

CHAPTER I

INRODUCTION

1.1 Background of the study

The capital structure refers to the proportion of debt and equity capital. This has an important place in the theory of financial management. The financing decision of a firm relates to the choice of proportion of debt and equity to finance the investment requirement of which a proper balance is necessary to ensure a trade off between risk and return to the shareholder. An optimal capital structure, which consists of reasonable proportion of debt and equity, can help to maximize the value and ultimately the shareholders wealth.

In Nepal, some companies do not plan capital structure and it develops of the financial decisions taken by the financial manager without any formal planning. Those companies may prosper in the short-run, but ultimately they will face great difficulties in raising funds to finance their activities. The unplanned capital structure of the companies will also fail to economize the use of their funds. Thus, it is being increasingly realized that a company should plan its appropriate capital structure to maximize the use of funds and be able to adapt more easily to changing conditions.

The research is concerned with the study of capital structure management of some selected manufacturing companies. To describe the capital structure of any firm the long-term source of funds is necessarily used. Well financial performance depends on optimal capital structure. The term capital refers to the long-term funds like debt equity. The capital mix, which leads to the maximum value and minimum cost of capital, is optimal capital structure, which can be obtained by changing the financing mix.

Composition of capital structure is one of the most important components of solvency analysis. Capital structure refers to a company's sources of financing

and its economic attributes. Capital structure is usually measured in terms of the relative magnitude of the various financing sources. A company's financing stability and risk of insolvency depend on its financing sources and the types and sizes of various assets its own. Common size and ratio analysis of capital structure are preliminary measures of the risk of the company's capital structure. The higher the proportion of debt, the larger the fixed charges of interest and debt repayment and the greater the likelihood of insolvency during period of earnings decline or hardship. Capital structure measures serve as screening devices (Bernstein and Wild, 1997:58). This study is directed towards analyzing the effect of capital structure on the value of the firm in the context of Nepalese manufacturing.

1.2. A brief overview of manufacturing companies selected for the study

1.2.1 Nepal lube oil limited:

Nepal lube oil Ltd. is only public enterprise in the country, which has been established to produce Gulf Mobil and lubricants oil (in various sizes) to meet domestic demand for the same. This lube oil, which was founded in the year 2041 B.S. (1984AD) under the Nepal oil corporation, NIDC. National Trading Ltd, Salt Trading, Himal Cement Company and Rastriya Beema Santhan as public sector and private investor also have invested their capital for the establishment of NLOL. The prime objective of NLOL is to reasonable price. NLOL is one of the public undertakings of the country, which has an authorized capital of Rs.50 million. Its issued capital is Rs.30 million and paid up capital is Rs.20, 292,200.

1.2.2 Bottlers Nepal Limited:

Bottlers Nepal Limited was established as a private limited company under the company Act 1964 in 1973 A.D. It was converted to public limited company in 1984. It is one of the manufacturing and processing companies, which are manufacturing soft drinks, under the brand name coca-cola company. The company also makes the sales of the soft drinks under the registered trade name

of Coca Cola Company. Its registered office is located at Balaju, Kathmandu. The company has established a subsidiary company, Bottlers Nepal (Terai) limited in chitwan District. The main objective of the company is to produce and to market soft drinks under the brand name of Coke, Fanta and Sprite etc in the country. Raw materials for the production are imported from France and Atlanta. Flavor of the coke is prepared by the company secretly and is sold without disclosure. These are brought from countries like Singapore, India and Germany. It has production capacity of 430 bottlers per minute.

The company has authorized share capital of Rs.64.8 million and paid up value per share is Rs.100. It has issued capital of Rs.43.5 million and paid up capital is rs.19, 673,000.

1.3. Focus of the study:

Nepal is among the least developing countries with a low per capita income of U.S. \$450. It has a slow industrial growth with 2.9% and 4.5% economic growth (Economic survey, 2009/10). Thus, the economic growth is not satisfactory for an overall growth of the national economy, and industrialization is essential for the sustainable long-term improvement of the country.

Though there are numerous manufacturing industries in Nepal, most of them are suffering from heavy losses and some of them have already closed. Similarly, most of the industries use major portion of their income in paying interest and could not afford for the improvement of new technology. Some industries even could not meet the interest and other expenses from the income, so they increase loan (debt) and become more levered. Capital structure decision directly affects the shareholders risk and return and market value of the share. As capital structure decision includes decision of debt and equity mix, which has implications for the shareholder's earning and risk which in turn, will affect the cost of capital and market value of the firm.

