

**CAPITAL STRUCTURE MANAGEMENT OF NABIL BANK  
LIMITED AND SIDDHARTHA BANK LIMITED**

**by:**

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## **RECOMMENDATION**

This is to certify that the thesis

Submitted by

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**Entitled**

**Capital Structure Management of NABIL Bank Limited and Siddhartha  
Bank Limited**

has been prepared as approved by this department in the prescribed format of  
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## **VIVA-VOCE SHEET**

We have conducted the Viva-Voce examination of the  
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and found the thesis to be the original work of the student and written according  
to the prescribed format. We recommended the thesis to be accepted as partial  
fulfillment of the requirement for

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## **DECLARATION**

I hereby declare that the work done in this thesis entitled "Capital Structure Management of NABIL Bank Limited and Siddhartha Bank Limited" submitted to Saptagandaki Multiple Campus, Faculty of Management, Tribhuvan University is my original work. It is done in the form of partial fulfillments of the requirement of the degree of Master of Business studies (M.B.S.) under the supervision of Mr. Kapil Dev Subedi, Lecturer of Saptagandaki Multiple Campus.

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Date: September, 2012

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## LIST OF ABBREVIATIONS

A.D.	:	Anno Domini/After Death
ABBS	:	Anywhere Branch Banking System
ADB	:	Agricultural Development Bank
AGM	:	Annual General Meeting
ATM	:	Automated Teller Machines
B.S.	:	Bikram Sambat
C.V.	:	Coefficient of Variation
CAR	:	Capital Adequacy Ratio
CE	:	Capital employed
DER	:	Debt Equity Ratio
DFL	:	Degree of Financial Leverage
DOL	:	Degree of operating Leverage
EBL	:	Everest Bank Limited
EBT	:	Earning Before Tax
EPR	:	Earning Power Ratio
EPS	:	Earning per Share
FD	:	Fixed Deposit
FY	:	Fiscal Year
HBL	:	Himalayan Bank Limited
IDC	:	Industrial Development Centre
JVBs	:	Joint Venture Banks
Ltd.	:	Limited
MBS	:	Masters of Business Studies
MOF	:	Ministry of Finance
NABIL	:	NABIL Bank Limited
NBBL	:	Nepal Bangladesh Bank Limited
NBL	:	Nepal Bank Limited
NEA	:	Nepal Electricity Authority
NEPSE	:	Nepal Stock Exchange

NGO	:	Non-Government Organization
NIBL	:	Nepal Investment Bank Limited
NIDC	:	Nepal Industrial Development Corporation
NOI	:	Net Operating Income
NPA	:	Non-Performing assets
NRB	:	Nepal Rastra Bank
NTC	:	Nepal Telecom
NW	:	Net Worth
P.E.	:	Probable Error
RBB	:	Rastriya Banijya Bank
ROA	:	Return on Assets
ROE	:	Return on Equity
S.D.	:	Standard Deviation
SBL	:	Siddhartha Bank Limited
TD	:	Total Debt
UAE	:	United Arab Emirates
USA	:	United states of America

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

Capital structure management plays vital role in a real life of an organization. Organization whether they are government owned or privately owned, have to make pertinent capital structure decision in identifying exactly how much capital is needed to run their operation smoothly. Generally fund is acquired by the firm in two way equity and debt. Equity provides the ownership to the shareholders. On the other hand, the debt or borrowed fund has a fixed charge irrespective to the earnings of the firm and firm has to pay fixed charge periodically to the debt provider. The collected capital may be big or small in amount which builds up the financial power it would be worthy and productive if such amount is collected from various people are utilized in proper way.

Capital structure is different from financial structure as financial structure includes both long term and shot term sources of financing. Thus, a firm's capital structure is only a part of its financial structure. Thus, the financial structure shows the true picture of organization. It reflects out of short term obligation and long term sources of fund of the company. Different factor such as sale stability assets structure operating leverage, growth rate, profitability, taxes management attitude, lender attitudes, market condition, legal requirement etc. should be taken into consideration while designing the capital structure.

The success and failure of the industry mainly depends, the ability of the top management and make appropriate capital structure management. One of the most perplexing issues facing financial managers is to relationship between capital structure and stock price. How much debt financing, as opposed to equity financing should a firm use? Should different industries and different firms within industries have different capital structures and if so what are the factors that lead to these differences? (Brigham et.al., 1999, p. 251) studied capital structure which leads to the following conclusion:

1. There exists an optimal capital structure, or at least an optimal range of structure, for every firm.

2. However, financial theory is not powerful enough at this point to locate a firm optimal capital structure with precision.
3. The capital structure is not set in isolation; rather it depends on a set of factors. Which include the firm's dividend policy, its capital investment opportunities, and investor's preferences for different types of securities at each point in time?

Capital structure is concerned with the management of liabilities side of the balance sheet. It refers to the way the firm's assets are financed with. Prudent financial structure design requires answers to the following questions:

1. What should be the maturity composition of the firm's sources of funds?
2. In what proportions relative to should the various forms of permanent financing be utilized?

The first question refers to the division of short-term and long term funds, which is turn is decided by assets structure of the firm. The second question refers to the ratio of debt, preferred stock and equity to total assets, which implies capital structure management. The important aspect of capital structure management is to find out the proper mix that will maximize market price of share or minimize composite cost of capital. The proper mix is known as optimal capital structure.

Within a period of two and half decades, the Nepalese financial system has grown significantly both in terms of business volume and size of assets and market. The period show a number of financial institutions coming into existence with varied rapture of operations and offering a wide range of financial service. Since the second half of the 1980, significant achievement have been made in Nepalese financial system in mid July 2007, the Nepalese financial comprised the commercial banks, development banks, cooperatives, non-government organizations and some non banking financial institutions. Commercial banks, development banks, cooperatives and non-government organization licensed to carry out limited banking business come under the regulatory and supervisory jurisdiction of NRB.

## **1.2 Statement of the Problem**

Business accepts various types of deposits from the general public and lend them to various sectors for generating some return at the same time assuming some level of risk associated with the specific sector. This means risk and return runs both way. To

minimize risk for a given level of return and/or to maximize return for a given level of risk, banks have to manage their optimum capital structure. But in case of our country Nepal, banks are not paying enough attention towards this fact. The two oldest government involved banks (Nepal Bank Ltd and Rastriya Banijya Bank Ltd) face loss despite their strong capital and deposit base is due to the lack of their capability in capital structure management. In other words the reason behind the weak financial position of these banks is the inability of their proper management of capital structure, which causes higher cost of fund. The matter of assisting in economic growth of the country by these banks is far away from the reality in this context of being burden to themselves with the proposition of non performing loan about 20% of their total loan portfolio. Meanwhile the authorities are also going on with their campaign to bring these two largest and oldest banks of the country back to their health.

Other commercial banks are also not showing enough consciousness towards the capital structure management. Every bank seems to go after a few lucrative business sectors or business houses and go for under price war. This has disproportionately benefited a few business people at the cost of a larger section of the population. The risk return trade off has not been properly analyzes before making capital proportion, which has resulted the higher cost of fund then the acceptable level and is in comparatively increasing trend. Current situation of banking sector shows the growth of non performing assets (NPA) has been faster than the growth of credit due to the higher cost of fund and poor management of loan.

Since a few years back, the trend of launching joint venture banks seems stopped and also reversed. Some of the foreign banks have withdrawn their investment from Nepal. Certainly the withdrawal of foreigners is as the result of some anomalies in Nepali banking sector irrespective of what the withdrawing foreign bank would say officially to the Nepali authorities and/or the general public. If such situation of short sightedness prevails for longer, Nepalese banking sector may fail into the crisis as in East Asia and Argentina in past and even the public deposits made in these banks may be unsecured. To avoid such potential crisis the concerned authority (i.e. Nepal Rastra Bank and the commercial banks themselves) have to pay their proper attention in their capital structure management. Rare researches made regarding this issue also indicate the less perceived importance for such a sensitive fact.

The main attempts of this study will be to answer the following questions:

- a. How far have NABIL Bank Ltd. and Siddhartha Bank Ltd (SBL) been able to maintain the optimum capital structure?
- b. How far NABIL and SBL are able to generate the income from utilization of debt efficiently?
- c. What are the factors affecting financial efficiency?
- d. To what extent the investors of these banks are getting benefits from its current operation?
- e. What is the actual overall financial condition of these banks?
- f. What is the correlation between risk and return of the bank?
- g. Is there proper capital structure management in the banks under study?

### **1.3 Objective of the Study**

The main objective of the study is to highlight the comparative study of capital structure and its impact upon overall banks performance of these two commercial banks. The optimum capital structure maximizes the valuation of the banks and minimizes the overall cost of capital. Besides this following are also special objectives of the study.

- a. To examine comparative position in capital structure between two banks.
- b. To analyze the various sources of capital and their cost.
- c. To examine the relationship between operating profit and interest expenses to measure the debt service capacity of the banks.
- d. To analyze the return on capital in relation to capital employed.
- e. To examine capital structure.

### **1.4 Significance of the Study**

The financing sector of Nepal is expanding day by day. In recent days, the nation is facing with lot of obstacle. In this situation the manufacturing and trading sector is also running slowly, beside that, banks are increasing and they expanding their market. So the Capital is essential. Capital is a backbone of every organization. Various factors affect the capital structure. Stability and growth rates, cost of capital,

management attitude, taxes, investment opportunity, control and flexibility etc. This study will be helpful to the company's overview to their capital structure management and to formulate future strategies to do much better in their horizon.

So capital structure is an essential indicator of a company's financial decision making. It is the large extent determinant of the company's profitability. This study will provide a useful feedback to academic institutions, bank employees, trainees, investors, policymaking bodies and those concerned with banks in the formulation of appropriate strategies for improving the performance of banks.

Since from past few years, the situation of the country is deteriorating day by day. Uncertainty and fear have bounded every sector of the economy. Every year the government is assigning fewer funds for development purposes. This has seriously hit not only the economic growth of the country but also the investment environment in the country. So being active members of the country, commercial banks of Nepal are also affected by this situation. On this ground, management of banks should have to think precisely before making any investment. Therefore, all these events have raised the necessity for formulating sound capital structure policy.

To judge the long term financial position of the firm's capital structure should be analyzed. Capital structure analysis would help to indicate and to follow the appropriate mix of debt and owners equity in financing the firm's assets. A firm having good return and efficient management is considered to be better and bright in the future. Therefore to this significance on account, this study on behalf of the firm's capital structure is justified as a specific subject matter. In addition this study helps to specify the entire glory of commercial banks in Nepal taking these two banks (NABIL Bank Ltd. and Siddhartha Bank Ltd.) on an average. It helps to show the strength and weakness of these two banks. Similarly it helps to show the financial healthiness to its investors and at the same time to the concerned stakeholders.

### **1.5 Justification of the Study**

This study is concerned with the capital structure management of NABIL Bank Limited and Siddhartha Bank Ltd.

As very rare researches have been performed regarding this issue it is expected that this study will significantly contribute towards the field of capital structure.

The banks capital structure should be managed in such a way that the fund could be provided efficiently and effectively. The goal of the study is to examine the efficiency and the performance of these two banks management and reflected in the financial records and reports. Especially the following points justify the study.

- a. The study makes me to specify the entire glory of these two commercial banks especially in the sector of capital structure.
- b. This study focuses on these two banks regarding capital structure, its appraisal and analysis as comparative case study. It helps to find out which bank is showing comparatively performance. It helps to indicate strengths and weakness of these banks especially in the sector of capital structure.
- c. The study will help to show the financial position of the banks to the investors as a social work point of view and at the same time to the concerned management as management finance student point of view.
- d. Optimum capital structure is the secret of success of the banks. Due to the lack of sound capital structure many organization are facing the failure in Nepal so this study will contribute to help NRB to develop policy guidelines regarding capital adequacy norms.
- e. This study will also helpful to depositors, lenders, borrowers, management, Shareholders and customers of the banks under research.

### **1.6 Limitations of the Study**

Every works have been its own restriction and limitation due to the lack of time, resources and knowledge the work is completed within the periphery of its limitation. Despite ample efforts on the part of the researcher this study is not free from limitation. This study also will have some limitations which will be as follows:

- a. This study is based on secondary data. Thus the result of the analysis depends on accuracy of available information.
- b. The study covers only the latest five fiscal years from 2007/08 to 2010/11.
- c. The study is mainly conducted on the basis of secondary sources of data eg. Annual reports of various banks, NRB and governments publications and other related journals, the primary data will be included where matters.

- d. The study only covers the capital structure management only NABIL Bank Limited and Siddhartha Bank Limited.
- e. Standard normal performance level is not available as benchmark, especially in Nepalese context. So interpretations of data depend upon judgment.

### **1.7 Organization of the Study**

The study has been organized into five chapters as per Tribhuvan University's prescribed specimen of master thesis. Each devoted to some aspects of the study of capital structure of these two commercial banks in Nepal. The titles of each of these chapters are as follows:

**Chapter I: Introduction-** This chapter contains the introductory part of the study where the general backgrounds of the study the major issues to be investigated and the objectives of the study were presented.

**Chapter II: Review of Literature-** This chapter is concerned toward the review of literature of related studies. It contains conceptual framework, major studies in general and reviews of major studies in Nepal.

**Chapter III: Research Methodology-** This chapter describes the research methodology employed in the study. It includes the research design, nature and source of data selection or enterprises, method of analysis, use of statistical tools. Limitations of the study and the definitions of the used terms.

**Chapter IV: Data Presentation and Analysis -** This chapter deals with the presentation and analysis of data. It consists of analyzing of capital structure of these two commercial banks in Nepal.

**Chapter V: Summary, Conclusions and Recommendations-** This chapter states summary and conclusion of the study. Also presents the major findings compare them with theory and other empirical evidence to the extent possible. The bibliography and appendixes have been incorporated at the end of the study.

## **CHAPTER TWO**

### **REVIEW OF LITERATURE**

This chapter deals with review of literature. Review of literature means reviewing research studies or other relevant propositions in the related area of the study so that all the past studies, their conclusions and deficiencies may be known and further research can be conducted. Since completely new and original problems are rare it is necessary to show how the problem under investigation relates to previous research works done under similar topic, however a previous study not be exactly replicated. It is believed that the review of literature is literature which is helpful to show the needs of the research work and to justify the work. It tries to clear the conceptual thought and bank related terms. So this chapter has been organized through the study of different books; articles published in journals and master's level thesis as below:

Conceptual Framework

Review of Related Studies

Review of Thesis

#### **2.1 Conceptual Framework**

This section is devoted to discuss briefly about the theoretical concept regarding the theories of capital structure.

##### **2.1.2 Concept of Capital Structure**

Before knowing the capital structure, we must know about the financial structure. Financial structure refers to the way the firm's assets are financed. Financial structure is represented by the liabilities side of the balance sheet. It includes short-term debt and long term debt as well as shareholders equity. Shareholders equity includes common stock, paid-in or capital surplus, different kinds of reserves and accumulated amount of retained earning.

Capital structure or the capitalization of the firm is the permanent financing. It includes long term debt, preferred stock and shareholders equity. Thus a firm's capital structure is only a part of its financial structure. The determination of the degree of liquidity of a firm is not a simple task. In the long run, liquidity may depend on the profitability of a firm, but whether it survives to achieve long run profitability

depends to some extent on its capital structure. This term includes only long-term debt and total stockholders investment. Some companies do not plan their capital structure, and it develops as a result of the financial decision taken by the financial manager without any formal planning.

These companies may prosper in the short run but ultimately they may face considerable difficulties in raising funds to finance their activities. With unplanned capital structure, these companies may also fail to economize the use of their funds. Theoretically, the financial manager should plan an optimal capital structure for his company. The optimal capital structure is obtained when the market value per share become maximum. In practice, the determination of an optimal capital structure is a formidable task, and one has to beyond the theory.

There are significant variations among industries and among individual companies within any industry in terms of capital structure. Since a number of factors influence the capital structure decision of a company, the judgment of the person making the capital structure decision plays a crucial part. These factors are highly psychological, complex and qualitative and do not always follow accepted theory, since capital markets are not perfect and the decision has to be taken under imperfect knowledge and risk.

Capital structure planning is a key to the objective of profit maximization ensures minimum cost of capital and the maximum rate of return to equity holders. The amount of capital a firm need is not its only financial consideration and equally important is the capital mix; the kind of capital that form the company's financial base. How much will be the equity money representing funds owned by the stockholders in the enterprises? How much will be borrowed? How much will be raised by other means? A financial manager determines the mix of debt and equity securities, which would maximize the value of the equity stock. To maximize the shareholders' wealth as well to minimize the opportunity cost of capital optimal capital structure is required. Debt is an important part of capital structure and determines the leverage of the firm. It is two-edged sword. It increases shareholders return when the firm has high operating income, but makes them worse than they otherwise would be when the firm has low operating income.

Capital means money or fund in the dictionary. Without capital no one can do any thing. The capital has both features of risk as well as return. So optimal capital mix is required to obtain high return in tolerable amount of risk. And management of this optimal capital mix is called capital structure management. Capital rises from debenture, long-term debt, preference shares, equity raises, short-term debt including retained earning, reserve and surplus also. Every types of fund have risk. They require different rate of return. Common stock is riskier and it require higher rate of return. Preference shares are riskier than debt. So, its required rate of return will be higher than that of debt.

Therefore it is necessary that the firm should make a portfolio of such types of capitals, which results higher return with low cost of capitals. The firm should also able to generate at least sufficient cash flow to pay investors and creditors (i.e. shareholders, preference shareholders and debt holders). So the firm should yield more cash flow than to just satisfy the investor's expectation to maximize shareholders wealth. And the firm should try to obtain necessary funds in lowest cost as soon as possible.

The cost of capital will depend upon the proportion of capital (debt and equity) when capital structure is optimal it gets optimal risk which makes entrepreneurs capable to hold the market in this competitive business environment for long period. On the basis of priority to achieve the money in the liquidation of the firm long-term debt get first priority, short term debt get second priority, preference share get third priority and equity share get last priority. The capital structure should be planned generally keeping in view the interest of the equity shareholders and the financial requirement of a company. However the interest of other groups, such as employees, customers, creditors, society and government, should also be given reasonable consideration. The management of a company may fix its capital structure near the top of this range in order to make maximum use of favorable leverage, subject to other requirements such as flexibility, solvency, control and norms set by the financial institutions, the Security Exchange Board of Nepal and stock exchanges.

“The firm’s mix of different securities is known as capital structure. The choice of capital structure is fundamentally a marketing problem. The firm can issue dozen’s of various securities in countless combination but it attempts to find the combination which maximizes its overall market value” (*Bearly and Mytes, 1994: 397*).

“The two principal sources of long term financing are equity and debt capital. The composition of these two long term financing is known as capital structure. Under normal economic condition, the earnings per share can be increased using higher leverage. But leverage also increases the financial risk of the share holder” (*Gautam and Thapa, 2060: 223*).

“Different sources of financing are used to finance current and fixed assets. The sources of financing may be short-term and long-term, but they are usually grouped into debt and equity which characterized the firm’s capital structure” (*Pradhan, 1996:356*).

A distinction is usually made between financial and capital structure. Financial structure refers to all sources, both short and long term that are used to finance the entire assets of a firm, Where as capital structure is taken as the capitalization part of a firms total financing which includes only the long term sources such as long term debt and equity. Thus, the capital structure is a part of the financial structure. “The composition of capital structure could differ from company to company which is directly guided and controlled by management of the company. However a reasonable satisfactory capital structure can be determined considering relevant factors and analyzing the impact of alternative financing proposals on the earning per share” (*Chandra,1985:176*).

“The capital structure is the combination of long-term debt and equity. It is a part of financial structure i.e. comprised to the total combination of preferred stock, common stock, long term debt and current Liabilities. If current Liabilities are removed from it we get capital structure” (*Mathur, 1979:92*).

One of the financial manager’s principal goals is to maximize value of firm. For this purpose the firm should select a financial mix (Financial leverage), which will help in achieving the objective of financial management with a view to, maximize the value of share. In order to attain this business goal, firm should select an appropriate capital structure. Given the objective of the firm to maximize the value of equity share, the firm should select a financial mix which helps in achieving the objective of financial management. “If the capital structure decision affects the total value of the firm, a firm should select such a financial mix as will maximize the shareholders wealth.

Such a capital structure is referred to as the optimum capital structure” (*Khan and Jain, 1995: 473*).

“An optimum capital structure would be obtained at the combination of debt and equity that minimizes the weighted average cost of capital” (*Pandey, 1995:11*).

“Optimum capital structure can be defined as that mix of debt and equity this will maximize the market value of company. If such an optimum does exist it is two fold. It maximizes the value of company and hence the wealth of its owners; it minimizes the company's cost of capital which in turn increase its ability to find new wealth creation investment opportunities” (*Solman, 1969:92*).

“Capital structure is the permanent financing of the firm represented primarily by long term debt, preferred stock and common stock, capital surplus and accumulated retained earnings” (*Weston and Brigham, 2004:434*).

“Capital structure is defined as the composition of a firm’s long term financial represented by its long-term debt, preferred stock and common stock. When current liabilities are included, the total generally is called financial structure” (*Henderson, Trennepehl and Wert, 1984:434*).

“Leverage and capital structure are closely related concepts linked to cost of capital and therefore capital budgeting decision. Leverage results from the use to fixed-cost assets of tend to magnify return to the firm's owners. Changes in leverage result in changes in level of return and associated risk. Generally increase in leverage result in increase in return and risk, where as decrease in leverage result in decreased return and risk. The amount of leverage in the firm’s capital structure the mix of long term debt and equity maintained by the firm, can significantly affect its value by affective return and risk. Because of its effect on value, the financial manager must understand how to measure and evaluate leverage when attempting to create the best capital structure” (*Gitman, 1988:43*).

“Financial leverage generally raises expected EPS, but it also increases the risking of the firm’s securities. Because the risk its stock and bonds increases as the debt/assets ratio rises, so do the interest rate in debt and the required rate of return on equity Thus, leverage produces two opposing effects: higher EPS which leads to a higher stock price, but increased risking which depresses stock price. There is, however, a debt/assets ratio that strikes an optimal balance between these opposing effects; this

ratio is called optimal capital structure, and it is the one that maximizes the price of the firm' stock" (*Brigham, 1980:341*).

Thus the capital structure management means the appropriate mix of long-term capital and short-term capital, which gives the company sufficient profit. Optimal capital structure has certain risk and appropriate return. This is done by a good management. In this study, one gets certain question, which is, how much debt is appropriate varies company to company as well as firm to firm. In this reference, Prasanna Chandra has given the following suggestion in tanning the capital structure for establishing new company.

- a. The debt-equity ratio does not exceed 2:1 for large capital-intensive projects a higher debt-equity ratio of 4:1 or even 6:1 may be allowed. (Debt for this purpose is defined as long-term debt plus preference capital, which is redeemable after 12 years)
- b. The ratio of preference capital to equity does not exceed 1:3
- c. Promoters hold at least 25% of the equity capital.

The factors listed above given information's to the financial manager should adhere in proper maximizes the value and minimizes the overall cost of capital of the firms. There are four-dimensional lists when thinking about capital structure decision.

**(I) Taxes:** - If a company is a tax-paying entity, the increase in leverage reduces the income tax paid by the company and increases the tax paid by the investors. If the company has a large accumulated loss; an increase in leverage cannot reduce corporate tax, but does increase personal taxes.

**(II) Bankruptcy Cost:** - With presence of bankruptcy cost, financial distress is costly other things equal, distress is more likely for the firms generally issue less debt.

