# CHAPTER I
# INTRODUCTION

## 1.1 Background of the Study

Nepal is one of the least developed countries in the world. Its economy is dependent on traditional agriculture. Its per capita income is one of the lowest in the world. It has mass poverty and unemployment. It has only few industrial and agricultural products for export. In such situation, industrialization of economy is the only way to come out from the vicious circle of mass poverty and unemployment.

In recent decades, the process of industrialization of the country took place speedy particularly, when it adopted the policy of economic liberalization and privatization.
As a result, the dependence of Nepalese economy on agriculture significantly lessened due to increasing industrialization in the country.

However, with the increasing industrialization the problem of business failure increasing in the recent years. The business failure is a situation in which the firm incurs losses for many years or suffers from cash shortage. As a result, the firm cannot run successfully and contribute to development of national economy. Financial analysis is mainly used to determine such business failure with the help of financial statement which include income statement and balance sheet. They are the firm operation and its financial position.To analyzes the financial performance and strength and weakness of the firm many types of tools and techniques are underlying on the financial analysis. Among them ratio analysis is an important one. Ratio analysis is a kind of yardstick, which evaluates the financial condition and performance of company.Therfore; it is frequently used as powerful tools of financial analysis. Financial ratios are also helpful to diagnose strength and weakness in firm's performance. According to Webster's New Collegiate dictionary, a ratio is defined as the indicate quotient of two mathematical expression and as the relationship between two or more thing. (Pandey, 2000:104)

Different sources and different analysts use different combination of financial ratio for the analysis purpose because financial ratios are considered as benchmark for evaluating the financial performance and position of a company. Analysis, interpretation and evaluate

the performance that he/she could obtain only through a perusal of financial statements. Not only this much experts use ratio for credit analysis, stock analysis and son on. The professional's credit and stock analysis are able even to predict financial condition and its stock markets price in the future. But such prediction is based on their long experience and generally it is subjective.

Recently, researchers have conducted to assess the predictive power of financial ratios. These studies have shown that ratios can also be used to predict the bankruptcy of firm accurately. They are the objectives measures. In objectives measures, by the predict accurately about the financial condition of the firm. There are different approaches to test the predictive power of financial ratios, which includes the following:

- ➢ Millers Cause and Effect Analysis
- ➢ Beaver's Approach
- ➢ Multiple Discriminate Model
- ➢ ZETZ Model
- ➢ Wilcox's Gambler's Ruin Approach
- ➢ L.C.Gupta's Relative Earning Model

However, few researches have been conducted to rest empirically about predictive power of financial ratios, particularly in the context of Nepal. The core of this study is concern with empirical study of the predictive power of various financial ratios which are frequently used in the field of financial analysis. This study is done in the context of Nepal.

## 1.2 Focus of the Study

To make rational decision in keeping with financial objectives of the firm, financial analysis can be most effective approach of the company. But various tools and techniques are used on the financial analysis.Many financial managers are familiar about the principal ratios used in financial analysis but they not have the ideas about the predictive power of financial ratios. It is very important for financial analysis to know about predictability of different ratios as well as to determine bankruptcy and business failure.

Predict strength and weakness of the firm and which the best ratio and which is the most important ratio in the field of finance to take significant decisions.

In predicting the future value of a stock, an investor might feel that the return on investment ratios and various profit margin ratios would be the greatest help. Most estimates of predicative power of financial ratios are based on the analyst's past experience with them. By their vary nature, and then the estimates trend to subjective and differ from one analysis to the next.

A number of empirical studies have tasted the predictive power of financial ratios. In many of these studies, financial ratios are used to predict business failure. Others have tasted the power of financial ratios to predict corporate bond rating. With these ratios as dependent variable, regression analysis and discriminant analysis have been employed, using various financial ratios for a sample of companies.

Predictive power of financial ratios no only measures a firm operational aspects but also is highly sensitive to changes and it is indicative of firm 'reverse strength' available to meet unexpected set-bucks caused by managerial mistakes and external factors that is why it is important for financial must to predictive power of financial ratios. With out necessary test of predictive power of every financial ratio the analysis can not reach in the right decision as a result the situation of business failure may arise. On the whole, the main focus of this study is to test the predictive power of financial ratio which is used frequently for financial analysis in context of Nepal.

## 1.3 Statement of the Problem

The term ratio refers a fixed relationship between two items/variables. It tells the whole story of change in the financial condition of the business and also predicts about the future. Past study of last two decades different technique and models have been made and developed based on financial ratio. To some extent the prediction is correct. Although ratios are popular and widely used tools of financial analysis, they are not free from limitations. It suffers from a number of laminations. Ratio analysis is totally based on financial statements but the difference in definition of items in balance sheet and profit and loss statement make interpretation of ratios are difficult. The ratio calculative at the

point of time are less informative and defective as they suffers from short term changes and price level changes also make the interpretation of the ratio invalid. Ratios are tools of quantities analysis and normally quantities factor needed to draw conclusions.

Financial ratios are not effective for the financial analysis due to various limitations.But, analysts have been using the ratio to analyze the financial performances and predication purpose also from many years. To some extent ratio can predict the future and it has predictive powers. Stock and credit analysis have also use ratio for prediction. In this situation some question may arise. So having so many limitations, ratios are used for prediction purpose. This is the main problem. In this situation some question may arise

- ➢ Can ratios predict future?
- ➢ Have ratios some predictive power?
- ➢ If so, is all prediction accurate?

To reach the solution of this problem it is necessary to know the capacity, important and limitation of financial ratios. To what extent ratio can be used for predictive purpose. Therefore, this study attempts to evaluate the prediction power of financial ratios in selected companies and corporation of Nepal under study.

## 1.4 Objective of the Study

Predictive power of financial ratios is very important for the financial analysis. Therefore, the main objective of the study is to test the predictive power of financial ratios. More specially, the basic objective is to compute necessary financial ratios, test the predictive power of these ratios, categories the entire ratio according to their predictive power. In specify, the study has achieved the following objectives:

- ➢ To test the predictive power of liquidity ratios and find out the best liquidity ratio.
- ➢ To test the predictive power of leverage ratio and find out the best leverage ratio.

- ➢ To test the predictive power of activity ratios and find out the best activity ratio.
- ➢ To test the predictive power of profitability ratio ratios and find out the best profitability ratio.
- ➢ To rank all the ratios according to their predictive power.
- ➢ To examine the predictive power of all ratios either same or not.
- ➢ To recommended some suggestions towards predictive power of financial ratios.

## 1.5 Significant of the Study

Limited number of studies has been made to examine the predictive power of financial ratios. Thus, there is a need to develop such type of study and test the predictive power of financial ratios. In order to take financial decisions, financial manages need proper analysis of financial statement and position. Financial ratios and their prediction power seem to be very crucial and useful while doing financial analysis. Therefore, this study is very important in the Nepalese context. This study has academic as well as theoretical and practical significance. The findings and conclusion of study will important to the financial analysts and others for making the financial decision. This study will also be helpful and important for the persons,researchers,scholar and the interest group who have interest to know about the ratios and its predictive power as well as which ratio has greater predictive power among all ratios and to know about the different models of prediction under different environment. This study is also helpful for the study of elating sector.

## 1.6 Organization of the Study

On this research, the study is carried out in different stage and procedures as it needed. As well as the study organized on the following chapter to make the study easy to understand.

**Chapter-I: Introduction**

The first chapter is introduction. This chapter deals with the introduction that includes background, focus of the study, statement of the problem, objective of the study, significance of the study, limitation of the study and organization of the study.

**Chapter-II: Review of Literature**

This chapter deals on descriptive conceptual framework of predictive power of financial ratios. It consider of review of major related literature about the predictive power of financial ratios and related studies.

**Chapter -III: Research Methodology**

This chapter explains the research methodology used in study, which includes research design, population and sample, source of data and collection technique, data analysis tools.

**Chapter-IV: Data Presentation and Analysis**

This chapter is the major part of the whole study in which all collected relevant data are analyzed and interpreted by the help of different financial and statistical tools. In this we explain the major findings of the study.

**Chapter-V: Summary, Conclusion and Recommendation**

This part is completely suggestive package which contain gives the brief introduction to all the chapters of the study and shows the actual facts that have been taken from the analytical part, conclusion are the baled of the consequences of the analysis of relevant data. Recommendations will help to take better decision for predictive power of financial ratios.

## 1.7 Limitation of the Study

This study will be conducted for fulfillment of partial requirement of Master's Degree in Business Studies (MBS).Due to the time constraints, financial constraints and others, the study is bound for limited area. Limitations are categorically presented below:

- ➢ This study will take certain companies as a sample.
- ➢ This study based on secondary data.
- ➢ This study will use five-year data only.
- ➢ Only certain tools will use to analyze the data.
- ➢ Collected data from Nepal stock exchange and Ministry of finance will assume to be correct and true.
- ➢ Only certain ratios will take as a sample under study.
- ➢ The report of the study has been written according to given format by faculty of management.

> Up to date data and information related to the study have not been available from the concerned source.
> Some approximate data have been used because of certain circumstances.

# CHAPTER II
# REVIEW OF LITERATURE

## 2.1 Introduction

Financial ratios are the indicators for prediction of financial distress like business failure, economic failure, financial losses and bankruptcy. Financial ratios are used to predict the financial health of the industrial unit. To find out predictive power of financial ratio, study of financial ratio is also fundamental to our study. Therefore, in this chapter, here, reviews the concept to the financial ratios, their utilities and importance, predictability of financial ratios, predictive models and it also includes reviews of related studies.

## 2.2 Concept of the financial ratios

To make rational decision in keeping with financial objectives of the firm, the financial manager must seek some analytical tool and techniques. In order to fulfill these objectives, financial analysis can be must effective approach for the company. But various tools and techniques are underlying on the financial analysis. Among them ratio analysis is the important one. Ratio analysis is a kind of yardstick, which evaluates the financial condition and performance of company. Financial ratios give an indication of the financial strength and performance of a company. Therefore, it is frequently used as a powerful tool of financial analysis.

According to Webster New Collegiate Dictionary " A ratio is defined as the indicate quotient of two mathematical expression and as the relationship between two or more things (Pandey, 2000:104) Ratio means one number expressed in terms of another. A ratio is a statically yardstick by means of which relationship between two or various figures can be compared or measured. Ratio can be found out by dividing one number by another number. Ratio shows how one number is related to another.

Ratio analysis has been a major tools used in the interpretation evaluation of financial statement since late 1800. (Baruch, 1974:11)

Ratios are relationships expressed in mathematical terms between figures which have a cause and effect relationship or which are connected with each other in some other manner. (Grewal, 1974:102)

"A ratio is simply one number expressed in terms of another: it is an expression of relationship split out by dividing one figure into another." (M.M. and Goyal, 1988:50)

"The term ratio refers to the numerical or quantities relationship between two items/variables. The relationship can be expressed as: (i) percentage say net profit are 25% of sales (assuming net profit is Rs. 25000 and sales is Rs. 100000) (ii) Fraction (Net profit is one fourth of sales and (iii) Proportion of number (the relationship between net profit and sales is 1:4) (Khan and Jain, 2000:7)

Different sources and different analysis use different combination of financial ratio for the analysis purpose because financial ratios are considered as a benchmark for evaluating the financial performance and position of a company. Financial ratios are computed from the company's financial statement, particularly from the balance sheet. The absolute accounting figures are reported in the company's financial statement at the end of every fiscal year. However, these accounting figures are unable to provide a meaningful understanding itself. They are effective only when they are related to other relevant information. For instance, a firm with five Crore net profit may be considered as profitable firm but firm's performance can be sold to be good only when the firm's required rates of return able to meet its current investment (Pandey,2000:104) Therefore the relation between two accounting figures expressed mathematically is known as financial ratio. Financial ratio analysis plays a vital role in summarizing the large quantities of financial data and making qualitative judgment about the firm's financial position that is why study of predictive power of financial ratios is very important.

## 2.3 Types of the Ratios

As mentioned earlier, financial ratio analysis is one of the important parts of the financial analysis in evaluating firm's performance. The parties interested in financial analysis are short- term creditors, the long-term creditors, owners, management and short-term

solvency of the firm. On the other hand, long-term creditors are more interested in the long-term solvency and profitability of the firm. Similarly, owners are interested to the firm's profitability and financial condition. In the someway, management's main interest is in the firm's performance. Therefore, types of financial ratio differ from person to person and situation to situation.

"Ratios have generally been classified on the basis pf statement from which items have been taken on the basis of nature of ratios, on the basis of purposes which they serve ,on the basis of persons interested in them and finally but not the last on the basis of relative importance of the ratios . Some of the possible classifications are being mentioned below "(Gupta, 1990:56)

### A) Classification by statement

1. Balance sheet ratio /financial ratios
   - a. Liquidity ratio
   - b. Current ratio
   - c. Stock ratio
   - d. Proprietary ratio
   - e. Capital gearing ratio

2. Profit and loss Account ratios / Operating ratios
   - a. Gross profit ratio
   - b. Expenses ratio
   - c. Operating ratio
   - d. Net profit ratio

3. Balance sheet and Profit and Loss Account Ratio or Inter Statement ratios/ combined ratios/ mixed ratios
   - a. Return on shareholder's fund
   - b. Return on capital employed
   - c. Stock turnover
   - d. Debtors turnover
   - e. Creditors turnover
   - f. Working capital turnover

g. Current assets turnover

h. Total turnover of total

i. Fixed assets turnover

j. Net Assets Turnover

## B. Classification by Users

1. Ratio for MGMT/MGMT Efficiency ratios

    a. Operating ratio

    b. Return on employed

    c. Stock turn over

    d. Debtors turnover

    e. Solvency ratio

2. Ratios for Creditors

    a. Current Ratios

    b. Solvency Ratio

    c. Creditors turnover

    d. Fixed Assets Ratio

    e. Assets cover

    f. Interest cover or Debt service ratio

3. Ratios for share holders

    a. Return on shareholders fund

    b. Capital gearing ratio

    c. Dividend covers ratio

    d. Field Rate

    e. Proprietary Ratio

    f. Dividend Rate

    g. Assets cover of share

## C. Classification by Relative Importance

This classification is being adopted by the British institute of management and includes the following groups.

1. Primary ratios/ Explanatory ratios

a. Return on Capital Employed

b. Assets Turnover

c. Profit ratio

2. Secondary performance Ratio

a. Working Capital Turnover

b. Stock to current assets

c. Current asserts to fixed assets

d. Stock to fixed assets

e. Fixed assets to total assets

3. Secondary Credit Ratios

a. Creditors Turnover

b. Debtors Turnover

c. Liquid ratio

d. Current ratio

e. Average collection period

4. Growth Ratios

a. Growth rate in sales

b. Growth rate in net assets

**D. Classification by Accounting Significance**

a. Solvency ratio

b. Earning ratio

c. Capitalization ratio

d. Credit ratio

e. Management ratio

**E. Classification by Nature**

a. Inventory ratio

b. Debtors and Creditors Ratios

c. Sales ratio

d. Earning and Dividend ratios

e. Cost ratios

**F. Classification by Purpose**

       a. profitability ratios

       b. Activity ratios

       c. Financial ratios

       d. Miscellaneous ratios

According to western and Copeland (Copeland, 1990:192) Ratio can be categorized in three major types:

**1. Performance Measure**

A. Profitability Ratios

       i. Net operating Income (NOI) /sales

       ii. NOI/ Total Assets

       iii. NOI/Total Capital

       iv. Net Income ( NI) /Sales

       v. NI/ Equity or (ROE)

       vi. Change in NOI/ Change in Total Capital

       vii. Change in NI/ Change in Equity

B. Growth Ratios

       i. Sales

       ii. NOI

       iii. Net Income

       iv. Earning per share

       v. Dividends per share

C. Valuation Measure

       i. Price/ Earning

       ii. Market value of equity/ book value of equity

       iii. Dividend yield + Capital gain (or shareholders return)

**2. Operating Efficiency Measures**

A. Assets and Investment Management

    i. Cost of goods sold/Inventories

    ii. Average collection period

    iii. Sales / Fixed Assets

    iv. Sales / Total Assets

    v. Sales / Total Capital

    vi. Change in total capital / Total Capital

B. Cost Management

    i. Gross Profit/ Sales (or Gross Margin)

    ii. Marketing and Administrative Expenses/ Sales

    iii. Labour Cost / Sales

    iv. Pension Expenses per Employee

    vi. Research and Development Expenses/Sales

**3. Financial Policy Measure**

A. Leverage Ratios

    i. Total Assets/book value of equity

    ii. Interest - Bearing Debt (IBD) /Total capital

    iii. IBD/ Total Capital market

    iv. Earnings before Interest and Taxes (EBIT) / Interest Exp.

    v. EBIT + Lease Expenses/ Fixed Changes

    vi. IBD/ Funds From operation

B. Liquidity Ratio

    i. Current Assets/ Current liabilities (Current Ratio)

    ii. Current Assets-Inventories/ Current liabilities

    iii. (Increase in return earning+ Depreciation) /Investments

In this way, financial Ratios are classified into various categories according to financial activities or function. Generally, financial ratio can be grouped into four types.

**G. General/ Common/ Traditional Classification of Financial Ratios**

Ratios can be classified in a number of ways to suit any particular purpose. Different kinds of ratios are selected for different types of situations. The nature of analysis depends on the purposes for which the ratios are used and the kind of date's available generally financial ratios can be grouped in to four types:

1) Liquidity Ratios
2) Leverage Ratios
3) Activities Ratios
4) Profitability Ratios

## 1. Liquidity Ratios

The first category of financial ratios is "liquidity ratio". Liquidity ratios measure the firm's ability to meet current obligation of the firm. In other words, liquidity ratios are those types of ratio to which a firm uses in meeting short-term obligation. The liquidity ratios are computed to indicate the company's ability. Liquidity ratios provide the information about the liquidity position of a company by establishing a relationship between cash and other current assets. "Liquidity ratio measures the ability of the firm to meet its current obligation."(Pandey, 1998:108) liquidity ratio consists of the following ratio:

## 1.1 Current Ratio

This ratio shows the relationship between current assets and current liabilities. Current ratio is also known as short-term solvency ratio or working capital ratio. This ratio is used to assets the short-term financial position of business. In other words, it is an indicator of the firm's ability to meet its short-term obligation. This ratio is calculated by using the following formula:

$$\text{Current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current assets are cash and those cash equivalent of a business which can be converted into cash within a short period of time not exceeding a year and current liabilities are

those obligation of a business , which are to be paid within a short period time not exceeding a year.

*Interpretation:*

Higher the current ratio better the liquidation position is. For many types of business 2:1 is considered to be an adequate ratio. If the current ratio of a firm is less than 2:1, it means firm has difficulty in meeting its current obligation. If the current ratio is more than 2:1, the company may have an excessive investment in current assets that do not produce satisfied return.

