203	-----	3228	-----
Depreciation	480	480	-----	3228	-----
Deferred expenditure	10	10	-----	3228	-----
Administrative and Other Expenses	2770	1624	1146	3228	0.327
Total	4148	2317	1831	3228	0.538

$$\text{CM Ratio} = 1 - \text{VC ratio}$$

$$= 1 - 0.538$$

$$= 0.462$$

$$\text{BEP} = \frac{FC}{\text{CM ratio}}$$

$$= \frac{2317}{0.462}$$

$$= \text{Rs } 5015 \text{ (in Lac)}$$

$$\text{MOS} = \text{Actual Sales} - \text{BEP Sales}$$

$$= 3228 - 5015$$

$$= \text{Rs. (1787) in Lac}$$

APPENDIX -8

PROFIT AND LOSS ACCOUNT

FOR THE YEAR ENDED ASHAD 32, 2065 (JULY 16, 2008)

Rs. In '000

Particulars	2064/65	2063/64
Sales	579437	518815
Consumption of food, Provisions and beverages	103779	96303
Gross Profit		
Other Income	475658	425513
	35426	27408
Total		
Administrative and other expenses	511084	449921
Management fees	373743	347093
	15554	13727
Profit/(Loss) from operation		
Interest	121787	89101
Depreciation	17355	19627
Exchange Gain/(Loss)	43106	42202
Dividend income	(1128)	1757
Deferred expenditure	(269)	(100)
Profit/Loss on sale of Fixed Assets	987	254
Employees' Housing	(899)	(1094)
Bonus	3132	1323
	5409	2285
Profit/(Loss) before Taxation		
Provision for Taxation	54097	22847
	854	-
Profit/(Loss) after Taxation		
Payment of account of prior year taxation	54948	22847
Balance of profits brought forward	-----	10015
	39833	15669
Profit available for appropriation		
Appropriation	94881	48531
Proposed Dividend		
	9612	8697
Balance carried over to Balance Sheet		
	85269	39834

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APPENDIX- 1

Calculation of Mean, Standard Deviation and Coefficient of Variation of Budgeted Revenue and Actual Revenue (In Million Rs)

Year	Budgeted Sales (X)	(X- \bar{X})	(X- \bar{X}) ²	Actual Sales (Y)	(Y- \bar{Y})	(Y- \bar{Y}) ²
2060/61	432	(29.4)	864.36	405	(61.2)	3745.44
2061/62	342	(119.4)	14256.36	323	(143.2)	20506.24
2062/63	456	(5.4)	29.16	440	(26.2)	686.44
2063/64	515	53.6	2872.96	546	79.8	6368.04
2064/65	562	100.6	10120.36	617	150.8	22740.64
Total	2307		28143.2	2331		54046.8

$$\begin{aligned}\text{Mean } (\bar{X}) &= \frac{\sum X}{N} \\ &= \frac{2307}{5}\end{aligned}$$

$$\begin{aligned}\text{Mean } (\bar{Y}) &= \frac{\sum Y}{N} \\ &= \frac{2331}{5}\end{aligned}$$

$$= 466.2$$

$$\begin{aligned}\text{Standard Deviation of X } (\sigma) &= \sqrt{\frac{1}{N} \sum (X - \bar{X})^2} \\ &= \sqrt{1/5(28143.2)} \\ &= 75.02\end{aligned}$$

$$\begin{aligned}\text{Standard Deviation of Y } (\sigma) &= \sqrt{\frac{1}{N} \sum (Y - \bar{Y})^2} \\ &= \sqrt{\frac{1}{5} (54046.8)} \\ &= 103.97\end{aligned}$$

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

$$= \frac{75.02}{461.4} \times 100$$

$$= 16.26\%$$

$$\text{C.V of Y} = \frac{\sigma}{Y} \times 100$$

$$= \frac{103.97}{466.2} \times 100$$

$$= 22.30\%$$

APPENDIX -2

Calculation of Correlation and Probable Error of Correlation of Soaltee Hotel Limited

(Rs. in

Million)

Year	X	Y	XY	X ²	Y ²
2060/61	432	405	174960	186624	164025
2061/62	342	323	110466	116964	104329
2062/63	456	440	200640	207936	193600
2063/64	515	546	281190	265225	298116
2064/65	562	617	346754	315844	380689
Total	2307	2331	1114010	1092593	1140759