1.4. Statement of the problem

Generally, every company has its own policy in determining capital structure for operating business activities. Some of the business use only equity capital some use only debt capital and some combine both equity and debt capital. Therefore, determination of the capital structure largely depends upon the company policy on cost of capital. Most of the companies make low cost capital structure.

As underdeveloped country, Nepal has many manufacturing companies established and yet few are running and majority closed down. There is no doubt that they need to seek for long term profits and be transparent in their strategy, policy and management so as to contribute more to country's GDP.

This research attempts to have the answer of following question:

- a) How are the companies managing their financing needs?
- b) Are they having optimal capital structure management?
- c) What is the quality of financial management good in manufacturing companies?
- d) Does the relationship between cost of capital and return on capital affect the capital structure management?

1.5. Objective of the study:

The main objective of this study is to analyze, evaluate and interpret the capital structure employed by the selected organizations. The specific objectives of the study are pointed out as under:

- a) To examine the capital structure of selected companies.
- b) To assess the debt servicing capacity of the selected companies.
- c) To analyze cost of capital and return on capital in relation to the capital employed.

- d) To analyze the relationship between capital structure and cost of capital in selected Nepalese manufacturing companies.

1.6. Limitation of the study

Certain limitation does not exist in this study. In Nepalese content, data problem is very acute. Necessary may not be available due to business secrecy and only audited data will be available.

The following assumption has been under this study.

- a) This study will be done on the basis of secondary data therefore; reliability of conclusion of the study will be based on the accuracy of secondary data.
- b) This consistency of the result is strictly based on the information provided to us.
- c) The main purpose of the study is to fulfill the partial requirement of MBS thesis.
- d) Study period is included from year 2006/07 to 2010/011 of selected manufacturing information.
- e) Due to the lack of time and financial resource only two companies are selected as sample for study.

1.7. Organization of the study

As discussed in previous section, this study intends to find the empirical relationship between the value of the company and capital structure together with other explanatory variables in the context of Nepalese listed manufacturing companies. To achieve the

Objectives of the study as stated in above section, this study contains five chapters in the pattern as stated below:

Chapter I Introduction:

This chapter deals with the subject matter of the study consisting background of the study, overview of manufacturing companies, focus of the study, statement of problem, objective of the study and organization of the study.

Chapter II Review of literature:

This chapter deals about review of literature it includes a discussion on the review of books i.e. capital structure theories, financial leverage, determination of capital structure factors affecting capital structure review of major empirical studies and review of dissertations works relating to the capital structure study.

Chapter III Research methodology:

This chapter deals about research methodology, it consist of methodology, adopted to achieve the objective i.e. research design, nature and sources of data selection of enterprises, method of data selection, method of analysis and specification of the variables.

Chapter IV Analysis and Interpretation:

This chapter deals with the analysis and interpretation of data by using statistically and financial models described as well as major findings of the study in chapter.

Chapter V Summary, conclusion and recommendation:

This chapter indicate that the summary, conclusions and recommendations of the study. After that, all necessary appendices are also included after bibliography.

CHAPTER II

REVIEW OF LITERATURE

Introduction:

This chapter highlights relevant literature to make the base of knowledge for the study. The scholars in respect of capital structure have expressed different reason. Review of literature comprises of provision articles concerned with the study.

This chapter is a comprehensive study in the conceptual frame work review of books journals and various researches regarding the capital structure, cost of capital, theories of capital structure and financial leverage.

2.1 Conceptual Framework

Capital structure is the permanent financing of the firm represented preliminary by long term debt, preferred stock and common equity, but excluding all the short term credit.

The capital structure is the combination of the long term debt and equity; it is a part of financial structure, comprised of total combination of preferred stock, common stock and long term debt and current liabilities. If current liabilities are removed from it we get capital structure.

The capital structure involves long term loan financing decision or choice between debt and equity capital. Selection of appropriate mix of debt and equity tends to minimize cost of capital and maximize and value of firm or shareholders wealth. The cost of capital and value of the firm varies with changes in capital structure. The cost of capital and capital structure are interrelated and has a joint impact upon the value of the firm.

Capital structure refers to the combination of long term sources of funds, such as debentures, long term debt, preference share capital and equity share capital including reserves and surpluses. Capital structure represents the relationship among different kinds of long term sources of capital and their amount. Normally, a firm raises long term capital through the issue of common shares sometimes accompanied by preference shares. The share capital is often supplemented by debt securities and other long-term borrowed capital. In some cases, the firm accepts deposits. In going concern, retained earnings or surplus too form a part of capital structure. Except for the common shares, different kinds of external financing i.e. preference as well as borrowed capital carry fixed return to the investors.