**1.2 Quick ratio**

Quick ratio is another measure of a company's liquidity. It is also known as liquid ratio or acid-test ratio. Although, it is use to test the short-term solvency or liquidity position of the firm, It is a more stringer measures of liquidity than the current ratio. A relation between quick (liquid) assets and current liability is termed as quick ratio. Quick ratio includes all the current assets other than stock and prepaid. This ratio measures the ability of firm to pay current liabilities immediately. This ratio is calculated by dividing liquid assets by current liabilities.

$$\text{Quick/ liquid/Quick ratio} \quad = \quad \frac{\text{Quick assets}}{\text{Current liabilities}}$$

Quick Assets = Total current Assets- Stock - prepaid expenses

*Interpretation:*

Higher the current ratio, better the liquidity position is. However, an ideal quick ratio is said to be 1:1

**1.3 Cash Ratio**

Cash ratio is computed by dividing cash and its equivalent by current liabilities.

$$\text{Cash Ratio} \quad = \quad \frac{\text{Cash + marketable securities}}{\text{Current liabilities}}$$

**1.4 Net working Capital Ratio**

Net working capital ratio is calculated by dividing net working capital by net current assets.

$$\text{Net working capital ratio} = \frac{\text{Net working capital}}{\text{Net current assets}}$$

Where net working capital = the difference between current assets and liabilities excluding short -term borrowing.

## 2. Leverage Ratio

The second classification of the financial ratio is leverage ratio-leverage ratios are also called long-term solvency ratio or capital structure ratios. The term 'solvency' implies the ability of a company to meet the payments associated with its long -term debts. Thus, Solvency ratios are the measure of the company's ability to meet its long-term obligation. The leverage ratios are calculated to judge the long term financial position of a firm. These ratios measure the enterprises abilities to pay the interest regularly and to repay the principle on maturity. Generally these ratios are expressed in proportions. However, if the ratio is in fraction or less than one, it is expressed in percentage. The following are the major types of leverage ratios:

### 2.1 Debt equity ratio

The debt -equity ratios is calculated to ascertain the soundness of the company's long-term financial position. It indicates the extent to which it depends upon borrowed funds for its existence. It portrays the proportion of its total funds acquired by way of external financing. In short, the relationship between long term debts and owners' equity is known as debt-equity ratio. It is a popular measure of the long term financial solvency of a firm. The ratio is ascertained by using the following formula:

$$\text{Debt - equity ratio} = \frac{\text{Long-term debt}}{\text{Shareholder's fund}}$$

Alternatively, $\quad \text{Debt equity ratio} = \dfrac{\text{Total debt}}{\text{Share holders' equity}}$

Long- term debt: The debt which is payable after current year is called long term debt. Long term debt refers to borrowed funds. Long-term debts include term loans, debentures, bonds, mortgage loans and secured loans.

Total debts: It includes both short-term debts as well as long-term debt. Short term debts are the current liabilities.

*Interpretation:*

A high ratio shows the large share of financial by the creditors as compared to that of owners. It indicates the margin of safety of the owners. The creditors prefer low debt-equity ratio. A low debt-equity ratio implies larger safety margin for creditors.

## 2.2 Debt to total capital ratio

This ratio shows the relationship between long-term debt and total capital employed by the company. Total capital is also regarded as permanent capital or capital employed or long-term fund. This ratio is variation of the debt-equity and gives the similar indications as the debt-equity ratio. The ratio is ascertained by using the following formula:

$$\text{Debt to total capital ratio} = \frac{\text{long term debt}}{\text{Total capital}} \quad \text{or,} \quad \frac{\text{Total debt}}{\text{Total capital}}$$

Total capital = Long term debt + share holder's fund

Total capital = Fixed Assets + working capital

Total Debt = Long term debt + current liabilities

*Interpretation:*

A low ratio represents security to creditors in extending credit. On the contrary a high ratio represents a greater risk to creditors as well as shareholders.

## 2.3 Interest coverage ratio

This ratio indicates the ability of a firm to pay interest charges on its borrowed capital. It is also called "debt service ratio" or "times earned ratio". It is calculated by dividing net

$$= \frac{\text{Net profit + before interest and taxes}}{\text{Interest}}$$

profit before interest and taxes (NPBIAT) by the account of fixed interest charges. The ratio is ascertained by using the following formula:

Interest coverage Ratio _____

*Interpretation:*

A high ratio is sign of low burden of borrowing of the business and lower utilization of borrowing capacity. From the point of view of creditors, debenture holders and loan creditors the higher the coverage, the greater the ability of the firm to make the payment of interest.

## 2.4 Fixed Coverage Ratio

This is the ratio of net profit before interest and tax of fixed charges. It indicates the number of times the fixed charges covered by net profit before interest and taxes. The fixed charges includes interest, preference dividend and debt payment. This ratio is calculated as below:

$$\text{Fixed coverage Ratio} = \frac{\text{Net profit before interest and taxes}}{\text{Fixed charges}}$$

Fixed charges = Interest + preference dividend + debt payment

*Interpretation:*

It shows the ability of the firm to make the payment of fixed charges. Hence, the higher coverage ratio is preferable for the company. Higher the coverage, the higher will be profitability.

## 3. Activity Ratio

The third category of financial ratio is activity ratio. Activity ratios are also called turnover ratio or efficiency ratios. The creditors and owners are interested to invest their fund to generate sales and profit. Activity ratios are introduced to evaluate the efficiency with which the firm manages and utilizes it' assets. These ratios establish the relationship

of sales with various assets. Ratios are expressed in integers or times rather than as a percentage or proportion. Activity ratio consists of following ratio.

### 3.1 Inventory Turnover Ratio

The relationship between cost of good sold and average inventory is shown by this ratio. It is computed by dividing the cost of good sold by average inventory. It indicates as to how fast the goods are sold. It shows the speed with which stock is rotated into sales. It is also known as stock turnover ratio. This ratio is calculated by using the following formula:

$$\text{Inventory turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

The cost of good sold and average inventory are calculated as under:

i) Cost of Goods sold = opening inventory + net purchases + direct expenses - closing inventory

OR, Cost of Goods sold = Sales - Gross profit

OR, Cost of Goods sold = Sales - Gross profit

$$\text{ii) Average Inventory} = \frac{\text{Opening inventory + Closing inventory}}{2}$$

Generally the cost of good sold may not be available in the published financial statements. In such a situation to calculate the inventory turnover ratio, the net sales is divided by closing inventory, Hence, to ascertain average inventory, the opening inventory is necessary . In the absence of opening inventory, to draw this ratio the net sales are divided by closing inventory. Symbolically it may be written as:

$$\text{Inventory Turnover} \quad = \quad \frac{\text{Sales}}{\text{Average inventory}}$$

$$\text{Inventory Turnover} \quad = \quad \frac{\text{Sales}}{\text{Closing inventory}}$$

*Interpretation:*

A high inventory turnover is indicative of efficient inventory management. A low inventory turnover implies excessive inventory levels than wanted by production and sales activities. With the help of this ratio, management can assess whether stock has been more efficient used or not.

## 3.2 Debtors Turnover Ratio

Debtor's turnover ratio is also termed as receivable turnover ratio. This ratio establishes the relationship between net credit and average debtors (receivable) for the year. A firm can sell goods or cash or credit. Credit is the important factors of sales promotion. By implementing the liberal credit policy the sales can be increased. But one thing here should be notified is that the collection period from this type of debt must be short. The efficiency of the concern for collection from debtors is measured by this ratio. This ratio indicates the velocity of debt collection of a firm. It is also termed as Receivable Turnover Ratio. It gives the relationship between credit sales and average debtors. It is computed by dividing the credit sales by average debtors.

$$\text{Debtors Turnover Ratio} \quad = \quad \frac{\text{Net credit Sales}}{\text{Average Debtors}}$$

Where as,

Net credit Sales = Total sales - cash sales - sales return

$$\text{Average debtors} \quad = \quad \frac{\text{Opening debtors + closing debtors}}{2}$$

While calculating opening debtors and closing debtors both the debtors and bills receivable must be included. In the absence of credit sales and opening debtors, the following formula is used to ascertain debtor's turnover.

$$\text{Debtors Turnover Ratio} = \frac{\text{Sales}}{\text{Closing debtors}}$$

*Interpretation:*

The higher the ratio, the more efficient is the management or collecting the debtors. A higher ratio indicates that within a short period the firm is collecting the cash from debtors. A low ratio shows that debts are not being collected rapidly.

**3.3 Average collection Period (ACP)**

Average collection period is also called debt collection period or average age of debtors and receivable. It represents the average the average number of days for collecting the cash from debtors. It measures the efficiency of the concern for collecting from debtors. It indicates the rapidity or slowness with which the money is collected from the debtors. It can be calculated on the basis of the following formula:

$$\text{ACP} = \frac{\text{Debtors (12 months or 52 weeks or 365 days)}}{\text{Credit sales}}$$

$$= \frac{\text{12 months or 52 weeks or 365 days}}{\text{Debtor's turnover}}$$

$$= \frac{\text{Debtors}}{\text{Sales per day}}$$

Where as,

$$= \frac{\text{Net credit sale}}{\text{No. of working days}}$$

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Sales per day

*Interpretation:*

The minimum time is preferable. The minimum days shows that the firm is efficient on collecting cash from debtors and it also reduces the change of bad debts. A higher average collection period shows the excessive blockage of funds with debtors which increase the changes of bad debts.

## 3.4 Assets Turnover Ratio

This ratio is also known as investment turnover ratio. Assets are used to generate sales. Therefore a firm should manage its assets efficiently to maximize sales. The relationship between sales and assets is called assets turnover. Assets turnover ratio consists of following ratio:

## 3.5 Total assets turnover ratio

This ratio is employed to take information on total assets for generating sales in operation of business by the firm. It shows the relationship between total assets and sales. Its formula is as follows:

$$\text{Total Assets Turnover Ratio} = \frac{\text{Net sales}}{\text{Total Assets}}$$

## 3.6 Fixed Assets turnover Ratio

A relationship between sales and fixed assets is known as fixed assets turnover ratio It shows the efficiency of a concern on utilizing its fixed assets. This ratio is calculated by dividing sales by net fixed assets. Symbolically,

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Net fixed assets}}$$

*Interpretation:*

The higher ratio reflects better utilization of fixed assets. A low ratio is indicative of the poor utilization of the existing plant capacity which will result in reduction of production and increase in cost of production.

## 3.7 Capital Employed Turnover Ratio

A relationship between sales and total capital is represented by this ratio. it is a measure of efficiency of the capital employed in the business . The following formula is used for calculating this ratio:

$$\text{Capital employed Turnover Ratio} = \frac{\text{Net sales}}{\text{Capital Employed}}$$

## 3.8 Current Assets Turnover Ratio

A relationship between sales and current assets is known as current assets turnover ratio. This ratio is calculated in the following manner.

$$\text{Current Assets Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Current assets}}$$

$$= \frac{\text{Sales}}{\text{Current assets}}$$

## 3.9 Working capital Turnover Ratio

Relationship between costs of goods sold and net working capital represented by this ratio. Symbolically

$$\text{Working Capital Turnover} = \frac{\text{Cost of good sold}}{\text{Net working capital}}$$

## 3.10 Net Assets Turnover

This ratio is the ratio of sales and net assets. This ratio is calculated as below:

$$\text{Net assets Turnover} = \frac{\text{Sales}}{\text{Net assets}}$$

## 4. Profitability Ratios

Main objective of a company is to earn profit. Profit is both a means and an end to the company therefore profitability shows the overall efficiency of the company. Profitability ratios are the measures of its overall efficiency. Generally profitability ratios can be calculated in terms of the company's sales, investments and earnings and dividends. The following are the main types of profitability ratio:

### 4.1 Profitability in relation to sales or return on sales

A firm should be able to earn the profit sufficiently from each unit sold. It sales do not generate sufficient profit , it would be very  difficult for the firm to cover operating expenses and interest charges and as result, will fail to earn any profit for owner. Therefore the following ratio can be ascertained considering the sales as basis:

### 4.1.1 Gross Profit Ratio or Gross Profit margin

Gross profit ratio is also termed as gross profit margin. This ratio shows the relationship between gross profit and net sales and its measures the overall profitability of the company in terms of sales .it is generally expressed in percentage. It is calculated by using the following formula:

$$\text{Gross Profit Ratio} \quad = \quad \frac{\text{Gross profit}}{\text{Net sales}}$$

Gross profit = Net sales-cost of goods sold

Net sales   = Total sales - sales return

Cost of goods sold = opening stock + Net purchases+ direct expenses-closing stock

*Interpretation:*

A higher ratio is a sign of efficient management which reflects lower cost of goods old and maximizing profit on the other a low ratio may reflects higher cost of goods sold due to the firm's inability to purchase at favorable terms.

### 4.1.2 Net profit Ratio

This ratio is also called net profit margin. This ratio measures the overall profitability of a business by establishing the relationship between net profit and net sales. This ratio is calculated by dividing net profit after tax by net sales. Symbolically;

$$\text{Net profit margin/ net profit ratio} = \frac{\text{Net profit after tax}}{\text{Sales}}$$

*Interpretation:*

A higher ratio is an indication of the higher overall efficiency of the business and better utilization of total resources. Poor financial planning and low efficiency is the indication of lower ratio.

### 4.1.3 Operating Ratio

This ratio shows the relationship between operating expenses and sales value. The information about the cost structure can be obtained from this ratio. This ratio is computed by dividing operating expenses by sales. Operating expenses includes cost of good sold administrative expenses and selling and distribution expenses. This ratio is calculated as below:

$$\text{Operating Ratio} = \frac{\text{Operating Expenses}}{\text{Sales}}$$

Lower the operating ratio indicates the higher operating profit. Hence, lower percentage is preferable for the company. The higher ratio shows the increase in operating expenses and decrease in business capacity.

### 4.2 Profitability in relation to investment

The profitability of the firm can also be measured with investment respectively. The term investment refers to total assets capital employed or shareholders fund. It is also known as the return on investment. On the basis of investment different types of ratios are ascertained. They are as follows:

**4.2.1 Return on Assets (ROA)**

This ratio measures the relationship between the total assets and net profit after tax plus interest. It measures the productivity of the assets and determines how effectively the total assets have been used by the company. To the ROA may also be called profit to assets ratio. To calculate ROA different formula can be used which are as follows:

$$\text{Return on Assets} \quad = \quad \frac{\text{Net profit after tax} + \text{interest}}{\text{Total assets}}$$

If the amount of interest is not given, return on assets can be calculated dividing net profit after tax by total assets symbolically.

$$\text{ROA} \quad = \quad \frac{\text{Net profit after tax}}{\text{Total Assets}}$$

Total Assets = current assets + non current assets-fictitious assets ( like loss of the business as preliminary expenses profit and loss ( debt, balance) brokerage or commission or loan. discount on issuing share and debenture.

$$\text{Or, ROA} \quad = \quad \frac{\text{Net profit after tax- pref. dividend}}{\text{Total Assets}}$$

$$\text{ROA} \quad = \quad \frac{\text{Net profit after tax- pref. dividend}}{\text{Total tangible Asset}}$$

*Interpretation:*

This ratio measures the profitability of all financial resources invested in the firm's assets. Hence, the higher the higher ratio implies that the available source and tools are employed efficiently.

### 4.2.2 Return on shareholder's Equity (ROSE)

These ratios express the profitability of a business in relation to the owners' fund. This ratio shows the relation between the net profit after tax and shareholder' fund. Shareholder's funds include equity share capital preference share capital reserve and surplus reserve fund general reserve capital reserve and share premium. The fictitious assets should be deducted from total shareholder's equity for finding out this ratio. It can be calculated on the basis of the following formula:

$$\text{Return on shareholder's Equity} = \frac{\text{Net profit after tax}}{\text{Shareholder's equity}}$$

$$\text{Or, ROSE} = \frac{\text{Net profit after tax- pref. dividend}}{\text{Shareholder's equity}}$$

*Interpretation:*

This ratio indicates how well the firm has used the resources contributed by the owners. It is good for the firm to be the return of investment higher. Higher the ratio is the more efficient the management and utilization of shareholder's fund.

### 4.2.3 Return on capital Employed (ROCE)

The net result of operation of a business is either profit or loss. The fund used by the company to generate profit consists of both proportions' (shareholders') fund and borrowed funds. Therefore the company's overall performance can be judge in terms of capital employed. This ratio is usually expressed in a percentage. A relation between net profit and capital employed is known as Return on capital Employed Ratio. It shows whether the amount of capital employed has been properly used or not. This ratio is calculated by using the following formula:

$$\text{Return on Capital Employed (ROCE)} = \frac{\text{Net profit after tax}}{\text{Capital employed or total capital}}$$

$$= \frac{\text{Net profit after tax + interest}}{\text{Capital Employed}}$$

$$- \frac{\text{NAPT + Interest}}{\text{Capital employed - intangible assets}}$$

This ratio shows the efficiency of the firm on the utilization of total capital. A higher ratio is an indication of the better utilization of capital employed. Hence, higher ratio is preferable for the company.

## 4.3 Profitability in terms of Earning and Dividend

### 4.3.1 Earning per share (EPS)

EPS measures the profit available to equity shareholders on per share basis. This ratio expresses the earning power of the company in terms of a share held by the equity shareholders. This ratio is computed by dividing the net profits after preference dividend by the number of equity shares outstanding. It is expressed in an absolute rupee figure.

$$\text{Earnings per Share} \quad = \quad \frac{\text{Net profit after tax- preference dividend}}{\text{No. of equity shares outstanding}}$$

*Interpretation:*

The more per share return, the more excellent it is and the less per share return, the worse it is.

### 4.3.2 Dividend per Share (DPS)

The profit earned by the company finally belongs to the equity shareholders. Therefore, all or some of them are distributed to them which are known as dividend. The ratio shows how much per share of stock held by them is paid out as dividends. Thus, this ratio shows the relationship between dividends paid to shareholders and the number of shares out standing. The amount of earning distributed and paid as cash

Dividend is considered for calculated the dividend per share. This ratio is calculated by dividend the amount of dividend distributed to share holders by the number of common shares outstanding.

$$= \quad \frac{\text{Dividend available to shareholders}}{\text{No of equity share outstanding}}$$

Dividend per Share (DPS) $\qquad$ ———————————————

The dividend per share is considered excellent when it is higher.

## 2.4 Steps in Ratio Analysis

Ratio analysis involves the following steps:

i. To create the ratio which are relevant to their objective of analysis?

ii. To calculate the ratios.

iii. To compare the calculated ratios with the ratios of the same firm relating to past or with the industry ratios

iv. Interpretation and evaluation of ratios.

## 2.5 Importance and advantages of ratio analysis

Ratio Analysis is an important tool for analysis the company's financial performance. Ratio analysis is an important and useful technique to check upon the efficiency of an organization. The management can arrive at important decision by using ratio analysis. The ratio is used for expressing the mutual relation of different accounts consisting in the financial statements. The following are the important advantages of the ratios.

### *Analysis Financial Statement*

Ratio analysis is an important technique of financial statements analysis. Financial ratios are useful for understanding the financial position of the company. Different users such as investors, management, bankers and creditor use the ratios to analysis the financial statement of the company for their decision making purpose.

### *Judging Efficiency*

Financial Ratios are important for judging the company's efficiency in terms of its operations and management. They help judge how well the company has been able t utilize its assets and earn profits.

### Locating Weakness

Financial Ratios can also be in locating weakness of the company's operations even though in overall performance may be quite good. Management can then pay attention to the weakness and take remedial measures to overcome them.

### Formulating Plans

Although financial ratios are used to analyze the company's past financial performance, they can also be used to establish future trends of its financial performance. As a result, they help formulate the company's future plans.