**(III) Assets Type:** - The cost of distress is likely to be greater for firms whose value depends on growth opportunity or intangible assets. These firms are likely to pursue more profitable opportunities and if default occurs, their assets may erode rapidly. Hence, firms whose assets are weighted forward intangible assets should borrow significantly less on average their holding assets they can kick.

**(IV) Financial Slack:** - In the long run, a company's value rests more on its capital investment on operating decisions than on financing. Therefore, you need to make

sure that your firm has sufficient financial slacks, so that financing is quickly accessible when good investment opportunity arises. Financial slack is most valuable to firms that have able positive NPV growth opportunity. That is another reason why growth company usually sticks to conservation capital structure.

### **2.1.2.1 Assumptions of Theories of Capital Structure**

In order to grasp, the capital structure and the value of the firm on the cost of capital controversy properly we make the following assumptions:-

- a. Firms employ only two types of capital debt and equity.
- b. The total assets of the firms are given. The degree of leverage can be changed by selling debt to repurchase shares or selling shares to retire debt.
- c. Investors have the same subjective probability distributions of expected future operating earnings for a given firm.
- d. The firm has a policy of paying 100% dividends.
- e. The operating earnings of the firm are not expected to grow.
- f. The business risk is assumed to be constant and independent of capital structure.
- g. The corporate and personal income taxes do not exist. This assumption is relaxed later on.

In the theoretical analysis of capital structure one shall use the following symbols.

B = Total market value of debt

S = Total market value of stock

V = Total market value of firm (B+S)

$K_e$  = Equity capitalization rate

$K_d$  = Cost of debt/yield on debt

$K_o$  = Overall capitalization rate

I = Total amount of capital interest

EBIT or NOI = Earning before interest & taxes or net operating income.

$$1. \text{ Cost of debt } (K_d) = \frac{\text{Interest}}{\text{Debt}} = \frac{I}{B}$$

$$2. \text{ Cost of equity } (K_e) = \frac{\text{EBIT} - I}{S} = \frac{\text{NOI} - I}{S}$$

$$3. \text{ Overall cost of capital } (K_o) = K_d \left(\frac{B}{V}\right) + K_e \left(\frac{S}{V}\right) \frac{\text{NOI}}{V}$$

$$4. \text{ Value of the firm } (V) = B + S \quad \text{or,} \quad V = \frac{\text{NOI}}{K_o}$$

### 2.1.2.2 Theories of Capital Structure

The approaches / theories to explain the relationship between capital structure, cost of capital and value of the firm are: -

1. Net income approach
2. Net operating income approach
3. Traditional approach
4. Modigliani-Miller (M-M) approach
5. Millar Model

#### I) Net Income (NI) Approach

In this theory, the cost of debt and cost of equity are assumed to be independent to the capital structure. The weighted average cost of capital declines and the total value of the firm rise with increased use of leverage.

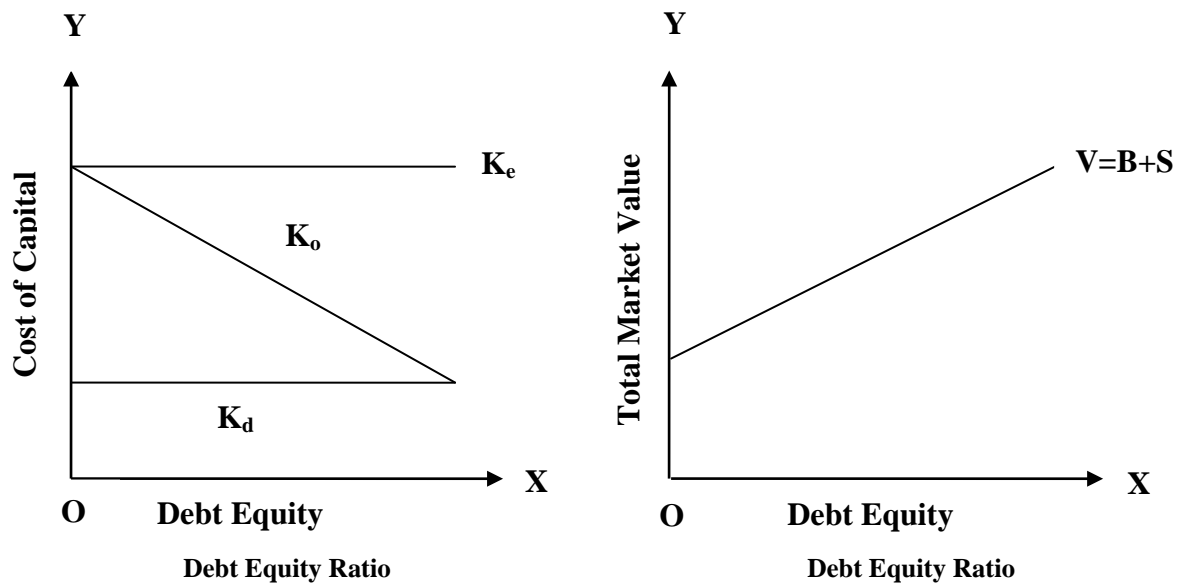
#### Assumption of net income approach:

1. The use of debt does not change the risk perception of investors; as a result, the equity capitalization rate ( $K_e$ ) and the debt capitalization rate ( $K_d$ ) remain constant with change in leverage
2. The debt capitalization rate is less than the equity capitalization rate (i.e.  $K_d < K_e$ )
3. The corporate income tax do not exist
4. Overall cost of capital decreases as leverage increases. (Rabindra Bhattarai, 2006:343)

From above assumption, we know about NI, if  $K_e$  and  $K_d$  are constant, increased use of debt, by increasing the shareholders earning will result in higher value of the firm via higher value of equity. Consequently, the overall cost ( $K_o$ ) will decrease.

**Figure No. 2.1**

**The effect of Leverage on Cost of Capital & Total Market Value under NI Approach**



*(Source: Van Horne, 2005:255)*

In the above figure, Y-axis called cost of capital and X-axis called degree of leverage. Under approach,  $K_e$  and  $K_d$  are assumed as constant. As the proportion of debt is increase in the capital structure, being less costly it causes weighted average cost of capital to decrease approach the cost of debt. The optimum capital structure would occur at the pointing where the value of the form is maximum and overall cost of capital is minimum.

As the whole assumption of NI,  $K_e$  and  $K_d$  are constant and  $K_d$  is less than the  $K_e$

Therefore,  $K_o$  decreases, when  $B/V$  increase. Also  $K_e=K_d$  and  $S=V$

When,  $\frac{B}{V} = 0$  Also,  $\therefore K_o = \frac{EBIT}{V}$

or

$$\frac{NOI}{V}, \therefore K_o = K_e - (K_e - K_d) \frac{B}{V}$$

## II) Net Operating Income (NOI) Approach

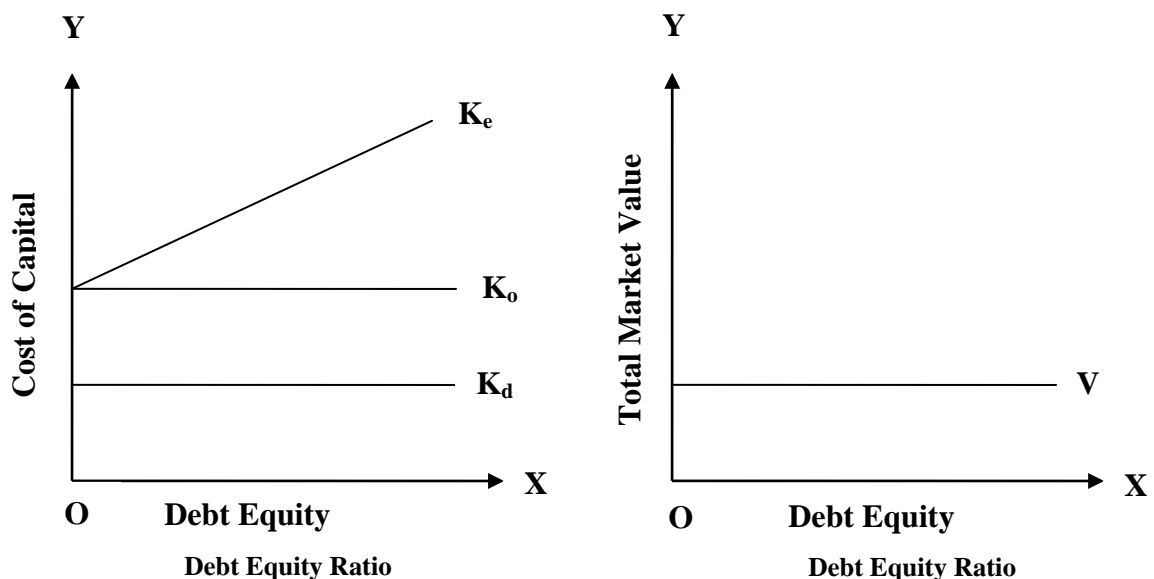
This theory was identified by David Durand. Under the net operating income (NOI) approach, the cost of equity is assumed to increase linearly with leverage. As a result, the weighted average cost of capital remains constant and the total value of the firm also remains constant as leverage is changed.

### Assumption of net operating income approach:

- i. The market capitalizes the value of the firm as a whole. Thus, the split between debt and equity is not important.
- ii. The market uses an overall capitalization rate, ( $K_o$ ) to capitalize the net operating income.  $K_o$  depends on the business risk and the business risk is assumed to remain unchanged.  $K_o$  is constant.
- iii. The use of less costly debt funds increase. Thus, the advantage of debt is offset exactly by the increase in the equity capitalization rate,  $K_e$ .
- iv. The debt capitalization rate.  $K_d$  is a constant.
- v. The corporate income taxes do not exist.

From above assumption we know that the leverage/capitalization structure decision of the firm is irrelevant. Any change in leverage will not lead to any change in the total value of the firm and the market price of shares, as the overall cost of capital is independent of the degree of leverage.

**Figure No. 2.2**  
**The effect of Leverage on Cost of Capital & Total Market Value**



(Source: Van Horne, 2005:256)

In the above figure, it shows that  $K_o$  and  $K_d$  are constant and  $K_e$  is continuously increased. As the firm increases its degree of leverage the fixed charge increases, with

the result that the financial risk also increases. As long as  $K_d$  remains constant,  $K_e$  is a constant linear function of the debt to equity ratio.  $K_0$  cannot be altered through leverage. The NOI approach implies there is no one optimum capital structure.

The cost of equity capital is found as follow.

$$\therefore K_e = K_o + (K_o + K_d) \frac{B}{S}$$

$$\therefore K_e = \frac{NOI - I}{V - B}$$

### III) Traditional Approach

“In this theory, the value of the firm is determined by adding the market value of the firm's debt to the market value of its equity. Once market value has been determined the overall cost of capital or overall capitalization rate, can be found” (*Gitman, 1988:43*).

It is also known as an intermediate approach, it comprises between net income approach & operating income approach. From this view, we know that the value of firm can be judicious mix of debt and stock of the firm.

“The cost of capital decline with leverage because debt capital is cheaper than equity capital within reasonable, or acceptable, limit of debt. The statement that debt funds are cheaper than equity fund carries the clear implication that the cost of debt, plus the increased cost of equity, together on a weighted basic, will be less than the cost of equity which existed on equity before debt financing” (*Alexander, 1963:11*).

At last we know that from traditional approach, overall cost of capital will decrease with the use of debt financing. From traditional approach, the manners in which the overall cost of capital reacts to changes in capital structure can be divided into three stages are given below.

#### Stage - 1

In this stage, the cost of equity  $K_e$  remains constant or less slightly with debt. But when it increases, it does not increase fact enough to offset the advantage of low cost debt  $K_d$ , remains constant or rises negligibly. Since the market views the use of debt

as a reasonable policy. As a result, the value of the firm 'V' increases or the overall cost of capital,  $K_o = \frac{X}{V}$

$\therefore K_o = K_e \left(\frac{S}{V}\right) + K_d \left(\frac{B}{V}\right)$ , falls with increase leverage.

### **Stage - 2**

“In this stage, the firm has reached a certain degree of leverage increases in leverage have a negligible effect on the value, or the cost of capital of the firm. This is so because the increases in the cost of equity due to the added financial risk offset the advantage of low cost of debt. Within that range of at the specific pint, the value of the firm will be maximum or the overall cost of capital will be minimum” (*Pandey, 1995:633*).

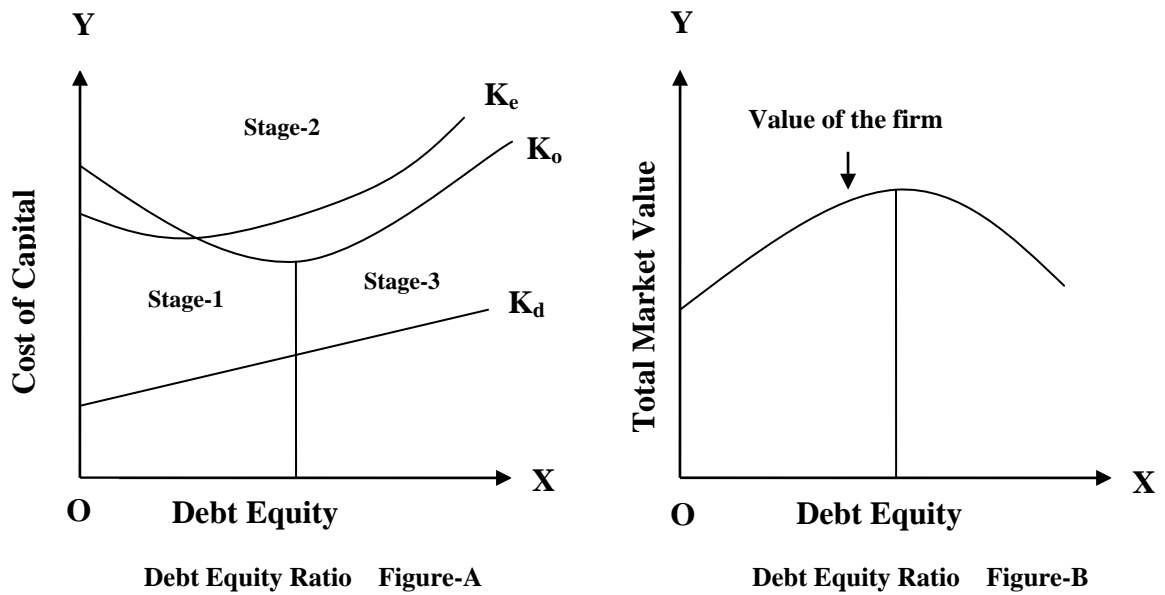
### **Stage - 3**

In this stage, the value of the firm decreases with leverage or the cost of the capital increases with leverage. This happens because investors perceive a high degree of financial risk and demand a higher equity capitalization rate, which offsets the advantage of low cost debt. From above stage we know,

- i. Increase valuation and decreased overall cost of capital
- ii. Optimum valuation and optimal overall cost of capital
- iii. Declined valuation and increased overall cost of capital

Thus, the overall effect of these three stages is to suggest that the cost of capital is a function of leverage. It declines with leverage and after reaching a minimum point or range starts raising. The relation between cost of capital and leverage is graphically shown as follows.

**Figure No. 2.3**  
**Relationship between Cost of Capital & Leverage**



(Source: Van Horne, 2005:257)

In the above figure-A, the cost of equity,  $K_e$ , increases with increase in leverage, but much more rapidly than the cost of debt. The cost of debt will remain fixed as leverage increases, until a point is reached where lenders feel that the firm is becoming financially risky. At this point, the cost of debt,  $K_d$ , will increase. The overall cost is optimal in 'O' line and then after  $K_o$  is increasing upward. In figure-B, the firm value is optimal until the line of 'O' then it gives downward value.

#### **IV) Modigliani-Miller (M-M) Approach**

The Modigliani-Miller thesis (Modigliani F. and M.H. Miller, "The cost of capital, corporate finance, and The Theory of Investments," American Economic Review, June 1958) relating to the relation is akin to net operating income approach. M-M approach, supporting the net operating income approach, argues that, in the absence of taxes, total market value and cost of capital of the firm remain invariant to the capital structure changes. They make a formidable attack on the transitional position by offering behavioral justification for having the cost of capital  $K_e$  remain constant through all degree of leverage. M-M contend that cost of capital is equal to the capitalization rate of a pure Equity stream of income and the market value is ascertained by capitalizing its expected income at the appropriate discount rate of its

risk class. M-M position is based on the idea that no matter how you divide up the capital structure of a firm among debt Equity and other claims, there is a conversion of investment value. However, the following assumptions regarding the behavior of the investors and the capital market, the actions of the firms and the tax environment are crucial for the validity of the M-M hypothesis.

**Perfect Capital Markets:** - This specifically means that (a) investors are free to buy or sell securities; (b) they can borrow without restriction at the same term as the firms do; and (c) they behave rationally. It is also implied that the transaction costs, the cost of buying and selling securities do not exist.

**Homogeneous Risk Classes:** - Firms can be grouped into homogeneous risk classes. Firms would be considered to belong to a homogeneous risk class if their expected earning has identical risk characteristics. It is generally implied under the M-M hypotheses that firms within same industry constitute the homogeneous class.

**Risk:** - The risk of investors is defined in terms of the variability of the net operating income. The risk to investors depends on both the random fluctuations of the expected NOI and the possibility that the actual value of the variable may turn out to be different than their best estimate.

**Full Payout:** - Firm's distribute all net earnings to the shareholders, which mean a 100% payout.

**No Taxes:** - In the M-M theory hypothesis assume that no corporate income taxes exist.

**Terminology and notation used in Modigliani Miller (M-M) theory are given below.**

**Terminology:**

- i. Levered: - A firm that uses debt and equity in its capital structure is called levered firm.
- ii. Un-levered:- A firm that uses only equity in capital structure is called un-levered firm.
- iii. Risk Premium: - Risk premium is the expected additional return required by the equity holders for making a risky investment.

**Notation:**

$K_{eu}$  = Equity capitalization rate of an un-levered firm.

$K_{el}$  = Equity capitalization rate of a levered firm.

$K_d$  = The debt capitalization rate.

$K_{ou}$  = Overall capitalization rate of un-levered firm.

$V_u$  = Value of an un-levered firm.

$V_L$  = Value of a levered firm.

$T$  = Corporate tax-rate.

$BT$  = Present value of tax-shield benefits of debt/PV of interest tax-shield.

The MM cost of capital hypothesis can be best expressed in terms of their proposition I and II (*Modigliani and Miller, 1969: 261-279*).

**Propositions**

The theorem was originally proven under the assumption of no taxes. It is made up of two propositions which can also be extended to a situation *with* taxes.

Consider two firms which are identical except for their financial structures. The first (Firm U) is un-levered: that is, it is financed by Equity only. The other (Firm L) is levered: it is financed partly by Equity, and partly by debt. The Modigliani-Miller theorem states that the value of the two firms is the same.

**Proposition (1)**

In this proposition, the overall cost of capital ( $K_o$ ) and the value of the firm ( $V$ ) are independent of its capital structure. The  $K_o$  and 'V' are constant for all degree of leverage. The total value is given by capitalizing the expected stream of operating earnings at a discount rate appropriate for its risk class. This is their preposition-1 and can be expressed as follows.

$$\therefore V = \frac{EBIT}{K_o} \text{ or } \frac{NOI}{K_o}$$

For un-levered firm  $K_o = K_e$

$$\therefore V_o = \frac{NOI}{K_{ou}} = \frac{NOI}{K_{eu}}$$

And

For levered firm

$$\therefore V = \frac{\text{NOI}}{K_{ou}}$$

From the above proposition, M-M theory conclude that the total market value of the firm is unaffected by financing mix, it follows that the cost of capital is independent of the capital structure.

This proposition states the implication of the earlier propositions for investment decision making. It emphasizes the point that investment and financing decisions are independent because the average cost of capital is not affected by the financing decision.

### **Proposition -II**

This proposition states that the  $K_e$  is equal to the capitalization rate of a pure equity stream plus a premium for financial risk equal to the difference between the pure equity capitalization rate ( $K_e$ ) and ( $K_d$ ) times the ratio of debt to equity. In other words,  $K_e$  increases in a manner to offset exactly the use of a less expensive source of funds represented by debt. The cost of equity capital for levered firm ( $K_{el}$ ) is equal to the cost of equity of an un-levered firm ( $K_{eu}$ ) plus a risk premium equal to the difference between  $K_{eu}$  and  $K_d$  multiplied by the debt equity ratio.

$$\therefore K_{el} = K_{eu} + (K_{eu} - K_d) \frac{B}{S}$$

Since,  $K_{eu} = K_{ou}$  So,

$$\therefore K_{el} = K_{ou} + (K_{ou} - K_d) \frac{B}{S}$$

This proposition shows the impact of financial leverage on the cost of equity. Due to the increase in leverage, the firm gets the benefit of cheaper debt, but the benefit is exactly offset by an increase in the cost of equity in the form of risk premium demanded by shareholders.

**M-M Theory (With Taxes):-** In this theory, M-M's hypothesis that the value of the firm is independent of its debt policy is based on the critical assumption that the corporate income taxes do not exist. In reality, corporate income taxes exist, and

interest paid to debt holders is treated as deductible expenses. Dividends paid to shareholders on the hand, are not tax deductibles.

“Thus, unlike dividends, the return to debt holders is not subject to the taxation at the corporate level. This makes debt financing advantageous. In their 1963 article, M-M shows that the value of the firm will increase with debt due to the deductibility of interest charges for tax computation, and the value of the levered firm will be higher than the unleveled firm” (*Pandey, 1995:633*).

Thus, the value of the levered firm is equal to the value of the un-levered firm plus the present value of the interest tax-shield as shown below.

∴ Value of a levered firm = Value of an un-levered firm + PV of interest tax-shield

$$V_L = V_u + DT$$

The value of an un-levered firm when corporate taxes exist is,

$$\therefore V_u = \frac{\text{NOI} (1-T)}{K_{ou}} = \frac{\text{NI}}{K_{eu}}$$

Where, NI = Net income after tax. Also, when a firm is un-levered,

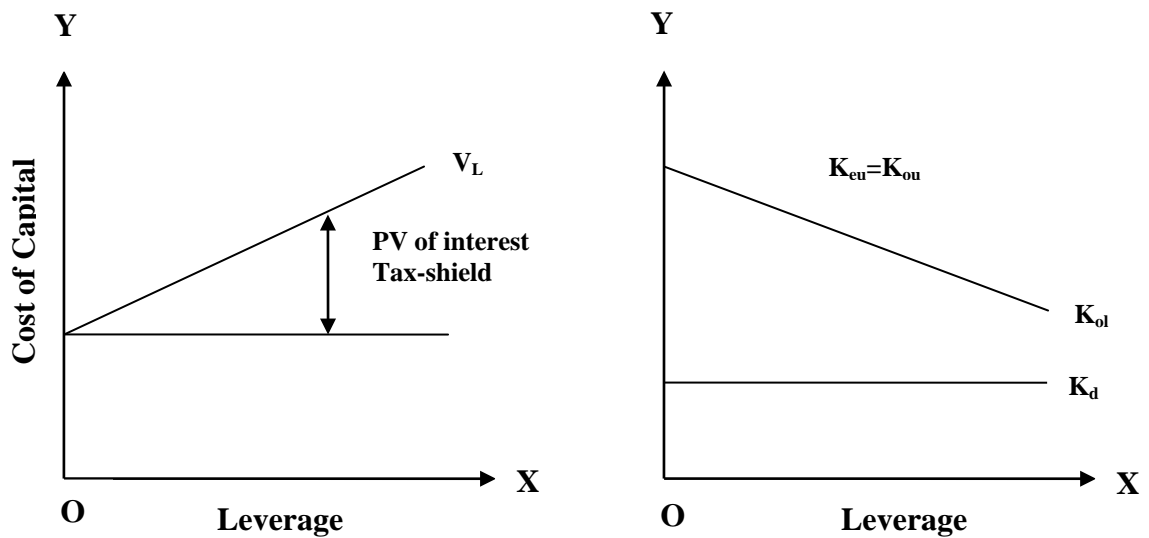
$$K_{ou} = K_{eu}, \text{ thus}$$

$$\therefore V_L = \frac{\text{NI}}{K_{eu}} + DT$$

From above equation implies that when the corporate tax rate, T, is positive ( $T > 0$ ), the value of the levered firm will increase continuously with debt. Thus, theoretically the value of the firm will be maximized when it employs 100 percent debt. As a broad, the figures are presented below.