Capital structure is made up of debt and equity securities which comprise a firm's finance of its assets. It is the permanent financing of the firm represented by long term debt plus preferred stock plus net worth. Capital structure decision is one of the most important decisions that are taken by financial manager. Once the financial manager is able to determine the best combination of debt and equity, he or she must raise the appropriate amount through best available sources.

2.1.1 Optimal capital structure

The optimal capital structure is the structure or the combination of debt and equity that maximizes the price of the firm's stock. Optimum capital structure minimizes the company's cost of capital. The value will be maximized and the cost will be minimum when the margined cost of each source of the funds is same. The optimal capital structure is combination of debt, preferred stock and common equity at which the weighted average cost of capital optimal. Optimal capital structure is defined as that combination of debt and equity where the value of the firm is maximized.

The optimal capital structure may be defined as the relationship of debt and equity securities that maximizes the value of firm's equity stock. There should be balance between risk and return borne by equity shareholders. The objectives of optimal capital structure are as follows.

- i) To maximize return on equity capital
- ii) To minimize cost of capital.
- iii) To maintain control power.
- iv) To increase flexibility
- v) To employ high-grade securities

2.1.2 Financial structure and capital structure

Financial structure refers to the composition of sources and amount of funds collected to use or invest in business. The various means used to raise funds represent the financial structure of an enterprise. The financial structure of an enterprise is shown by the left hand side (liabilities plus equity) of the balance sheet. Traditionally short term borrowing are excluded from the list of methods of financing the firm's capital budgeting decisions and therefore the long – term claims are said to represent the proportionate relationship between debt and equity. Equity includes paid up share premium and reserves and surplus (retained earning) (Pandey, 1994: 529). Financial structure is different form capital structure as capital structure includes only the long-term sources of financing while financial structure includes both long-term and short-term sources of financing.

2.1.3 Theories of Capital Structure

In respect to capital structure decision of the firm, several capital structure theories have been developed over the period. The theories introduced in early stage are based on the assumption of investor's view over the degree of leverage. Those theories are:

Net income approach (NI)

Net operating income approach (NOI)

Traditional approach

Modigliani-Miller's approach

- Without taxes
- With taxes

These two divergent views are the variations of the net income approach (NI) and the net operating income approach (NOI) as an originally developed by Durand (David Durand) in 1958, a comprehensive analysis of capital structure by Franco Modigliani and Miller (Modigliani and Miller; 1958:125). Published an article on the issue of capital structure irrelevancy. The article is considered to be the most significant work. In financial research, in this article M-M logically assert that the value of the firm or the cost of capital is independent of capital structure decision of the firm. However, two conflicting views exist on the relationship between capital structures and cost of capital or the value of the firm.

2.1.4 Assumption of the theory of Capital Structure

To present the analysis as simply as possible, the following assumptions have been made:-

- There are no corporate or personal income taxes and no bankruptcy costs. (This assumption is relaxed later on).
- The ratio of debt to equity for a firm is changed by issuing debt to repurchase stock or issuing stock to pay off debt. In other words, a change in capital structure is effected immediately. In this regard, we assume no transaction costs.

- The firm has a policy of paying 100 percent of its earnings in dividends.
- The expected values of the subjective probability distributions of expected future operating earnings for each company are the same for all investors in the market.
- The operating earnings of the firm are not expected to grow. The expected values of the probability distributions of expected operating earnings for all future periods are the same as present operating earnings.
- Firms employ only two types of capital i.e. debt & equity and the business risk is assumed to be constant and independent of capital structure and financial risk (Pandey, 1986:228)
- The total assets of the firm are given. The degree of leverage can be changed by selling debt to repurchase share or selling share to retire debt.

In this analysis of capital structure theories the following three rates are concerned

(Van Horne, 1994:225).

$$i) \quad K_i = \frac{F}{B}$$

$$ii) \quad K_e = \frac{E}{S}$$

$$iii) \quad K_o = \frac{NOI}{Vr}$$

Where, $V_f = B + S$. Here, K_o is an overall capitalization rate for the firm. It is defined as the weighted average cost of capital and may also be expressed as follows;

$$K_o = K_i \left(\frac{B}{B + S} \right) + K_e \left(\frac{S}{B + S} \right)$$

Where as,

k_i = cost of debt,

F = Annual interest charges or total interest payment,

B = market value of debt outstanding,

k_e = cost of equity,

E = earning stock outstanding,

k_o = Overall capitalization rate or overall cost of capital,

NOI = Net operating income or earnings,

V_f = Total market value of the firm. (i.e. B+S).