### Comparing Performance

It is essential for a company to know how well it is performing over the year and as compared to the other firms of the similar nature. Besides it is also important to know well its different divisions are performing among themselves in different years. Ratio analysis is facilities such comparison.

### Inter-intra Firm Comparison

A firm may like to compare its performance with that of other firms and of industry in general. The comparison is called inter-firm comparison. If the performance of different units belonging to the same firm is to be compared then it is called intra-firm comparison. Such comparison is almost impossible without proper accounting ratios. Even the progress of a firm from year can not be measured without the help of ratios.

### Others Importance

Helpful to Assessing operating Efficiency of the Business

Helpful in measuring financial solvency

Helpful in future forecasting

Helpful in decision making

Helpful in corrective action

Helpful in communication

Helpful in cost control

## 2.6 Limitations of Ratio analysis

The ratio analysis contributes a lot to portray the financial position of a business but they suffer from various limitations. A number of limitations of the ratio analysis are given below:

### Limited used of single Ratio

A single ratio is itself is not important. It would be able to convey anything. For making a meaningful conclusion a number of ratios which makes confusion to analyst are to be calculated.

### Difficult to interpret

It is very difficult task to fix an adequate standard for compression purpose. There are no rules of thumb for all ratios which can be accepted norms. It renders interpretation of the ratio difficult.

### Ignored Qualitative Factors

Ratio analysis is related to the qualitative analysis only but not with a qualitative analysis because it is ignored by ratio analysis.

### Limitation of Accounting Record

Ratio analysis is related to financial statement. Financial statement itself is subject to limitations this ratio analysis also suffers from the inherent weakness of the financial statement.

### Arithmetical Window Dressing

For showing the better picture for financial position and profitability of a firm, a financial statement can easily be window dressed. So the analyst must be very careful on making decision from ratios calculated from such financial statement.

### Wrong Conclusion

The analyst or user must have knowledge about the concern whose statements have been used for calculating the ratio. Only then the conclusion may be drawn. The conclusion may be wrong if it has been drawn without any knowledge of related firm.

*Price level Changes*

While making comparisons of ratios no allowance for charges in general price level is made. A charge in price level can seriously affect the validity of comparison for different periods.

*Mislead by Accounting*

These must be uniformity in the accounting procedure used by the concerns which are going to be taken as a basis for comparison charge in accounting procedure often makes ratio analysis misleading.

## 2.7 Review of Previous Studies

The past study in the last two decades several research using different technique and models have been made and developed different predictive models to evaluate predictive power of financial ratio and to predict financial distressed. These are:

## A. Miller's cause and effect analysis

This model was first of all, developed by Donald E Miller and later it is popular as the Miller's cause and effect analysis. Donald E. Miller described a cause and effect ratio in his book i. e. "The meaningful interpretation of financial statement" in 1966 A.D. Donald E. Miller categorized ratios into two parts;

a) Casual Ratio
b) Ratio that measure effect

Donald E. Miller said that the cause and effect relationship could be imposed only when ratios are interrelated to each other. The cause and effect does not indicate the relationship between ratio and the ultimate survival of a firm. In some cases, Miller's cause and effect creates the problem of the ' egg- and -chicken tale". What we need is evidence about which ratios are important to predict firm's ability and survival of firms. Similarly Millers also used some illustration to eliminate some of the most important problems that arises in practical analysis in this imperfect word. Distortions and

incomparability resulting from price level change and differences among firms in respect of financial practices.

## B. Univarate Model

Under Univariate approach and attempt is made to predict financial distress on the basis of single financial ratio. In other words, each ratio is considered individually for distressed company and non- distressed company. There are two important assumptions in this approach. (George, 1978:463)

a) The distribution of the variable for distressed firms differs systematically from the distribution of the variable for the non-distressed firms and

b) These systematically difference can be capitalized on for prediction purposes.

In Univarate analysis, we have to choose the mean values of financial ratios of distressed and non-distressed firms and compared each other up to maximum of six years. To prediction of financial distress the ratios of mixed sample of distressed and non-distressed company are arranged in ascending order. The arrangement of mixed sample ratios helps us to find a best cut - off point. The cut - off point is an optimum value that minimizes the percentage of classification error rate.

If ratio of the company is above the cut off point the company is treated as financially distressed company on the contrary, if the ratio of the company is below the cut off point the company is treated as financially distressed. For our study purpose, the ratio which shows the least percentage classification error at the earlier possible time has the highest predictive power.

## C. Beaver's Approach

Beaver (1966) ( Ramakant, Gupta and Mathur , 1993:17) William Beaver provided the first analysis of distress on the basis of financial ratio, although, there we find similar studies by Patrick on that topic before the Second World War.

Beaver defines financial distress as "the inability of the firm to pay its financial obligation as they mature". Beaver analyses over 30 commonly used ratios of that ability on the

basis of 158 companies, one half them distressed and other half them non-distressed. As mentioned earlier, he conducted three major empirical to establish the predictive power of the ratio.

i) Comparison of mean values between distressed and non-distressed group
ii) Dichotomous classification test.
iii) Analysis of livelihood ratio

His study used univariate basis using a test called dichotomous classification test. The ratio with smallest percentage of prediction error was taken as the best indicator. The best ratio was cash flow to total debt and other best ratios with low classification error were: net income to total assets, current and long term liabilities to total debt, working capital to total assets, current ratio.

## D. Wilcox's Gambler's Ruin Approach (Gupta, 1985:10)

Another model of financial distress prediction using predictive power of financial ratios is "Wilcox's Gambler's Ruin Approach". This model is first of all developed by Jarrod W. Wilcox. The assumption of this model is that at any moment the firm's financial state can be defined by its adjusted cash poison of net liquidation value. Jarrod W. Wilcox defines the liquidation values for assets and debts as follows:

|                       | Liquidation value (%) |
|-----------------------|:---------------------:|
| Cash equivalent       | 100                   |
| Other current assets  | 70                    |
| Long-term assets      | 50                    |
| Debt                  | 100                   |

The adjust cash position or net liquidation of the form is computed by deducting the liquidation value of the debts from the liquidation by deducting the liquidation value of the debts from the liquidation value of assets. The liquidation values vary from year to year or time to time due to changeable nature of cash inflows and out flows. Another assumption of this model is that the changes in financial state take place always by a fixed amount labeled as size of the bet. If the probability of occurrence of an event i.e. Firms'

gaining is denoted by p and the probability of non occurrence of the event i.e. Firm's losing is denoted by q the firm is treated as financially distressed until if the value of p does not exceed the value of q. The length of the financial distressed is being determined by the size of the firm's net liquidation value in combination with the size and probabilities. According to Jarrod W. Wilcox ' this approach is based on the concept of reserve strength' this strength consists in the firm's net liquidation value. The empirical tests showed that true reserve strength was primarily related to the strength or equity base: Due to several arbitrary assumptions the model is neither convincing nor realistic.

## E. Zeta Model:

Prof. Altman adopted ZETA Model based on discriminant analysis is a statistical technique used to classify an observation into one of several a priori grouping dependent upon the observation's individuals characteristics. It is used primarily to classify and or make predictions in problems where the dependent variable appears in qualitative form e.g. Male or female distressed and non-distressed; (Atman,1968:591).Atman's study based on the theory that a single financial ratio is never a good indicator of but a combination of ratios may lead to better prediction.

Prof. Atman takes a sample of 66 corporations. His sample was composed of 33 non-distressed firm and 33 distressed firm. Prof. Atman adopted the MDA to arrive at the popular 'Z' score.

The discriminant function obtained by prof. Atman is (Western and Copeland, 1910:235)

$Z = 0.012x_1 + 0.014x_2 + 0.033x_3 + 0.006x_4 + 0.999x_5$

Where z= overall index

X1= working capital /total assets (in %)

X2 = Retained earning / Total assets (in %)

X3= EBIT/ Total assets (in %)

X4= market value of equity/ book value of debt (in %)

X5 = sales / Total assets (times)

Variables x1 to x4 must be computed in absolute percentage, but variable x5 should be expressed as percentage value divided by 100 for the 'Z' score model ,Atman established that firms having Z< 1.81 were distressed and firm those having Z > 2.99 were non-distressed .the optimum cut off point is made on the basis of minimum error of misclassification error. i.e. 2.675 Or 2.68.

## F. L.C. Gupta's relative Earning model

L.C. Gupta did similar types of study with Indian data. In this study an attempt is made to distinguish distressed and non-distressed companies on the basis of financial ratio. He takes a sample of 41 textile companies of which 20 were distressed and 21 non-distressed to test the predictive power of 63 financial ratios. His analysis suggested that many of the ratios employed by him showed the criteria of percentage classification error to judge the predictive power financial ratio. The calculation of percentage classification may be illustrated by an example. For this purpose we have a mixed sample of 4 distressed (D) and 4 non distressed (N) company with their ROI and arranged on ascending order.

| -5 | -2 | 3 | 4 | 6 | 8 | 10 | 12 |
|----|----|-----|---|---|---|-----|-----|
| D | D | (N) | D | N | N | (D) | (N) |

In order to make his analysis he chooses a cut off point discriminates the distressed grouped from non-distressed group. The right side of cut off point represent not distressed group and left side represents distressed group. The optimum cut off is made on the basis of the least number of misclassification errors. In the above example, there are two misclassifications (shown in parenthesis) out of 8 items. This means that percentage classification error is 25 percent i.e. ( 2/8) .The ratio which showed the least percentage error at the earliest possible time was deemed to have the highest predictive power of different financial ratio was determined for each year for the period 1962 -64,L.C. Gupta's study revealed that the two ratio of about equal merit were:

 EBDIT/Sales
 OCF/Sales

## G. Multivariate Model

The multivariate model is used by Prof. Edward I. Atman in 1968 AD to establish a model for predicting financial distressed of the firm. His sample of 33 not -distressed companies with the paired sample of 33 distressed companies. One limitation of univariate model is that examines financial ratios individually. Under multivariate approach, an attempt is made to predict financial distressed of the basis several financial ratios. In other word, multivariate model considers several ratios in order to develop an index of a meaningful predictive model. "multivariate model seeks to predict financial distressed using a methodology that considers the combined influence" ( Ramakant, Jain and Mathur, 1993:8) The multivariate model or approach is the technique so multiple discriminant analysis which is commonly used in financial distress prediction. The multiple discriminant analysis helps to combine the several ratios into a single measure of the probability of financial distress. Generally, discriminant analysis includes the following three steps. (Western and Copeland, 1910:235)

a) Establish mutually exclusive group classification. Each group is distinguished by probability distribution of the characters.

b) Collect data for observations in the group.

c) Derive linear combination of these characteristics which "best" discriminate between the group (where bets mean the ones that minimize the probability misclassification)

The discriminant linear function is;

$Z = a_1 x_1 + d_2 x_2 + \ldots\ldots\ldots + an\ x_n$

Where Z = discriminant index

X1 = Independent variable (I = 1, 2…………n)

Ai  = coefficient of variable (I =1, 2……………n)

# CHAPTER III
# RESEARCH METHODOLOGY

## 3.1 Introduction

Research methodology is another important aspect of the thesis writing. Research methodology is a systematic and scientific method or technique that is used in handling a problem by the researcher. In other words, research methodology provides various instructions as regard to the methods and process associated with the overall study. Research methodology is very helpful in identifying the research problem. Infect, research in an art of scientific investigation.

In Nepal there are different kinds of companies are established to earn profit in our society. Some companies have been working efficiently since establishment and some companies have been closed due to poor management performance. In this context, this study attempts to analyze predictive power of financial ratio with the help of Nepalese company's financial performance represents of limited time frame. In order to fulfill this objective every study needs an appropriate research methodology to discover the better result of the investigation. In order words an appropriate research methodology has to be followed to achieve ultimate goals.

## 3.2 Research Design

The study is also required the appropriate research design to achieved desired objectives of the investigation. Research design is a systematic plan and conceptual structure within which the study is to be conducted. Research design is a clear map of the all types of a house (i.e. Map of house) or it is a plan of research which includes what, why, when, how aspect of research.

Research design is the conceptual structure and frame of the study that is adopted by the research in analyzing the problem. In this context, this present study adopts those research design which analytical as well as exploratory in nature. Similarly the present study also follows the method of ratio analysis with a view to achieve better result from the analysis. Finally this study also follows the historical research design because research must be

based on past phenomenon. Past knowledge and data can not be avoided. In conclusion it can be said that research is more quantitative rather than qualitative.


## 3.3 Population, sample and basis of Sick and Non-sick Classification

Our basic objective is to test the predictive power of some financial ratios with the help of the financial statement of different companies which are taken from both manufacturing and non- manufacturing sector therefore, the financial statement i.e. published balance sheet and profit and loss account of different selected companies from 2004 to 2008 will be assumed as population of the study. Among them ten companies are sick companies and another ten are non-sick companies. For our purpose sick companies and non-sick companies are defined in the simplest way. A company is said to be sick if it incurs a loss instead of earning a profit at any year of the study or sample period or whole year of the sample companies. For our study the sick companies are as follows:


1. Lumbani Bank Ltd.

2. Nepal Bangladesh Bank Ltd

3. NCC Bank Ltd.

4. Bageshwory Development bank Ltd.

5. National Hydropower Company Ltd.

6. Nepal Electricity Authority

7. Janakpur Cigarette Factory Ltd

8. Nepal Khadda Sansthan

9. Sahayogi Vikas Bank Ltd.

10. Herb Production & Processing Corporation


 On the contrary a company is said to be non-sick which are in profit all the sample year in other words a company is non-Sick if it is able to earn some profit in all the sample year no matter what the profit is. For our study non-sick companies are:


1. Standard Chartered Bank Ltd

2. Nabil Bank Ltd.

3. National Investment Bank Ltd.

4. Everest Bank Ltd

5. Himalayan Bank Ltd.

6. Nepal Telecom Ltd

7. Hetauda Cement Factory Ltd.

8. Bishal Bazar Company Ltd.

9. Bahu Byabasaya Udhyog

10. Sagarmatha Insurance Company Ltd

## 3.4 Nature and Sources of Data

Every study needs adequate information from different sources. Thus the main task of the researcher is to collect information and data from different sources. Generally there are two type of data collection. The first is primary data collection and second is secondary data collection. The primary data are those which are collected a fresh and for the first time and those happen to be original in character. Likewise, the secondary data are those which have already been collected by someone else and which have already been passed through the statistical process. This study is based on secondary data and these data have been extracted from the web site of Nepal stock Exchange limited, the published Balance Sheet and profit and loss account of companies and annual report of the minestry of the finance.

## 3.8 Financial and Statistical Tools and Techniques

Predictive power of financial ratios is evaluated with the help of relevant financial and statistical tools and techniques. For this purpose various financial and statistical tools and techniques are available. In fact all financial and statistical tools and techniques may not be able to handle the problem at all. Thus it is researcher responsibility to select appropriate financial ratio can be evaluated by using ratio analysis, univariate model and arithmetic mean. Each of these is separately explained below.

### 3.8.1 Ratio Analysis

In order to find out the predictive power of financial ratio, it is first necessary to prepare a list of sick companies and non-sick companies then financial ratios of each company for each year are computed that is why ratio analysis is considered as most important tools and techniques in this study. Ratios are relationship expressed in mathematical terms between figures which have a cause and effect relationship or which are connected with

each other in some other manner. There are different types of financial ratios. These are liquidity ratio, leverage ratio, activity ratio and profitability ratio. These ratios play important role to find out predictive power of financial ratios. To find out predictive power of financial ratios, ratios are calculated on the basis of the financial statement of various companies of Nepal and the financial statement contains the audited balance sheet and the profit and loss account. Top fifteen ratios are selected from four major types of ratios and key number has been given to each ratio. The selected ratios and the key number as follows:

Liquidity Ratios

- **R1**-Current ratio
- **R2**-Quick Ratio
- **R3**-Net Working Capital Ratios

Leverage Ratios

- **R4**-Debt to equity ratio
- **R5**-Debt to Total Assets Ratios
- **R6**-Interest Coverage ratio
- **R7**-Fixed Assets to current assets ratio

Activity Ratios

- **R8**-Fixed Assets Turnover Ratio
- **R9**-Total Assets Turnover Ratio
- **R10**-Capital Employed Turnover Ratio
- **R11**-Current Assets Turnover

Profitability Ratios

- **R12**-Net Profit Margin
- **R13**-Return On Total Assets
- **R14**-Return On Capital Employed
- **R15**-Return Shareholders Equity

### 3.8.2 Univariate Model

Univariate model is used to calculate the total number of misclassification. In univariate model each ratio is calculated individually for sick companies and non-sick companies. In order to identify the total number of misclassification, it is first necessary to prepare a list of sick, the ratio of sick companies and non-sick companies are computed and arranged in ascending order. The order may show different patterns such as:

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i. The sick companies ( S'S) and non sick companies ( N'S) may  be well mixed in the combined ordered sequence suggesting that no significant difference exists between two classes with

respect to the particular characters is ties used for ordering the sequence. The sequence for example may be like this:

S  N  S  N   N  S  N  S   S  N

ii. The S's and N's may not mingle at all. All the S's being greater than all the N's or vice verse, indicating that the two classes really fall into distinct populations in accordance with the characteristics for example

S  S....S  N  N....N

iii. Another Pattern in which the two groups do not mingle. At all can be of the type in which   the whole of middle space in an array is occupied by one class of items and both the extremities by the other class, that is too high and two low values of the characteristic are associated with on class and moderate values with the other class for example;

S  S  S  N  N  N  N  N  N  S  S  S  S

iv) that array may show strong or mild tendency for items belonging to one class to bigger than items to the another the result being that majority of one class are at the other and with an  overlap  between   the  two  generally  in  the  middle  portion  of  the  array,  for example;

S S S S  N S N  S N  N  N  S N  N

After arranging the ratio of sick group and non sick group we determine the best cut off point. The cut off of point is that which minimizes the total number of misclassification error. The univariate model is presented below by an example;

Assume that we are examining the predictive power of financial ratio and have computed it values for our sample companies. for this purpose we have chosen twenty companies

out of which ten are sick and ten are non sick letter 's' denotes the sick companies and letter 'N' denotes

non sick companies .The letter 'S' and 'N' denote the positions of the sick and the non sick companies in the array respectively.


S  S  S  S  S  S  S  N  N  S  S  N  S  N  N  N  N  N  N  N

1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20

↑

The cut off point is that where the arrow is shown .the above example shows that the least error. Cut off point lies between rank 11 to 12  which divide twenty companies into two zones  i.e. The sick zone ( rank 1-11 ) and the non sick zone (rank 12-20) . In this case the total number of misclassification is found to be 3 (which are indicated by star) if we have taken any other cut off point, the total number of misclassification will have been greater. The percentage of total number of misclassification in this case is 13 (i.e. total number of misclassification error divided by total number of companies) the ratio which has the lowest percentage classification error is the most efficient ratio. The idle ratio is one which results no misclassification error. The ratio which shows the least percentage classification error at the earlier possible time has the highest predictive power.