Figure No. 2.4

Relationship between Costs of Capital & Leverage



(Source: Van Horne, 2005:269)

The above figure shows that because of the tax deductibility of interest charges, a firm can increase its value or lower its cost of capital continuously with leverage. Thus the optimum capital structure is reached when the firm employs 100% debt. In practice, firms neither employ large amount of debt, nor are lenders ready to lend beyond certain limits.

“Why do companies not employ extreme level of debt in practice? There could be two possibilities: First, we need to consider the impact of both corporate and personal taxes for corporate borrowing—personal income tax may offset the advantage of the interest tax shield. Second, borrowing may involve extra costs (in addition to contractual interest cost) of financial distress which may also offset the advantage of the interest shield” (Pandey, 1995:633).

**V) The Miller Model**

M-M introduced the theory first by assuming the absence of corporate and personal taxes in 1958. Later in 1963 they developed their theory by considering the corporate taxes. Although, M-M introduced corporate taxes in the second revision of their model. They did not extend tax model to include personal taxes. "However in his presidential address to the American Finance Association, Merton Miller introduced a

model designed to show how leverage effect firm's value when both personal and corporate taxes are taken in to account" (Brigham, Gapenski and Ehrhart, 2001:632). Due to the miller argument, changes in the capital structure have no effect on the firm total valuates. This position is the same as M-M's original proposition in the world of no taxes. But it contrasts sharply with their corporate adjustment article, in which they found that debt has substantial advantages.

Miller model suggest that in market equilibrium personal and corporate tax effects cancel out. He assumes that the personal tax on stock income ( $T_{PS}$ ) is zero. Accordingly his model implies that at the margin, the personal tax rate on debt income ( $T_{PD}$ ) must equal to corporate tax rate ( $T_C$ ). When  $t_{pd} = t_c$  changes in proportion of debt in the capital structure decisions by the corporation would be irrelevant (Van Horne, 1983:264)

With personal taxes included, under the same set of assumptions used in the M-M model the value of an un-levered firm is found as follows.

$$V_u = \frac{EBIT(1 - T_c)(1 - T_{ps})}{K_{eu}}$$

The value of levered firm under Miller Model can be found as follows:

$$V_l = V_u + \text{Present value of debt tax shield}$$

Where, 
$$V_l = V_u + D \left( 1 - \frac{(1 - T_c)(1 - T_{ps})}{(1 - T_{pd})} \right)$$

$T_c$  = Corporate tax rate

$T_{pd}$  = Personal tax rate on income from debt

$K_{eu}$  = Equity capitalization rate of un-levered firm

### 2.1.2.3 Determinants of Capital Structure Decision

Capital structure refers to the mix of long-term sources of fund, which maximizes value of the firm/equity holders. Concepts/definitions of capital structure give the main theme of optimal capital structure.

“Theoretically, the financial manager should plan an optimum capital structure for his company. The optimum capital structure is obtained when the market value per share is maximum. The values will be maximized when the marginal cost of each source of

funds is the same. In practice, the determination of an optimum capital structure is a formidable task and one has to go beyond the theory. There are significant variations among industries and among individual companies within an industry in term of capital structure. Since a number of factors influence the capital structure decision of a company, the judgment of the person making the capital structure decision plays a crucial part. Generally, the factors listed below and briefly discussed, all have an important bearing on the firm's capital structure decision” (*Weston and Brigham, 2004:619*).

**(1) Asset Structure:** - The firm, whose assets are suitable as security for loans tend to use debt heavily, Thus real estate companies are tends to be highly levered. While manufactures with heavy investment in specialized machinery and work in progress employ less debt.

**(2) Operating Leverage:** - Other thing the same, a firm with less operating leverage is better able to employ financial leverage because, the Interaction of operating and financial leverage determines the overall impact of a decline in sales on operating income and net cash-flows.

**(3) Sales Stability:** - A firm whose sales are relatively stable can safely take on more debt and incur higher fixed charges than a company with unstable sales. Utility companies, because of their stable demand, have historically been able to use more financial leverage than industrial firms.

**(4) Profitability:** - One often observes that firm's with very high rate of return on investment use relatively little debt. Although there is on theoretical justification for this fact, the practical reason seems to be that very profitable firm's such as IBM and KODAK simply do not need to do much debt financing. Their high rates of return enable them to do most of their financing with retained earnings.

**(5) Growth Rate:** - Other things remain the same, faster growing firm must rely more heavily on external capital. Further, the flotation costs involved in selling common stock exceed those incurred in selling debt. Thus, to minimize financing costs, rapidly growing firms tend to use somewhat more debt than do slower-growth companies.

**(6) Taxes:** - Interest is a deductible expense, while dividends are not. Hence, the higher a firm's corporate tax rate the greater the advantage of using debt.

**(7) Controls :-** A management concerned about control may prefer to issue debt rather than (voting) common stock to raise funds of course, if market conditions are favorable, a firm can sell non-voting equity shares or make a pre-emptive offering, allowing each share holder to maintain proportionate ownership. Generally, only in closely held firms or firms threatened by takeover control become a major concern in the capital structure decision process.

**(8) Market Condition: -** Conditions in the stock and bond markets undergo both long and short-run changes, which can have an important bearing on a firm's optimal capital structure. For example, during the credit crunch in the winter of 1982, there was simply no market at any "reasonable" interest rate for new long-term bonds. Low rated companies that needed capital were forced to go to the stock market or to the short term debt market. Actions such as this do not represent permanent changes in target capital structure but are of temporary departures from targets, the important point, however, is that stock and bond market conditions do influence the type of securities used for a given financing.

**(9) Lenders and Rating Agency Attitude: -** Regardless of manager's own analysis of the proper leverage factors for their firms there is no question that the lender's and rating agencies attitudes are frequently important determinants of financial structure. In the majority of cases, the corporation discusses its financial structure with lenders and rating agencies and gives much weight to their advice. But when management is so confident of the future that it seeks to use leverage beyond the norms for its industry, lenders may be unwilling to accept such debt increases or may do so only at a high price.

**(10) Management Attitude: -** In the absence of proof that one capital structure will lead to higher stock prices than another, management can exercise its own judgment about a proper choice. Some management tends to be more conservative than others and thus use lesser amount of debt than the average firm in their industry, while for other management the reverse is true.

**(11) The Firm's Internal Condition: -** A firm's own internal condition can also have a bearing on its target capital structure. For example, suppose a firm has just successfully completed a Research & Development program and it projects higher earnings in the immediate future. However, the new earnings are not yet anticipated by

investors and hence is not reflected in the price of the stock. This company would not want to issue stock, it would prefer to finance with debt until the higher earning materialize and are reflected in the stock price at which time it might want to sell an issue of common stock, retire the debt and return to its target capital structure.

**(12) Cash Flow:** - The key concern of the firm, when considering a new capital structure, must center on its ability to generate the necessary cash flows to meet obligation. Cash forecast reflecting ability to service debt (and preferred stock) must support any capital structure shift.

**(13) Contractual Obligation:** - A firm may be contractually constrained with respect to the type or form of funds it subsequently raises. For example a contract describing condition of an earlier bond issue might prohibit the firm from selling additional debt except where the claims of holders of such debt are made subordinate to the existing debt. Contractual constraints on the sale of additional stock as well as the ability to distribute dividends on stock might also exist.

**(14) Timing** - Timing decisions will have to be necessary based on expected development in a hard-to-predict market. If the price of the company's equity stock is currently depressed but is expected to rise in the wake of better performance and / or bullish development in the market, it may be advantageous to resort to debt finance now and equity finance later. On the other hand, if the price of company's equity stock is balanced, it may be desirable to resort to equity finance now and debt finance later.

This above consideration is most important for developing aim of financing about debt and stock. "The management of company may fix its capital structure near top of those ranges in order to make maximum use of favorable leverage for further detail, subject to other requirement as given below" (*Pandey, 1995:649*).

**Profitability:** - The capital structure of the company should be the most advantageous. Within the constraints, maximum use of leverage at a minimum cost should be made.

**Solvency:** - The use of excessive debt threatens the solvency of the company. To the point debt does not add significant risk it should be used, otherwise its use should be avoided.

**Flexibility:** - The capital structure should not be inflexible to meet the changing condition. It should be possible for a company to adopt its capital structure with a

minimum cost and delay if warranted by a changed situation. It should also be possible for the company to provide funds whenever needed to finance its profitable activities.

**Capacity:** - The capital structure should be determined within the debt capacity of the company and its capacity should not be exceeded. The debt capacity of a company depends on its ability to generate future cash flows. It should have enough cash to pay creditor's fixed charges and principal sum.

**Control:** - The capital structure should involve minimum risk of loss of control of the company. The owners of closely held companies are particularly concerned about dilution of control.

The above considerations are the general features of an appropriate capital structure. The particular characteristics of a company may reflect some additional specific features. The company will have to plan its capital structure initially at the time of its promotion. Subsequently, whenever funds have to be raised to financial investment, a capital structure decision is involved.

#### **2.1.2.4 Optimum Capital Structure**

The overall cost of capital is minimized; theoretically at least when the firm reaches its optimum capital structure. The optimum capital structure strikes a balance between the risk and returns and thus maximizes the price of the price of the stock. "Optimum capital structure can be properly defined as that combination of debt and equity that attains the stated managerial goals maximization of the firm's market value, and which minimizes the firm's cost of capital. As the existence of an optimum capital structure implies the simultaneous optimization of both the cost of capital and the firm's market value, occupies a central position in the theory of financial management" (*Phillipatos, 1974: 237*).

"An optimum capital structure would be obtained at the combination of debt and equity that maximizes the total value of the firm (value of shares plus value of debt) or minimizes the weighted average cost of capital" (*Panday, 1999: 277*).

Some of important objectives of the optimal structure are as follows:

- i. To maximize return on equity capital
- ii. To minimize cost of capital

- iii. To minimize risk
- iv. To increase flexibility
- v. To maintain control power
- vi. To employ high grade security

#### **2.1.2.5 Capital Structure Decision**

The determination of capital structure is not concerned only with value, return and cost but in practice, it involves additional considerations. Attitudes of managers with regard to financing decisions are quite often influenced by their desire; not to lose control; but to maintain operating flexibility and to have convenient and cheaper means of raising funds. The most important considerations are:

- i. Concern about dilution of control
- ii. Desire to maintain operating flexibility
- iii. Ease of marketing capital inexpensively
- iv. Capacity for economics of scale, and
- v. Agency costs (Rabindra Bhattarai, 2006:4)

#### **2.1.2.6 Important Tools of Capital Structure**

**Decision:** - In the management, basic tools are necessary for getting appropriate decision. Financial manager should determine the capital structure that best to the company. It is appropriate, when the company will have optimal capital structure. When the cost of capital tends to increase due to more debt, the use of more debt makes the capital structure Volatile.

There are two approaches given below, which give the manager basic for taking decision.

- i. EBIT-EPS Analysis
- ii. Cash flow Analysis

**EBIT-EPS Analysis:** - In our search for an appropriate capital structure, we need to understand how sensitive is earnings per share (EPS) to changes in earnings before interest and tax (EBIT) under different financial alternatives. Finance manager always

wants to know about, what is the effect of leverage on risk? A precise answer to this question is not possible with the help of EBIT-EPS analysis.

The finance manager may do two things: (a) Compare the expected value of EBIT with its indifference value, and (b) assess the probability of EBIT falling below its indifference value. If the most likely value of EBIT exceeds the indifference value of EBIT, the debt financing option, may be advantageous. The larger the differences between expected value of EBIT and its indifference value, the stronger the case for debt financing, other things being equal.

“Given the variability of EBIT, arising out of the business risk of the company, the probability of EBIT falling below the indifference level of EBIT may be assessed. If such probability is negligible, the debt financing option is advantageous. On the other hand, if such probability is high, the debt financing alternative is risky” (*Chandra, 1985:577*).

The EBIT-EPS analysis is an important tool in the hands of financial manager to get an insight into the firm’s capital structure management. He/She can consider the possible fluctuations in EBIT and examine their impact on EPS under different financial plan. If the probability of earning a rate of return on the firm's assets less than the cost of debt is insignificant, a large amount of debt can be used by the firm in its capital structure to increase the earnings per share. This may have a favorable effect on the market value per share. On the other hand, if the probability of earning a rate of return of the firm's assets less than the cost of debt is very high, the firm should stop in employing debt capital. It may, thus be concluded that the greater the level of EBIT and lower the probability of downward fluctuation, the more beneficial it is to employ debt in the capital structure. However, it should be realized that the EBIT-EPS is a first step in deciding about a firm’s capital structure.

**Cash Flow Analysis:** - Cash flow analysis is most important part of the company. Cash flow analysis gives us information about liquidity position of the company. A Company with sound liquidity position will be able to pay fixed charges on basis of its cash generation. Fixed charges include.

- i. Principal and interest payments on debt
- ii. Lease payment.
- iii. Preferred stock dividends and etc

If firm unable to pay its fixed charges, it suffer form difficulty as market domination. It is bad for reputed company. The firm, therefore, must estate and analyze expected future cash flows, before committing itself of fixed charges.

A company must note the following two generalizations.

- i. The greater the expected future cash flows, the greater the debt capacity of the firm.
- ii. The more stable the expected future cash flows, the greater the debt capacity of the firm.

## **2.2 Review of Related Studies**

This section is devoted to review of important empirical works, concerning capital structure and cost of capital since 1958 till 2005. There are numerous studies in capital structure. So, it is out of the scope of this study to survey and review all the empirical work extensively and give here in detail. Therefore, some important studies and their findings are presented. In this section, review will be made on the foreign studies including Indian studies. The review is undertaken in four subsections. Section I focuses on the review of empirical works carried up to 1960s with their major findings. The second section deals with the review of studies during 1970s. Third section is devoted to review of studies during 1980s and finally fourth section deals with studies during 1990s respectively.

### **i) Review of Empirical Works**

**Modigliani and Miller (1958)** in their first study, they used the previous work of “Allen and Smith” in support of their independence hypothesis. In the first part of their work, MM tested their proposition I the cost of capital is irrelevant to the firm’s capital structure, by correlating after tax cost of capital, with leverage,  $B/V$ . They found that the correlation coefficient is statically in significant and position in sign. The regression line does not sauciest a curvilinear, U shaped cost of capital key of traditional view, and then the data are shown in scatter diagram. In the second part of their study, they tested their proportion II, the expected yield on common shares, is a linear function of debt to equity ratio. The second part of their study is consistent with their views, i.e. if the cost of borrowed funds increases, the cost of equity will decline to offset this increase.

**Modigliani and Miller (1963)** were conducted the second study in 1963 with correcting their original hypothesis for corporate taxes and expected cost of capital to be affected by leverage for its tax advantages. They therefore wanted to test whether leverage had tax advantages or not. For this, they conducted the mathematical analysis regarding the effect of leverage and other variables only because of the tax advantage involved.

**Barge (1963)** tested the same hypothesis. For the study purpose, he utilized cross section data from three different industries-61 rail road industries, 63 departmental store companies and 34 cement industries. For the railroad industries, he performed both yield as well as the average cost of capital test. The average cost of capital was computed by dividing the three year average income by the average total market value. He uses the ratio of long term debt to permanent capital, at book value as the measure of financial structure. The result obtained from the study suggested that the average cost of capital first tends to decline and then tends to rise as the debt capital increase in the capital structure. In the department store study, he computed the leverage in the same manner as the rail road study. Result obtained from the support to the traditional view. Barges final test was on cement industry. In this study, variables were estimated in the same manner as in the case of departmental store are results obtained from this study again concluded that the traditional view has supported.

**Weston (1963)** the research work done by Weston is “A Test of Cost of Capital Proposition”. He made some important improvement in the cost of capital model. He included firm size and growth as additional explanatory variables in his model. He found the regression co-efficient of leverage to be positive and significant, when he used M-M model. However, when the multiple regressions were run, he found that the correlation coefficient is significant and the regression coefficient is negative and significant. When the influence of growth is isolated, leverage is found to be negatively correlated with the cost of capital. He concluded that the apparent lack of influence of leverage on the overall cost of capital observed by M-M was due to the negative correlation of leverage with earning growth. Weston also tested M-M proposition II. When he used the M-M model, his results were found to be consistent with their results i.e. cost of equity is the linear function of debt equity ratio.

**Wipper (1966)** Wiper study is related to test the empirical relationship between “financial structure and value of the firm”. He tried to eliminate the principle problem of empirical study on the leverage and attempted to offer what were hoped to be more fruitful alternatives in determining the relationship between leverage and cost of capital. He found that shareholder’s wealth can be enhanced by judicious use of debt financing.

**Sharma and Rao (1967)** tested the M-M hypothesis that after allowing for the tax advantage from the interest paid on debt the value of a firm is independent its capital structure on the data of 30 engineering companies from Indian engineering industry. In this cross- sectional study for the year 1963, 1964 and 1865 they concluded that debt has non tax advantages and investors prefer corporate to personal leverage. So, it can be concluded that value of a firm rises up to leverage rate considered prudent. They found the co-efficient of debt variables to be more than the corporate income tax. They introduced debt as a separate independent variable. They used two stages least square as a method of arriving at the true expected future earnings.

**Peterson (1969)** in his study of manufacture firms showed the evidences contrary to the traditional view, on the relation between risk measured by the coefficient of variation of rate of return of total capital over the period of 1947-56 and leverage measured by the ratio of senior to junior capital at book value, then the ratio of senior to junior capital at market value and finally by the ratio of fixed charges to earning power.

## **ii) Review of Empirical Works**

**Rao and Lintzberges (1970)** were conducted the study of the effect of capital structure on the cost of capital in a less developed and less efficient capital market (India) and in a highly developed and efficient capital market (United States). They found that the results for the American utilities are consistent to the M-M proposition that except for the advantages of debt financing, the cost of capital is independent of capital structure, and the results also supported that the M-M hypothesis that investors are indifferent for the firm’s dividend policy. In case of Indian utilities, the results are inconsistent to the M-M approach and the traditional belief, the judicious use of financial leverage will lower the firm’s cost of capital and investors have a preference for current dividends. In conclusion, they contended that the M-M approach after

allowing for the tax advantage of debt, the firm's cost of capital is independent of capital structure does not appear to be application in the case of developing economy.

**Davenport (1971)** in his study used the British data of three unrelated industries chemical, food and metal manufacturing industries. They had concluded that the results of his study did not support the M-M contention, that the overall cost of capital is independent of the proportion of debt and preference share in the capital structure of the firm. They supported the traditional view of cost of capital and leverage because his result shows the u-shaped cost of capital schedule with respect to leverage.

**Hamada (1972)** provided the evidences that support of the M-M hypothesis. Lev and Pekelman (1975) tested the validity of multi period adjusted model and concluded that the equity and debt effect on the current period of financial policy of the firms. Similarly, Kim et. al. (1979) suggested that weak evidence supports to the Clientele hypothesis of miller. Schwartz and Aronson (1966), Remmers et.al. (1974) showed that industrial influence is not a significant determinant of financial structure in the USA, Norway and Netherlands. Scott (1972) conversely provided the evidence in the support of significant industrial influence on capital structure and suggested that firm in different industries have different financial structure. Scott and Martin (1975) also came to the same type of conclusions. Remembers et. al. (1979) also bolstered evidence for the significant industrial influence on financial structure in the Japanese and French cases.

**Rao and Rao (1975)** found the negligible positive impact of corporate income tax on corporate debt policy of manufacturing sector in India. Mishra(1978) showed that the evidence in favor of the tax avoidance hypothesis for sugar, Tobacco, trading Industries and Aggregate Corporate Sector of India. Chakarborty (1975) examined the effect of firm's characteristics on capital structure and found that negative association of debt and equity ratio of leverage, retained earnings, profitability scaled by capital employed and corporate tax and positive association with size, profitability scaled by sales and capital intensiveness measured by gross fixed assets to sales. Rao (1979) found the adverse effect of profitability on debt equity ratio. Pandey (1979) observed the adverse relationship between capital structure and cost of equity.

**Pandey (1978)** has tried to test the M-M approach in the developing economy with taking the sample from four different utilities cotton, chemicals, engineering and electricity from Indian market. He made some improvement in the model derived by M-M and used multiple regression equation for the year 1968, 1969 and 1970 for the pooled data of the three cross-section years. The improvement was made on the measurement of leverage and added earning variability and liquidity as risk measure variable in the regression equation. He used two types of leverage, the debt to total capital ratio, and the debt to equity ratio the two ratios were measured with or without preference share capital in the debt portion. Both leverage were done on book value and included short term loan as part of leverage.

### **iii) Review of Empirical Works (1980 - 1990s)**

**Barnea, Haugen and Sanbet (1981)** identified three problems that occur because of debt financing. First is the stockholders incentive to accept sub-optimal and high-risk projects, which transfer wealth from bond holders. Second, the presence of debt in capital structure causes the firm to forgo any investment with positive net market value being lower than the debt value. The third is the bankruptcy costs where bankruptcy probability increases with company might not be able to generate profits to pay back the interest and the loans.

**Pandey's (1981)** study is concerned with the test of relationship between the cost of capital and leverage, effect of leverage, Cost equity and, effect of tax deductibility on cost of capital in Indian context. In the cross sectional analysis of 131 observations drawn from Cotton, Chemical, Engineering and Electricity industries for the years 1966, 1969 and 1970, he found that the conclusion of M-M independent hypothesis does not hold reliable conclusion specially in the context of India. Matta (1984) found the negative relationship between debt equity ratio and growth rate. Garg (1988) suggested that there existed the relationship between business risk and debt equity ratio. Pandey (1984) did the attitude survey of the practicing managers of 30 Indian companies and drew the conclusion that Indian practicing manager have the concept of optimal capital structure and it should be maintained by every company.

**Bawen et.al. (1982)** Kester (1986) and Bradley et.al. (1989) studied in industrial influences on capital structure and found that the statistically significant industrial influences on financial structure. They have documented the leverage ratio of specific

industries. Their results are on broad agreement and showed that drugs instruments, electronics and food industries have consistently low leverage paper, textile mill products, still, airlines and cement industries have consistently high leverage. Further, Bready et.al. (1984) concluded that regulated industries are most highly levered firms. Several studies under the framework of agency cost and asymmetric information modes are carried out on the specific characteristics of industries and firms that determine the leverage ratio and provide the guidelines in formulation of their financing policy. The result showed that the study of 1980s do not agree each other in respect to their findings except in the use of the relationship established between the fixed assets and leverage. Bradely et.al (1984) Kester(1986), Titman and Wessels(1988), Wedig (1988) Friend and Lang (1988) and friend and Hasbruck(1988) concluded that the increase impact of the volatility of earnings on leverage. Auebach (1985) and Kim Sorensen (1986) found that the positive relationship between the volatility and leverage ratio. In general, the results of the studies in regard to the relationship between the volatility and leverage are inconsistent with the agency cost theory. This theory contented that high variance firm has lower agency cost of debt and hence higher financial leverage.