2.1.5 Net income (NI) Approach

This net income approach is suggested by David Durand. According to this approach the capital structure decision is relevant to the valuation of the firm, in other words, a change in the capital structure or financial leverage will lead to a corresponding change in the overall cost of capital as well as the total value of the firm. In other words, a change in the capital structure or financial leverage will lead to a corresponding change in the overall cost of capital as well as the total value of the firm. The degree of financial leverage is measured by the ratio of debt to equity. The weighted average cost of capital will decline, while the value of firm as well as the market price of ordinary shares will increase with the increase in leverage conversely, a decrease in leverage will cause an increase in the overall cost of capital and a decline both in value of the firm as well as market price of the equity shares.

The NI approach to valuation is based on the following three assumptions:

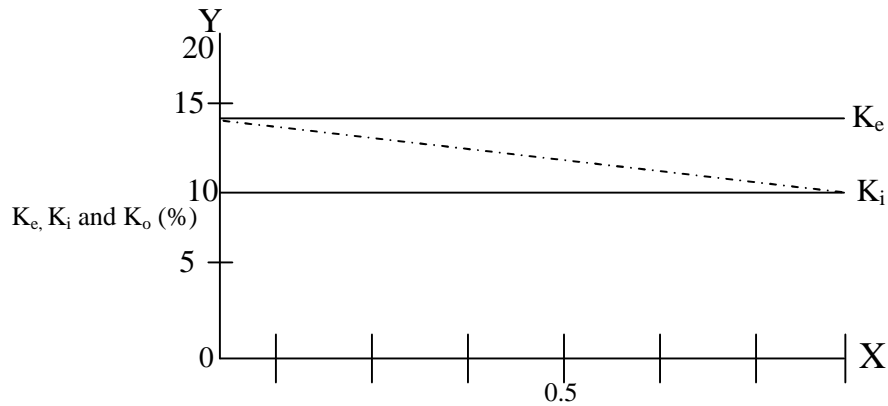
- i) There are no taxes.
- ii) That the cost of debt is less than the equity capitalization rate/cost of equity.
- iii) That the use of debt doesn't change with the introduction of debt or change is either the cost of debt or cost of equity.

The financial leverage according to NI approach is an important variable in the capital structure decision of a firm with a judicious mixture of debt and equity a firm can involve an optimum capital structure, which will be the one at which value the firm uses no debt or if the financial leverage is zero the overall cost of capital will be equal to the equity capitalization rate, the weighted average cost of capital will decline and will approach the cost of debt as the degree of leverage reaches one (Khan and Jain1995:476-477).

“The essence of the net income approach is that the firm can increase its value and lower the overall cost of capital by increasing the proportion of debt in the capital structure” (Pandey1998:230).

The use of additional debt has caused the total value of the firm to increase and the overall cost of capital to decrease. Thus, the decrease in leverage has increased the overall cost of capital and has reduced the value of the firm. As a result, the market price per share is affected (Khan and Jain, 1992:479).

The relationship between the various factors (i.e. k_e , k_i , k_o ,) with the degree of leverage, on the basis of its above mentioned assumption can be presented by figure as under.



Degrees of leverage

The degree of operating leverage (B/S) is plotted along the X-axis, while the percentage rate for K_i , K_e and K_o on the Y-axis. Due to the assumptions that k_e and k_i (i.e. cost of equity and cost of debt respectively) remain unchanged as the degree of leverage changes, where both curves are parallel to the X-axis. But as the degree of leverage increases, k_o (i.e. overall cost of capital) decreases and approaches the cost of debt when the leverage is 1.0, (i.e. $k_o=k_e$). It is obvious owing to the fact there is no equity amount in the firm's capital structure. At this point, the firm's overall cost of capital would be minimum. Therefore, the significant conclusion of the NI approach is that the firm can employ almost 100% debts to maximize its value.

Under this approach, total value of firm and k measured by (Pandey, 1998:231)

$$K_o = \frac{NOI}{V_r}$$

Where, k_o = overall cost of capital, NOI = Net operating income, V_r = value of the firm (i.e.B+S), B= Market value of debt outstanding S=Market value of stock outstanding.

2.1.6 Net operating Income approach (NOI)

Another theory of capital suggested by Durand David is the net operating income (NOI) approach. This approach is opposite to the NI approach. The essence of this approach is that the leverage/ capital 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 per shares, as the overall cost of capital is independent of the degree of leverage, and this approach (NOI) is based on the following proposition (Khan and Jain: 1992:481).