### 3.8.3 Arithmetic mean:

The arithmetic mean is also the most popular and widely used statistical technique "the arithmetic mean of value of a variable defined as the ratio of the total value to the number of values. (Shrestha, 2047: 76).  The value of arithmetic mean is computed by dividing sum of values by the number of values symbolically it is expressed as:


$$\text{Arithmetic mean} = \frac{\text{Sum of values}}{\text{Number of values}}$$

Or,

$$X = \frac{X_1 + X_2 + X_3 \ldots\ldots\ldots\ldots + X_N}{N}$$

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

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Whereas X = arithmetic mean X1 X2 = value of variables

X = sum of the values of variables, N = Total no of observatory

The arithmetic mean is also called "the average ". In case of arithmetic mean different method are used in different situation .in case of individual observation simple formula is used .in case of discrete frequency distribution, the value is obtained by dividing summation of frequency and variable by the total number of observations. In case of continuous frequency distribution the value is obtained by dividing summation of mid point and frequency by total number of observation.

## 3.9 The Analytical process and Procedure

The following steps required to examine the predictive power of financial ratios:

❖ Prepare the list of sick and non sick companies

❖ Collect financial statement of all sick and non-sick companies for the period 2004.to 2008 AD. The financial statement consist the audited balance sheet and the profit and loss account.

❖ Compute necessary financial ratios for each company for each year.

❖ Take the ratio in turn and from each year from 2004 to 2008 AD, from an ordered sequence, from the lowest to the highest magnitude of the ratio for the combined group of sick and non-sick companies.

❖ By observing in each array, determine the best cut off point to divide the ratios into two zones; i.e. the sick zone and non-sick zone. The best cut-off points is that which involves the least number of misclassifications and is determined by a trial and error process for each array separately. There can be two cut-off points in an array resulting in the same minimum number of classification

error. In such a care, as our interest is limited to the magnitude of classification error only, any one of these two cut-off points may be chosen.

❖ Finally, express the number of classification errors in each array in the form of percentage of the total number of items in the particular array.it is this figure of percentage classification error which forms the main basis for our conclusion. The ratio which shows the least percentage classification error the earliest possible time has the highest predictive power.

# CHAPTER IV
# DATA PRESENTATION AND ANALYSIS

## 4.1 Introduction

After acquiring the relevant data from different sources, they have been processed and analyzed in order to archive the objective of the study. In other words, once the data are collected from the different sources, they are classified according to some criteria. The main objective of the data presentation and analysis are to keep them in understandable form or change it from an unprocessed form to an understandable presentation. Therefore, data presentation and analysis is an important aspect of the study report.

Classification of data converts mass data into manageable form. Then they are presented in tabular form, after data collection is completed, the collected data will be in the raw form. Therefore, here it is researcher responsibility to process them into manageable form so that it can be later being presented to the readers of the study report. Different types of data need different types of method and technique. There are different types of method and technique, which can be used to present the data. Of the various methods and techniques, chart, graphs and tables are commonly used in the presentation of data, therefore, applying various statistical tools and technique makes the analysis of data, such analysis arrange simple one like percentage, average, variation to complicate one like demanding, sophisticated technique. Some important definition related to data presentation and analysis reproduced as follows.

"Technically speaking, data presentation implies editing, coding, classification and tabulation of collected data so that they are amenable to analysis" (Kothari, 1993:151)

In conclusion, it can be said that data presentation and analysis is the backbone of the thesis, presentation of data generally consists of tabulating, placing and keep them in presentable form by using figures and tables. Similarly, the analysis of data consists of organizing, tabulating and performing statistical analysis.

## 4.2 Analysis of Predictive Power of Liquidity ratios

The liquidity ratios are computed to indicate the company's ability to meet its obligation in the short term. Liquidity ratios provide the information about the liquidity position of a company by establishing a relationship between cash and other current assets. This part focuses on predictive power of three major liquidity ratios. They are current ratio, quick ratio and net working capital ratio. These three liquidity ratios have different predictive power and they predict about future more accurate than other does.

**Table No: 4.1**

**Current Ratio (R1)**

| NON-SICK GROUP<br>YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 1.07 | 1.06 | 1.07 | 1.07 | 1.09 |
| Nabil Bank Ltd. | 1.08 | 1.08 | 1.08 | 1.07 | 1.06 |
| Nepal Investment Bank Ltd. | 1.08 | 1.08 | 1.08 | 1.08 | 1.09 |
| Everest Bank Ltd | 1.08 | 1.09 | 1.08 | 1.07 | 1.08 |
| Himalayan Bank Ltd. | 1.05 | 1.06 | 1.05 | 1.06 | 1.07 |
| Nepal Telecom Ltd | 1.58 | 1.57 | 1.60 | 1.63 | 1.58 |
| Hetauda Cement Factory Ltd. | 1.63 | 1.65 | 1.67 | 1.67 | 1.69 |
| Bishal Bazar Company Ltd. | 0.96 | 1.03 | 0.98 | 1.55 | 2.60 |
| Bahu Byabasaya Udhyog | 5.29 | 6.58 | 10.63 | 26.68 | 11.71 |
| Sagarmatha Insurance Company Ltd. | 2.23 | 2.18 | 1.10 | 0.82 | 0.74 |
| SICK GROUP | | | | | |
| Lumbani Bank Ltd. | 1.03 | 1.05 | 0.85 | 0.92 | 1.04 |
| Nepal Bangladesh Bank Ltd. | 1.03 | 1.00 | 1.32 | 0.72 | 0.80 |
| NCC Bank Ltd. | 1.02 | 1.01 | 0.93 | 0.90 | 1.05 |
| Bageshwory Development bank Ltd. | 1.21 | 1.18 | 1.09 | 1.10 | 1.09 |
| National Hydropower Company Ltd. | 1.22 | 1.27 | 1.39 | 1.41 | 0.34 |
| Nepal Electricity Authority | 1.18 | 1.18 | 1.10 | 0.81 | 0.74 |
| Janakpur Cigarette Factory Ltd | 2.16 | 2.28 | 2.5 | 3.05 | 1.52 |
| Nepal Khadya Sansthan | 0.78 | 0.76 | 0.84 | 1.89 | 1.89 |
| Sahayogi Vikas Bank Ltd | 1.29 | 1.38 | 1.18 | 1.30 | 1.30 |
| Herb Production & Processing Corporation | 0.71 | 0.70 | 0.69 | 0.69 | 0.72 |

*Source: Annual Report, Nepal Stock Exchange*
        *and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

**Table No: 4.2**

**R1 in ascending order**

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| 1 | 0.71* | 0.70* | 0.69* | 0.69* | 0.30* |
| 2 | 0.78* | 0.76* | 0.84* | 0.72* | 0.72* |
| 3 | 0.96 | 1.00* | 0.85* | 0.81* | 0.74 |
| 4 | 1.02* | 1.01* | ➡ 0.93* | 0.82 | 0.74* |
| 5 | 1.03* | 1.03 | 0.98 | 0.90* | 0.80* |
| 6 | ➡ 1.03* | ➡ 1.05* | 1.05 | ➡ 0.92* | 1.04* |
| 7 | 1.05 | 1.06 | 1.07 | 1.06 | ➡ 1.05* |
| 8 | 1.07 | 1.06 | 1.08 | 1.07 | 1.06 |
| 9 | 1.08 | 1.08 | 1.08 | 1.07 | 1.07 |
| 10 | 1.08 | 1.08 | 1.08 | 1.07 | 1.08 |
| 11 | 1.08 | 1.09 | 1.09* | 1.08 | 1.09 |
| 12 | 1.18* | 1.18* | 1.10 | 1.10* | 1.09 |
| 13 | 1.21* | 1.18* | 1.10* | 1.30* | 1.09* |
| 14 | 1.22* | 1.27* | 1.18* | 1.41* | 1.30* |
| 15 | 1.29* | 1.38* | 1.32* | 1.55 | 1.52* |
| 16 | 1.58 | 1.57 | 1.39* | 1.63 | 1.58 |
| 17 | 1.63 | 1.65 | 1.60 | 1.67 | 1.69 |
| 18 | 2.16* | 2.18 | 1.67 | 1.89* | 1.89* |
| 19 | 2.23 | 2.28* | 2.50* | 3.05* | 2.60 |
| 20 | 5.29 | 6.58 | 10.63 | 26.68 | 11.71 |
| M.E. | 6 | 6 | 6 | 6 | 5 |
| M.E.% | 30% | 30% | 30% | 30% | 25% |

Note: * Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

The best cut-off point is determined by dividing the ratios into two zones (i.e. sick group and non-sick group) and the best cut-off point is that point which involves least no of

misclassification error. From the table no: 4.2 we found that 6 companies misclassified in the year 2004(i.e. 3 sick companies are placed above cut-off point and 5 non-sick companies are placed below cut-off point) and 4 companies are misclassified in the year 2005. Similarly, 3, 5 and 6 companies are misclassified in the year 2006, 2007 and 2008.

The table no 4.2 shows that the misclassification error is 25% (i.e. no of misclassified companies divided by total sample companies) in year 2004 and 28% in year 2005. Similarly, the misclassification error is 23%, 30% and 40% in the year 2006, 2007 and 2008.

The Above table no 4.2 shows in the year 2004 the misclassification error is only 24% but it is increase to 30% and 35% in the year 2005 and 2006 that means predictive power of current ratio is in decreasing trend because higher the misclassification error reflects lower predictive power. The predictive power of current ratio in the year 2004 is highest than other year because of the lowest percentage of classification error and the predictive power of current ratio is lowest in the year 2006 because the highest percentage of classification error.

## Quick Ratio (R2)

| NON-SICK GROUP                              YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 1.07 | 1.06 | 1.07 | 1.07 | 1.09 |
| Nabil Bank Ltd. | 1.08 | 1.08 | 1.08 | 1.07 | 1.06 |
| Nepal Investment Bank Ltd. | 1.08 | 1.08 | 1.08 | 1.08 | 1.09 |
| Everest Bank Ltd | 1.08 | 1.09 | 1.08 | 1.07 | 1.08 |
| Himalayan Bank Ltd. | 1.05 | 1.06 | 1.05 | 1.06 | 1.07 |
| Nepal Telecom Ltd | 1.53 | 1.55 | 1.58 | 1.61 | 1.56 |
| Hetauda Cement Factory Ltd. | 1.63 | 1.65 | 1.67 | 1.67 | 1.69 |
| Bishal Bazar Company Ltd. | 0.96 | 1.03 | 0.98 | 1.55 | 2.60 |
| Bahu Byabasaya Udhyog | 2.28 | 3.58 | 7.22 | 17.39 | 8.37 |
| Sagarmatha Insurance Company Ltd. | 2.23 | 2.18 | 1.10 | 0.82 | 0.74 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 1.03 | 1.05 | 0.85 | 0.92 | 1.04 |
| Nepal Bangladesh Bank Ltd. | 1.03 | 1.00 | 1.32 | 0.72 | 0.80 |
| NCC Bank Ltd. | 1.02 | 1.01 | 0.93 | 0.90 | 1.05 |
| Bageshwory Development bank Ltd. | 1.21 | 1.18 | 1.09 | 1.10 | 1.09 |
| National Hydropower Company Ltd. | 1.21 | 1.26 | 1.37 | 1.39 | 0.27 |
| Nepal Electricity Authority | 1.12 | 1.08 | 1.00 | 0.75 | 0.67 |
| Janakpur  Cigarette Factory Ltd | 2.16 | 2.28 | 2.5 | 3.05 | 1.52 |
| Nepal Khadya Sansthan | 0.78 | 0.76 | 0.84 | 1.89 | 1.89 |
| Sahayogi Vikas Bank Ltd | 1.29 | 1.38 | 1.18 | 1.30 | 1.30 |
| Herb Production & Processing  Corporation | 2.24 | 2.33 | 0.17 | 0.19 | 0.20 |

*Source: Annual Report, Nepal Stock Exchange*
        *and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

# Table No: 4.4

## R2 in ascending order

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|------|------|------|------|------|------|
| 1 | 0.78* | 0.76* | 0.17* | 0.19* | 0.20* |
| 2 | 0.96 | 1.00* | 0.84* | 0.72* | 0.27* |
| 3 | 1.02* | 1.01* | 0.85* | 0.75* | 0.67* |
| 4 | 1.03* | 1.03 | ➡ 0.93* | 0.82 | 0.74 |
| 5 | ➡ 1.03* | ➡ 1.05* | 0.98 | 0.90* | 0.80* |
| 6 | 1.05 | 1.06 | 1.00* | ➡ 0.92* | 1.04* |
| 7 | 1.07 | 1.06 | 1.05 | 1.06 | ➡ 1.05* |
| 8 | 1.08 | 1.08 | 1.07 | 1.07 | 1.06 |
| 9 | 1.08 | 1.08 | 1.08 | 1.07 | 1.07 |
| 10 | 1.08 | 1.08* | 1.08 | 1.07 | 1.08 |
| 11 | 1.12* | 1.09 | 1.08 | 1.08 | 1.09 |
| 12 | 1.21* | 1.18* | 1.09* | 1.10* | 1.09 |
| 13 | 1.21* | 1.26* | 1.10 | 1.30* | 1.09* |
| 14 | 1.29* | 1.38* | 1.18* | 1.39* | 1.30* |
| 15 | 1.53 | 1.55 | 1.32* | 1.55 | 1.52* |
| 16 | 1.63 | 1.65 | 1.37* | 1.61 | 1.56 |
| 17 | 2.16* | 2.18 | 1.58 | 1.67 | 1.69 |
| 18 | 2.23 | 2.28* | 1.67 | 1.89* | 1.89* |
| 19 | 2.24* | 2.33* | 2.50* | 3.05* | 2.60 |
| 20 | 2.28 | 3.58 | 7.22 | 17.39 | 8.37 |
| M.E. | 7 | 7 | 6 | 6 | 5 |
| M.E.% | 35% | 35% | 30% | 30% | 25% |

Note: * Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

The best cut-off point is determined by dividing the ratios into two zones (i.e. sick group and non-sick group) and the best cut-off point is that point which involves least no of misclassification error. The above table no: 4.4 shows that 7 companies are misclassified in the year 2004. (i.e. 1 non-sick companies are placed above cut-off point and 6 sick companies are placed below cut-off point) and 7 companies are misclassified in the year 2005. Similarly, 6, 6 and 5 companies are misclassified in the year 2006, 2007 and 2008.

By observing table no: 4.4, we found that the misclassification error is 35% (i.e. no of misclassified companies divided by total sample companies) in year 2004 and 2005. Similarly, the misclassification error is 30%, 30% and 25% in the year 2006, 2007 and 2008.

The table no 4.4 shows that in the year 2004, the misclassification error is only 35% but it is remains the same in the year 2005. That means the predictive power of quick ratio is same in these two years. The predictive power of quick ratio in the year 2008 is highest than other year because of the lowest percentage of classification error and the predictive power of quick ratio is lowest in the year 2004 and 2005 because the highest percentage of classification error. Higher the misclassification error reflects lower predictive power.

**Table No: 4.5**

**Working Capital ratio (R3)**

| NON-SICK GROUP / YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 0..07 | 0.06 | 0.06 | 0.07 | 0.09 |
| Nabil Bank Ltd. | 0.07 | 0.08 | 0.08 | 0.1 | 0.09 |
| Nepal Investment Bank Ltd. | 0.08 | 0.08 | 0.07 | 0.07 | 0.08 |
| Everest Bank Ltd | 0.08 | 0.09 | 0.07 | 0.06 | 0.07 |
| Himalayan Bank Ltd. | 0.07 | 0.06 | 0.06 | 0.06 | 0.07 |
| Nepal Telecom Ltd | 0.36 | 0.36 | 0.38 | 0.38 | 0.37 |
| Hetauda Cement Factory Ltd. | 0.39 | 0.4 | 0.4 | 0.4 | 0.41 |
| Bishal Bazar Company Ltd. | -0.03 | 0.03 | -0.02 | 0.35 | 0.62 |
| Bahu Byabasaya Udhyog | 0.75 | 0.85 | 0.9 | 0.96 | 0.91 |
| Sagarmatha Insurance Company Ltd. | 0.21 | 0.16 | 0.09 | -0.22 | -0.35 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 0.04 | 0.05 | -1.81 | -0.08 | 0.04 |
| Nepal Bangladesh Bank Ltd. | 0.03 | 0.003 | 0.24 | -0.39 | -0.26 |
| NCC Bank Ltd. | 0.01 | 0.01 | -0.08 | -0.11 | 0.05 |
| Bageshwory Development bank Ltd. | 0.16 | 0.16 | 0.81 | 0.09 | 0.82 |
| National Hydropower Company Ltd. | 0.25 | 0.22 | 0.28 | 0.29 | -1.93 |
| Nepal Electricity Authority | 0.19 | 0.16 | 0.09 | -0.22 | -0.35 |
| Janakpur  Cigarette Factory Ltd | 0.52 | 0.56 | 0.6 | 0.67 | 0.34 |
| Nepal Khadya Sansthan | 0.23 | 0.24 | 0.26 | 0.47 | 0.47 |
| Sahayogi Vikas Bank Ltd | 0.22 | 0.27 | 0.15 | 0.23 | 0.23 |
| Herb Production & Processing  Corporation | 0.81 | 0.85 | -0.45 | -0.45 | -0.39 |

*Source: Annual Report, Nepal Stock Exchange  and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

**Table No: 4.6**

**R3 in ascending order**

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|------|------|------|------|------|------|
| 1 | -0.03 | 0.003* | -1.81* | -0.45* | -1.93* |
| 2 | 0.01* | 0.01* | -0.45* | -0.39* | -0.39* |
| 3 | 0.03* | 0.03 | -0.08* | -0.22 | -0.35 |
| 4 | ➡ 0.04* | 0.05* | -0.02 | -0.22* | -0.35* |
| 5 | 0.07 | 0.06 | 0.06 | -0.11* | -0.26* |
| 6 | 0.07 | 0.06 | 0.06 | ➡ -0.08* | 0.04* |
| 7 | 0.08 | 0.08 | 0.07 | 0.06 | ➡ 0.05* |
| 8 | 0.08 | 0.08 | 0.07 | 0.06 | 0.07 |
| 9 | 0.16* | 0.09 | 0.08 | 0.07 | 0.07 |
| 10 | 0.19* | 0.16 | 0.09 | 0.07 | 0.08 |
| 11 | 0.21 | ➡ 0.16* | ➡ 0.09* | 0.09* | 0.09 |
| 12 | 0.22* | 0.16* | 0.15* | 0.10 | 0.09 |
| 13 | 0.23* | 0.22* | 0.24* | 0.23* | 0.23* |
| 14 | 0.25* | 0.24* | 0.26* | 0.29* | 0.34* |
| 15 | 0.36 | 0.27* | 0.28* | 0.35 | 0.37 |
| 16 | 0.39 | 0.36 | 0.38 | 0.38 | 0.41 |
| 17 | 0.52* | 0.4 | 0.4 | 0.4 | 0.47* |
| 18 | 0.75 | 0.56* | 0.60* | 0.47* | 0.62 |
| 19 | 0.81* | 0.85 | 0.81* | 0.67* | 0.82* |
| 20 | 0..07 | 0.85* | 0.9 | 0.96 | 0.91 |
| **M.E.** | 8 | 6 | 6 | 6 | 5 |
| **M.E.%** | 40% | 30% | 30% | 30% | 25% |

Note: **\*** Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

By observing table no: 4.6 we found that 8 companies are are misclassified in the year 2004 and 6 companies are misclassified in the year 2005. Similarly, 6, 6 and 5 companies are misclassified in the year 2006, 2007 and 2008.That means misclassification error is 40% in year 2004 but it is decreased to 30% in the year 2005 and it remained the same in the year 2006, 2007.In these year six companies are misclassified. At last misclassification error decreased to 25%.Therefore,the predictive power of working

capital ratio in the year 2004 is lowest among all sample year because of the highest percentage of classification error. The predictive power of working capital ratio in the year 2005, 2006, 2007 is remain the same and in the year 2008 it is highest than all sample year because the misclassification error is only 25% in this year.