**Mayer (1984)** pointed out that financial economists have not hesitated to give advice on capital structure, even though how firm actually chase their capital structure remains a puzzle as the theories developed did not seem to explain fully actual financing behavior. Mayer states that internal financing is preferred more than external financing. This is due to the transaction (flotation) costs and the resulting agency costs of issuing new securities. When retained earnings are not sufficient, debt financing is the next choice before considering offering new stocks. The reason is that the flotation costs of debt issuing are lower than those of equity issuing.

**Auerbach (1985)** argues that beverage is inversely related to the growth rate because the tax deductibility of interest payments is less valuable to fast growing firms since they usually have more non-debt tax shields.

**Monohar Krishna Shrestha (1985)**, His study on “analysis of capital structure in selected public enterprises” argue that most of public enterprises have confusing capital structure since the corporation are not guided by any objectives based financial plan and policies. The corporations are using least combination of debt with equity to avoid financial burden as far as possible. According to Mr. Shrestha, the debt-equity

ratio should neither be highly levered to create too much financial obligations that lie beyond capacity to meet nor should be much lower low levered to infuse operational strategy to bypass responsibilities without performance. He used ratio analysis as the tool of analysis and found the selected public enterprises. He further added that in many instances aphorism becomes the basis of capital structure and most of them want to eliminate debt if possible to relieve financial obligations.

#### **iv) Review of Empirical Works**

**Mackin-Mason (1990)** studied the tax effect on corporate financing decisions. The study provided evidence of substantial tax effect on the choice between debt & equity. He concluded that changes in the marginal tax rate for any firm should affect financing decisions. When already exhausted (with loss carry forwards) or with a high probability of facing a zero tax rate, a firm with high tax shield is less likely to finance with debt. The reason is that tax shields lower the effective marginal tax rate on interest deduction.

**Harris and Ravi, (1991)**, pointed that numerous attempts to explain capital structure have proved to be inconclusive. The capital structure decision is ever more complicated when it is examined in an international context; particularly in developing countries where markets are characterized by controls and institutional constraints.

**Thies and Klock (1992)** found results that pertain to long term debt and common equity. The findings also refute claims that there is no cross sectional relationship between variability and capital structure and suggests that there are differences in the utilization of leverage across time and firms.

**Radhe S. Pradhan (1994)** on his research financial management and practices in Nepal in 1992. The survey mainly dealt with financial function, sources and types of financing, financing decisions involving debt effect of change in taxes on capital structure, financial distress dealing with banks and dividend policy. The major findings of study connected with financial management are given as:

- i. Banks and retained earnings are the two most widely used financing sources.
- ii. Generally, there is no definite time to borrow the issues stocks. That is majorities of respondents are unable to predict when interest rate will low or go up are unable to predict when the stock will go down or up.

- iii. The enterprises have a definite performance for bank loans at a lower level of debts.
- iv. Most enterprises do not borrow from one bank only and they do switch between banks which ever offer best interest rates.
- v. Most enterprises find that banks are flexible in interest rate and convenience. To sum up it can be said that out of numerous studies on the capital market of Nepal.
- vi. This study is established itself as a milestone and an outstanding one.

### **2.3 Review of Thesis**

During the study, several thesis works has been carried out by the pervious students. Among them some research are found to be relevant for this study. They are presented as follows:

Dhakal (2001), in his thesis “*A Comparative Analysis of Capital Structure Management Between Nepal Bangladesh Bank Limited and Himalayan Bank Limited*”, has the following objectives:

- i. To find out comparative position in capital structure between two banks.
- ii. To analysis the various source of capital and determine their cost.
- iii. To analyze the return on capital in relation to capital employed.
- iv. To suggest the appropriate capital structure and profitability trend.
- v. To study capital adequacy ratio to measure strength of the capital base.

His thesis analyzes and studies the secondary data and major findings of this study are:

- i. The proportion of shareholders equity is found much lower in both the banks. On the basis of average of entire study period it is found that the proposition of shareholders equity of NBBL is higher than that of HBL. But the fluctuation of the proposition of shareholders equity is more in HBL as compare to NBBL.
- ii. Higher total debt to total assets ratio of both banks shows that both banks are using maximum leverage, which might be dangerous to these banks.

- iii. Higher overall capitalization rate of HBL in every year shows that HBL is more capable to utilize the value of the firm compare to NBBL.

Pradhan, (2007), in her thesis, “*A Comparative Analysis of Capital Structure Management Between Nepal Bangladesh Bank Limited and Himalayan Bank Limited*” has the following objectives:

- i. To find out comparative position in capital structure between two banks.
- ii. To analysis the source of capital and determine their cost of capital of NBBL and HBL.
- iii. To measure the structure, risk and efficiency of the bank.
- iv. To suggest measure to attain appropriate capital structure.

The research was conducted mainly on the basis of secondary data. The research findings of the study summarized as follows:

- i. All Joint Venture banks have used high percentage of total debt in raising the assets. The higher ratio constituted that the outsiders claim in total assets of the bank is higher than owners claim.
- ii. The interest coverage ratio shows that all banks are able in paying interest. In comparison Himalayan Bank Ltd is operating efficiently in terms of interest coverage ratio.
- iii. The private sector banks have been successful in increasing their deposits and credit portfolio is remarkable over the last few years. The figures also show that most of the banks have been cautious about loans and advances. The operating profit to Joint Venture bank has gone up, so have the provision for loan loss. In short, the banking sector in Nepal is somehow doing well even though it has to face a number of challenges during the past few years.

Shrestha, (2008), in her thesis, “*Analysis of the Capital Structure of the Joint Venture Banks of Nepal*”, has the following objectives:

- i. To analysis the relationship of the capital structure and the cost of capital of the selected Joint Venture banks.
- ii. To analyze the comparative capital structure of selected JVBs in terms of the financial and statistical tools.

- iii. To analyze the profitability position of the banks.
- iv. To provide suggestion and recommendations on the basis of analysis to impose the financial weakness of JVBs.

Her thesis analyzes and studies mainly secondary data. The research finding of this thesis summarized as follows:

- i. All JVBs has used high percentage of total debt in raising the assets. The higher ratio constitutes that the outsiders claim in total assets of the banks is higher than owners claim. The financial risk of the SBI bank average degree of financial leverage constitutes 5.04 times which indicates the higher degree of financial risk.
- ii. The NI approach implies that proportion of higher leverage consequently increase the value of the firm. This approach is well acquainted with this study as the value of the banks has increased in accordance to the increasing portion of leverage. The  $K_0$  of five banks is positive even though the rate of return is in decreasing trend except Nabil Bank.
- iii. The private sector banks have been successful in increasing their deposit and credit portfolio remarkably over the study period. The figures also show that most of these banks have been cautious about loans and advances. The operating profits of all the private sector commercial banks have gone up, so has the provision for loan loss. In short, the banking sector in Nepal is somehow doing well even though it has to face a number of hurdles during the past few years.

Dhakal, (2008), In his study “*A study on capital structure management of selected commercial banks (with special reference to Himalayan Bank, Nepal SBI Bank, Everest Bank And Nepal Investment Bank Ltd.)*” analysis the capital structure of different five year period.

His main objectives are as follows:

- i. To explain competitive position and the situation of the selected banks.
- ii. To analyzes the combination of capital with long and short term debt and equity capital.

- iii. To analyze different financial and statistical tools are used to analyze and compare these banks.

He used different financial tools such as: debt equity ratio, Debt Ratio, interest coverage ratio, price earning ratio, return on assets, return on shareholders equity, and he find capitalization rate. He used different statistical tools such as: mean, standard deviation, correlation coefficient, probable of error of correlation, variance and regression analysis. He uses the different ratios and present different table and chart. His findings can be summarized as follows:

- i. From the study bank are found to be highly levered. The companies financial mix accounts a higher proportion of debt and it is increasing every year. Most of the banks cannot manage the current assets.
- ii. The interest coverage ratio during the study period was positive for all selected bank.
- iii. In case of ROA and ROE, EBL has higher ratio than any other banks. Which indicated the EBL best bank among the selected banks.
- iv. The average EPS of EBL and HBL higher than other selected banks and EPS of EBL is fund to be in increasing trend and EPS of other banks are fluctuating during the study period.
- v. The cost of banks are increasing, the main cause of cost increase may unskilled manpower, overstaffing, unsystematic arranged of material, level of unnecessary and expenses is high and misuse of the facilities and resources.
- vi. The correlation coefficient of the variable of selected bank for the statistical analysis is found positive to each other. The coefficients are all statistically significant in more than average banks. A positive correlation means both of the variables are moving toward the same direction.

Malik, (2009), in his thesis, "*Capital Structure Management in Nepal*", has following objectives:

- i. To show the trend of composition of assets and capital structure
- ii. To analyze the return on equity and assets
- iii. To analyze the value of the firm

- iv. To analyze the aggregate liability bearing capacity of the selected organization
- v. To analyze the relationship between liability and assets of the organization
- vi. To analyze the profitability of the selected organization

His thesis analyzes and studies the secondary data, major findings of this study are:

- i. Being big financial houses NTC and NEA dominates other organization in volume related issues so the gearing of other organizations is not seen in the figure. Other than these houses don't have debt transaction during the sampled period too
- ii. Comparatively, total loan liabilities to shareholders fund ratio of NIBL is highest, ratio of NABIL is in second position, NEA is in third position, HGICL is in fourth position and NTC is in fifth position.
- iii. Comparatively, total debt to total assets ratio of NIBL is highest, ratio of NABIL is higher, NEA is in third position HGICL is in fourth position and NTC is in fifth position.
- iv. Interest bearing capacity of NTC is higher than other organization and HGICL is in moderate capacity to bear the load of interest expenses and other organization are seem very weak in the concern of interest expenses bearing.

Sapkota (2011) has conducted a research entitled "*Capital Structure of Nabil Bank Limited.*" The major objectives of the study were to examine and analyze the capital structure of Nabil Bank Limited. Following were the specific objectives of the study:

- i. To examine the existing financial position regarding capital structure.
- ii. To analyze the composition of Nabil Bank Limited of the mixture of debt and equity.
- iii. To evaluate the relationship between deposit and capitalization of Nabil Bank Limited.
- iv. To examine the different profitability ratios of Nabil Bank Limited.

This study was based on secondary data provided by Nabil Bank Limited. Data and information are collected from balance sheet of Nabil Bank Limited. There relevant data and information were collected from different sources, mentioned in bibliography. From the analysis he has find out some findings, which are as follows:

- i. Share capital : Liabilities are increasing more than share capital.
- ii. Reserve & surplus: Reserve & surplus trend is not consistently.
- iii. Shareholders Equity : Reserve and surplus is more than paid up capital.
- iv. Debt To Equity : Debt to equity ratio in average more than 2. It means the claim of creditors and share holders against the property of the firm.
- v. Debt to Capacity : The ratio must be greater than 1. In overall the interest coverage of the Nabil bank is too small to cover the debt cost.
- vi. Capital structure position : The mix of debt and equity is in the average ratio.
- vii. Return on total Deposit : In simply ROD is satisfactory because ratio of ROD is greater than 1.75 and the more ratio shows the more earning.

#### **2.4 Research Gap**

As the above research works are concerned with capital structure. They are mostly done by taking single or multiple firms and their analysis is in absolute nature. The studies also observed same defects in capital structure. The tools used for analysis have been limited to ratio analysis. So this study tries to explore the capital structure patterns in banking industry. Moreover this research is comparative study of two banks which will provide information to the concern party for comparative analysis. Furthermore this study will be helpful to the interested groups. At least this study will be different from the above in-terms of sample companies, data presentation as well as statistical used for interpretation and analysis of data with using latest data from FY 2006/07 to 2010/11.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

“Research Methodology refers to the four various sequential steps to be adopted by a researcher in studying a problem with certain objective in view” (*Kothari,2004:19*).

“Research methodology basically describes the methods, processes, tools and techniques applied in the entire process of a scientific research. Research is the process of systematic and in-depth study or search for any particular topic, subject or area of investigation backed by collection, presentation and interpretation or relevant details or data” (*Michael, 1985:26*).

In this chapter, the topics, “Capital structure management” of two banks has been analyzed. It gives to know about the capital structure management of these two banks. The major objectives of this study include measuring the relationship between debt and equity capital to analyze the comparative trend of various variables, to analysis the financial decision through correlation analysis. So this chapter is divided into different subheadings like: research design, population and sample, source of data, data collection techniques, data analysis tools, limitations of the methodology and review of related studies.

#### 3.2 Research Design

Since this study seeks to analyze the capital structure management in terms of risks and returns of NABIL Bank Ltd. and Siddhartha Bank Ltd. to establish the nature of relationship between the returns of the selected banks and the market return as well as between the selected banks themselves, the research design of the study is analytical and correlation type. Since this study is based on the process of collecting, verifying and synthesizing past evidences systematically and objectively to reach a conclusion, this is also a historical research. Moreover, as the study is concentrated on the comparative study of the capital structure management of the two selected banks, it can be also considered as a descriptive research as well as a comparative research.

The study first of all analyses the risk and return of NABIL and SBL on the basis of income from investing activities. For this purpose the study determines the average,

standard deviation and coefficient of variation of the return of NABIL and SBL. The study also analyses the risks of the respective banks in terms of coefficient of variance and correlation coefficient. Besides, the study also focuses on analyzing the different variables related to the capital structure management of both banks. Secondly, the study analyses the risks and return of NABIL and SBL on the basis of net return. Thirdly, the study concentrates on the hypothesis testing to test the significance of observed correlation coefficient and the significance of computed average returns.

### **3.3 Population and Sample**

Population is the universe about which the study has aimed to enquire and the sample is the representative of the population. Since the study is concerned with the capital structure management of the selected two commercial banks, the population for the study has, therefore been all the twenty nine commercial banks which are currently in operation in our country.

There are 32 commercial banks in Nepal but in this research only two commercial banks are taken for sample i.e. NABIL & SBL. The census of the population is neither feasible nor desirable for the study of this nature, a sample from the population has, therefore been selected for the purpose of study. For the selection of the sample from the population, judgmental sampling method has been followed. As the study comparatively analyses the capital structure performances of the two comparable commercial banks has been selected for the study, which are:

#### **i) NABIL Bank Limited (NABIL)**

The door for opening commercial banks was opened to the private sector with the establishment of NABIL Bank in 12<sup>th</sup> July 1984 A.D. as the first joint venture bank of Nepal with the capital of 30 million and a team of less than 50 housed in a small outlet at Durbar Marg. First NABIL Bank Ltd was known as Nepal Arab Bank Ltd when the bank was tied up with Dubai Bank Ltd - UAE. But now the whole management has been taken over by the Nepal and all top officials are Nepalese citizens, so the bank known as NABIL Bank Ltd with no full forms. The bank has been very successful in generating massive volume of deposits providing various international standard service such as anywhere banking, Automated Teller Machines (ATM) at the various outlets of the country, which provides visa card, master card, credit card facilities, issuing wide range of debit and credit cards, providing online

banking service etc. Beyond these banking services, the bank has been successfully providing USA visa application service at the Maharajgunj branch, where application for USA visa are handled. Now NABIL banks 47 branches and 63 ATM's are in operation. (*www.nabilbank.com*)

#### **ii) Siddhartha Bank Limited (SBL)**

Siddhartha Bank Limited (SBL) commenced operations in 24<sup>th</sup> December 2002. The Bank is promoted by a group of highly reputed Nepalese dignitaries having wide commercial experience, In Nepal, today stands as one of the premier banks in the country. While the promoters come from a wide range of sectors they possess immense business acumen and share their valuable experiences towards the betterment of the bank. Siddhartha Bank now boasts of strong retail banking and trade operations complementing its longstanding corporate finance expertise. Within a short span of time, Siddhartha Bank has been able to establish itself as a healthy and strong institution, with profitability, capital adequacy and portfolio quality of the highest order. The bank provides a full range of commercial banking services through 39 branches and more than 16 ATM's established in Kathmandu, Birgunj, Biratnagar, Pokhara, Damak, Narayangarh, Patan & other parts of Nation along with an extension counter at B & B Hospital. Motto of the bank is "Our Business is to Understand Your Business".

Siddhartha Bank provides various products and services. Siddhartha Bank Limited offers a wide variety of services ranging from a small saving account to large finances. It has something for every section of the society and its services are tailor-made to suit every customer. (*www.siddharthabank.com*)

### **3.4 Nature and Type of Data**

Since the study is basically analytical and historical on nature, most of the data are based on the past performance of the sampled commercial banks. For the purpose of the study, all the data used are second-hand published data of the respective banks under study. Such data have been derived from the financial statements of the companies concerned.

### **3.5 Sources of Data**

All the data used in this study are obtained from the secondary sources. The main sources of the data are the financial statements of the selected commercial banks

under study and of other banks also. The required financial statements have been obtained from the website of Nepal Stock Exchange Limited: [www.nepalstock.com](http://www.nepalstock.com), [www.nepalstockmarket.com.np](http://www.nepalstockmarket.com.np), [www.nabilbank.com](http://www.nabilbank.com), [www.siddharthabank.com](http://www.siddharthabank.com), Annual Reports of the selected commercial banks and Banking and Financial Statistics published by NRB. Moreover, some of the data required for this study has also been obtained from the Economic Survey 2011, a publication of Nepal Government, ministry of finance and Economic Review, a NRB publication.

### **3.6 Data Gathering Procedure**

After identification of the sources of data, the required data for the study have been gathered through the following procedures:

- i. To obtain the data from Nepal Stock Exchange Limited, first of all, the financial statements of all the listed commercial banks were-down loaded on the PC. Secondly, all the downloaded financial statements were transcribed into computer printouts and the data required for the study were taken there from.
- ii. To get the separate annual reports of the selected commercial banks, the authorized staffs of the respective banks were approached and required data were used selectively for the study & respective website of the banks were accessed for the same.
- iii. To have the data from NRB publications (Economic Review and Banking and financial Statistics), website of NRB ([www.nrb.org.np](http://www.nrb.org.np)) was accessed.
- iv. The required data of the government publications were also gathered from the website of Ministry of Finance, Nepal.
- v. Other books and journals had also been consulted.

### **3.7 Data Processing Procedure**

Data thus gathered through different procedures have been further processed according the requirements of the study. First of all the collected data were thoroughly studied to identify the required data for the study for the analytical purpose. Secondly, all the required data were extracted from those sources as per need of the study. Then after, these data have been applied for the analysis of the risk and return of NABIL and SBL on the basis of income from investing activities. For this purpose the data

have been used to determine the average return, standard deviation and coefficient of variation of NABIL and SBL. The data have been also processed for the analyses the risks of the respective banks in terms of coefficient of variance and correlation coefficient. Besides, they have been used for capital structure performance measure of the selected banks. The data have also been applied for the analysis of the risks and return of NABIL and SBL on the basis of net return. The data have also been used for the purpose of hypothesis testing (i.e. testing the significance of the observed correlation coefficients and significance of the computed mean values). Further more the collected data have been processed for the comparative analysis of the selected banks on the basis of capital adequacy risks, liquidity risks and credit risks.

### **3.8 Tools of Analysis**

Although the separate sections of the techniques of analysis have not been presented in the study, the descriptive, correlation and inferential techniques of analysis have been applied through out the study. For the purpose of descriptive analysis, risk and return of the banks under study have been analyzed on the basis of interest income and net income of the respective banks. During this course of analysis, return of the selected commercial banks along with their averages, standard deviation and coefficient of variation have been computed and arranged in the tabular form for their descriptive analysis to observe the variability of the return over the period of the study. The risks of the selected banks have also been analyzed descriptively with respect to covariance with correlation coefficient. Descriptive analysis has also been used to analyze the risk return tradeoff to the selected banks on the basis of net return on total investments and the capital adequacy risks, liquidity risks and credit risks of the banks under study.

The technique of correlation analysis has also been applied for the study while calculating correlation coefficient of the returns of the selected banks.

For inferential analysis, null and alternative hypothesis have been formulated and tested with the help of Students test. By applying the inferential technique of analysis, the significance of the observed correlation coefficients and the significance of the computed mean returns have been analyzed. If the calculated t-values are less than the tabulated values at 5% level of significance for the given degree of freedom, the null hypothesis is accepted and alternative hypothesis is rejected and vice versa.

### 3.8.1 Financial Analysis

To make rational interpretations, keeping with the objectives of the study, various analytical financial tools have been used in the study, which has mentioned below:

#### a. Total Debt to Equity Ratio

The debt to equity ratio indicates the relationship between debt and equity capital. It is used to appraise the capital structure of a bank. It measures the relative claim or contribution of creditors and owners against the bank's assets or financing debt to equity ratio can be determined in different ways. For the purpose of this following model is used:

$$\text{D/E Ratio} = \frac{\text{Total Debt}}{\text{Total Equity Capital}} \times 100$$

Where,

D/E Ratio = Debt to Equity Ratio

Total Debt = Long Term Debts + Current Liabilities

Total Capital = (Share Capital + Share Premium + General Reserve + Accumulated Profit + Other Fee Reserves)

#### b. Interest Coverage Ratio (ICR)

Interest coverage ratio is another tool to appraise the capital structure of levered bank, which is determined by dividing EBIT to interest charges. It reflects the debt servicing capacity of a firm. Thus the ratio is used to analyze the debt servicing capacity of the banks. Following is the expressing of interest coverage ratio:

$$\text{Interest Coverage Ratio} = \frac{\text{EBIT}}{\text{Interest Charges}}$$

Where,

ICR = Interest coverage ratio

EBIT = Earning before interest and taxes

#### c. Return on Equity (ROE)

The return on equity indicates the relationship between net profits after taxes to total equity capital. It is a measure of the rate of return to the firm's share holder's investment. It approximates the net benefit that the shareholders have received from

investing their capital in the financial firm (i.e. placing their funds at risk in the hope of earning a suitable profit) Higher ratio is the more favorable for the shareholder's which represents the sound management and efficient mobilization of the owner's equity.