$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{n \sum x^2 - (\sum x)^2} \sqrt{n \sum y^2 - (\sum y)^2}}$$
$$= \frac{5 \times 1114010 - 2307 \times 2331}{\sqrt{5 \times 1092593 - (2307)^2} \sqrt{5 \times 1140759 - (2331)^2}}$$
$$= 0.99$$
$$\text{P.E} = 0.6745 \frac{1-r^2}{\sqrt{n}}$$
$$= 0.6745 \frac{1-(0.99)^2}{\sqrt{5}}$$
$$= 0.0060$$

APPENDIX -9

Balance Sheet of Soaltee Hotel Company Limited

AS AT JULY 16, 2008 (ASHAD 32, 2065)

(Rs. in Lakh)

	As at July <u>15, 2008</u>	As at July <u>16, 2007</u>
<u>CAPITAL AND LIABILITIES</u>		
<u>Capital & Reserve</u>		
Share Capital	86,969	86,969
Reserve & Retained Earning	<u>143,655</u>	<u>98,320</u>
	230,624	185,289
<u>Medium & Long Term Loan</u>		
Secure	<u>95,439</u>	<u>109,000</u>
Total	<u>326,063</u>	<u>294,289</u>
<u>ASSETS</u>		
Fixed Assets	427187	447784
Capital Work in Progress	6131	6131
Welfare tax asset	10869	10015
Movable assets	2930	-----
Investment	19967	19967
<u>CURRENT ASSETS, LOANS AND ADVANCES</u>		
Inventories	49403	48086
Sundry Debtors	103304	103930
Cash and Bank Balance	14296	10962
Prepaid, Advance, Loan & Deposits	<u>43291</u>	<u>30191</u>
	<u>210270</u>	<u>193169</u>
<u>Less: Current Liabilities</u>		
Current Liabilities	285654	328488
Proposed Dividend	9612	8397
Provision	<u>56025</u>	<u>45847</u>
	<u>351291</u>	<u>383032</u>
Net Current Asset	(141021)	
(189863)		
Deferred Expenditure	----	255
Total	<u>326060</u>	<u>294289</u>
Contingent Liabilities	53819	49269

APPENDIX -10

Computation of SSC, SST, SSW, MSC & MSE

Let,

X_A = Total Revenue of Hotel industry

X_B = Revenue of SHL

X_c = Profit of SHL

Computation of Variances

(Rs. in

Lakh)

Fiscal Year	X_A	X_B	X_C	X_A^2	X_B^2	X_C^2
2060/61	61483	4050	-471	3780159289	16402500	221841
2061/62	59930	3228	-923	3591604900	10419984	851929
2062/63	69485	4397	-203	4828165225	19333609	41209
2063/64	76434	5462	56	5842156356	29833444	3136
2064/65	80255	6172	230	6440865025	38093584	52900
	347587	23309	-1311	24482950795	114083121	1171015

Source: Nepal Tourism Statistics 2008

Now, Grand Total (T) = Total Sum of all Items = $\sum X_1 + \sum X_2 + \sum X_3$

$$= 347587 + 23309 - 1311$$

$$= 369585$$

Number of all items (N) = 15

Correction Factor (C.F) = $T^2 / N = (369585)^2 / 15 = 9106204815$

Total Sum of Square (SST) = $\sum X_A^2 + \sum X_B^2 + \sum X_C^2 - CF$

$$= 24482950795 + 114083121 + 1171015 - 9106204815$$

$$= 15492000116$$

Sum of Square between Column Factors (SSC)

$$\begin{aligned} &= \frac{(\sum x_A)^2}{n_A} + \frac{(\sum x_c)^2}{n_c} + \frac{(\sum x_c)^2}{n_c} - CF \\ &= (347587)^2/5 + (23309)^2/5 + (-1311)^2/5 - 9106204815 \\ &= 15166145339 \end{aligned}$$

Where,

n_A = Number of Item in Column A

n_B = Number of Item in Column A

n_C = Number of Item in Column A

$$\begin{aligned} \text{Sum of Square Due to Error (SSE)} &= \text{SST} - \text{SSC} = 15492000116 - 15166145339 \\ &= 325854777 \end{aligned}$$

$$\text{Mean Sum of Square between Column Factor (MSC)} = \frac{\text{SSC}}{K-1} = \frac{1516614539}{3-1}$$

$$= 7583072669.5$$

Where,

K = Number of Column = 3

$$\text{Mean Sum of Square Due to Error (MSE)} = \frac{\text{SSE}}{N-K} = \frac{325854777}{12} = 27154565$$