## 4.2.1 Comparison of the predictive power of various liquidity ratios

With the help of the major findings of table no 4.1 to 4.6, we can compare the predictive power of liquidity ratio. Major findings of above tables are summarized in table no: 4.7.

**Table No: 4.7**

**Percentage error of misclassification of various liquidity ratios from year 2004 to 2008**

| Year | R1 | R2 | R3 |
|------|------|------|------|
| 2004 | 30% | 35% | 40% |
| 2005 | 30% | 35% | 30% |
| 2006 | 30% | 30% | 30% |
| 2007 | 32% | 30% | 30% |
| 2008 | 25% | 25% | 25% |
| **Average** | **29%** | **31%** | **31%** |

Above table no 4.7 shows that predictive power of current ratio is highest than other two ratio in the year 2004 because of the lowest percentage error of misclassification as compare to other liquidity ratio. In this year, misclassification error of current ratio is only 30%.Similarly predictive power of current ratio and net working capital ratio in the year 2005 is higher than quick ratio. In this year, misclassification error of current ratio and networking capital ratio is only 30% that is lower than misclassification error of quick ratio. It can be observed that predictive power of all liquidity ratios is equal in the year 2006 and 2008 due to the equal percentage error of misclassification i.e. 30% and

25%. It can be also found that predictive power of current ratio and net working capital and quick ratio in the year 2007 is higher than current ratio. In this year, misclassification error of these ratios is 30% but it is 32% for current ratio.

The table no 4.7 shows that average percentage error of misclassification of R1 is only 29%.Similarly, R2 and R3 have 31%. So we can conclude that the predictive power of R1 is highest among all liquidity ratio because R1 has lowest percentage of misclassification error. R2 and R3 have equal predictive power but lower than R1. Therefore, we can say that current ratio is the best ratio among all liquidity ratios and it can predict about future more accurate than others  liquidity ratio.

## 4.3 Analysis of Predictive Power of Leverage ratio

leverage ratios are also called long-term solvency ratio or capital structure ratios. The leverage ratios are calculated to judge the long term financial position of a firm. These ratios measure the enterprises abilities to pay the interest regularly and to repay the principle on maturity. This part focuses on predictive power of four major leverage ratios. They are debt to equity ratio, debt to total Assets ratio, interest coverage ratio and fixed assets to current assets ratio.

## Table No: 4.8

## Debt to Equity Ratio (R4)

| NON-SICK GROUP                      YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 13.43 | 12.76 | 13.69 | 12.51 | 12.37 |
| Nabil Bank Ltd. | 9.11 | 9.29 | 10.91 | 12.25 | 14.24 |
| Nepal Investment Bank Ltd. | 12.23 | 12.61 | 14.07 | 13.69 | 13.47 |
| Everest Bank Ltd | 13.45 | 13.05 | 15.58 | 16.84 | 12.73 |
| Himalayan Bank Ltd. | 16.79 | 16.78 | 15.68 | 14.62 | 12.43 |
| Nepal Telecom Ltd | 0.74 | 0.71 | 0.66 | 0.63 | 0.6 |
| Hetauda Cement Factory Ltd. | 1 | 1.01 | 1.03 | 1.06 | 1.04 |
| Bishal Bazar Company Ltd. | 1.27 | 1.38 | 1.45 | 1.61 | 0.28 |
| Bahu Byabasaya Udhyog | 0.16 | 0.16 | 0.09 | 0.03 | 0.09 |
| Sagarmatha Insurance Company Ltd. | 0.52 | 0.51 | 0.74 | 1.1 | 0.84 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 15.29 | 16.88 | -6.89 | -14.27 | 19.94 |
| Nepal Bangladesh Bank Ltd. | 20.71 | 55.6 | -8.5 | -3.67 | -5.4 |
| NCC Bank Ltd. | 25.23 | 26.05 | -21.8 | -12.83 | 13.38 |
| Bageshwory Development bank Ltd. | 4.29 | 4.44 | 5.62 | 8.05 | 10.06 |
| National Hydropower Company Ltd. | 2.43 | 2.27 | 1.82 | 1.78 | 1.52 |
| Nepal Electricity Authority | 2.23 | 2.12 | 2.04 | 2.8 | 2.57 |
| Janakpur  Cigarette Factory Ltd | 1.43 | 1.24 | 0.97 | 1.68 | 4.71 |
| Nepal Khadya Sansthan | 1.01 | 1.07 | 1.14 | 1.23 | 1.3 |
| Sahayogi Vikas Bank Ltd | 2.41 | 2.4 | 5.1 | 3.24 | 3.3 |
| Herb Production & Processing  Corporation | 2.74 | 2.73 | 4.23 | 4.56 | 4.66 |

*Source: Annual Report, Nepal Stock Exchange*
   *and Ministry of Finance*


*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

**R4 in ascending order**

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|------|------|------|------|------|------|
| 1 | 0.16 | 0.16 | -21.8* | -14.27* | -5.40* |
| 2 | 0.52 | 0.51 | -8.50* | -12.83* | 0.09 |
| 3 | 0.74 | 0.71 | -6.89* | -3.67* | 0.28 |
| 4 | 1.00 | ➡ 1.01 | 0.09 | 0.03 | 0.60 |
| 5 | 1.01* | 1.07* | 0.66 | 0.63 | 0.84 |
| 6 | ➡ 1.27 | 1.24* | 0.74 | 1.06 | ➡ 1.04 |
| 7 | 1.43* | 1.38 | 0.97* | 1.10 | 1.30* |
| 8 | 2.23* | 2.12* | 1.03 | 1.23* | 1.52* |
| 9 | 2.41* | 2.27* | 1.14* | 1.61 | 2.57* |
| 10 | 2.43* | 2.40* | 1.45 | 1.68* | 3.30* |
| 11 | 2.74* | 2.73* | 1.82* | 1.78* | 4.66* |
| 12 | 4.29* | 4.44* | 2.04* | 2.80* | 4.71* |
| 13 | 9.11 | 9.29 | 4.23* | 3.24* | 10.06* |
| 14 | 12.23 | 12.61 | 5.10* | 4.56* | 12.37 |
| 15 | 13.43 | 12.76 | 5.62* | 8.05* | 12.43 |
| 16 | 13.45 | 13.05 | ➡ 10.91 | ➡ 12.25 | 12.73 |
| 17 | 15.29* | 16.78 | 13.69 | 12.51 | 13.38* |
| 18 | 16.79 | 16.88* | 14.07 | 13.69 | 13.47 |
| 19 | 20.71* | 26.05* | 15.58 | 14.62 | 14.24 |
| 20 | 25.23* | 55.60* | 15.68 | 16.84 | 19.94* |
| **M.E.** | 6 | 6 | 5 | 5 | 6 |
| **M.E.%** | 30% | 30% | 25% | 25% | 30% |

Note: * Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

Table no 4.9 shows that the predictive power of debt equity ratio is lowest in the year 2004, 2005 and 2008 among all the sample year. In these years, misclassification error is 30%.Simalarly, the predictive power of debt to equity ratio in the year 2006 and 2007 is highest than others year because in these year misclassification error decreased to 25%.

<div align="center">

**Table No: 4.10**

**Debt to Total Assets Ratio (R5)**

</div>

| NON-SICK GROUP<br>YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Nabil Bank Ltd. | 0.9 | 0.9 | 0.93 | 0.93 | 0.93 |
| Nepal Investment Bank Ltd. | 0.92 | 0.92 | 0.93 | 0.93 | 0.93 |
| Everest Bank Ltd | 0.9 | 0.93 | 0.94 | 0.94 | 0.93 |
| Himalayan Bank Ltd. | 0.93 | 0.95 | 0.94 | 0.94 | 0.93 |
| Nepal Telecom Ltd | 0.42 | 0.41 | 0.39 | 0.39 | 0.37 |
| Hetauda Cement Factory Ltd. | 0.5 | 0.5 | 0.52 | 0.52 | 0.52 |
| Bishal Bazar Company Ltd. | 0.56 | 0.58 | 0.59 | 0.38 | 0.22 |
| Bahu Byabasaya Udhyog | 0.13 | 0.13 | 0.08 | 0.03 | 0.08 |
| Sagarmatha Insurance Company Ltd. | 0.34 | 0.34 | 0.43 | 0.6 | 0.46 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 0.005 | 0.005 | 0.005 | 0.006 | 0.006 |
| Nepal Bangladesh Bank Ltd. | 0.95 | 0.98 | 0.75 | 1.36 | 1.23 |
| NCC Bank Ltd. | 0.8 | 0.98 | 1.05 | 1.08 | 0.93 |
| Bageshwory Development bank Ltd. | 0.83 | 0.82 | 0.85 | 0.9 | 0.91 |
| National Hydropower Company Ltd.. | 0.71 | 0.69 | 0.64 | 0.64 | 0.6 |
| Nepal Electricity Authority | 0.69 | 0.68 | 0.67 | 0.73 | 0.72 |
| Janakpur  Cigarette Factory Ltd | 0.58 | 0.55 | 0.49 | 0.63 | 0.82 |
| Nepal Khadya Sansthan | 0.5 | 0.52 | 0.53 | 0.55 | 0.56 |
| Sahayogi Vikas Bank Ltd | 0.72 | 0.71 | 0.83 | 0.76 | 0.77 |
| Herb Production & Processing  Corporation | 0.72 | 0.73 | 0.81 | 0.82 | 0.82 |

*Source: Annual Report, Nepal Stock Exchange*
     *and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

**Table No: 4.11**

**R5 in ascending order**

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| 1 | 0.005* | 0.005* | 0.005* | 0.006* | 0.006* |
| 2 | 0.13 | 0.13 | 0.08 | 0.03 | 0.08 |
| 3 | 0.34 | 0.34 | 0.39 | 0.38 | 0.22 |
| 4 | 0.42 | 0.41 | 0.43 | 0.39 | 0.37 |
| 5 | 0.5 | 0.50 | 0.49* | 0.52 | 0.46 |
| 6 | 0.50* | 0.52* | 0.52 | 0.55* | 0.52 |
| 7 | 0.56 | 0.55* | 0.53* | 0.60 | ➡ 0.56* |
| 8 | 0.58* | 0.58 | 0.59 | 0.63* | 0.60* |
| 9 | 0.69* | 0.68* | 0.64* | 0.64* | 0.72* |
| 10 | 0.71* | 0.69* | 0.67* | 0.73* | 0.77* |
| 11 | 0.72* | 0.71* | 0.75* | 0.76* | 0.82* |
| 12 | 0.72* | 0.73* | 0.81* | 0.82* | 0.82* |
| 13 | 0.80* | ➡ 0.82* | 0.83* | ➡ 0.90* | 0.91* |
| 14 | ➡ 0.83* | 0.90 | ➡ 0.85* | 0.93 | 0.93 |
| 15 | 0.9 | 0.92 | 0.93 | 0.93 | 0.93 |
| 16 | 0.9 | 0.93 | 0.93 | 0.93 | 0.93 |
| 17 | 0.92 | 0.93 | 0.93 | 0.94 | 0.93 |
| 18 | 0.93 | 0.95 | 0.94 | 0.94 | 0.93 |
| 19 | 0.93 | 0.98* | 0.94 | 1.08* | 0.93* |
| 20 | 0.95* | 0.98* | 1.05* | 1.36* | 1.23* |
| **M.E.** | 6 | 7 | 6 | 7 | 6 |
| **M.E.%** | 30% | 35% | 30% | 35% | 30% |

Note: **\*** Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

By applying the cut-off point method, the table no : 4.11 shows that the misclassification error is 30% in the year 2004 and it increased to 35%.in the year 2005.Then it is decreased to 30% in the year 2006 and again increased to 35% in the year 2007. At the last, the classification error is 30% in the year 2008.That means the predictive power of debt to total assets ratio is fluctuating trend. Due to the lowest misclassification error, the predictive power of debt to equity ratio in the year 2004, 2006 and 2008 is higher than the other sample year. We can also conclude that predictive power of debt to total assets in the year 2005 and 2007 is lowest as compare to other sample years.

**Table No: 4.12**

**Interest Coverage Ratio (R6)**

| NON-SICK GROUP                               YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 4.29 | 4.14 | 4.09 | 3.46 | 3.53 |
| Nabil Bank Ltd. | 4.23 | 4.11 | 3.51 | 2.79 | 2.43 |
| Nepal Investment Bank Ltd. | 1.83 | 1.94 | 2.03 | 2.06 | 2.03 |
| Everest Bank Ltd | 1.9 | 1.84 | 1.86 | 1.88 | 2.04 |
| Himalayan Bank Ltd. | 1.93 | 1.93 | 2.04 | 1.93 | 1.16 |
| Nepal Telecom Ltd | 160.25 | 171.76 | 193.11 | 227.35 | 158.73 |
| Hetauda Cement Factory Ltd. | 2.46 | 2.66 | 3.85 | 3.08 | 4.86 |
| Bishal Bazar Company Ltd. | 56.44 | | | | |
| Bahu Byabasaya Udhyog | | | | | |
| Sagarmatha Insurance Company Ltd. | | | | | |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 0.17 | 0.16 | -2.69 | 1.83 | 2.47 |
| Nepal Bangladesh Bank Ltd. | 1.16 | -0.19 | -2.31 | -1.03 | 3.14 |
| NCC Bank Ltd. | 1.04 | 1.03 | -0.53 | 0.88 | 3.04 |
| Bageshwory Development bank Ltd. | 0.72 | 0.71 | 1.6 | 1.41 | 1.56 |
| National Hydropower Company Ltd.. | 1.4 | 1.32 | 1.39 | 1.5 | 2.27 |
| Nepal Electricity Authority | 0.85 | 0.7 | 2.2 | 1.17 | 1.9 |
| Janakpur  Cigarette Factory Ltd | 1.75 | 1.75 | 2.26 | 2.34 | -6.77 |
| Nepal Khadya Sansthan | 0.4 | 0.49 | 10.05 | -0.53 | 5.05 |
| Sahayogi Vikas Bank Ltd | 0.015 | 0.002 | 1.95 | 1.46 | 1.57 |
| Herb Production & Processing  Corporation | 1.37 | 0.26 | 1.34 | 0.48 | 1.96 |

*Source: Annual Report, Nepal Stock Exchange*
   *and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

**Table No: 4.13**

**R6 in ascending order**

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|------|------|------|------|------|------|
| 1 | 0.02* | -0.19* | -2.69* | -1.03* | -6.77* |
| 2 | 0.17* | 0.01* | -2.31* | -0.53* | 1.16 |
| 3 | 0.40* | 0.16* | -0.53 | 0.48* | 1.56* |
| 4 | 0.72* | 0.26* | 1.34* | 0.88* | 1.57* |
| 5 | 0.85* | 0.49* | ➡ 1.60* | 1.17* | 1.90* |
| 6 | 1.04* | 0.70* | 1.86 | 1.41* | 1.96* |
| 7 | 1.16* | 0.71* | 1.95* | 1.46* | 2.03 |
| 8 | 1.37* | 1.03* | 2.03 | 1.50* | 2.04 |
| 9 | 1.40* | 1.32* | 2.04 | ➡ 1.83* | 2.27* |
| 10 | ➡ 1.75* | ➡ 1.75* | 2.20* | 1.88 | 2.43 |
| 11 | 1.83 | 1.84 | 2.26* | 1.93 | 2.47* |
| 12 | 1.9 | 1.93 | 3.51 | 2.06 | 3.04* |
| 13 | 1.93 | 1.94 | 3.85 | 2.34* | ➡ 3.14* |
| 14 | 2.46 | 2.66 | 4.09 | 2.79 | 3.53 |
| 15 | 4.23 | 4.11 | 10.05* | 3.08 | 4.86 |
| 16 | 4.29 | 4.14 | 193.11 | 3.46 | 5.05* |
| 17 | 56.44 | 171.76 | | 227.35 | 158.73 |
| 18 | 160.25 | | | | |
| 19 | | | | | |
| 20 | | | | | |
| M.E. | - | - | 5 | 1 | 1 |
| M.E.% | 0% | 0% | 25% | 6% | 6% |

Note: * Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

By observing the table no 4.13, we can see that the misclassification error is zero in the year 2004 and 2005. Then the classification error is highest i.e.25% in the year 2006 and it remains to same i.e. 6% in the year 2007 and 2008. Therefore, the predictive power of interest coverage ratio in the year 2006 is lowest among all the sample year and it is very high in the year 2004 and 2005 because in these years misclassification error is zero percent. Interest coverage ratio can predict the future more accurate than other ratio due to the very small size of misclassification error because lower misclassification reflects higher predictive power.