For the purpose of the study following model is used to determine the return on equity ratio:

$$ROE = \frac{Net\ Profit\ After\ Taxes}{Total\ Equity\ Capital} \times 100$$

Where,

$$Total\ Equity\ Capital = Paid-up\ Capital + Reserves\ Funds\ and\ Surplus.$$

#### **d. Return on Assets (ROA)**

Return on Assets express the relationship between net incomes end total assets. It measures the return on all the firm's assets after interest and taxes it is primarily an indicator of managerial efficiency it indicator of management of the firm capable for converting the institution's assets in to net earnings and increasing ratio is favorable . it is calculated by using the following models:

$$ROA = \frac{Net\ Profit\ After\ Taxes + Interest}{Total\ Assets} \times 100$$

#### **e. Fixed Deposit to Capital Employed**

Capital employed includes shareholders equity and fixed deposits

$$\frac{Fixed\ Deposit}{Capital\ Employed}$$

Where, Capital Employed = Fixed Deposit + Net Worth

#### **f. Analysis of Debt Capacity of the Banks**

To analyze debt capacity of the banks or to indicate the firm's ability to meet interest obligation; interest coverage ratio is calculated. Interest coverage ratio is one of the most conventional coverage ratios which measure the relationship between what is normally available from operation of the firm and the claims of outsiders. It is used to taste firm's debt servicing capacity. It is determined by dividing operating profit by the fixed interest charges on debt.

$$\text{Interest Coverage Ratio} = \frac{\text{EBIT}}{\text{Interest}}$$

#### **g. Overall Capitalization Rate ( $K_o$ )**

The overall capitalization rate is calculated under net income approach, which measures the degree of leverage of firm. This approach assumes that cost of debt is less than cost of equity. So, if the degree of financial leverage is increased weighted average cost of capital will decline. As a result value of firm will increase. Higher the use of cheaper debt lowers the cost and consequently increases the value. Overall capitalization rate is calculated as:

$$K_o = \frac{\text{EBIT}}{\text{Value of firm}}$$

#### **h. Earning Power Ratio (EPR)**

The profitability of firm can be measured either in relation to investment or operating efficiency. The overall profitability can be measured on the basis of combination of these two ratios. Which is known as earning power ratio.

$$\text{Earning Power Ratio} = \frac{\text{Net Profit After Tax}}{\text{Total Assets}}$$

#### **i. Return on Capital Employed (ROCE)**

Return on capital employed ratio is another ratio related to the profitability of long term funds. The ratio provides us a test of profitability related to the sources of long term funds and sufficient insights into how efficiently long term funds of owners and creditors are being used. It explains net income for each unit of long term funds. The higher the ratio, more efficient is the use of capital employed. From the point of view of judging operational efficiency return on capital employed is also more useful measure. The ratio is formulated as:

$$ROCE = \frac{\text{Net Income}}{(\text{Fixed Deposits} + \text{Net Worth})}$$

Where,

$$\text{Total Value of Firm} = \text{Fixed Deposits} + \text{Net Worth}$$

### 3.8.2 Statistical Tools

The statistical tools applied in this study are Expected rate of return, Standard Deviation, Coefficient of Variation, Karl Pearson's Coefficient of Correlation and Students t-test. As this research is related to financial subject matter so, statistical tools and formula are expressed in financial terms except correlation coefficient, coefficient of (multiple) determination ( $r^2$ ) and Student's t-test. Due to the most use of average and standard deviation in financial sector also the researcher has used the financial notation for these statistical tools.

#### a. Expected Rate of Return or Average Rate of Return

Expected rate of return or average rate of return is the most popular and widely used measure of representing the entire data. Expected rate of return has been used to compute the average rate of return of the variable of the selected two commercial banks. It is the sums of multiply of the variables with their respective probability distribution.

Symbolically,

$$\text{Expected rate of return } E(X) = \sum_{i=1}^N X(P_i)$$

Where,

$E(X)$  = Expected rate of return

$X$  = variables (Amount of Study Variables)

$P_i$  = Probability distribution of  $i^{\text{th}}$  variables for each study period.

#### b. Standard Deviation

The standard deviation measures the absolute value of risk, i.e., variability of the returns from the mean returns. It is also known as root mean square deviation for the reason that it is the square root of the mean of the squared deviations from the arithmetic mean.

Symbolically,

$$\text{Standard Deviation } (\sigma) = \sqrt{\sum_{i=1}^N P_i \times \{X - E(X)\}^2} \dots\dots\dots \text{(If Probability is given)}$$

Standard Deviation ( $\sigma$ ) =  $\sqrt{\frac{\sum_{i=1}^N \{X - E(X)\}^2}{N-1}}$  ..... (If historical data is given)

Where,

$\sigma$  = The Greek Letter Sigma, which denotes the Standard Deviation.

$P_i$  = Probability distribution of  $i^{\text{th}}$  variables for each study period.

$\{X - E(X)\}^2$  = Mean deviation squared.

$N$  = No. of years

**c. Coefficient of Variation**

As noted above the standard deviation is the absolute measure of risk. In the case of the different mean returns, it misleads to the invalid decision. Hence, to overcome on such a problem, a standardized per unit risk can be used to measure the risk which is called Coefficient of Variation. It indicates risk per unit of average return. Variability in return (i.e. the risk) has therefore been measured by the coefficient of variation. In our study, coefficient of variation has been computed to show the Bank-wise variability or risk return relationship in respect of interest rate and rate of return on total investments. It can be computed by dividing the standard deviation by average rate of return.

Symbolically,

Coefficient of Variation (C.V.) =  $\frac{\sigma_x}{E(x)}$

Where,

$\sigma$  = Standard Deviation

$E(x)$  = Mean Rate of Return

**d. Karl Pearson’s Correlation Coefficient**

Correlation is defined as the “relationship” (or association) between (among) the one dependent variable (or factor) and one (or more than one) independent variables or factors. In other words, correlation is the relationship between (or among) two or more variables (i.e. only one dependent variable and one or more independent

variables. Thus, correlation is a statistical tool, with the help of which, we can determine whether or not two or more variables are correlated and if they are correlated the degree (extent) and direction of correlation is determined. Stated differently, it helps in studying the covariance of two or more variables. There are several methods of analyzing the correlation between the two variables such as, Graphic Method, Karl Pearson's Coefficient of Correlation, Concurrent Deviation method, Least Square Method and so on. Among them, Karl Pearson's Correlation Coefficient is most widely used in practice. In our study, Karl Pearson's Correlation Coefficient has been used in order to establish the relationship between the returns of NABIL and SBL. Karl Pearson's Correlation Coefficient is denoted by the symbol  $r$ , which is mathematically defined as;

$$\text{Correlation coefficient between X and Y } (r_{XY}) = \frac{\sum XY}{\sqrt{\sum X^2} \sqrt{\sum Y^2}}$$

Where,

X and Y = Variables

$r_{XY}$  = Correlation coefficient between variables X and Y.

$\sum XY$  = Summation of multiple of mean deviation of variables X and Y.

$\sum X^2$  = Summation of mean deviation squared of variable X.

$\sum Y^2$  = Summation of mean deviation squared of variable Y.

#### **e. Coefficient of (Multiple) Determination ( $r^2$ )**

The coefficient of (multiple) determination is a measure of the degree of linear association or correlation between two variables one of which happens to be independent and other being depended variables. It measures the percentage total variation in dependent variables explained by independent variables. The value of the coefficient of (multiple) determination can range from zero to one (i.e.  $0 < r^2 < 1$ ). If  $r^2$  is equal to 0.75, it indicates that independent variables used in regression model explain 75 percentage of the total variation in the dependent variable. It is calculated as,

$$r^2 = \frac{\text{Explained Variables}}{\text{Total Variation}}$$

### **f. Simple Regression Analysis**

The regression analysis confined to the study of only two variables at a time is called simple regression analysis. The regression equation having only one independent variable is known as simple regression equation and it is defined as:

$$Y = a + bx$$

Where, Y= Dependent variable

a = Constant

b = Coefficient of regression of Y on X.

X = Independent variable

## CHAPTER FOUR

### PRESENTATION AND ANALYSIS OF DATA

#### 4.1 Capital Structure Analysis

Capital structure of the bank is analyzed incorporating the analysis of relationship between fixed deposits and shareholders equity, its composition and index, financial mix ratios analysis and capitalization rate analysis.

##### 4.1.1 Fixed Deposit Analysis

Fixed deposit of bank is considered as long term debt collected from the depositors. Fixed deposit is only one long term source of debt capital for these two banks, NABIL and SBL so far. The following table shows the position of fixed deposits in the bank over the past five years (i.e. 2006/07 to 2010/11).

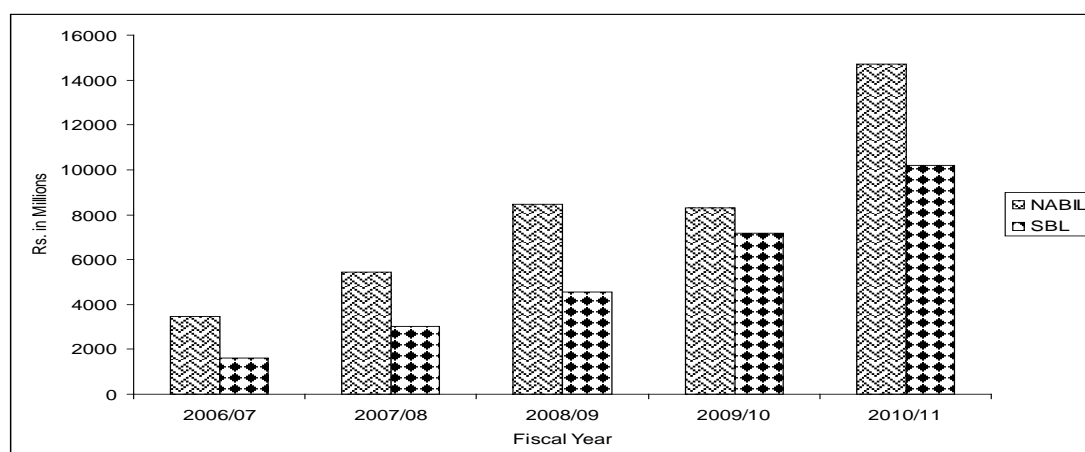
**Table No. 4.1**

**Fixed Deposit Position & Index Table of NABIL & SBL (Rs. in Million)**

FY	NABIL			SBL		
	Fixed Deposit	Index	% Change	Fixed Deposit	Index	% Change
2006/07	3449.09	100.00	-	1632.09	100.00	-
2007/08	5435.99	157.61	57.61	3022.56	185.20	85.20
2008/09	8464.09	245.41	55.71	4562.72	279.57	50.96
2009/10	8310.71	240.96	-1.81	7158.20	438.60	56.88
2010/11	14711.16	426.53	77.01	10195.73	624.72	42.44
<b>Average</b>			47.13	<b>Average</b>		58.87

*Source: Annual Report of NABIL and SBL*

**Figure No. 4.1**  
**Comparative Bar Diagram of Fixed Deposits**



Fixed Deposits of NABIL is increased during study period except in fiscal year 2009/10. The fixed deposit of the bank is increased by 77.01% in fiscal year 2010/11, which is the highest increment during the study period.

Similarly fixed deposit of SBL is also increased every year. Banks fixed deposit is increased by 85.20% in FY 2007/08. It was just five year of banks operation so fixed deposit increase rate is very high then average increased rate.

On average fixed deposit increasing rate is higher for SBL than NABIL and in volume NABIL has more fixed deposit than that of SBL for final fiscal year of our study period (i.e.2010/11). Both the banks were found increasing fixed deposits in their financial mix.

#### 4.1.2 Analysis of Shareholders Equity

The shareholders equity of the banks include paid-up capital, general reserve, capital reserve, proposed dividend, other reserve, retained earning and exchange equalization fund.

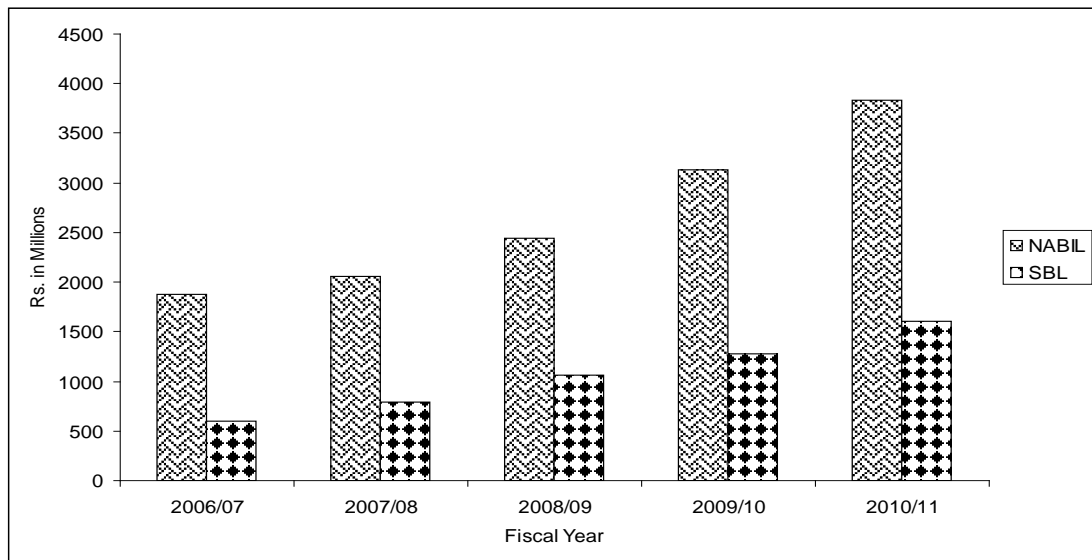
**Table No. 4.2**  
**Shareholders Equity Position & Index Table of NABIL & SBL**

*(Rs. in Million)*

FY	NABIL			SBL		
	Net Worth	Index	% Change	Net Worth	Index	% Change
2006/07	1875.00	100.00	-	603.14	100.00	-
2007/08	2057.00	109.71	9.71	793.71	131.60	31.60
2008/09	2437.20	129.99	18.49	1068.35	177.14	34.60
2009/10	3130.24	166.95	28.43	1278.74	212.02	19.69
2010/11	3834.23	204.50	22.49	1603.54	265.87	25.40
<b>Average</b>			19.78	<b>Average</b>		27.82

*Source: Annual Report of NABIL and SBL*

**Figure No. 4.2**  
**Comparative Bar Diagram of Net Worth**



As shown in table 4.2 the shareholders equity position of both banks showed a fluctuating trend but not negative trend. The net worth of NABIL bank is increased by 28.43% in fiscal year 2009/10, which is the highest increment during the study period.

In case of SBL, the annual rate of % change in the fiscal year 2007/08 was 31.60% and by the end of fiscal year 2010/11 it reached 25.40% and the highest increment in % change is 34.60% in fiscal year 2008/09.

On average net worth increasing rate is higher for SBL than NABIL but not in volume of SBL has more net worth than NABIL during the study period (i.e. 2006/07 – 2010/11). Both the banks were found increasing net worth in their financial mix.

#### 4.1.3 Fixed Deposit & Net Worth of NABIL & SBL

**Table No. 4.3**  
**Fixed Deposit & Net Worth of NABIL & SBL (Rs. in Million)**

Fiscal Year	NABIL		SBL	
	Fixed Deposit	Net Worth	Fixed Deposit	Net Worth
2006/07	3449.09	1875.00	1632.09	603.14
2007/08	5435.99	2057.00	3022.56	793.71
2008/09	8464.09	2437.20	4562.72	1068.35
2009/10	8310.71	3130.24	7158.20	1278.74
2010/11	14711.16	3834.23	10195.73	1603.54

As shown in table 4.3, fixed deposits and net worth of NABIL is higher than SBL, the highest amount of fixed deposit and net worth of NABIL is in fiscal year 2010/11 which is Rs. 14711.16 million and Rs.3834.23 million respectively. And the highest amount of fixed deposit and net worth of SBL is in fiscal year 2010/11 which is Rs.10195.73 million and Rs.1603.54 million respectively.

#### 4.1.4 Fixed Deposit to Total Debt Ratio

**Table No. 4.4**  
**Fixed Deposit to Total Debt Ratio of NABIL & SBL**

*Rs. in Million*

Fiscal Year	NABIL			SBL		
	Fixed Deposit	Total Debt	Ratio %	Fixed Deposit	Total Debt	Ratio %
2006/07	3449.09	20454.98	16.86	1632.09	4152.90	39.30
2007/08	5435.99	25196.34	21.57	3022.56	7150.60	42.27
2008/09	8464.09	34695.61	24.40	4562.72	10581.45	43.12
2009/10	8310.71	40737.16	20.40	7158.20	16603.01	43.11
2010/11	14711.16	48245.50	30.49	10195.73	21198.89	48.10
<b>Average</b>			<b>22.74</b>			<b>43.18</b>
<b>SD</b>			<b>5.10</b>			<b>8.67</b>
<b>CV</b>			<b>22.43</b>			<b>20.08</b>

Total debt includes borrowing from banks, deposits, bills payable, bills for collection and other liabilities. The portion of fixed deposit of NABIL in total debt is in average of 22.74%. It is highest of 30.49% in fiscal year 2010/11 and the lowest of 16.86% in fiscal year 2006/07.

In case of SBL, portion of fixed deposit to total debt is the highest of 48.10% in fiscal year 2010/11 and the lowest of 39.30% in fiscal year 2006/07 throughout the study period. And on average percentage of fixed deposit to total debt is 43.18% for SBL.

The volume of fixed deposit to total debt fluctuated more in NABIL than in SBL (i.e. CV=22.43%>20.08%). The ratio of fixed deposit to total debt of NABIL is found below the combined average of 32.96% throughout the study period but average ratio of SBL is above the combined average. Above figures show that SBL has higher portion of fixed deposits in total debt than that of NABIL.

#### 4.1.5 Analysis of Financial Mix of the Banks

This research has analyzed financial mix of the banks using ratio analysis as financial tool for the data available from the concerned banks annual reports.

##### 4.1.5.1 Debt to Equity Ratio (DER)

It shows the relationship between borrowed funds and owners capital. This ratio reflects the relative claims of creditors and shareholders against the assets of the firm. This ratio is widely popular measure of the long term financial viability of a firm and it is important to appraise the financial structure of a firm.

A higher ratio shows a large share of financing by the creditors relatively to the owners. Therefore, there is a large claim against the assets of the firm which is a dangerous signal for the creditors. It would be riskier to the creditors. A high proportion of debt in the financial structure would lead to inflexibility in the operation of the firm because firm is largely liable to pay the interest even if the firm is suffering from the losses, where a smaller ratio shows smaller claim of creditors. To the creditors relatively high stake of the owners implies sufficient safety margin and substantial protection against shrinkage in assets. Debt equity can be calculated in the following ways.

##### i. Fixed Deposit to Net Worth Ratio

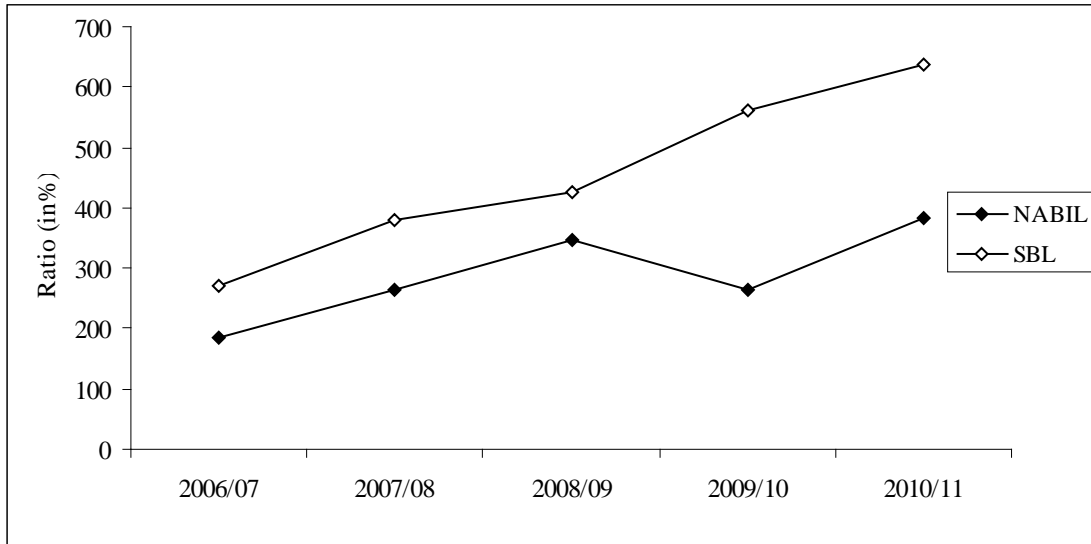
**Table No. 4.5**  
**Fixed Deposit to Net Worth Ratio of NABIL & SBL**

*Rs. in Million*

Fiscal Year	NABIL			SBL		
	Fixed Deposit	Net Worth	Ratio %	Fixed Deposit	Net Worth	Ratio %
2006/07	3449.09	1875.00	183.95	1632.09	603.14	270.60
2007/08	5435.99	2057.00	264.27	3022.56	793.71	380.81
2008/09	8464.09	2437.20	347.29	4562.72	1068.35	427.08
2009/10	8310.71	3130.24	265.50	7158.20	1278.74	559.79
2010/11	14711.16	3834.23	383.68	10195.73	1603.54	635.83
<b>Average</b>			<b>288.94</b>			<b>454.82</b>
<b>SD</b>			<b>78.36</b>			<b>144.89</b>
<b>CV</b>			<b>27.12</b>			<b>31.86</b>

*Source: Annual Report of NABIL and SBL*

**Figure No. 4.3**  
**Line Diagram of Fixed Deposit to Net Worth**



The above table shows the debt equity ratio in terms of fixed deposits (FD) to shareholders equity (NW) of the banks (NABIL and SBL). The ratio is more significant to determine whether fixed deposits financing is strength of the profitability of the bank. Both the banks have more DER i.e. greater claims of the creditors than that of owners.

DER of NABIL is 383.68% in Fiscal year 2010/11 which is the highest ratio during the study period. It is minimal of 183.95% in fiscal year 2006/07 and average DER of NABIL is 288.94%. Similarly for SBL, DER is highest in fiscal year 2010/11 i.e. 635.83% and minimum of 270.60% in fiscal year 2006/07. Average DER ratio for SBL is 454.82%.

On average this ratio is higher for SBL than that of NABIL. But on the basis of coefficient of variation (C.V), the C.V of SBL is found higher than the CV of NABIL i.e. 31.86% > 27.12%. This shows that the variability of fixed deposits to net-worth ratio is higher in SBL than in NABIL.

If we consider the average ratio of fixed deposit to net-worth, it is higher for SBL than that of NABIL. This explains that SBL has more claims of creditors than that of owners. Further it depicts that SBL has higher portion of fixed deposits than shareholders equity in its capital structure in comparison to NABIL, but the figures

are highly varied during the study period so we can not interpret the results on the basis of average.

## ii. Total Debt to Net Worth Ratio

**Table No. 4.6**  
**Total Debt to Net Worth Ratio of NABIL & SBL**

*Rs. in Million*

Fiscal Year	NABIL			SBL		
	Total Debt	Net Worth	Ratio %	Total Debt	Net Worth	Ratio %
2006/07	20454.98	1875.00	1090.93	4152.90	603.14	688.55
2007/08	25196.34	2057.00	1224.91	7150.60	793.71	900.91
2008/09	34695.61	2437.20	1423.58	10581.45	1068.35	990.45
2009/10	40737.16	3130.24	1301.41	16603.01	1278.74	1298.39
2010/11	48245.50	3834.23	1258.28	21198.89	1603.54	1322.01
<b>Average</b>			<b>1259.82</b>			<b>1040.06</b>
<b>SD</b>			<b>120.72</b>			<b>270.01</b>
<b>CV</b>			<b>9.58</b>			<b>25.96</b>

*Source: Annual Report of NABIL and SBL*

The above calculation shows the portion of total debt in shareholders equity. In Fiscal year 2006/07, NABIL has 1090.93% of debt to net-worth which is the lowest return throughout the study period. NABIL has highest ratio of 1423.58% in fiscal year 2008/09 having average debt to net worth of 1259.82%.

Similarly, SBL has 688.55% of debt capital in every 100% net worth in fiscal year 2006/07 which is the lowest ratio throughout the study period. SBL has highest ratio of 1322.01% in fiscal year 2010/11 having an average total debt to net worth of 1040.06%.

The average ratio of NABIL is found above the combined average of 1149.94% throughout the study period where the average ratio of SBL is below the combined average. This depicts that NABIL has employed high total debt capital or outside funds as compared to equity fund, since the bank is extremely levered than SBL.

A normal fluctuation on the ratio has been noticed in both the banks however the CV is lower in NABIL than in SBL, which shows that the ratio of NABIL is more consistent than that of SBL.