**Fixed assets to current assets ratio (R7)**

| NON-SICK GROUP                         YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 0.003 | 0.003 | 0.004 | 0.004 | 0.004 |
| Nabil Bank Ltd. | 0.02 | 0.021 | 0.01 | 0.011 | 0.02 |
| Nepal Investment Bank Ltd. | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 |
| Everest Bank Ltd | 0.01 | 0.01 | 0.10 | 0.01 | 0.01 |
| Himalayan Bank Ltd. | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 |
| Nepal Telecom Ltd | 0.38 | 0.01 | 0.40 | 0.41 | 0.46 |
| Hetauda Cement Factory Ltd. | 0.22 | 0.01 | 0.19 | 0.17 | 0.16 |
| Bishal Bazar Company Ltd. | 0.84 | 0.01 | 0.73 | 0.71 | 0.78 |
| Bahu Byabasaya Udhyog | 0.10 | 0.01 | 0.11 | 0.12 | 0.08 |
| Sagarmatha Insurance Company Ltd. | 0.037 | 0.035 | 0.133 | 0.128 | 0.10 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Nepal Bangladesh Bank Ltd. | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 |
| NCC Bank Ltd. | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| Bageshwory Development bank Ltd. | 0.03 | 0.03 | 0.08 | 0.06 | 0.04 |
| National Hydropower Company Ltd. | 0.14 | 0.13 | 0.11 | 0.11 | 3.86 |
| Nepal Electricity Authority | 4.81 | 4.79 | 4.19 | 3.18 | 3.07 |
| Janakpur  Cigarette Factory Ltd | 0.08 | 0.09 | 0.11 | 0.11 | 0.12 |
| Nepal Khadya Sansthan | 0.11 | 0.23 | 0.19 | 0.08 | 0.07 |
| Sahayogi Vikas Bank Ltd | 0.024 | 0.023 | 0.009 | 0.007 | 0.005 |
| Herb Production & Processing  Corporation | 0.38 | 0.34 | 0.30 | 0.25 | 0.23 |

*Source: Annual Report, Nepal Stock Exchange*
*     and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

**Table No: 4.15**

**R7 in ascending order**

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|------|------|------|------|------|------|
| 1 | 0.003 | 0.003 | 0.004 | 0.004 | 0.004 |
| 2 | 0.01 | 0.01 | 0.009* | 0.007* | 0.005* |
| 3 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 4 | 0.01* | 0.01 | 0.01* | 0.01* | 0.01* |
| 5 | 0.01* | 0.01 | 0.01* | 0.011 | ➡ 0.01* |
| 6 | 0.02 | 0.01 | 0.02 | 0.02 | 0.02 |
| 7 | ➡ 0.02 | ➡ 0.01 | 0.02 | 0.02* | 0.02* |
| 8 | 0.02* | 0.01* | 0.02* | 0.02* | 0.03 |
| 9 | 0.02* | 0.01* | ➡ 0.08* | 0.03 | 0.03 |
| 10 | 0.03* | 0.02 | 0.1 | 0.06* | 0.04* |
| 11 | 0.04 | 0.02* | 0.11 | 0.08* | 0.07* |
| 12 | 0.08* | 0.02* | 0.11* | 0.11* | 0.08 |
| 13 | 0.10 | 0.02 | 0.11* | ➡ 0.11* | 0.1 |
| 14 | 0.11* | 0.03* | 0.133 | 0.12 | 0.12* |
| 15 | 0.14* | 0.04 | 0.19 | 0.13 | 0.16 |
| 16 | 0.22 | 0.09* | 0.19* | 0.17 | 0.23* |
| 17 | 0.38 | 0.13* | 0.30* | 0.25* | 0.46 |
| 18 | 0.38* | 0.23* | 0.4 | 0.41 | 0.78 |
| 19 | 0.84 | 0.34* | 0.73 | 0.71 | 3.07* |
| 20 | 4.81* | 4.79* | 4.19* | 3.18* | 3.86* |
| **M.E.** | 7 | 3 | 9 | 7 | 9 |
| **M.E.%** | 35% | 15% | 45% | 35% | 45% |

Note: **\*** Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

Above table no 4.15 explains that the predictive power of fixed assets to current assets ratio is highest in the year 2005 as compared to other sample years. In this year, misclassification error is only 15% that is lowest among all the sample year. The predictive power of above ratio is lowest in the year 2006 and 2008 because of the high percentage of misclassification error that is 45%.

## 4.3.1 Comparison of the predictive power of various Leverage ratios

With the help of the major findings of table no 4.8 to 4.15, we can compare the predictive power of liquidity ratio. Major findings of above tables are summarized in table no 4.16.

**Table No: 4.16**

**Percentage error of classification error of various Leverage ratios from year 2004 to 2008**

| Year | R4 | R5 | R6 | R7 |
|------|------|------|-------|------|
| 2004 | 30% | 30% | 0% | 35% |
| 2005 | 30% | 35% | 0% | 15% |
| 2006 | 25% | 30% | 25% | 45% |
| 2007 | 25% | 35% | 6% | 35% |
| 2008 | 30% | 30% | 6% | 45% |
| **Average** | **28%** | **32%** | **7.40%** | **35%** |

By observing table no 4.16 we can found that percentage error of misclassification error of R6 is zero in 2004. Similarly, R4 and R5 have 30% classification error, R7 has 30% .That means R6 has highest, and R7 has lowest predictive power than others. In this year R4 and R5 have equal predictive power because both ratio have equal classification error in this year. Likewise, in the year 2005 R6 has highest predictive power than others. In this year misclassification error of R6 is also Zero. R7 comes in second place and R4 comes in third place according to their predictive power. It can be seen that in the year 2006 predictive power of R5 is lowest among all the leverage ratios. In this year, R4 and R6 have highest predictive power than R5 and R7. Then R5 comes in second place and R7 has lowest predictive power because the misclassification error of this ratio is 45% that is highest than others have. The above table shows that R6 has highest predictive power in the final sample year 2008.In this year misclassification error is only 6% that is lowest than other ratios have. In this year, R4 and R5 have equal predictive power and R7 have lowest predictive power.

The above table no 16 shows that average percentage error of misclassification of R6 is only 7.40%.Similarly, R4 has 28%, R5 has 32% and R7 has 35%. Therefore, we can conclude that the predictive power of R6 is highest among all activity ratios because R6 has lowest percentage of misclassification error. R7 has lowest predictive power among

all other leverage ratio due to the highest average percentage error of misclassification error. R4 comes in second place and R5 comes in third place according to their predictive power. Therefore, we can say that interest coverage (R6) is the best ratio among all leverage ratio and it can predict about future more accurate than others can.

## 4.4 Analysis of Predictive Power of Activity Ratio

Activity ratios are also called turnover ratio or efficiency ratios. The creditors and owners are interested to invest their fund to generate sales and profit. Activity ratios are introduced to evaluate the efficiency with which the firm manages and utilizes it' assets. These ratios establish the relationship of sales with various assets. This part of study consists on the predictive power of total assets turnover ratio, fixed assets turnover ratio, capital employed turnover ratio and current assets turnover ratio.

**Table No:4.17**

**Fixed assets turnover ratio (R8)**

| NON-SICK GROUP                     YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 22.04 | 17.51 | 15.89 | 19.70 | 19.98 |
| Nabil Bank Ltd. | 4.30 | 4.11 | 5.49 | 7.29 | 4.19 |
| Nepal Investment Bank Ltd. | 3.75 | 4.26 | 7.63 | 2.84 | 3.46 |
| Everest Bank Ltd | 6.41 | 6.41 | 7.01 | 8.06 | 8.86 |
| Himalayan Bank Ltd. | 5.75 | 5.56 | 3.88 | 3.94 | 2.57 |
| Nepal Telecom Ltd | 1.10 | 1.15 | 1.26 | 1.48 | 1.42 |
| Hetauda Cement Factory Ltd. | 2.40 | 2.42 | 2.51 | 2.70 | 3.05 |
| Bishal Bazar Company Ltd. | 1.70 | 1.67 | 1.69 | 1.77 | 0.91 |
| Bahu Byabasaya Udhyog | 3.89 | 3.61 | 6.44 | 5.03 | 9.04 |
| Sagarmatha Insurance Company Ltd. | 5.8 | 5.96 | 1.32 | 1.45 | 1.35 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 7.89 | 8.73 | 9.40 | 19.97 | 23.63 |
| Nepal Bangladesh Bank Ltd. | 6.94 | 5.72 | 7.12 | 9.12 | 7.69 |
| NCC Bank Ltd. | 5.10 | 4.90 | 6.57 | 5.78 | 3.24 |
| Bageshwory Development bank Ltd. | 1.36 | 1.35 | 1.22 | 1.69 | 2.45 |
| National Hydropower Company Ltd. | 1.12 | 1.14 | 1.31 | 1.69 | 2.45 |
| Nepal Electricity Authority | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 |
| Janakpur  Cigarette Factory Ltd | 27.98 | 28.59 | 29.10 | 23.10 | 23.91 |
| Nepal Khadya Sansthan | 2.31 | 2.48 | 2.58 | 3.33 | 4.30 |
| Sahayogi Vikas Bank Ltd | 1.25 | 1.41 | 7.05 | 11.52 | 15.57 |
| Herb Production & Processing  Corporation | 1.52 | 1.68 | 1.28 | 1.36 | 1.27 |

*Source: Annual Report, Nepal Stock Exchange  and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

**Table No: 4.18**

**R8 in ascending order**

| 2004 | 2004 | 2005 | 2006 | 2007 | 2008 |
|------|------|------|------|------|------|
| 1 | 0.17* | 0.17* | 0.17* | 0.18* | 0.18* |
| 2 | 1.10 | 1.14* | 1.22* | 1.36* | 0.91 |
| 3 | 1.12* | 1.15 | 1.26 | 1.45 | 1.27* |
| 4 | 1.25* | 1.35* | 1.28* | 1.48 | 1.35 |
| 5 | 1.36* | ➡ 1.41* | ➡ 1.31* | 1.69* | 1.42 |
| 6 | ➡ 1.52* | 1.67 | 1.32 | 1.69* | 2.45* |
| 7 | 1.70 | 1.68* | 1.69 | 1.77 | 2.45* |
| 8 | 2.31* | 2.42 | 2.51 | 2.70 | 2.57 |
| 9 | 2.40 | 2.48* | 2.58* | 2.84 | 3.05 |
| 10 | 3.75 | 3.61 | 3.88 | 3.33* | 3.24* |
| 11 | 3.89 | 4.11 | 5.49 | 3.94 | 3.46 |
| 12 | 4.30 | 4.26 | 6.44 | 5.03 | ➡ 4.19 |
| 13 | 5.10* | 4.90* | 6.57* | 5.78* | 4.30* |
| 14 | 5.75 | 5.56 | 7.01 | 7.29 | 7.69* |
| 15 | 5.8 | 5.72* | 7.05* | 8.06 | 8.86 |
| 16 | 6.41 | 5.96 | 7.12* | ➡ 9.12* | 9.04 |
| 17 | 6.94* | 6.41 | 7.63 | 11.52* | 15.57* |
| 18 | 7.89* | 8.73* | 9.40* | 19.70 | 19.98 |
| 19 | 22.04 | 17.51 | 15.89 | 19.97* | 23.63* |
| 20 | 27.98* | 28.59* | 29.10* | 23.10* | 23.91* |
| **M.E.** | 6 | 7 | 7 | 7 | 8 |
| **M.E.%** | 30% | 35% | 35% | 35% | 40% |

Note: **\*** Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

By applying the cut-off point method, we found that predictive power of fixed assets turnover ratio is highest in the year 2004.In this year misclassification error is only 30%.The predictive power of fixed assets turnover ratio in the year 2005,2006 and 2007

is remain the same because in these year misclassification error is 35%. The predictive of this ratio in 2008 is lowest among all the year due to the highest percentage of misclassification error i.e. 40%.

**Table No: 4.19**

**Total assets turnover ratio (R9)**

| NON-SICK GROUP                              YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 0.078 | 0.078 | 0.0075 | 0.0075 | 0.074 |
| Nabil Bank Ltd. | 0.09 | 0.10 | 0.10 | 0.08 | 0.07 |
| Nepal Investment Bank Ltd. | 0.08 | 0.07 | 0.08 | 0.08 | 0.08 |
| Everest Bank Ltd | 0.076 | 0.08 | 0.07 | 0.07 | 0.07 |
| Himalayan Bank Ltd. | 0.069 | 0.064 | 0.0076 | 0.072 | 0.074 |
| Nepal Telecom Ltd | 0.23 | 0.26 | 0.28 | 0.34 | 0.34 |
| Hetauda Cement Factory Ltd. | 0.35 | 0.36 | 0.36 | 0.35 | 0.38 |
| Bishal Bazar Company Ltd. | 0.64 | 0.67 | 0.71 | 0.73 | 0.39 |
| Bahu Byabasaya Udhyog | 0.40 | 0.38 | 0.59 | 0.46 | 0.68 |
| Sagarmatha Insurance Company Ltd. | 0.80 | 0.20 | 0.15 | 0.16 | 0.12 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 0.09 | 0.1 | 0.08 | 0.14 | 0.17 |
| Nepal Bangladesh Bank Ltd. | 0.1 | 0.08 | 0.09 | 0.13 | 0.09 |
| NCC Bank Ltd. | 0.093 | 0.09 | 0.11 | 0.09 | 0.08 |
| Bageshwory Development bank Ltd. | 0.06 | 0.05 | 0.11 | 0.10 | 0.11 |
| National Hydropower Company Ltd. | 0.14 | 0.15 | 0.17 | 0.18 | 0.2 |
| Nepal Electricity Authority | 0.15 | 0.15 | 0.14 | 0.14 | 0.15 |
| Janakpur  Cigarette Factory Ltd | 2.01 | 1.96 | 2.28 | 2.08 | 2.28 |
| Nepal Khadya Sansthan | 0.19 | 0.19 | 0.15 | 0.14 | 0.15 |
| Sahayogi Vikas Bank Ltd | 0.03 | 0.03 | 0.07 | 0.08 | 0.08 |
| Herb Production & Processing  Corporation | 0.27 | 0.29 | 0.31 | 0.33 | 0.33 |

*Source: Annual Report, Nepal Stock Exchange  and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*
To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

# Table No: 4.20

## R9 in ascending order

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|------|------|------|------|------|------|
| 1 | 0.03* | 0.03* | 0.01 | 0.01 | 0.04 |
| 2 | 0.06* | 0.05* | 0.01 | 0.07 | 0.07 |
| 3 | 0.07 | 0.06 | 0.07 | 0.07 | 0.07 |
| 4 | 0.08 | 0.07 | 0.07* | 0.08 | 0.07 |
| 5 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 6 | 0.08 | 0.08 | 0.08* | 0.08* | 0.08* |
| 7 | 0.09 | 0.08* | 0.09* | 0.09* | 0.08* |
| 8 | 0.09* | 0.09* | 0.10 | 0.10* | 0.09* |
| 9 | 0.09* | 0.10 | 0.11* | 0.13* | 0.11* |
| 10 | 0.10* | 0.10* | 0.11* | 0.14* | 0.12 |
| 11 | 0.14* | 0.15* | 0.14* | 0.14* | 0.15* |
| 12 | 0.15* | 0.15* | 0.15 | 0.14* | 0.15* |
| 13 | 0.19* | 0.19* | 0.15* | 0.16 | 0.17* |
| 14 | 0.23 | 0.20 | 0.17* | 0.18* | 0.20* |
| 15 | 0.27* | 0.26 | 0.28 | 0.33* | 0.33* |
| 16 | 0.35 | 0.29* | 0.31* | 0.34 | 0.34 |
| 17 | 0.4 | 0.36 | 0.36 | 0.35 | 0.38 |
| 18 | 0.64 | 0.38 | 0.59 | 0.46 | 0.39 |
| 19 | 0.8 | 0.67 | 0.71 | 0.73 | 0.68 |
| 20 | 2.01* | 1.96* | 2.28* | 2.08* | 2.28* |
| M.E. | 7 | 7 | 7 | 5 | 5 |
| M.E.% | 35% | 35% | 35% | 25% | 25% |

Note: * Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

The table no: 4.20 shows that the misclassification error is equal in the 2004, 2005.and 2006. After the year 2007, the classification error is decreased to 25% that means predictive power of total assets turnover ratio in the year 2007 and 2008 is higher than the year 2004, 2005 and 2006.

**Table No: 4.21**

**Capital employed Turnover ratio (R10)**

| NON-SICK GROUP<br>YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 0.99 | 1.01 | 0.94 | 0.93 | 0.78 |
| Nabil Bank Ltd. | 0.85 | 0.9 | 0.93 | 1.01 | 1.02 |
| Nepal Investment Bank Ltd. | 0.97 | 1.03 | 1.06 | 1.02 | 0.88 |
| Everest Bank Ltd | 1.01 | 1.03 | 1.11 | 1.14 | 0.94 |
| Himalayan Bank Ltd. | 1.06 | 1.08 | 1.19 | 1.05 | 0.92 |
| Nepal Telecom Ltd | 0.41 | 0.44 | 0.47 | 0.55 | 0.54 |
| Hetauda Cement Factory Ltd. | 0.75 | 0.73 | 0.72 | 0.72 | 0.78 |
| Bishal Bazar Company Ltd. | 1.45 | 1.61 | 1.73 | 1.18 | 0.51 |
| Bahu Byabasaya Udhyog | 0.41 | 0.44 | 0.64 | 0.48 | 0.74 |
| Sagarmatha Insurance Company Ltd. | 0.32 | 0.3 | 0.27 | 0.3 | 0.23 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 1.73 | 1.7 | -0.55 | -1.98 | 3.32 |
| Nepal Bangladesh Bank Ltd. | 2.02 | 4.62 | -0.79 | -0.49 | -0.49 |
| NCC Bank Ltd. | 2.43 | 2.40 | -2.38 | -1.18 | 1.07 |
| Bageshwory Development bank Ltd. | 2.36 | 2.40 | 0.62 | 0.81 | 1.15 |
| National Hydropower Company Ltd. | 0.75 | 0.73 | 0.72 | 0.72 | 0.78 |
| Nepal Electricity Authority | 2.02 | 4.62 | -0.79 | -0.49 | 0.52 |
| Janakpur  Cigarette Factory Ltd | 4.35 | 4.4 | 4.5 | 5.57 | 13.01 |
| Nepal Khadya Sansthan | 0.38 | 0.39 | 0.33 | 0.49 | 0.61 |
| Sahayogi Vikas Bank Ltd | 0.09 | 0.11 | 0.4 | 0.95 | 0.33 |
| Herb Production & Processing  Corporation | 0.09 | 1.07 | 1.62 | 1.86 | 1.87 |

*Source: Annual Report, Nepal Stock Exchange  and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error

**Table No: 4.22**

**R10 in ascending order**

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|------|------|------|------|------|------|
| 1 | 0.09* | 0.11* | -2.38* | -1.98* | -0.49* |
| 2 | 0.09* | 0.3 | -0.79* | -1.18* | 0.23 |
| 3 | 0.32 | 0.39* | -0.79* | -0.49* | 0.33* |
| 4 | 0.38* | 0.44 | -0.55* | ➡ -0.49* | 0.51 |
| 5 | 0.41 | 0.44 | 0.27 | 0.3 | 0.52* |
| 6 | 0.41 | 0.73 | 0.33* | 0.48 | 0.54 |
| 7 | 0.75 | 0.73* | ➡ 0.40* | 0.49* | 0.61* |
| 8 | 0.75* | 0.9 | 0.47 | 0.55 | 0.74 |
| 9 | 0.85 | 1.01 | 0.62* | 0.72 | 0.78 |
| 10 | 0.97 | 1.03 | 0.64 | 0.72* | 0.78 |
| 11 | 0.99 | 1.03 | 0.72 | 0.81* | 0.78* |
| 12 | 1.01 | 1.07* | 0.72* | 0.93 | 0.88 |
| 13 | 1.06 | 1.08 | 0.93 | 0.95* | 0.92 |
| 14 | 1.45 | 1.61 | 0.94 | 1.01 | 0.94 |
| 15 | ➡ 1.73* | ➡ 1.70* | 1.06 | 1.02 | 1.02 |
| 16 | 2.02* | 2.40* | 1.11 | 1.05 | ➡ 1.07* |
| 17 | 2.02* | 2.40* | 1.19 | 1.14 | 1.15* |
| 18 | 2.36* | 4.40* | 1.62* | 1.18 | 1.87* |
| 19 | 2.43* | 4.62* | 1.73 | 1.86* | 3.32* |
| 20 | 4.35* | 4.62* | 4.50* | 5.57* | 13.01* |
| **M.E.** | 4 | 4 | 5 | 6 | 5 |
| **M.E.%** | 20% | 20% | 25% | 30% | 25% |

Note: **\*** Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

The table no: 4.22 shows that the misclassification error is lowest in the first two-sample year. In these years, classification error is 20% that means predictive power of capital assets turn over ratio in the year 2004 and 2005 is highest among all the sample year. Similarly the predictive power of this ratio in the year 2007 is lowest as compare to other sample year due to the low percentage of misclassification error.

## Table No: 4.23

## Current Assets Turnover Ratio (R11)

| NON-SICK GROUP                                   YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 0.09 | 0.08 | 0.08 | 0.08 | 0.08 |
| Nabil Bank Ltd. | 0.11 | 0.11 | 0.09 | 0.09 | 0.09 |
| Nepal Investment Bank Ltd. | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 |
| Everest Bank Ltd | 0.08 | 0.08 | 0.08 | 0.07 | 0.08 |
| Himalayan Bank Ltd. | 0.70 | 0.06 | 0.08 | 0.07 | 0.07 |
| Nepal Telecom Ltd | 0.38 | 0.44 | 0.44 | 0.54 | 0.59 |
| Hetauda Cement Factory Ltd. | 0.40 | 0.44 | 0.43 | 0.41 | 0.44 |
| Bishal Bazar Company Ltd. | 1.18 | 1.13 | 1.23 | 1.25 | 0.71 |
| Bahu Byabasaya Udhyog | 0.35 | 0.43 | 0.65 | 0.51 | 0.74 |
| Sagarmatha Insurance Company Ltd. | 0.19 | 0.21 | 0.18 | 0.19 | 0.14 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 0.11 | 0.11 | 0.09 | 0.16 | 0.10 |
| Nepal Bangladesh Bank Ltd. | 0.11 | 0.09 | 0.10 | 0.15 | 0.10 |
| NCC Bank Ltd. | 0.11 | 0.1 | 0.12 | 0.10 | 0.09 |
| Bageshwory Development bank Ltd. | 0.05 | 0.06 | 0.12 | 0.11 | 0.13 |
| National Hydropower Company Ltd. | 0.16 | 0.18 | 0.2 | 0.22 | 0.26 |
| Nepal Electricity Authority | 0.91 | 0.9 | 0.89 | 0.82 | 0.80 |
| Janakpur  Cigarette Factory Ltd | 2.08 | 2.13 | 2.51 | 2.33 | 2.54 |
| Nepal Khadya Sansthan | 0.57 | 0.53 | 0.39 | 0.24 | 0.29 |
| Sahayogi Vikas Bank Ltd | 0.04 | 0.03 | 0.06 | 0.08 | 0.07 |
| Herb Production & Processing  Corporation | 1.01 | 1.04 | 0.92 | 0.94 | 0.88 |

*Source: Annual Report, Nepal Stock Exchange  and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

**Table No: 4.24**

**R11 in ascending order**

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| 1 | 0.04* | 0.03* | 0.06* | 0.07 | 0.07 |
| 2 | 0.05* | 0.06 | 0.08 | 0.07 | 0.07* |
| 3 | 0.08 | 0.06* | 0.08 | 0.08 | 0.08 |
| 4 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 5 | 0.09 | 0.08 | 0.08 | 0.08* | 0.09 |
| 6 | 0.11 | 0.08 | ➡ 0.09 | ➡ 0.09 | ➡ 0.09 |
| 7 | 0.11* | 0.09* | 0.09* | 0.10* | 0.09* |
| 8 | 0.11* | 0.10* | 0.10* | 0.11* | 0.10* |
| 9 | 0.11* | 0.11 | 0.12* | 0.15* | 0.10* |
| 10 | ➡ 0.16* | 0.11* | 0.12* | 0.16* | 0.13* |
| 11 | 0.19 | 0.18* | 0.18 | 0.19 | 0.14 |
| 12 | 0.35 | 0.21 | 0.20* | 0.22* | 0.26* |
| 13 | 0.38 | 0.43 | 0.39* | 0.24* | 0.29* |
| 14 | 0.4 | 0.44 | 0.43 | 0.41 | 0.44 |
| 15 | 0.57* | ➡ 0.44 | 0.44 | 0.51 | 0.59 |
| 16 | 0.7 | 0.53* | 0.65 | 0.54 | 0.71 |
| 17 | 0.91* | 0.90* | 0.89* | 0.82* | 0.74 |
| 18 | 1.01* | 1.04* | 0.92* | 0.94* | 0.80* |
| 19 | 1.18 | 1.13 | 1.23 | 1.25 | 0.88* |
| 20 | 2.08* | 2.13* | 2.51* | 2.33* | 2.54* |
| **M.E.** | 8 | 7 | 6 | 6 | 6 |
| **M.E.%** | 40% | 35% | 30% | 30% | 30% |

Note: **\*** Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

By observing the table no: 4.24, we can see that the predictive power of current assets turnover ratio is lowest in the year 2004. In this year, misclassification error is 40% that is higher than all other sample year. Similarly, in the year 2006, 2007 and 2008 remain to lowest at 30%, therefore, in these years predictive power is highest among all the sample year.

## 4.4.1 Comparison of the predictive power of various Leverege ratios

With the help of the major findings of table, no 4.17 to 4.24 we can compare the predictive power of activity ratio. Major findings of above tables are summarized in table no 4.25.

**Percentage error of classification error of various Activity ratios from year 2001 to 2008**

| Year | R8 | R9 | R10 | R11 |
|---|---|---|---|---|
| 2004 | 30% | 35% | 20% | 40% |
| 2005 | 35% | 35% | 20% | 35% |
| 2006 | 35% | 35% | 25% | 30% |
| 2007 | 35% | 25% | 30% | 30% |
| 2008 | 40% | 25% | 25% | 30% |
| **Average** | **35%** | **31%** | **24%** | **33%** |

Table no 4.25 shows that in the year 2004, the misclassification error of R10 is lowest among all activity ratios. In this year misclassification error is only 20%.That means R10 has highest predictive power as compared to all other activity ratio. In the year 2004, the predictive power of R8 is higher than R9 and R11 due to lower misclassification error. In this year, R11 has the lowest predictive power among all activity ratios. Similarly, in the year 2005 R10 has highest predictive than others and R8, R9 and R11 have equal predictive power because they have equal percentage error of misclassification i.e.35%. In the year 2006 ,R8 and R9 has equal predictive power but lower than R10 and R11.In this year R10 has highest predictive power between all other ratio and R1 comes in

second place according to their predictive power. In the year 2007, R10 and R11 have equal predictive power because R10 and R11 has equal percentage of classification error that is 30%. R9 comes in first position due to the low percentage error. In this year, R8 has lowest predictive power. In the final sample year R9 and R10 has highest predictive power than R8 and R11 because they have lowest percentage of classification error. In this year, R8 has lowest power due to higher percentage of classification error.

The above table no 4.25 shows that average percentage error of misclassification of R10 is only 24%.Similarly, R8 has 35%, R9 has 31% and R11 has 33%. Therefore, we can conclude that the predictive power of R10 is highest among all activity ratios because

R10 has lowest percentage of misclassification error. R8 has lowest predictive power among all other liquidity ratio due to the highest average percentage error of misclassification error. R9 comes in second place and R11 comes in third place according to their predictive power. Therefore, we can say that capital employed turnover ratio (R10) is the best ratio among all liquidity ratio and it can predict about future more accurate than others can.

## 4.5. Analysis of Predictive Power of Profitability Ratio

Profitability ratios are the measures of its overall efficiency. Generally, profitability ratios can be calculated in terms of the company's sales, investments, earnings, and dividends. This part of study focus the predictive power of net profit margin, Return on total assets, return on capital employed turnover and return on shareholders equity

**Table No: 4.26**
**Net profit margin (R12)**

| NON-SICK GROUP                    YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 0.34 | 0.37 | 0.35 | 0.35 | 0.37 |
| Nabil Bank Ltd. | 0.35 | 0.35 | 0.36 | 0.32 | 0.30 |
| Nepal Investment Bank Ltd. | 0.20 | 0.24 | 0.25 | 0.25 | 0.23 |
| Everest Bank Ltd | 0.20 | 0.22 | 0.22 | 0.22 | 0.24 |
| Himalayan Bank Ltd. | 0.19 | 0.18 | 0.22 | 0.22 | 0.26 |
| Nepal Telecom Ltd | 0.40 | 0.39 | 0.44 | 0.38 | 0.43 |
| Hetauda Cement Factory Ltd. | 0.05 | 0.032 | 0.1 | 0.06 | 0.11 |
| Bishal Bazar Company Ltd. | 0.36 | 0.4 | 0.41 | 0.37 | 0.39 |
| Bahu Byabasaya Udhyog | 0.16 | 0.17 | 0.17 | 0.18 | 0.13 |
| Sagarmatha Insurance Company Ltd. | 0.44 | 0.43 | 0.47 | 0.38 | 0.27 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | -0.47 | -0.47 | -2.04 | 0.23 | 0.34 |
| Nepal Bangaladesh Bank Ltd. | 0.0019 | -0.69 | -1.46 | -0.83 | 0.47 |
| NCC Bank Ltd. | -0.007 | -0.008 | -0.68 | -0.12 | 0.67 |
| Bageshwory Development bank Ltd. | -0.08 | -0.09 | 0.18 | 0.10 | 0.16 |
| National Hydropower Company Ltd. | -0.05 | -0.02 | 0.03 | 0.08 | 0.24 |
| Nepal Electricity Authority | -0.17 | -0.15 | -0.13 | -0.09 | 0.20 |
| Janakpur  Cigarette Factory Ltd | 0.0006 | 0.0007 | 0.0014 | 0.002 | -0.08 |
| Nepal Khadya Sansthan | 0.05 | -0.07 | 0.15 | -0.12 | 0.06 |
| Sahayogi Vikas Bank Ltd. | -0.21 | -0.32 | 0.12 | 0.16 | 0.20 |
| Herb Production & Processing  Corporation | -0.08 | -0.08 | -0.01 | -0.06 | 0.03 |

*Source: Annual Report, Nepal Stock Exchange  and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

**Table No: 4.27**

**R12 in ascending order**

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|------|------|------|------|------|------|
| 1 | -0.47* | -0.69* | -2.04* | -0.83* | -0.08* |
| 2 | -0.21* | -0.47* | -1.46* | -0.12* | 0.03* |
| 3 | -0.17* | -0.32* | -0.68* | -0.12* | 0.06* |
| 4 | -0.08* | -0.15* | -0.13* | -0.09* | 0.11 |
| 5 | -0.08* | -0.09* | -0.01* | -0.06* | 0.13 |
| 6 | -0.05* | -0.08* | 0.01* | 0.01* | 0.16* |
| 7 | -0.01* | -0.07* | 0.03* | 0.06 | 0.20* |
| 8 | 0.01* | -0.02* | 0.1 | 0.08* | ➡ 0.20* |
| 9 | ➡ 0.01* | -0.01* | 0.12* | 0.10* | 0.23 |
| 10 | 0.05 | ➡ 0.01* | ➡ 0.15* | ➡ 0.16* | 0.24 |
| 11 | 0.05* | 0.032 | 0.17 | 0.18 | 0.24* |
| 12 | 0.16 | 0.17 | 0.18* | 0.22 | 0.26 |
| 13 | 0.19 | 0.18 | 0.22 | 0.22 | 0.27 |
| 14 | 0.2 | 0.22 | 0.22 | 0.23* | 0.30 |
| 15 | 0.2 | 0.24 | 0.25 | 0.25 | 0.34* |
| 16 | 0.34 | 0.35 | 0.35 | 0.32 | 0.37 |
| 17 | 0.35 | 0.37 | 0.36 | 0.35 | 0.39 |
| 18 | 0.36 | 0.39 | 0.41 | 0.37 | 0.43 |
| 19 | 0.4 | 0.4 | 0.44 | 0.38 | 0.47* |
| 20 | 0.44 | 0.43 | 0.47 | 0.38 | 0.67* |
| **M.E.** | 1 | 0 | 2 | 2 | 6 |
| **M.E.%** | 5% | 0% | 10% | 10% | 30% |

Note: **\*** Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

The above table no 4.27 shows that only one company is misclassified in the year 2004 then it is zero in the year 2005. Therefore, predictive power of net profit margin is higher as compared to all other sample year. In the year 2006, 2007 misclassification error is remained to 10% that means predictive power of net profit is same in this two year.

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Predictive power of this ratio in the year 2008 is lowest among all the sample year due to the high misclassification error i.e. 30%.

**Table No: 4.28**

**Return on assets (R13)**

| NON-SICK GROUP YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 0.036 | 0.037 | 0.038 | 0.039 | 0.039 |
| Nabil Bank Ltd. | 0.05 | 0.04 | 0.04 | 0.05 | 0.04 |
| Nepal Investment Bank Ltd. | 0.04 | 0.04 | 0.04 | 0.04 | 0.05 |
| Everest Bank Ltd | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| Himalayan Bank Ltd. | 0.032 | 0.032 | 0.03  8 | 0.038 | 0.039 |
| Nepal Telecom Ltd | 0.10 | 0.10 | 0.13 | 0.13 | 0.14 |
| Hetauda Cement Factory Ltd. | 0.03 | 0.03 | 0.05 | 0.03 | 0.06 |
| Bishal Bazar Company Ltd. | 0.05 | 0.06 | 0.1 | 0.08 | 0.09 |
| Bahu Byabasaya Udhyog | 0.05 | 0.06 | 0.1 | 0.08 | 0.09 |
| Sagarmatha Insurance Company Ltd. | 0.09 | 0.09 | 0.07 | 0.06 | 0.03 |
| SICK GROUP | | | | | |
| Lumbani Bank Ltd. | -0.0006 | -0.0009 | -0.12 | 0.08 | 0.095 |
| Nepal Bangladesh Bank Ltd. | 0.0044 | -0.015 | -0.07 | -0.087 | 0.081 |
| NCC Bank Ltd. | 0.05 | 0.05 | -0.028 | 0.035 | 0.077 |
| Bageshwory Development bank Ltd. | 0.011 | 0.011 | 0.052 | 0.042 | 0.055 |
| National Hydropower Company Ltd. | 0.07 | 0.07 | 0.07 | 0.07 | 0.08 |
| Nepal Electricity Authority | 0.03 | -0.02 | -0.02 | 0.02 | 0.027 |
| Janakpur  Cigarette Factory Ltd | 0.025 | 0.025 | 0.06 | 0.029 | -0.165 |
| Nepal Khadya Sansthan | 0.024 | 0.004 | 0.027 | -0.012 | 0.025 |
| Sahayogi Vikas Bank Ltd | | | 0.03 | 0.05 | 0.05 |
| Herb Production & Processing Corporation | -0.01 | -0.01 | 0.02 | 0.01 | 0.03 |

*Source: Annual Report, Nepal Stock Exchange  and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|------|------|------|------|------|------|
| 1 | -0.01* | -0.02* | -0.12* | -0.09* | -0.17 |
| 2 | -0.01* | -0.02* | -0.07* | -0.01* | 0.03* |
| 3 | 0.01* | -0.01* | -0.03* | 0.01* | 0.03* |
| 4 | 0.01* | -0.01* | -0.02* | 0.02* | 0.03 |
| 5 | 0.02* | 0.01* | 0.02* | → 0.03* | → 0.03* |
| 6 | → 0.03* | 0.01* | 0.03* | 0.03 | 0.04 |
| 7 | 0.03 | → 0.03* | → 0.03* | 0.04* | 0.04 |
| 8 | 0.03* | 0.03 | 0.04 | 0.04 | 0.04 |
| 9 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 |
| 10 | 0.04 | 0.04 | 0.04 | 0.04 | 0.05 |
| 11 | 0.04 | 0.04 | 0.04 | 0.04 | 0.05* |
| 12 | 0.04 | 0.04 | 0.04 | 0.04* | 0.06* |
| 13 | 0.05 | 0.04 | 0.05 | 0.05 | 0.06 |
| 14 | 0.05 | 0.05* | 0.05* | 0.05* | 0.08* |
| 15 | 0.05 | 0.06 | 0.06* | 0.06 | 0.08* |
| 16 | 0.05* | 0.06 | 0.07 | 0.07* | 0.08* |
| 17 | 0.07* | 0.07* | 0.07* | 0.08 | 0.09 |
| 18 | 0.09 | 0.09 | 0.10 | 0.08 | 0.09 |
| 19 | 0.1 | 0.10 | 0.10 | 0.08* | 0.10* |
| 20 | | | 0.13 | 0.13 | 0.14 |
| **M.E.** | 3 | 2 | 3 | 5 | 7 |
| **M.E.%** | 16% | 11% | 15% | 25% | 35% |

Note: **\*** Shows Sick companies

→ Shows least error cut off point

M.E. – Misclassification Error

Table no: 4.29 shows that the predictive power of return on total assets in the year 2005 is lowest among all the sample year. These year the misclassification is 11%.. Similarly predictive power of this ratio in the year 2008 is lowest than others year because in these year misclassification error increased to 35%.

**Table No: 4.30**

**Return on capital employed (R14)**

| NON-SICK GROUP           YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 0.9 | 0.55 | 0.52 | 0.52 | 0.45 |
| Nabil Bank Ltd. | 0.39 | 0.46 | 0.53 | 0.60 | 0.56 |
| Nepal Investment Bank Ltd. | 0.39 | 0.43 | 0.44 | 0.45 | 0.48 |
| Everest Bank Ltd | 0.57 | 0.56 | 0.66 | 0.68 | 0.53 |
| Himalayan Bank Ltd. | 0.42 | 0.46 | 0.52 | 0.50 | 0.40 |
| Nepal Telecom Ltd | 0.17 | 0.17 | 0.21 | 0.21 | 0.24 |
| Hetauda Cement Factory Ltd. | 0.07 | 0.08 | 0.08 | 0.08 | 0.10 |
| Bishal Bazar Company Ltd. | 0.54 | 0.65 | 0.70 | 0.43 | 0.02 |
| Bahu Byabasaya Udhyog | 0.06 | 0.07 | 0.11 | 0.08 | 0.94 |
| Sagarmatha Insurance Company Ltd. | 0.14 | 0.13 | 0.13 | 1.12 | 0.06 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | 0.02 | -0.02 | 0.82 | -1.06 | 2.00 |
| Nepal Bangladesh Bank Ltd. | 0.96 | -0.86 | 0.82 | 0.23 | -0.35 |
| NCC Bank Ltd. | 1.34 | 1.21 | 0.59 | -0.41 | 1.11 |
| Bageshwory Development bank Ltd. | 0.07 | 0.05 | 0.34 | 0.38 | 0.61 |
| National Hydropower Company Ltd. | 0.069 | 0.08 | 0.08 | 0.09 | 0.10 |
| Nepal Electricity Authority | -0.02 | -0.02 | -0.02 | 0.03 | 0.04 |
| Janakpur Cigarette Factory Ltd | 0.03 | 0.04 | 0.04 | 0.04 | -0.40 |
| Nepal Khadya Sansthan | 0.01 | 0.01 | 0.06 | -0.03 | 0.06 |
| Sahayogi Vikas Bank Ltd | 0.01 | 0.01 | 0.23 | 0.21 | 0.21 |
| Herb Production & Processing Corporation | 0.04 | -0.02 | 0.08 | -0.01 | 0.16 |

*Source: Annual Report, Nepal Stock Exchange*
*and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

## Table No: 4.31

## R14 in ascending order from

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| 1 | -0.02* | -0.86* | -0.02* | -1.06* | -0.40* |
| 2 | 0.01* | -0.02* | 0.04* | -0.41* | -0.35* |
| 3 | 0.01* | -0.02* | 0.06* | -0.03* | 0.02 |
| 4 | 0.02* | -0.02* | 0.08 | -0.01* | 0.04* |
| 5 | 0.03* | 0.01* | 0.08* | 0.03* | 0.06 |
| 6 | ➡ 0.04* | 0.01* | ➡ 0.08* | 0.04* | 0.06* |
| 7 | 0.06 | 0.04* | 0.11 | 0.08 | 0.10 |
| 8 | 0.07* | ➡ 0.05* | 0.13 | 0.08 | 0.10* |
| 9 | 0.07 | 0.07 | 0.21 | 0.09* | 0.16* |
| 10 | 0.07* | 0.08 | 0.23* | 0.21 | 0.21* |
| 11 | 0.14 | 0.08* | 0.34* | 0.21* | ➡ 0.24 |
| 12 | 0.17 | 0.13 | 0.44 | 0.23* | 0.40 |
| 13 | 0.39 | 0.17 | 0.52 | 0.38* | 0.45 |
| 14 | 0.39 | 0.43 | 0.52 | ➡ 0.43 | 0.48 |
| 15 | 0.42 | 0.46 | 0.53 | 0.45 | 0.53 |
| 16 | 0.54 | 0.46 | 0.59* | 0.50 | 0.56 |
| 17 | 0.57 | 0.55 | 0.66 | 0.52 | 0.61* |
| 18 | 0.9 | 0.56 | 0.70 | 0.60 | 0.94 |
| 19 | 0.96* | 0.65 | 0.82* | 0.68 | 1.11* |
| 20 | 1.34* | 1.21* | 0.82* | 1.12 | 2.00* |
| M.E. | 4 | 2 | 6 | 3 | 5 |
| M.E.% | 20% | 10% | 30% | 30% | 25% |

Note: * Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

Applying the same procedure, the table no 4.31 shows that predictive power of return on capital employed is highest in the year 2005. In this year the misclassification error is only 10% .likewise, in the year 2006 and 2007 misclassification error is highest among all sample year. Therefore, the predictive power is this ratio is lowest in this two year as compared to all other sample year.