From the above table, we can say that both banks are extremely levered. Both the banks are facing heavy burden of interest payment due to the employment of more debts. Both the banks financial structure shows the dangerous signals to the creditors. In future the banks may lead to inflexibility in the operation. But by nature banks capital structure heavily depends on that capital.

#### 4.1.5.2 Debt to Total Capital Ratio

The relationship between creditors fund and owners capital can also be shown by debt to capital ratio. This type of capital structure ratio is deviated from the debt equity ratio. Here, it states that the outsider's liabilities are related to the total capitalization to the firm and not only to the shareholders equity. There are various related ratios i.e.

##### i. Fixed Deposit to Capital Employed

Capital employed includes shareholders equity and fixed deposits

$$\frac{\text{Fixed Deposit}}{\text{Capital Employed}}$$

Where, Capital Employed = Fixed Deposit + Net Worth

**Table No. 4.7**

**Fixed Deposit to Capital Employed Ratio of NABIL & SBL (Rs. in Millions)**

Fiscal Year	NABIL				SBL			
	Fixed Deposit	Net Worth	Capital Employed	Ratio %	Fixed Deposit	Net Worth	Capital Employed	Ratio %
2006/07	3449.09	1875.00	5324.09	64.78	1632.09	603.14	2235.23	73.02
2007/08	5435.99	2057.00	7492.99	72.55	3022.56	793.71	3816.27	79.20
2008/09	8464.09	2437.20	10901.29	77.64	4562.72	1068.35	5631.07	81.03
2009/10	8310.71	3130.24	11440.95	72.64	7158.20	1278.74	8436.94	84.84
2010/11	14711.16	3834.23	18545.39	79.33	10195.73	1603.54	11799.27	86.41
<b>Average</b>				73.39				80.90
<b>SD</b>				5.67				5.26
<b>CV</b>				7.73				6.50

*Source: Annual Report of NABIL and SBL*

The ratio of fixed deposit to capital employed has been fluctuated for both banks over the study period. NABIL has recorded the ratio 79.33% in fiscal year 2010/11 which

is the highest ratio during the study period. NABIL has lowest ratio of 64.78% in fiscal year 2006/07 having average ratio of 73.39%.

Similarly, DER in-terms of fixed deposit to capital employed of SBL is 73.02% which is the lowest ratio during the study period. SBL has the highest ratio of 86.41% in fiscal year 2010/11 having average ratio of 80.90%.

The CV of SBL is found less than that of NABIL i.e.  $6.50% < 7.73%$ ; this shows that the variability of ratio is extremely more in SBL.

**Table No. 4.8**  
**Total Debt to Total Assets Ratio of NABIL & SBL**

*(Rs. in Million)*

Fiscal Year	NABIL			SBL		
	Total Debt	Total Assets	Ratio %	Total Debt	Total Assets	Ratio %
2006/07	20454.98	22329.97	91.60	4152.90	4755.96	87.32
2007/08	25196.34	27329.39	92.20	7150.60	7948.64	89.96
2008/09	34695.61	37132.76	93.44	10581.45	11654.86	90.79
2009/10	40737.16	43867.40	92.86	16603.01	17881.75	92.85
2010/11	48245.50	52079.73	92.64	21198.89	22802.43	92.97
<b>Average</b>			<b>92.55</b>			<b>90.78</b>
<b>SD</b>			<b>0.69</b>			<b>2.33</b>
<b>CV</b>			<b>0.75</b>			<b>2.57</b>

*Source: Annual Report of NABIL and SBL*

The above computation of D/CR in-terms of total debt to total assets shows that the share of total assets is financed by the outsider's fund. The ratio shows that the assets of the banks, the banks have been financed more by funds collected from creditors.

The ratio of total debt to total assets of NABIL is 91.60% in fiscal year 2006/07 which is the lowest ratio during the study period but for 2008/09 it is increased to 93.44% recording the highest ratio during the study period. NABIL has an average D/CR ratio of 92.55% in terms of total debt to total assets.

Where as the same ratio of SBL is 87.32% for fiscal year 2006/07, which is the lowest ratio for the study period. SBL recorded highest D/CR in fiscal year 2010/11 having average ratio of 90.78%. The ratio is highly fluctuated in SBL than in NABIL i.e.  $2.57% > 0.75%$

The ratio of total debt to total assets is recorded over 80% in both banks that show that both banks are found using higher debt capital to finance their assets. In both banks, creditor's margin of safety is very low. It is found around 10% to 12% of average which indicates higher risk. However, the ratio is found much higher in SBL than that of NABIL.

#### 4.1.6 Analysis of Debt Capacity of the Banks

To analyze debt capacity of the banks or to indicate the firm's ability to meet interest obligation; interest coverage ratio is calculated. Interest coverage ratio is one of the most conventional coverage ratios which measure the relationship between what is normally available from operation of the firm and the claims of outsiders. It is used to taste firm's debt servicing capacity. It is determined by dividing operating profit by the fixed interest charges on debt.

$$\text{Interest Coverage Ratio} = \frac{\text{EBIT}}{\text{Interest}}$$

From the view point of the creditors, the larger the coverage ratio greater the ability of firm to handle fixed charges and assurance of payment of interest to creditors. However, too high or low ratio as well is unfavorable to the firms, high ratio implies that firms is very conservative in using debt and low ratio implies that firm is using excess debt and doesn't have the ability to offer assured payment of interest to creditors.

**Table No. 4.9**  
**EBIT and Interest Charges of NABIL & SBL (Rs. in Million)**

FY	NABIL		SBL	
	EBIT	Interest	EBIT	Interest
2006/07	1254.99	351.16	254.41	153.71
2007/08	1544.20	555.71	424.76	271.71
2008/09	1847.43	758.44	646.87	401.89
2009/10	2631.95	1153.28	1136.34	813.62
2010/11	3585.29	1960.11	1755.17	1406.49

**Table No. 4.10****Interest Coverage Ratio of NABIL & SBL (In Times)**

<b>Bank</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>Average</b>	<b>S.D</b>	<b>C.V</b>
NABIL	3.57	2.78	2.44	2.28	1.83	2.58	0.65	25.19
Change	-	-0.79	-0.34	-0.16	-0.45			
SBL	1.66	1.56	1.61	1.40	1.25	1.49	0.17	11.41
Change	-	-0.10	0.05	-0.21	-0.15			
Combined Average						2.04		

*Source: Annual Report of NABILL and SBL*

The interest coverage ratio of NABIL was 1.83 times, which is the lowest ratio during our study period recording the highest ratio of 3.57 times in fiscal year 2006/07. NABIL maintained average interest coverage ratio of 2.58 times. Throughout the study period interest coverage ratio of NABIL is above the normal standard of two times except in fiscal year 2010/11.

Similarly, interest coverage ratio of SBL is 1.66 times in fiscal year 2006/07 which is the highest ratio during our study period recording the lowest ratio of 1.25 times in fiscal year 2010/11. SBL maintained its average interest coverage ratio of 1.49 times. Throughout the study period interest coverage ratio of SBL is below the normal standard of two times.

Higher the ratio indicates higher capacity to bear the high volume of interest charge and vice versa. NABIL bank have interest coverage ratio above the normal ratio i.e. 2 times and SBL have below the normal ratio, which could be considered as tight debt service capacity. So far NABIL is observed in better condition than SBL in their debt service capacity.

The variation of the ratio of SBL is observed less in comparison to NABIL i.e. CV of SBL is 11.41 whereas 25.19 is recorded in NABIL, which indicates that interest coverage ratio of SBL is consistent than that of NABIL.

Both banks are able to meet the interest obligation. In banking business, interest coverage ratio should not be tight so that banks could be able to service the debt coverage ratio. Moreover, the ratio of SBL in fiscal year 2010/11 is 1.25 times only, which is very tight to meet its interest obligation. The banks should have to pay more attention in this matter either increase its EBIT or maintaining its interest obligation (cost of fund).

#### 4.1.7 Capital Structure Position of the Banks

When debt and equity are properly mixed, it minimizes the cost of capital and maximizes the value of firm. In-order to analyze the value of banks, fixed deposits and equity share capitals are taken into consideration. Net income approach is considered to fix out the overall capitalization rate of banks. Here, net worth is equal to equity share.

In order to analyze the capital structure management of banks value of the firm is calculated as below. The value of firm is determined by adding debt and equity. The structure of banks is of fixed deposits and equity share capital only.

**Table No. 4.11**  
**Capital Structure Mix of NABIL (Rs. in Million)**

<b>FY</b>	<b>Fixed Deposit</b>	<b>Equity Share</b>	<b>Total Value of Firm</b>	<b>Proportion</b>
2006/07	3449.09	1875.00	5324.09	0.65 : 0.35
2007/08	5435.99	2057.00	7492.99	0.73 : 0.27
2008/09	8464.09	2437.20	10901.29	0.78 : 0.22
2009/10	8310.71	3130.24	11440.95	0.73 : 0.27
2010/11	14711.16	3834.23	18545.39	0.79 : 0.21

*Source: Annual Report of NABIL*

**Table No. 4.12**  
**Capital Structure Mix of SBL (Rs. in Million)**

<b>FY</b>	<b>Fixed Deposit</b>	<b>Equity Share</b>	<b>Total Value of Firm</b>	<b>Proportion</b>
2006/07	1632.09	603.14	2235.23	0.73 : 0.27
2007/08	3022.56	793.71	3816.27	0.79 : 0.21
2008/09	4562.72	1068.35	5631.07	0.81 : 0.19
2009/10	7158.20	1278.74	8436.94	0.85 : 0.15
2010/11	10195.73	1603.54	11799.27	0.86 : 0.14

*Source: Annual Report of SBL*

The proportion of debt capital to equity of NABIL is above 70% in all fiscal year except in fiscal year 2006/07 during our study period. The proportion was 0.65:0.35 in fiscal year 2006/07 which is the lowest proportion of debt to equity over the study period. NABIL recorded the highest proportion of 0.79:0.21 in fiscal year 2010/11.

Likewise, the proportion of debt capital to equity of SBL is above 70% in all fiscal year during our study period. The proportion is 0.73:0.27 in fiscal year 2006/07 which is the lowest proportion of debt to equity over the study period. SBL recorded highest proportion of debt to equity of 0.86:0.14 in fiscal year 2010/11.

#### 4.1.8 Overall Capitalization Rate ( $K_o$ )

The overall capitalization rate is calculated under net income approach, which measures the degree of leverage of firm. This approach assumes that cost of debt is less than cost of equity. So, if the degree of financial leverage is increased weighted average cost of capital will decline. As a result value of firm will increase. Higher the use of cheaper debt lowers the cost and consequently increases the value. Overall capitalization rate is calculated as:

$$K_o = \frac{\text{EBIT}}{\text{Value of firm}}$$

**Table No. 4.13**

**EBIT and Value of the Firm of NABIL & SBL (Rs. in Million)**

Fiscal Year	NABIL		SBL	
	EBIT	Value of Firm	EBIT	Value of Firm
2006/07	1254.99	5324.09	254.41	2235.23
2007/08	1544.20	7492.99	424.76	3816.27
2008/09	1847.43	10901.29	646.87	5631.07
2009/10	2631.95	11440.95	1136.34	8436.94
2010/11	3585.29	18545.39	1755.17	11799.27

**Table No. 4.14**

**Overall Capitalization Rate of NABIL and SBL (in%)**

Fiscal Year	NABIL		SBL	
	$K_o$	Change	$K_o$	Change
2006/07	23.57	-	11.38	-
2007/08	20.61	-2.96	11.13	-0.25
2008/09	16.95	-3.66	11.49	0.36
2009/10	23.00	6.05	13.47	1.98
2010/11	19.33	-3.67	14.88	1.41
<b>Average</b>	20.69		12.47	

Source: Annual Report of NABIL and SBL

Average overall capitalization rate ( $K_o$ ) is 20.69% of NABIL. The maximum overall capitalization rate of NABIL is 23.57% in fiscal year 2006/07 due to increase in EBIT in comparison to its value, whereas the capitalization rate is recorded minimum of 16.95% in fiscal year 2008/09 because of its decrease in EBIT.

Similarly the average overall capitalization rate of SBL is 12.47% which is less than of NABIL. In addition the  $K_o$  of SBL in all period is lower than that of NABIL. The highest  $K_o$  of SBL is 14.88% found in 2010/11 and the lowest is 11.13% in fiscal year 2007/08.

From the above it is found that increase in financial leverage there is decrease in  $K_o$ . This shows that cost of debt is lower than cost of equity.

#### 4.1.9 Earning Power Ratio (EPR)

The profitability of firm can be measured either in relation to investment or operating efficiency. The overall profitability can be measured on the basis of combination of these two ratios. Which is known as earning power ratio.

$$\text{Earning Power Ratio} = \frac{\text{Net Profit After Tax}}{\text{Total Assets}}$$

**Table No. 4.15**  
**Earning Power Ratio of NABIL & SBL**

							<i>(In Percent)</i>	
Bank	2006/07	2007/08	2008/09	2009/10	2010/11	Average	S.D	C.V
NABIL	3.23	2.72	2.01	2.35	2.19	2.5	0.49	19.6
Change	-	-0.51	-0.71	0.34	-0.16			
SBL	1.36	1.2	1.22	1.22	1.05	1.21	0.11	8.96
Change	-	-0.16	0.02	0.002	0.17			
Combined Average						1.86		

*Source: Annual Report of NABIL and SBL*

The earning power ratio of NABIL was 2.19%. Which is nearly average percentage during our study period recording the highest ratio 3.23% in FY 2006/07 and lowest ratio is 2.01% in FY 2008/09. NABIL maintain average earning power ratio 2.5%.

Similarly, earning power ratio of SBL was 1.05%. Which is nearly average percentage during our study period recording the highest ratio 1.36% in FY 2006/07

and lowest ratio is 1.05% in FY 2010/01. SBL maintain average earning power ratio 1.21%. Overall the combine ratio is 1.86%. Through out the study period earning power ratio of SBL is below the normal standard.

The variation of the ratio of SBL is observed less in comparison to NABIL i.e. CV of SBL is 8.96% where 19.6% in NABIL which indicates that earning power ratio SBL is consistent then that of NABIL.

#### 4.1.10 Return on Assets (ROA)

Return measures the profitability of banks that explains the return on all financial resources invested in the banks assets are satisfactory or not. ROA is a useful measure of how well a manager is doing the job because it indicates how well banks assets are being used to generate profit. The ratio explains net income for each unit of assets, indicates overall effectiveness of management in generating profits with its available assets. From the view of judging operational efficiency, the rate of return on total assets is more useful measure.

The higher ratio indicates the higher efficiency in utilizing its overall resources and vice-versa. The bank has to earn satisfactory return on assets for its survival. Below table exhibits the ROA of NABIL and SBL for the period between FY 2006/07 to 2010/11.

$$\text{Return on Assets} = \frac{\text{Net Profit After Tax}}{\text{Total Assets}}$$

**Table No. 4.16**  
**Return on Assets of NABIL & SBL**

*(In Percent)*

Bank	2006/07	2007/08	2008/09	2009/10	2010/11	Average	S.D	C.V
NABIL	4.8	4.75	4.05	4.97	5.95	4.9	0.68	13.9
Change	-	-0.05	-0.7	0.92	0.98			
SBL	4.6	4.61	4.67	5.77	7.22	5.37	1.45	21.3
Change	-	0.01	0.06	-1.1	1.45			
<b>Combined Average</b>						<b>5.14</b>		

*Source: Annual Report of NABIL and SBL*

Above table shows the ROA of NABIL has fluctuating trend in FY 2006/07 to 2010/11 with average return of 5.14%, absolute measure on SD of 0.68% and relative

measure on CV of 13.9% indicates more efficiency and consistency on the ratio of NABIL. Similarly, the ratio of SBL has also fluctuating trend. The minimum ratio is 4.6% in FY 2006/07 and maximum ratio is 7.22% in FY 2010/11. Moreover, an average return ratio of 5.37% absolute measure on SD of 1.45% and relative measure on CV of 21.3%, which is moderate, it indicates less consistency on the ratio with comparing to NABIL.

#### 4.2 Return on Capital Employed (ROCE)

Return on capital employed ratio is another ratio related to the profitability of long term funds. The ratio provides us a test of profitability related to the sources of long term funds and sufficient insights into how efficiently long term funds of owners and creditors are being used. It explains net income for each unit of long term funds. The higher the ratio, more efficient is the use of capital employed. From the point of view of judging operational efficiency return on capital employed is also more useful measure. The ratio is formulated as:

$$ROCE = \frac{\text{Net Income}}{(\text{Fixed Deposits} + \text{Net Worth})}$$

Where,

Total Value of Firm = Fixed Deposits + Net Worth

**Table No. 4.17**  
**Net Income and Value of the Firm of NABIL & SBL**

*(Rs. in Million)*

Fiscal Year	NABIL		SBL	
	Net Income	Value of Firm	Net Income	Value of Firm
2006/07	720.73	5324.09	64.91	2235.23
2007/08	742.72	7492.99	94.83	3816.27
2008/09	746.47	10901.29	142.79	5631.07
2009/10	1031.05	11440.95	217.92	8436.94
2010/11	1138.57	18545.39	240.85	11799.27

**Table No. 4.18**  
**Return on Capital Employed (in %)**

<b>FY</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>Average</b>	<b>S.D</b>	<b>C.V</b>
<b>NABIL</b>	13.54	9.91	6.85	9.01	6.14	9.09	2.92	32.12
<b>Change</b>	-	-3.63	-3.06	2.16	-2.87			
<b>SBL</b>	2.90	2.48	2.54	2.58	2.04	2.51	0.30	11.95
<b>Change</b>	-	-0.42	0.06	0.04	-0.54			
<b>Combined Average</b>						<b>5.80</b>		

*Source: Annual Report of NABIL and SBL*

Return on capital employed of NABIL is 6.14% in fiscal year 2010/11 which is the lowest ratio during the study period. However NABIL recorded its highest return on capital employed of 13.54% in fiscal year 2006/07 having average return on capital employed of 9.09%.

On the other hand the lowest return on capital employed of SBL is 2.04% in fiscal year 2010/11 but the height figure of 2.90% in fiscal year 2006/07 having average return on capital employed of 2.51%.

On the ground of combined average of 5.80%, the ratio of SBL is found below than combined average in all periods, at the same time coefficient of variation of NABIL is more than that of SBL. This shows that ratio of NABIL is highly fluctuated throughout the period i.e.  $CV = 32.12\% > C.V = 11.95\%$ . This further explains that NABIL is not able in handling long term funds properly.

#### **4.3 Return on Equity (ROE)**

This ratio carries the relationship of return to the source of funds. This ratio shows whether the banks have earned a satisfactory return from its internal sources or not. Return on capital employed has expressed previously, the profitability of the banks in relation to the funds supplied by the creditors and owners together. But this ratio is used to measure exclusively return on owner's fund.

Hence, this ratio reveals how profitably the owners fund has been utilized by the banks and indicates whether a bank can compete for private source of capital in the company. Higher the ratio, higher will be the investment, which the shareholders will undertake. Return of equity ratio can be formulated as:

$$\text{ROE} = \frac{\text{Net Income}}{\text{Net Worth}}$$

**Table No. 4.19**  
**Net Income and Net Worth of NABIL & SBL**

*(Rs. in Million)*

Fiscal Year	NABIL		SBL	
	Net Income	Net Worth	Net Income	Net Worth
2006/07	720.73	1875.00	64.91	603.14
2007/08	742.72	2057.00	94.83	793.71
2008/09	746.47	2437.20	142.79	1068.35
2009/10	1031.05	3130.24	217.92	1278.74
2010/11	1138.57	3834.23	240.85	1603.54

**Table No. 4.20**  
**Return on Equity (in %)**

FY	2006/07	2007/08	2008/09	2009/10	2010/11	Average	S.D	C.V
NABIL	38.44	36.11	30.63	32.94	29.69	33.56	3.68	10.97
Change	-	-2.33	-5.48	2.31	-3.25			
SBL	10.76	11.95	13.37	17.04	15.02	13.63	2.48	18.20
Change	-	1.19	1.42	3.67	-2.02			

*Source: Annual Report of NABIL and SBL*

The return on equity of NABIL is lowest of 29.69 % and that is the highest of 38.44% in fiscal year 2006/07 and decreased to 36.11% in fiscal year 2007/08. Average return on equity of NABIL is 33.56%.

The return on equity of SBL is found fluctuating in nature. The ratio is lowest of 10.76% in fiscal year 2006/07 and reached to the highest of 17.04% in fiscal year 2009/10 and again it decreased to 15.02% in fiscal year 2010/11. Than after having an average return on equity of 13.63%

Coefficient of variation shows that return on equity ratio of SBL is highly fluctuated than the ratio of NABIL i.e.  $CV = 18.20\% > CV = 10.97\%$ . NABIL seems more consistent in respect of return on equity than that of SBL.

Both the banks have satisfactory return of equity of above 10% in all fiscal years, which shows that both banks have utilized their shareholders equity in satisfactory manner.

#### 4.4 Statistical Analysis

This Chapter incorporates some statistical tools, which are used to analyze the data to achieve the objective of the study. Such statistical tools are Karl Pearson's Correlation Coefficient & multiple regression analysis.

##### 4.4.1 Correlation Coefficient Analysis

Correlation analysis deals with the statistical technique which measures the degree of relationship (or association) between the variables. In other words, it helps us in analyzing the co-variation of two or more variables. If two quantities vary such that movement in one variable accompanied by movement in other, then they are said to be correlated.

##### 4.4.1.1 Correlation Coefficient between EBIT & Interest Payment

The relationship between EBIT & Interest payment is evaluated in order to measure debt serving capacity of the banks. It is assumed that there is significant relationship between EBIT & Interest payment. Here interest payment (X) is dependent variable and EBIT (Y) is independent variable. The following result obtained for NABIL & SBL.

**Table No. 4.21**  
**Correlation Coefficient between EBIT & Interest Payment**

Fiscal Year	NABIL		SBL	
	Interest(X)	EBIT(Y)	Interest(X)	EBIT(Y)
2006/07	351.16	1254.99	153.71	254.41
2007/08	555.71	1544.20	271.71	424.76
2008/09	758.44	1847.43	401.89	646.87
2009/10	1153.28	2631.95	813.62	1136.34
2010/11	1960.11	3585.29	1406.49	1755.17
r	0.9853		0.9966	
r <sup>2</sup>	0.9425		0.9931	
P.E.	0.0173		0.0021	
6P.E.	0.1041		0.0125	
Relation	Positive		Positive	
Sign/Insig	Significant		Significant	

*Source: Annual Report of NABIL and SBL*

$$r = \frac{\sum XY}{\sqrt{\sum X^2} \sqrt{\sum Y^2}} \quad \text{P.E.} = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

The correlation between EBIT & Interest payment of NABIL is 0.9853 and it is 0.9966 in SBL, which shows higher positive relationship in both the banks.

Coefficient of determination ( $r^2$ ) of NABIL indicated that 94.25% variation in interest payment is explained by the independent variable EBIT, where as in the case of SBL 99.31% of the variation in the interest payment is explained by EBIT.

Considering the probable error (P.E.), the value of 'r' of both the banks are greater than six times of the P.E. Therefore, we can say that the value of 'r' is significant i.e., there is significant relationship between EBIT & Interest payment. This depicts us that the banks are significantly able to service their debt.

#### 4.4.1.2 Correlation Coefficient between Return & Debt Capital

The relationship between return and debt capital of both the banks is analyzed in order to examine whether debt capital is significant in generating more return. It is assumed that there is significant relationship between return and debt capital.