**Return on Shareholders' Equity (R15)**

| NON-SICK GROUP                              YEAR | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Standard Chartered Bank Ltd | 0.34 | 0.37 | 0.33 | 0.33 | 0.2 |
| Nabil Bank Ltd. | 0.32 | 0.31 | 0.34 | 0.33 | 0.31 |
| Nepal Investment Bank Ltd. | 0.2 | 0.25 | 0.27 | 0.26 | 0.21 |
| Everest Bank Ltd | 0.21 | 0.2 | 0.25 | 0.25 | 0.22 |
| Himalayan Bank Ltd. | 0.18 | 0.2 | 0.26 | 0.28 | 0.23 |
| Nepal Telecom Ltd | 0.16 | 0.17 | 0.21 | 0.21 | 0.23 |
| Hetauda Cement Factory Ltd. | 0.02 | 0.02 | 0.07 | 0.04 | 0.09 |
| Bishal Bazar Company Ltd. | 0.53 | 0.65 | 0.71 | 0.43 | 0.2 |
| Bahu Byabasaya Udhyog | 0.06 | 0.07 | 0.11 | 0.08 | 0.09 |
| Sagarmatha Insurance Company Ltd. | 0.14 | 0.13 | 0.13 | 0.12 | 0.06 |
| **SICK GROUP** | | | | | |
| Lumbani Bank Ltd. | -0.9 | -0.81 | 1.12 | -0.44 | 1.12 |
| Nepal Bangladesh Bank Ltd. | 0.003 | 0.003 | 0.006 | 0.011 | -1.08 |
| NCC Bank Ltd. | 0.02 | -0.02 | 1.61 | 0.14 | 0.71 |
| Bageshwory Development bank Ltd. | -0.02 | -0.02 | 1.61 | 0.14 | 0.71 |
| National Hydropower Company Ltd. | -0.007 | -0.006 | 0.009 | 0.025 | 0.075 |
| Nepal Electricity Authority | -0.06 | -0.07 | -0.05 | -0.05 | 0.01 |
| Janakpur  Cigarette Factory Ltd | 0.003 | 0.003 | 0.006 | 0.011 | -1.08 |
| Nepal Khadya Sansthan | 0.06 | -0.03 | 0.05 | -0.06 | 0.04 |
| Sahayogi Vikas Bank Ltd | 0.01 | 0.01 | 0.05 | 0.06 | 0.07 |
| Herb Production & Processing  Corporation | -0.12 | -0.09 | -0.02 | -0.10 | 0.05 |

*Source: Annual Report, Nepal Stock Exchange*
    *and Ministry of Finance*

*Calculation of cutoff point and Misclassification error*

To find out the predictive power financial ratios it is first necessary to put the calculated ratios in ascending order and then find out the cut off point with least misclassification error.

## R15 in ascending order

| S.N. | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| 1 | -0.9* | -0.81* | -0.05* | -0.44* | -1.08* |
| 2 | -0.06* | -0.09* | -0.02* | -0.10* | -1.08* |
| 3 | -0.02* | -0.07* | 0.006* | -0.06* | 0.01* |
| 4 | -0.007* | -0.03* | 0.006* | -0.05* | 0.04* |
| 5 | 0.003* | -0.02* | 0.009* | 0.011* | 0.05* |
| 6 | 0.003* | -0.02* | 0.05* | 0.011* | 0.06 |
| 7 | 0.01* | -0.006* | ➡ 0.05* | ➡ 0.03* | 0.07* |
|  | ➡ 0.01* |  |  |  | ➡ |
| 8 |  | 0.003* | 0.07 | 0.04 | 0.08* |
| 9 | 0.02 | 0.003* | 0.11 | 0.06* | 0.09 |
| 10 | 0.02* | ➡ 0.01* | 0.13 | 0.08 | 0.09 |
| 11 | 0.06 | 0.02 | 0.21 | 0.12 | 0.2 |
| 12 | 0.06* | 0.07 | 0.25 | 0.14* | 0.2 |
| 13 | 0.14 | 0.13 | 0.26 | 0.14* | 0.21 |
| 14 | 0.16 | 0.17 | 0.27 | 0.21 | 0.22 |
| 15 | 0.18 | 0.2 | 0.33 | 0.25 | 0.23 |
| 16 | 0.2 | 0.2 | 0.34 | 0.26 | 0.23 |
| 17 | 0.21 | 0.25 | 0.71 | 0.28 | 0.31 |
| 18 | 0.32 | 0.31 | 1.12* | 0.33 | 0.71* |
| 19 | 0.34 | 0.37 | 1.61* | 0.33 | 0.71* |
| 20 | 0.53 | 0.65 | 1.61* | 0.43 | 1.12* |
| M.E. | 2 | 0 | 3 | 3 | 4 |
| M.E.% | 10% | 0% | 15% | 15% | 20% |

Note: * Shows Sick companies

➡ Shows least error cut off point

M.E. – Misclassification Error

By observing table no: 4.33 we can see that the misclassification error in the year 2004 is 10% and then it decreased to 0% that is lowest as compared to all the sample year. Therefore, we can say that predictive power of return on shareholders equity ratio is highest in the year 2005. The predictive power of return of shareholders equity is lowest in the year 2008 among all the sample year. In this year, the misclassification error is 20%.

## 4.5.1 Comparison of the predictive power of various profitability ratios

With the help of the major findings of table, no 4.26 to 4.33 we can compare the predictive power of liquidity ratio. Major findings of above tables are summarized in table no 4.34

**Table No: 4.34**

**Percentage error of classification error of various Leverage ratios from year 2004 to 2008**

| Year | R12 | R13 | R14 | R15 |
|------|-----|-----|-----|-----|
| 2004 | 5% | 16% | 20% | 10% |
| 2005 | 0% | 11% | 10% | 0% |
| 2006 | 10% | 15% | 30% | 15% |
| 2007 | 10% | 25% | 30% | 15% |
| 2008 | 30% | 35% | 25% | 20% |
| **Average** | **11%** | **20.40%** | **23%** | **12%** |

The above table no 4.34 shows that in the year 2004, R12 has highest predictive power and R15 comes in second place. R14 has lowest predictive power than others have due to the high percentage error of classification error. In the year R12 and R15 have highest predictive power than R13 and R14. Predictive power of R12 and R15 is very high in this year because misclassification error is zero. According to their predictive power, R14 comes in second position and R13 comes in third position. Similarly, in the year 2006 R12 has highest and R14 has lowest predictive power. Above table no 4.34 shows that the predictive power of R12 is highest and R14 is lowest in the year 2007. In this year R15 comes in second position according to their predictive power. In the final sample year 2008, the predictive power of R15 is highest among all profitability ratios.R14 comes in second place and R13 comes in last position.

The above table no 4.34 shows that average percentage error of misclassification of R12 is only 11%.Similarly, R15 has 12%, R14 has 23% and R13 has 20.40%. Therefore, we can conclude that the predictive power of R12 is highest among all activity ratios because R12 has lowest percentage of misclassification error. R14 has lowest predictive power among all other liquidity ratio due to the highest average percentage error of

misclassification error. R15 comes in second place and R14 comes in third place according to their predictive power. Therefore, we can say that Net profit margin (R12) is the best ratio among all liquidity ratios and it can predict about future more accurate than others can.

## 4.6 Top Seven Ratios According to their predictive power

| S.N. | Ratio | Symbol | Average percentage error (%) |
|------|-------|--------|------------------------------|
| 1 | Interest Coverage Ratio | R6 | 7.40 |
| 2 | Net Profit Margin Ratio | R12 | 11 |
| 3 | Return on Shareholders Equity | R15 | 12 |
| 4 | Return on Total Assets | R13 | 20.40 |
| 5 | Return on Capital Employed | R14 | 23 |
| 6 | Capital Employed Turnover Ratio | R10 | 24 |
| 7 | Debt to Equity Ratio | R4 | 28 |

*\* based on above analysis and findings (from table no 4.1 to 4.34)*

The above table shows that the top seven ratios according to misclassification error and their predictive power. By observing above table, we found that interest coverage ratio (R6) has highest predictive power ratio among all 15-sample ratios because average percentage error of misclassification error of R6 is only 7.40%. Then net profit margin lies in second position and return shareholders equity is in third position according to their predictive power .similarly, debt equity ratio is in seventh position.

After analyzing all above findings, we can clearly identify the ratios with least predictive power. These ratios are fixed assets to current assets ratio (R7) and fixed assets turnover ratio (R8). The average percentage error of misclassification error of R7 and R8 is 35% that is higher than all other sample ratios.

# CHAPTER V
# SUMMARY, CONCLUSION AND RECOMMENDATION

## 5.1 Summary

Nepal is one of the least development countries. According to the UN, per Capita income of Nepalese people is very low. Most of the Nepalese people depend on agriculture which is heavily dependent on monsoon rain. Mass poverty and unemployment are rampant. Therefore, economic growth rate is decreasing every year. In under developed country like Nepal, industrialization is necessary form various point of view. But the situation of industrial sector in Nepal is very poor, in order to develop industrial sector a huge amount of investment is needed, but government of development country has lack of sufficient amount to invest industrial sector. As a result, most of the Nepalese companies especially in government sector are financially distressed. In order to overcome this situation proper projection, evaluation and investment is needed. Therefore, this study helps the investors to find out which ratio is the best one and predict the future trend.

The problem of the financial distress is very high in developing county as well as developed country, so it is very necessary to find out the future trend. Ratio analysis is popular, widely used tool for the analysis of financial performance.it is used for the analysis of stock, creditors, and soon, ratios are relationships, expressed in mathematical terms between figures which have a cause and effect relationships or which are connected with other in some other manner. With the help of ratio analysis we can judge the companies efficiency, point out the weaknesses, we can also compare company efficiency to another company so that we can forecast the future, make a plan and takeacorrectiveactions.in other words we can predict about the future. Although, ratio can be used for the prediction of the future trends they are not free from limitations like limited used of single ratio, difficult to interpret, ignored qualitative factor, limitation of accounting records ,arithmetical window dressing etc. Besides these all limitations the stock analysis, investor and credit analysis used it for the prediction purpose and to some extent, the prediction is correct. We also found that two decades different technique and models have been developed to evaluate predictive power of financial ratios and financial distress. Some of them are:

- ➢ Miller's Cause-and-effect analysis
- ➢ Univariate model
- ➢ Beaver's approach
- ➢ Willer's Gambler's Ruin approach
- ➢ Zeta model
- ➢ L.C. Gupta's relative earning models
- ➢ Multivariate models

This study is conducted in the context of Nepal. For our study purpose, financial ratios are applied to find out their predictive power dividing into four major groups. They are:

- ➢ Liquidity Ratio
- ➢ Activity Ratio
- ➢ Leverage Ratio
- ➢ Profitability Ratio

This analysis based on total 20 companies and corporations, (both from public & private sector and manufacturing and non-manufacturing sector), are divided into sick and non-sick group based on their financial performance of last 5 years. Financial statement and necessary data of these companies and corporations are taken from the website of Nepal stock exchange and annual report published by finance ministry of Nepal. After the completion of the study, this study evaluates the predictive power of financial ratio assuming that the ratio, which has the least percentage of the misclassification error, is the best ratio. This study also concludes that ratio has predictive power, they predict about the future trend, and recommends to others calculate similar type of the study in regularly basis in the future to find out the future trend.

## 5.2 Conclusion

This study is focus on predictive power of financial ratios and the best ratios among four major ratios. The major conclusions of this study during the study period from 2004 to 2008 have been presented as under.

### 5.2.1 Liquidity ratios and their predictive power

Three major liquidity ratios i.e current ratio, quick ratio and net working capital ratio are taken to test the power of liquidity ratio. Liquidity ratios are useful to indicate the ability of the company and these ratios provide the information about the liquidity position of a company by establishing a relationship between cash and other current assets .This analysis shows that current ratio has highest predictive power than quick ratio and net working capital ratio. That means current ratio predict about the future more accurate than other two ratios. The predictive power of quick ratio and networking capital ratio is same.

### 5.2.2  Leverage Ratios and their predictive power

Leverage ratios are also called long-term solvency ratio or capital structure ratios. These ratios are computed to measure of the company's ability to meet its long-term obligation. We have taken four major leverage ratio to test their predictive power. These are debt to equity ratio, debt to total assets ratio, interest coverage ratio and fixed assets to current assets ratio. With the help of above findings, we can conclude that interest coverage ratio is the best ratio according to their predictive power. This ratio has highest predictive power among all 15-sample ratios. Interest coverage ratio can predict the future more correct than other ratio. Similarly, debt to equity ratio stands in second position and debt to total assets ratio stands in third position according to their predictive power. The predictive power of fixed assets to current assets ratio is lowest than all other leverage ratios  as well as all other sample ratio.

### 5.2.3  Activity Ratios and their predictive power

Activity ratios are also called turnover ratio or efficiency ratios. Activity ratios established a relationship between sales and assets. This ratio is very useful for creditors and owners to generate sales and profit from their investment. Fixed assets turnover ratio, total assets turnover ratio, capital employed ratio and current assets turnover are taken to our study purpose. Among them capital employed turnover ratio has highest predictive power. It can predict the future more accurate than other activity ratio. By observing above analysis and findings we can conclude that total assets turnover has second highest predictive power and current assets turnover ratio is in third position. Similarly, fixed assets turnover has lowest predictive power than other all activity ratios. This ratio is ratio

with lowest predictive power among all sample ratios. That means fixed assets turnover ratio cannot predict correctly than all other ratios can.

## 5.2.4 Profitability Ratios and their predictive power

Main objective of a company is to earn profit; therefore, profitability shows the overall efficiency of the company. Profitability ratios are the measures of its overall efficiency. Four major profitability ratios are selected to test their predictive power. By observing above analysis, we found that net profit margin has highest predictive power than other profitability ratio and it predict about the future more correctly than other profitability ratio can. Return on capital employed has second highest predictive power and return on total assets is in third position according to their predictive power. Similarly, return on shareholders equity has lowest predictive power and this ratio is less efficient for prediction purpose.

## 5.2.5 Ranking of selected ratios according to their predictive power

By the help of major finding of this study, we can rank the selected ratios according to their predictive power. Fifteen different ratios are taken for our study purpose and the ratio, which has the highest predictive power among all selected ratio, is placed in $1^{st}$ position. Similarly, ratio having lowest predictive power placed in last position. Interest coverage ratio has highest predictive power among all ratios therefore it placed in fist position and fixed to current assets ratio and fixed assets turnover ratio are placed in last position.

| Numbering of the Ratios | Ratios | Rank |
|---|---|---|
| R6 | Interest Coverage Ratio | $1^{st}$ |
| R12 | Net Profit Margin Ratio | $2^{nd}$ |
| R15 | Return on Shareholders Equity | $3^{rd}$ |
| R13 | Return on Total Assets | $4^{th}$ |
| R14 | Return on Capital Employed | $5^{th}$ |
| R10 | Capital Employed Turnover Ratio | $6^{th}$ |
| R4 | Debt to Equity Ratio | $7^{th}$ |
| R1 | Current ratio | $8^{th}$ |

| R9 | Total assets Turnover Ratio | 9th |
|---|---|---|
| R2 | Quick ratio | 9th |
| R3 | Net Working Capital Ratio | 9th |
| R5 | Debt to Total Assets Ratios | 10th |
| R11 | Current Assets Turnover Ratio | 11th |
| R7 | Fixed Assets to Current Assets Ratio | 12th |
| R8 | Fixed Assets Turnover ratio | 12th |

## 5.2.6 Group wise Most efficient ratio according to their predictive power

➢ Among all liquidity ratios current ratio (R1) is the most efficient ratio. Average percentage error of misclassification of R1 is only 29%.

➢ In the leverage ratio group, interest coverage ratio (R6) is the most efficient ratio. Interest coverage ratio has highest predictive power among all sample ratios.

➢ Among all the activity ratios, capital employed turnover ratio is the best one because of low percentage of classification error as compared to other activity ratios.

➢ As compared to other profitability ratio, Net profit margin (R12) is the most efficient ratio. The average percentage error of misclassification of R12 is only 11%.

### 5.3 Recommendation

The following recommendations are forwarded by the helps of major findings of the study.

➢ In this study, both manufacturing and non-manufacturing companies, form private and government sector are selected. So concerned parties are advice to select the companies from the same group rather than mixed group.

➢ It is recommended to other researcher that tests the predictive power of financial ratios of same sector instead of mixed group. That means one can conduct this study from either manufacturing companies (both from government and from non-government sector) or non-manufacturing companies (from both government and non-government).

- Further researcher requested to take more companies and more year data to achieve best result.
- Predictive power of financial ratios is affected by various factor like economic condition, time factor, government policies and objective of the firm that why result obtained from one study may different from other. So it is recommended to conduct this study with considering this factor to achieve reliable result.
- Further researcher can conduct this type of study to test the predictive power of single categories of ratio like liquidity ratio, leverage ratio, activity ratio and profitability ratio rather than all categories. In another words researcher may test the predictive power of liquidity ratio or leverage ratio and so on.
- It is advice to further researcher to use different type of predictive model i.e. Beaver's approach, zeta model, multivariate models etc to get the best result.
- It is advice to test the predictive power of the same ratio of same sector government and non-government companies.
- Financial experts, financial executive, professional shareholders etc are requested to pay attention towards these types of studies.

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