Here, Return(X) is dependent variable and Debt Capital (Y) is independent variable. The following result is obtained for NABIL & SBL.

**Table No. 4.22**  
**Correlation Coefficient between Return & Debt capital**

Fiscal Year	NABIL		SBL	
	EBIT(X)	Debt Capital(Y)	EBIT(X)	Debt Capital(Y)
2006/07	1254.99	20454.98	254.41	4152.90
2007/08	1544.20	25196.34	424.76	7150.60
2008/09	1847.43	34695.61	646.87	10581.45
2009/10	2631.95	40737.16	1136.34	16603.01
2010/11	3585.29	48245.50	1755.17	21198.89
r	0.9930		0.9925	
$r^2$	0.9860		0.9850	
P.E.	0.0042		0.0045	
6P.E.	0.0253		0.0271	
Relation	Positive		Positive	
Sign/Insig	Significant		Significant	

*Source: Annual Report of NABIL and SBL*

$$r = \frac{\sum XY}{\sqrt{\sum X^2} \sqrt{\sum Y^2}}$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

From the above correlation between return and total debt capital in case of NABIL was 0.9930 which shows high positive relationship. This refers that increase in total capital increases return. Coefficient of determination ( $r^2$ ) of the bank is 98.60%, indicated that 98.60% of the variation in the return is explained by the debt capital. The probable error (6 P.E.) of the bank is 0.0253 less than value of 'r'. This indicated that there is significant relationship between the variables. This depicts that debt capital of the bank is significant in generating more returns.

Similarly, correlation between return and total debt capital of SBL is 0.9925 which showed that the variables are highly positively correlated. This refers that increase in debt capital increases return. Coefficient of determination ( $r^2$ ) of the bank indicated that 98.50% of the variable in dependent variable (return) is explained by independent variable (total debt capital). Considering the probable error (P.E.), the value of 'r' of the bank is greater than six times of the P.E. This depicts that debt capital of SBL is significant in generating more returns.

#### **4.4.1.3 Coefficient of Correlation between Debt Equity Ratio & Return on Equity**

The correlation between DER(X) and ROE(Y) of both the banks is analyzed in order to know whether increase in debt capital portion in the capital structure increase return on equity. The following result is obtained for NABIL & SBL.

**Table No. 4.23****Correlation Coefficient between Debt equity Ratio (DER) & Return on Equity (ROE)**

Fiscal Year	NABIL		SBL	
	DER(X)	ROE(Y)	DER(X)	ROE(Y)
2006/07	1090.93	38.44	688.55	10.76
2007/08	1224.91	36.11	900.91	11.95
2008/09	1423.58	30.63	990.45	13.37
2009/10	1301.41	32.94	1298.39	17.04
2010/11	1258.28	29.69	1322.01	15.02
r	0.9850		0.9957	
r <sup>2</sup>	0.9702		0.9914	
P.E.	0.0090		0.0026	
6P.E.	0.0539		0.0156	
Relation	Positive		Positive	
Significant/ Insignificant	Significant		Significant	

Source: Annual Report of NABIL and SBL

$$r = \frac{\sum XY}{\sqrt{\sum X^2} \sqrt{\sum Y^2}}$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

From the above table, correlation between ROE and DER, ROE being dependent on DER, it is found positive relationship in both banks i.e., increase in leverage, increases ROE (Which is the objective of financial leverage). Coefficient of determination (r<sup>2</sup>) indicated that 97.02% of the variation in ROE is explained by DER of NABIL where as in case of SBL 99.14% of the variable in ROE is explained by DER

Considering probable error (P.E.), it is found that the value of 'r' is greater than six times P.E. of NABIL. So, it can be concluded that the value of 'r' is significant. The value of 'r' is found more than six times P.E. of SBL. So it can be concluded that value of 'r' is significant. This means that debt equity ratio of NABIL is significant in

generating more returns on equity. Thus there is proper relationship between ROE & DER.

#### 4.4.1.4 Coefficient of Correlation between Overall Capitalization Rate (K<sub>o</sub>) & Debt Equity Ratio (DER)

The correlation coefficient between overall capitalization rate(X) and debt equity ratio (Y) in terms of total debt to net worth is calculated in order to measure whether increase in the debt equity ratio decrease overall capitalization rate of the banks. Applying Karl Pearson's correlation coefficient, the following result is obtained for NABIL & SBL.

**Table No. 4.24**  
**Correlation Coefficient between Overall Capitalization Rate (K<sub>o</sub>) & Debt Equity Ratio**

Fiscal Year	NABIL		SBL	
	K <sub>o</sub> (X)	DER(Y)	K <sub>o</sub> (X)	DER(X)
2006/07	23.57	1090.93	11.38	688.55
2007/08	20.61	1224.91	11.13	900.91
2008/09	16.95	1423.58	11.49	990.45
2009/10	23.00	1301.41	13.47	1298.39
2010/11	19.33	1258.28	14.88	1322.01
r	0.9820		0.9906	
r <sup>2</sup>	0.9643		0.9813	
P.E.	0.0108		0.0056	
6P.E.	0.0646		0.0338	
Relation	Positive		Positive	
Sign/Insig	Significant		Significant	

Source: Annual Report of NABIL and SBL

$$r = \frac{\sum XY}{\sqrt{\sum X^2} \sqrt{\sum Y^2}}$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

From the above result, correlation between overall capitalization rate and debt equity ratio of SBL is found highly positive relationship of 0.9906, which indicated that increase in debt capital portion in capital structure increases overall capitalization rate.

Similar type of relationship is found in case of NABIL. Coefficient of determination( $r^2$ ) indicated that 96.43% and 98.13% (of NABIL & SBL respectively) of the variation in overall capitalization rate is explained by DER. Considering the probable error (P.E.), the value of 'r' of both the banks is found greater than six times their P.E., which indicate that there is significant relationship between DER and overall capitalization rate.

#### 4.4.2 Regression Analysis of Debt Equity and Return on Assets

A regression equation also can be fitted to show the degree of relationship between capital structure of the company and its profitability. For this purpose, debt equity ratio is taken as dependent variable and return on assets as independent variable. The regression equation of debt equity ratio (y) on return on assets (x) is given below:

$$Y = a + bx$$

**Table No. 4. 25**

**Simple Regression Result of Debt Equity on Return on Assets**

<b>Banks</b>	<b>Regression Equation</b>	<b>Regression Equation</b>	<b>Value of Constant 'a'</b>	<b>Regression Coefficient 'b'</b>
<b>NABIL</b>	DE (Y) on ROA (X)	$Y = 93.87 - 0.27X$	93.87	-0.27
<b>SBL</b>	DE (Y) on ROA (X)	$Y = 82.43 + 1.55X$	82.43	1.55

Above table shows NABIL the Y intercept  $a = 93.87$  tell us that when the amount of return on assets is zero, the expected change in the debt equity is 93.87 millions during the year. The slope b is -0.27 represent that each increase in return on assets of 1 million, we predict that the expected change in the debt equity ratio is -0.27 i.e. the debt equity is predicted to increase by -0.27 million for each 1 million increase in return on assets.

Above table shows SBL the Y intercept  $a = 82.43$  tell us that when the amount of return on assets is zero, the expected change in the debt equity is 82.43 millions during the year. The slope b is 1.55 represent that each increase in debt equity of 1

million, we predict that the expected change in the debt equity ratio is 1.55 i.e. the debt equity is predicted to increase by 1.55 million for each 1 million increase in return on assets.

#### 4.4.3 Regression Analysis of Interest Coverage Ratio and Earning Power Ratio

A regression equation also can be fitted to show the degree of relationship between capital structure of the company and its profitability. For this purpose, interest coverage ratio is taken as dependent variable and earning power ratio as independent variable. The regression equation of interest coverage ratio (y) on earning power ratio (x) is given below:

$$Y = a + bx$$

**Table No. 4.26**

#### **Simple Regression Result of Interest Coverage Ratio on Earning Power Ratio**

<b>Banks</b>	<b>Regression Equation</b>	<b>Regression Equation</b>	<b>Value of Constant 'a'</b>	<b>Regression Coefficient 'b'</b>
<b>NABIL</b>	ICR (Y) on EPR (X)	Y= -0.45 + 1.18X	-0.45	1.18
<b>SBL</b>	ICR (Y) on EPR (X)	Y= 0.07 + 1.18X	0.07	1.18

Above table shows NABIL the Y intercept a = -0.45 tell us that when the amount of earning power is zero, the expected change in the interest coverage is -0.45 millions during the year. The slope b is 1.18 represent that each increase in earning power ratio of 1 million, we predict that the expected change in the interest coverage ratio is -0.45 i.e. the interest coverage is predicted to increase by -0.45 million for each 1 million increase in earning power ratio.

Above table shows SBL the Y intercept a = 0.07 tell us that when the amount of earning power is zero, the expected change in the interest coverage is 0.07 millions during the year. The slope b is 1.18 represent that each increase in earning power ratio of 1 million, we predict that the expected change in the interest coverage ratio is 0.07 i.e. the interest coverage is predicted to increase by 0.07 million for each 1 million increase in earning power ratio.

#### 4.4.4 Regression Analysis of Debt Equity and Return on Capital Employed

A regression equation also can be fitted to show the degree of relationship between capital structure of the company and its profitability. For this purpose, debt equity ratio is taken as dependent variable and ROCE as independent variable. The regression equation of debt equity ratio (y) on ROCE (x) is given below:

$$Y = a + bx$$

**Table No. 4.27**

#### **Simple Regression Result of Debt Equity on Return on Capital Employed**

<b>Banks</b>	<b>Regression Equation</b>	<b>Regression Equation</b>	<b>Value of Constant 'a'</b>	<b>Regression Coefficient 'b'</b>
<b>NABIL</b>	DE (Y) on ROCE (X)	$Y = 94.41 - 0.20X$	94.41	-0.20
<b>SBL</b>	DE (Y) on ROCE (X)	$Y = 117.18 + 9.73X$	117.18	-9.73

Above table shows NABIL the Y intercept  $a = 94.41$  tell us that when the amount of ROCE is zero, the expected change in the debt equity is 94.41 millions during the year. The slope  $b$  is  $-0.20$  represent that each increase in debt equity of 1 million, we predict that the expected change in the debt equity ratio is  $-0.20$  i.e. the debt equity is predicted to increase by  $-0.20$  million for each 1 million increase in ROCE.

Above table shows SBL the Y intercept  $a = 117.18$  tell us that when the amount of ROCE is zero, the expected change in the debt equity is 117.18 millions during the year. The slope  $b$  is  $-9.73$  represent that each increase in debt equity of 1 million, we predict that the expected change in the debt equity ratio is  $-9.73$  i.e. the debt equity is predicted to increase by  $-9.73$  million for each 1 million increase in ROCE.

#### 4.5 Major Findings

1. Total fixed deposit of NABIL is in continuous increasing trend during the study period except in fiscal year 2009/10. Fixed deposit of NABIL is higher than that of SBL in all the years of our study period. On the other hand total fixed deposit of SBL is in continuous increasing trend during the entire study period. On average fixed deposit increasing rate is higher for SBL than NABIL.

2. Total shareholders equity (net worth) of NABIL is also continuous increasing trend during the study period. Shareholders equity of NABIL is higher than SBL in all the years during our study period. Similarly total shareholders equity of SBL is in continuous increasing trend during the entire study period. On average shareholders equity increasing rate is higher for SBL than NABIL.
3. The percentage of fixed deposit to total debt of SBL is higher than NABIL in all the five fiscal year. The ratio of the NABIL is in increasing trend however it is decreased in fiscal year 2009/10 but it has further increased in fiscal year 2010/11. Similarly the ratio of SBL is also in increasing trend except in fiscal year 2009/10 but it has also further increased in fiscal year 2010/11. The lower C.V. of SBL than NABIL shows that less volatile of the ratio in SBL.
4. Fixed deposit to net worth ratio of NABIL has increased in first three fiscal years then it has decreased in fiscal year 2009/10 but it has further increased in fiscal year 2010/11. Likewise the fixed deposit to net worth ratio of SBL has increased in every year during our study period. The higher C.V. of SBL shows that variability of the ratio is higher in SBL than in NABIL.
5. Total debt to net worth of NABIL is fluctuating and SBL has increasing trend during our study period. On average total debt to net worth ratio of NABIL is higher than that of SBL. The C.V. is lower in NABIL than in SBL, which shows that the ratio of NABIL is more consistent than that of SBL.
6. The ratio of fixed deposit to capital employed of NABIL is fluctuating during the entire study period and SBL has the increasing trend. The ratio of NABIL is increasing in year 2006/07, 2007/08 & 2008/09 after that it is decreased in 2009/10 then it further increases in year 2010/11. Likewise the ratio of SBL has increased in every year. The C.V. analysis shows that variability of the ratio is extremely more in SBL compare to NABIL.
7. The ratio of total debt to total assets is recorded over 80% in both banks that show that both banks are founded using higher capital to finance their assets. In both banks, creditor's margin of safety is very low. The fluctuation of ratio is higher in SBL than in NABIL.
8. Both banks are able to meet the interest obligation. Interest coverage ratio of NABIL is higher in every year than SBL during our study period. This shows

that NABIL has the greater ability to handle the fixed charges and to make the payment of interest to the creditors. But the interest coverage ratio of SBL is consistent than that of NABIL.

9. The proportion of debt capital to equity capital of SBL is more consistent than that of NABIL ranging from 73% to 86%. But the same ratio of NABIL is quite highly fluctuated ranged from 65% to maximum of 79%.
10. Higher overall capitalization rate of NABIL is more capable to utilize the value of the firm compare to SBL. It is found that increase in financial leverage there is decrease in  $K_o$ . This shows that cost of debt is lower than cost of equity.
11. Earning power ratio of NABIL & SBL was 2.19% & 1.05% respectively. NABIL maintain average earning power ratio 2.5% & SBL maintain 1.21%. Overall the combine ratio is 1.86%. Through out the study period earning power ratio of SBL is below the normal standard.
12. The return on assets of NABIL & SBL has fluctuating trend in FY 2006/07 to 2010/11 with average return of 5.14% & 5.37% respectively absolute measure on SD of 0.68% and relative measure on CV of 13.9% indicates more efficiency and consistency on the ratio of NABIL & measure on SD of 1.45% and relative measure on CV of 21.3% of SBL. Which is moderate, it indicates less consistency on the ratio with comparing to NABIL.
13. Return on capital employed of NABIL is higher for every year during our study period. Fluctuation of the ratio is more in NABIL and the average ratio is higher in NABIL than that of SBL. This result indicates that SBL is more capable to utilize its long-term capital.
14. Both the banks have satisfactory return on equity of above 10% in all fiscal years, which shows that both banks had utilized their shareholders equity in satisfactory manner. On average return on equity is higher for NABIL than that of SBL. Approximately two times more C.V. of SBL than NABIL indicates that the ratio is massively fluctuating in SBL. This ratio is very bad sign for the bank.
15. Correlation coefficient between EBIT & Interest payment of both banks is highly positive, which shows higher positive relationship. 94.25% of variation

in interest payment is explained by the independent variable EBIT of NABIL and the same for SBL is 99.31%. The relationship between EBIT and Interest payment of both banks is significant and they are significantly able to serve their debt.

16. Correlation coefficient between EBIT and debt capital of both banks is showing high positive relationship. This refers that increase in total debt capital increases return. 98.60% of coefficient of determination of NABIL shows that 98.60% of the variation in the return is explained by the debt capital. In the case of SBL 98.50% of the variation in dependent variable (return) is explained by independent variable (total debt capital). The debt capital of banks is significant in generating the more return.
17. High positive correlation coefficient of both banks between ROE and DER indicates that increase in leverage increases ROE (objective of financial leverage). Analysis shows that 97.02% of variation of NABIL and 99.14% variation of SBL in ROE is explained by DER. And debt equity ratio of both banks is significant in generating more return on equity.
18. Correlation between overall capitalization rate and debt equity ratio of both the banks is found highly positive relationship, which indicates that increase in debt capital portion in capital structure increase overall capitalization rate. Coefficient of determination ( $r^2$ ) indicates that 96.43% and 98.13% (NABIL & SBL respectively) of the variation in overall capitalization rate is explained by DER.
19. The regression equation debt equity and return on assets of NABIL shows if debt equity is zero the return on assets is negative in other hands if increase in debt equity, the return on assets must be decrease by -0.27 millions. Similarly, SBL shows if debt equity is zero the return on assets is positive in other hands if increase in debt equity, the return on assets must be increase by 1.55 millions.
20. The regression equation interest coverage and earning power of NABIL shows if debt equity is zero the earning power is positive in other hands if increase in interest coverage, the earning power must be increase by 1.18 millions. Similarly, SBL shows if debt equity is zero the earning power is positive in

other hands if increase in interest coverage, the earning power must be increase by 1.18 millions.

21. The regression equation debt equity and return on capital employed of NABIL shows if debt equity is zero the return on capital employed is negative in other hands if increase in debt equity, the return on assets must be decrease by -0.20 millions. Similarly, SBL shows if debt equity is zero the return on capital employed is negative in other hands if decrease in debt equity, the return on capital employed must be decrease by -9.73 millions.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Summary

This study has tried to cover the various aspects of capital structure of the banks under study covering the time period of five years, from FY 2006/07 to 2010/11. In the first introductory chapter, this study report has tried to give brief history and introduction of banking and its relation to the economy, status of commercial banks resources and their uses, brief profile of the concerned bank, general concepts to capital structure, the problem statement, objective of the study and its limitations and significance. In this study following objectives for the research: to find out the comparative analysis of two sample banks i.e. NABIL & SBL, to analyze the relationship between profit and interest expenses to measure the debt service capacity of sample banks and examine capital structure and cost of capital.

During the research works, an extensive review of various literatures, books, past thesis, journals have been made and Internet materials from relevant web site were also consulted. The works were compiled into the chapter two titled as “Review of Literature” of this study report.

Study gathered data from annual reports of the banks under study publications of NRB and web site of Nepal Stock Exchange is also used. (1) Financial tools to calculate expected rate of return. (2) Statistical tools such as mean, standard deviation, coefficient of variance, correlation coefficient & coefficient of determination (3) other banking tools along with details of research methodologies followed for this research works are mentioned in the Chapter three titled as “Research Methodology.”

Data relating to various activities of the Bank has been collected presented in tabular and various lines diagrams, figures and bars diagrams form and are tried to be interpreted in the study report in logical ways. Data are then analyzed applying various accounting financial, mathematical and statistical tools and findings of the study have been listed in a systematic manner.

## 5.2 Conclusions

While analyzing the capital structure of NABIL Bank Ltd. and Siddhartha Bank Ltd. the data are analyzed from the fiscal year 2006/07 to 2010/11. Based on the major findings of the study conclusions are drawn.

Both the banks have used high degree of leverage in its financial structure (i.e. fixed deposits to net worth and total debt to net worth are very high). Both the banks have highly geared up capital structure. Annual growth rate in shareholders equity of SBL is higher than NABIL but not in volume. Similarly the annual growth rate of fixed deposits of SBL is higher than NABIL and in volume NABIL has more fixed deposits than that of SBL. Both the banks were found increasing fixed deposits in their financial mix. Both the banks are able to maintain capital adequacy ratio. NABIL has significant strength of share in the market.

Return ratios of SBL are poor, at the same time return ratios of NABIL are not satisfactory. Therefore being geared up capital structure and insufficient returns represent the weak aspects of these two banks. SBL is weak in using long term funds and total debt and NABIL performing in using long term funds and total debt in not satisfactory. Operating expenses of NABIL is higher than SBL.

Both the banks are able to serve their debt capital adequately. However, interest coverage ratio of NABIL is higher than SBL during our study period. In case of interest coverage ratio, standard deviation and C.V. of NABIL is higher than SBL. Less C.V. is preferable so on the basis of interest coverage ratio SBL is less risky than NABIL. Debt equity ratio tends to increase return on shareholders equity significantly in case of both the bank.

In comparison, it is found that NABIL seems to be better in terms of capital structure as well as profitability than SBL. Thus it can be remarked from the analysis that NABIL promises a better future. Increase in value of the firm is the result of increasing market price of share not only leverage and it shows that only leverage cannot determine the overall capitalization rate.

### 5.3 Recommendations

There are many recommendations for the management of both banks. But due to the time constraints and limitations of the thesis only major recommendations are mentioned as below.

1. Interest coverage ratio of SBL bank is very poor however NABIL is in better position as compared to SBL in its debt servicing capacity. So management should increase the EBIT more as compare to interest expenses to increase its capacity to handle the fixed charge and its capacity to handle the fixed charge and to make the payment of interest to the creditors easily which will make the management capable to achieve the money in future. To increase the EBIT it is recommended to increase the commission base business of the banks.
2. SBL should give more attention towards its overall capitalization rate because it is less capable to utilize the value of the firm as compare to NABIL.
3. The value of the firm can be maximized by minimizing the overall cost of capital. The organizations should focus more on optimal capital structure rather than increasing debt portion or equity.
4. Commercial banks are recommended to go through its cost of capital while changing capital structure position. If the cost of capital is lower than its return, they are recommended to use more debt capital. If the cost of capital is higher than its return they are recommended to use only equity capital. But the banks can not run without debt because the major functions of the banks are to collect debt. So they are recommended to use its debt in profitable sector only.
5. It is recommended that cost and benefit should be analyzed before raising fund from different source of capital. Although debt creates tax benefit and increase ROE.
6. Banks are recommended to distribute more profit as dividend to their shareholders, so that they can increase their goodwill and can raise more share capital when their shares are issued in the market.
7. The capital structure decisions are not found to be considered properly by the banks. It affects the value of the firm and overall cost of capital so every

investment and financing decision of the company should be taken by considering the capital structure of the firm.

8. Both the banks vary incase of total assets, number of staff, number of branches, and their volume in transactions. Both the banks are well established, however office operating expenses of NABIL is higher than that of SBL. Similarly provision for staff bonus of NABIL is higher than that of SBL. So NABIL is suggested to minimize the cost. Operating cost of both banks seems high so operating cost also should minimize.
9. The capital structure of both the banks is highly levered. The proportion of debt and equity capital should be decided keeping in mind the efforts of tax advantage and financial distress. The banks, when it is difficult to pay interest and principal, ultimately lead to liquidation bankruptcy. For such, the banks should reduce the high use of debt capital.
10. The banks should give continuity in providing both conceptual and practical training to the staff to enhance their knowledge, skill and competency level, they should remain consistency vigilant in enhancing their moral and motivation. The banks have to enhance effectiveness, efficiency and proper coordination of its department tasks by continuously reviewing its structural design in accordance with the need of the changing time and situation.
11. It has been found that modern banking technologies followed by NRB of Nepal are mostly beneficial to the high level of depositors, so both the banks are suggested to make their technologies assessable to all kind of their depositors as far as possible.

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## **Website:**

[www.nabilbank.com](http://www.nabilbank.com)

[www.siddharthabank.com](http://www.siddharthabank.com)

[www.nrb.org.np](http://www.nrb.org.np)

[www.nepalstock.com](http://www.nepalstock.com)

## APPENDIX-I

### Fixed Deposit Position & Index Table of NABIL & SBL

Bank	NABIL			SBL		
	Fixed Deposit (Rs. in Million)	Index	% Change	Fixed Deposit (Rs. in Million)	Index	%Change
2006/07	3449.09	100.00	-	1632.09	100.00	-
2007/08	5435.99	157.61	57.61	3022.56	185.20	85.20
2008/09	8464.09	245.41	55.71	4562.72	279.57	50.96
2009/10	8310.71	240.96	-1.81	7158.20	438.60	56.88
2010/11	14711.16	426.53	77.01	10195.73	624.72	42.44
<b>Average</b>			47.13	<b>Average</b>		58.87

### Shareholders Equity Position & Index Table of NABIL & SBL

Bank	NABIL			SBL		
	Net Worth (Rs. in Million)	Index	% Change	Net Worth (Rs. in Million)	Index	%Change
2006/07	1875.00	100.00	-	603.14	100.00	-
2007/08	2057.00	109.71	9.71	793.71	131.60	31.60
2008/09	2437.20	129.99	18.49	1068.35	177.14	34.60
2009/10	3130.24	166.95	28.43	1278.74	212.02	19.69
2010/11	3834.23	204.50	22.49	1603.54	265.87	25.40
<b>Average</b>			19.78	<b>Average</b>		27.82

### Fixed Deposit and Total Debt of NABIL & SBL (Rs. in million)

Fiscal Year	NABIL		SBL	
	Fixed Deposit	Total Debt	Fixed Deposit	Total Debt
2006/07	3449.09	20454.98	1632.09	4152.90
2007/08	5435.99	25196.34	3022.56	7150.60
2008/09	8464.09	34695.61	4562.72	10581.45
2009/10	8310.71	40737.16	7158.20	16603.01
2010/11	14711.16	48245.50	10195.73	21198.89

### Fixed Deposit to Total Debt of NABIL & SBL

Bank/FY	2006/07	2007/08	2008/09	2009/10	2010/11	Average	S.D	C.V
NABIL	16.86	21.57	24.40	20.40	30.49	22.74	5.10	22.43
%Change	-	4.71	2.83	-4.00	10.09			
SBL	39.30	42.27	43.12	43.11	48.10	43.18	8.67	20.08
%Change	-	2.97	0.85	-0.01	4.99			
Combined Average						32.96		

**Fixed Deposit and Net Worth of NABIL & SBL (Rs. in million)**

Fiscal Year	NABIL		SBL	
	Fixed Deposit	Net Worth	Fixed Deposit	Net Worth
2006/07	3449.09	1875.00	1632.09	603.14
2007/08	5435.99	2057.00	3022.56	793.71
2008/09	8464.09	2437.20	4562.72	1068.35
2009/10	8310.71	3130.24	7158.20	1278.74
2010/11	14711.16	3834.23	10195.73	1603.54

**Fixed Deposit to Net Worth Ratio of NABIL & SBL (in %)**

Bank/FY	2006/07	2007/08	2008/09	2009/10	2010/11	Average	S.D	C.V
NABIL	183.95	264.27	347.29	265.50	383.68	288.94	78.36	27.12
Change	-	80.32	83.03	-81.79	118.18			
SBL	270.60	380.81	427.08	559.79	635.83	454.82	144.89	31.86
Change	-	110.21	46.27	132.71	76.04			
Combined Average						371.88		

**Total Debt and Net Worth of NABIL & SBL (Rs. in million)**

Fiscal Year	NABIL		SBL	
	Total Debt	Net Worth	Total Debt	Net Worth
2006/07	20454.98	1875.00	4152.90	603.14
2007/08	25196.34	2057.00	7150.60	793.71
2008/09	34695.61	2437.20	10581.45	1068.35
2009/10	40737.16	3130.24	16603.01	1278.74
2010/11	48245.50	3834.23	21198.89	1603.54

**Total Debt to Net Worth Ratio of NABIL & SBL (in %)**

Bank/FY	2006/07	2007/08	2008/09	2009/10	2010/11	Average	S.D	C.V
NABIL	1090.93	1224.91	1423.58	1301.41	1258.28	1259.82	120.72	9.58
Change	-	133.98	198.67	-122.17	-43.13			
SBL	688.55	900.91	990.45	1298.39	1322.01	1040.06	270.01	25.96
Change	-	212.36	89.54	307.94	23.62			
Combined Average						1149.94		

**Fixed Deposit and Capital Employed of NABIL & SBL (Rs. in million)**

Fiscal Year	NABIL			SBL		
	Fixed Deposit	Net Worth	Capital Employed	Fixed Deposit	Net Worth	Capital Employed
2006/07	3449.09	1875.00	5324.09	1632.09	603.14	2235.23
2007/08	5435.99	2057.00	7492.99	3022.56	793.71	3816.27
2008/09	8464.09	2437.20	10901.29	4562.72	1068.35	5631.07
2009/10	8310.71	3130.24	11440.95	7158.20	1278.74	8436.94
2010/11	14711.16	3834.23	18545.39	10195.73	1603.54	11799.27

**Fixed Deposit to Capital Employed of NABIL & SBL (in %)**

<b>Bank/FY</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>Average</b>	<b>S.D</b>	<b>C.V</b>
NABIL	64.78	72.55	77.64	72.64	79.33	73.39	5.67	7.73
Change	-	7.77	5.09	-5.00	6.69			
SBL	73.02	79.20	81.03	84.84	86.41	80.90	5.26	6.50
Change	-	6.18	1.83	3.81	1.57			
Combined Average						77.15		

**Total Debt and Total Assets of NABIL & SBL (Rs. in million)**

<b>Fiscal Year</b>	<b>NABIL</b>		<b>SBL</b>	
	<b>Total Debt</b>	<b>Total Assets</b>	<b>Total Debt</b>	<b>Total Assets</b>
2006/07	20454.98	22329.97	4152.90	4755.96
2007/08	25196.34	27329.39	7150.60	7948.64
2008/09	34695.61	37132.76	10581.45	11654.86
2009/10	40737.16	43867.40	16603.01	17881.75
2010/11	48245.50	52079.73	21198.89	22802.43

**Total Debt to Total Assets of NABIL & SBL (in %)**

<b>Bank/FY</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>Average</b>	<b>S.D</b>	<b>C.V</b>
NABIL	91.60	92.20	93.44	92.86	92.64	92.55	0.69	0.75
Change	-	0.60	1.01	-0.58	-0.22			
SBL	87.32	89.96	90.79	92.85	92.97	90.78	2.33	2.57
Change	-	2.64	0.83	2.06	0.12			
Combined Average						91.67		

**Capital Adequacy Ratio (in %) Core Capital**

<b>Bank/FY</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>Average</b>	<b>S.D</b>	<b>C.V</b>
NABIL	10.78	10.40	8.75	8.74	8.77	9.49	1.01	10.64
Change	-	-0.38	-1.65	-0.01	0.03			
SBL	13.29	10.78	10.27	8.26	8.00	10.12	2.15	21.25
Change	-	-2.51	-0.51	-2.01	-0.26			
Combined Average						9.81		

**Capital Adequacy Ratio (in %) Supplementary Capital**

<b>Bank/FY</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>Average</b>	<b>S.D</b>	<b>C.V</b>
NABIL	1.52	1.64	2.35	1.96	1.73	1.84	0.32	17.39
Change	-	0.12	0.71	-0.39	-0.23			
SBL	0.87	1.05	0.97	2.42	2.04	1.47	0.71	48.30
Change	-	0.18	-0.08	1.45	-0.38			
Combined Average						1.66		

**EBIT and Interest Charges of NABIL & SBL (Rs. in million)**

Fiscal Year	NABIL		SBL	
	EBIT	Interest	EBIT	Interest
2006/07	1254.99	351.16	254.41	153.71
2007/08	1544.20	555.71	424.76	271.71
2008/09	1847.43	758.44	646.87	401.89
2009/10	2631.95	1153.28	1136.34	813.62
2010/11	3585.29	1960.11	1755.17	1406.49

**Interest Coverage Ratio of NABIL & SBL (in times)**

Bank/FY	2006/07	2007/08	2008/09	2009/10	2010/11	Average	S.D	C.V
NABIL	3.57	2.78	2.44	2.28	1.83	2.58	0.65	25.19
Change	-	-0.79	-0.34	-0.16	-0.45			
SBL	1.66	1.56	1.61	1.40	1.25	1.49	0.17	11.41
Change	-	-0.10	0.05	-0.21	-0.15			
Combined Average						2.04		

**Capital Structure Mix of NABIL (Rs. in million)**

FY	Fixed Deposit	Equity Share	Total Value of Firm	Proportion
2006/07	3449.09	1875.00	5324.09	0.65 : 0.35
2007/08	5435.99	2057.00	7492.99	0.73 : 0.27
2008/09	8464.09	2437.20	10901.29	0.78 : 0.22
2009/10	8310.71	3130.24	11440.95	0.73 : 0.27
2010/11	14711.16	3834.23	18545.39	0.79 : 0.21

**Capital Structure Mix of SBL (Rs. in million)**

FY	Fixed Deposit	Equity Share	Total Value of Firm	Proportion
2006/07	1632.09	603.14	2235.23	0.73 : 0.27
2007/08	3022.56	793.71	3816.27	0.79 : 0.21
2008/09	4562.72	1068.35	5631.07	0.81 : 0.19
2009/10	7158.20	1278.74	8436.94	0.85 : 0.15
2010/11	10195.73	1603.54	11799.27	0.86 : 0.14

**EBIT and Value of the Firm of NABIL & SBL (Rs. in million)**

Fiscal Year	NABIL		SBL	
	EBIT	Value of Firm	EBIT	Value of Firm
2006/07	1254.99	5324.09	254.41	2235.23
2007/08	1544.20	7492.99	424.76	3816.27
2008/09	1847.43	10901.29	646.87	5631.07
2009/10	2631.95	11440.95	1136.34	8436.94
2010/11	3585.29	18545.39	1755.17	11799.27

**Overall Capitalization Rate of NABIL and SBL (in %)**

Fiscal Year	NABIL		SBL	
	K <sub>o</sub>	Change	K <sub>o</sub>	Change
2006/07	23.57	-	11.38	-
2007/08	20.61	-2.96	11.13	-0.25
2008/09	16.95	-3.66	11.49	0.36
2009/10	23.00	6.05	13.47	1.98
2010/11	19.33	-3.67	14.88	1.41
<b>Average</b>	20.69		12.47	

**Net Income and Value of the Firm of NABIL & SBL (Rs. in million)**

Fiscal Year	NABIL		SBL	
	Net Income	Value of Firm	Net Income	Value of Firm
2006/07	720.73	5324.09	64.91	2235.23
2007/08	742.72	7492.99	94.83	3816.27
2008/09	746.47	10901.29	142.79	5631.07
2009/10	1031.05	11440.95	217.92	8436.94
2010/11	1138.57	18545.39	240.85	11799.27

**Return on Capital Employed (in %)**

Bank/FY	2006/07	2007/08	2008/09	2009/10	2010/11	Average	S.D	C.V
NABIL	13.54	9.91	6.85	9.01	6.14	9.09	2.92	32.12
Change	-	-3.63	-3.06	2.16	-2.87			
SBL	2.90	2.48	2.54	2.58	2.04	2.51	0.30	11.95
Change	-	-0.42	0.06	0.04	-0.54			
Combined Average						5.80		

**Net Income and Net Worth of NABIL & SBL (Rs. in million)**

Fiscal Year	NABIL		SBL	
	Net Income	Net Worth	Net Income	Net Worth
2006/07	720.73	1875.00	64.91	603.14
2007/08	742.72	2057.00	94.83	793.71
2008/09	746.47	2437.20	142.79	1068.35
2009/10	1031.05	3130.24	217.92	1278.74
2010/11	1138.57	3834.23	240.85	1603.54

**Return on Equity (in %)**

Bank/FY	2006/07	2007/08	2008/09	2009/10	2010/11	Average	S.D	C.V
NABIL	38.44	36.11	30.63	32.94	29.69	33.56	3.68	10.97
Change	-	-2.33	-5.48	2.31	-3.25			
SBL	10.76	11.95	13.37	17.04	15.02	13.63	2.48	18.20
Change	-	1.19	1.42	3.67	-2.02			

### Correlation Coefficient between EBIT & Interest Payment

Year	NABIL		SBL	
	Interest(X)	EBIT(Y)	Interest(X)	EBIT(Y)
2006/07	351.16	1254.99	153.71	254.41
2007/08	555.71	1544.20	271.71	424.76
2008/09	758.44	1847.43	401.89	646.87
2009/10	1153.28	2631.95	813.62	1136.34
2010/11	1960.11	3585.29	1406.49	1755.17
r	0.9853		0.9966	
r <sup>2</sup>	0.9425		0.9931	
P.E.	0.0173		0.0021	
6P.E.	0.1041		0.0125	
Relation	Positive		Positive	
Significant/ Insignificant	Significant		Significant	

$$r = \frac{\sum XY}{\sqrt{\sum X^2} \sqrt{\sum Y^2}} \quad \text{P.E.} = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

### Correlation Coefficient between Return & Debt capital

Year	NABIL		SBL	
	EBIT(X)	Debt Capital(Y)	EBIT(X)	Debt Capital(Y)
2006/07	1254.99	20454.98	254.41	4152.90
2007/08	1544.20	25196.34	424.76	7150.60
2008/09	1847.43	34695.61	646.87	10581.45
2009/10	2631.95	40737.16	1136.34	16603.01
2010/11	3585.29	48245.50	1755.17	21198.89
r	0.9930		0.9925	
r <sup>2</sup>	0.9860		0.9850	
P.E.	0.0042		0.0045	
6P.E.	0.0253		0.0271	
Relation	Positive		Positive	
Significant/ Insignificant	Significant		Significant	

$$r = \frac{\sum XY}{\sqrt{\sum X^2} \sqrt{\sum Y^2}} \quad \text{P.E.} = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

### Correlation Coefficient between Debt equity Ratio & Return on Equity

Year	NABIL		SBL	
	DER(X)	ROE(Y)	DER(X)	ROE(Y)
2006/07	1090.93	38.44	688.55	10.76
2007/08	1224.91	36.11	900.91	11.95
2008/09	1423.58	30.63	990.45	13.37
2009/10	1301.41	32.94	1298.39	17.04
2010/11	1258.28	29.69	1322.01	15.02
r	0.9850		0.9957	
r <sup>2</sup>	0.9702		0.9914	
P.E.	0.0090		0.0026	
6P.E.	0.0539		0.0156	
Relation	Positive		Positive	
Significant/ Insignificant	Significant		Significant	

$$r = \frac{\sum XY}{\sqrt{\sum X^2} \sqrt{\sum Y^2}}$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

### Correlation Coefficient between Overall Capitalization Rate (K<sub>o</sub>) & Debt Equity Ratio

Year	NABIL		SBL	
	K <sub>o</sub> (X)	DER(Y)	K <sub>o</sub> (X)	DER(X)
2006/07	23.57	1090.93	11.38	688.55
2007/08	20.61	1224.91	11.13	900.91
2008/09	16.95	1423.58	11.49	990.45
2009/10	23.00	1301.41	13.47	1298.39
2010/11	19.33	1258.28	14.88	1322.01
r	0.9820		0.9906	
r <sup>2</sup>	0.9643		0.9813	
P.E.	0.0108		0.0056	
6P.E.	0.0646		0.0338	
Relation	Positive		Positive	
Significant/ Insignificant	Significant		Significant	

$$r = \frac{\sum XY}{\sqrt{\sum X^2} \sqrt{\sum Y^2}}$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

**Regression of NABIL**  
**Debt Equity(Y) and Return on Assets (X)**  
**Computation of Regression Equations**

<b>X</b>	<b>Y</b>	<b>XY</b>	<b>X<sup>2</sup></b>
4.8	91.6	439.68	23.04
4.75	92.2	437.95	22.56
4.05	93.44	378.43	16.4
4.97	92.86	461.51	24.7
5.95	92.64	551.2	35.4
$\sum X = 24.52$	$\sum Y = 462.74$	$\sum XY = 2268.77$	$\sum X^2 = 122.1$

Let the regression equation Debt Equity(Y) on ROA(X) be

$$Y = a + bx \text{----- (i)}$$

To find the values of a and b we have the following two normal equations.

$$\sum Y = na + b \sum X \text{----- (ii)}$$

$$\sum XY = a \sum X + b \sum X^2 \text{----- (iii)}$$

Substituting the values of n,  $\sum X$ ,  $\sum Y$ ,  $\sum XY$ ,  $\sum X^2$  in equation (ii) & (iii) we have,

$$462.74 = 5a + 24.52b \text{----- (ii)}$$

$$2268.77 = 24.52a + 122.1b \text{----- (iii)}$$

Solving (ii) & (iii)  $a = 93.87$ ,  $b = -0.27$

Substituting the values of a & b in equation (i), the regression equation DE (Y) on ROA (X) is  $Y = 93.87 - 0.27 X$

**Regression of SBL**  
**Debt Equity(Y) and Return on Assets (X)**  
**Computation of Regression Equations**

<b>X</b>	<b>Y</b>	<b>XY</b>	<b>X<sup>2</sup></b>
4.6	87.32	401.67	21.16
4.61	89.96	414.71	21.25
4.67	90.79	423.98	21.8
5.77	92.85	535.74	33.29
7.22	92.97	671.24	52.12
$\sum X = 26.87$	$\sum Y = 453.89$	$\sum XY = 2447.34$	$\sum X^2 = 149.64$

Let the regression equation Debt Equity(Y) on ROA(X) be

$$Y = a + bx \text{----- (i)}$$

To find the values of a and b we have the following two normal equations.

$$\sum Y = na + b \sum X \text{----- (ii)}$$

$$\sum XY = a \sum X + b \sum X^2 \text{----- (iii)}$$

Substituting the values of n,  $\sum X$ ,  $\sum Y$ ,  $\sum XY$ ,  $\sum X^2$  in equation (ii) & (iii) we have,

$$453.89 = 5a + 26.87b \text{----- (ii)}$$

$$2447.34 = 26.87a + 149.64b \text{----- (iii)}$$

Solving (ii) & (iii)  $a = 82.43$ ,  $b = 1.55$

Substituting the values of a & b in equation (i), the regression equation DE (Y) on ROA (X) is  $Y = 82.43 + 1.55X$

**Regression of NABIL**  
**Interest Coverage (Y) and Earning Power (X)**  
**Computation of Regression Equations**

<b>X</b>	<b>Y</b>	<b>XY</b>	<b>X<sup>2</sup></b>
3.23	3.57	11.53	10.43
2.72	2.78	7.56	7.4
2.01	2.44	4.9	4.04
2.35	2.28	5.36	5.52
2.19	1.83	4.01	4.8
$\sum X = 12.5$	$\sum Y = 12.9$	$\sum XY = 33.36$	$\sum X^2 = 32.19$

Let the regression equation Interest Coverage (Y) on Earning Power (X) be

$$Y = a + bx \text{----- (i)}$$

To find the values of a and b we have the following two normal equations.

$$\sum Y = na + b \sum X \text{----- (ii)}$$

$$\sum XY = a \sum X + b \sum X^2 \text{----- (iii)}$$

Substituting the values of n,  $\sum X$ ,  $\sum Y$ ,  $\sum XY$ ,  $\sum X^2$  in equation (ii) & (iii) we have,

$$12.9 = 5a + 12.5b \text{----- (ii)}$$

$$33.36 = 12.5a + 32.19b \text{----- (iii)}$$

Solving (ii) & (iii)  $a = -0.45$ ,  $b = 1.18$

Substituting the values of a & b in equation (i), the regression equation Interest Coverage (Y) on Earning Power (X) is  $Y = -0.45 + 1.18X$

**Regression of SBL**  
**Interest Coverage (Y) and Earning Power (X)**  
**Computation of Regression Equations**

<b>X</b>	<b>Y</b>	<b>XY</b>	<b>X<sup>2</sup></b>
1.36	1.66	2.26	1.85
1.2	1.56	1.87	1.44
1.22	1.61	1.96	1.49
1.22	1.4	1.71	1.48
1.05	1.25	1.32	1.12
$\sum X = 6.05$	$\sum Y = 7.48$	$\sum XY = 9.12$	$\sum X^2 = 7.38$

Let the regression equation Interest Coverage (Y) on Earning Power (X) be

$$Y = a + bx \text{----- (i)}$$

To find the values of a and b we have the following two normal equations.

$$\sum Y = na + b \sum X \text{----- (ii)}$$

$$\sum XY = a \sum X + b \sum X^2 \text{----- (iii)}$$

Substituting the values of n,  $\sum X$ ,  $\sum Y$ ,  $\sum XY$ ,  $\sum X^2$  in equation (ii) & (iii) we have,

$$7.48 = 5a + 6.05b \text{----- (ii)}$$

$$9.12 = 6.05a + 7.38b \text{----- (iii)}$$

Solving (ii) & (iii)  $a = 0.07$ ,  $b = 1.18$

Substituting the values of a & b in equation (i), the regression equation Interest Coverage (Y) on Earning Power (X) is  $Y = 0.07 + 1.18X$

**Regression of NABIL**  
**Debt Equity(Y) and Return on Capital Employed(X)**  
**Computation of Regression Equations**

<b>X</b>	<b>Y</b>	<b>XY</b>	<b>X<sup>2</sup></b>
13.54	91.6	1240.26	183.33
9.91	92.2	913.7	98.21
6.85	93.44	640.06	46.92
9.01	92.86	836.47	81.18
6.14	92.64	568.81	37.7
$\sum X = 45.45$	$\sum Y = 462.74$	$\sum XY = 4199.3$	$\sum X^2 = 447.34$

Let the regression equation Debt Equity(Y) on ROCE(X) be

$$Y = a + bx \text{----- (i)}$$

To find the values of a and b we have the following two normal equations.

$$\sum Y = na + b \sum X \text{----- (ii)}$$

$$\sum XY = a \sum X + b \sum X^2 \text{----- (iii)}$$

Substituting the values of n,  $\sum X$ ,  $\sum Y$ ,  $\sum XY$ ,  $\sum X^2$  in equation (ii) & (iii) we have,

$$462.74 = 5a + 45.45b \text{----- (ii)}$$

$$4199.3 = 45.45a + 447.34b \text{----- (iii)}$$

Solving (ii) & (iii)  $a = 94.41$ ,  $b = -0.20$

Substituting the values of a & b in equation (i), the regression equation DE (Y) on ROCE(X) is  $Y = 94.41 - 0.20X$

**Regression of SBL**  
**Debt Equity(Y) and Return on Capital Employed(X)**  
**Computation of Regression Equations**

<b>X</b>	<b>Y</b>	<b>XY</b>	<b>X<sup>2</sup></b>
2.9	87.32	253.23	8.41
2.48	89.96	221.61	6.15
2.54	90.79	230.61	6.45
2.58	92.85	239.55	6.66
2.04	92.97	189.56	4.16
$\sum X = 12.54$	$\sum Y = 453.89$	$\sum XY = 1134.66$	$\sum X^2 = 31.83$

Let the regression equation Debt Equity(Y) on ROCE(X) be

$$Y = a + bx \text{----- (i)}$$

To find the values of a and b we have the following two normal equations.

$$\sum Y = na + b \sum X \text{----- (ii)}$$

$$\sum XY = a \sum X + b \sum X^2 \text{----- (iii)}$$

Substituting the values of n,  $\sum X$ ,  $\sum Y$ ,  $\sum XY$ ,  $\sum X^2$  in equation (ii) & (iii) we have,

$$453.89 = 5a + 12.54b \text{----- (ii)}$$

$$1134.66 = 12.54a + 31.83b \text{----- (iii)}$$

Solving (ii) & (iii)  $a = 117.18$ ,  $b = -9.73$

Substituting the values of a & b in equation (i), the regression equation DE (Y) on ROCE(X) is  $Y = 117.18 - 9.73X$