- Overall cost of capital or capitalization rate k is constant-the NOI approach to valuation argues that the overall capitalization rate of the firm remains constant for all degree of leverage. The value of the firm, given the level of EBIT, is calculated as:

$$V = \frac{EBIT}{K_o}$$

In other words, the market evaluates the firm as a whole. The split of the capitalization between debt and equity is therefore, not important.

- Residual value of equity- the value of equity is a residual value, which is determined by deducting the total value of the debt (B) from the total value of the firm V_f . Thus, total market value of equity (S) = $V_f - B$.
- Changes in cost of equity capital- the cost of capital (k_e) increase with the degree of leverage. The increase in the proportion of debt in the capital structure relatively to equity shares would lead to an increase in the financial risk to the ordinary shareholders. In other words, the use of less costly debt funds increases the risk to shareholders. Thus, the advantage of debt is offset exactly by the increase in the equity-capitalization rate (K_e).

- Cost of debt- it has two parts, they are (i) explicit cost-represented by the rate of interest. Irrespective of the degree of leverage, the firm is assumed to be able to borrow at a given rate of interest. This implies that the increasing proportion of debt in the financial risk of the lenders and they don't penalize the firm by charging higher interest (ii) Implicit or hidden cost- as shown in the assumption relating the changes in k_e , increase in the leverage or the proportion of debt to equity causes an increase in the cost of equity capital. This increase in k_e being attributable to the increase in debt is the implicit part of k_i . Thus, the advantage associated with the use of debt, supposed to be a cheaper source of funds in terms of the explicit cost is exactly neutralized by the implicit cost represented by the increase in k_e , as a result, the real cost of debt and the real cost of equity, according to the NOI approach is the same and equal k_o .
- Optimum capital structure- the total value of the firm is unaffected by its capital structure, no matter what the degree of leverage is, the total value of the firm will remain constant. The market price of shares will also not change with the change in the debt-equity ratio. There is nothing such as an 'optimum capital structure'. Any capital structure is optimum according to this NOI approach.

Other critical assumption of the NOI approach can be explained as:

i) the corporate taxes don't exist. ii) the debt capitalization rate K_j is constant as K_o . iii) the market uses an overall capitalization rate (K_o) to capitalize the net operating income, iv) K_o depends on the business risk, if the business risk is assumed to remain unchanged, K_o is a constant.

$$Vr = (B+S) = \frac{NOI}{K_o}$$

The cost of equity (K) will be measured as follows:

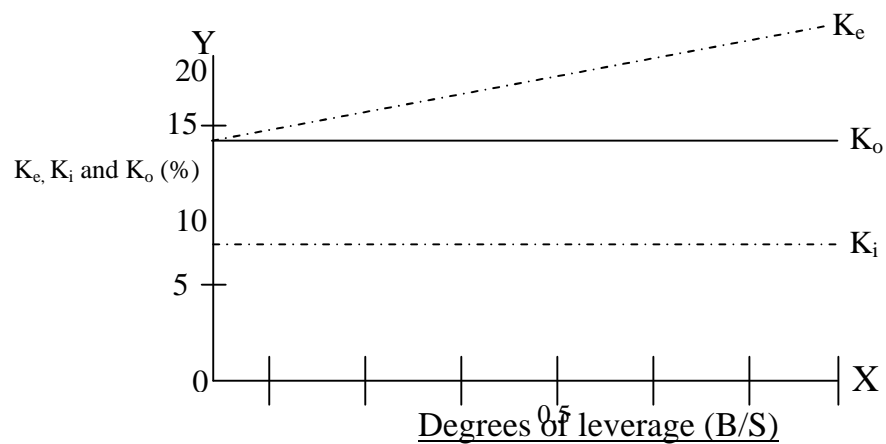
$$K_e = K_o + (K_o - K_i) \frac{B}{S}$$

Or,

$$K_e = \frac{E}{S}$$

Where, E is simply net operating income minus interest payments and S is market value of stock.

The relationship between the various factors (i.e. K_e , K_i , K_o) with the degree of leverage, on the basis of its above-mentioned assumptions, can be presented in figure as follows.



With this approach, net operating income is capitalized at an overall capitalization rate to obtain the total market value of the firm. The market value of the debt then is deducted from the total market value to obtain the market value of the stock. Under this approach (NOI), the overall capitalization rate, K_o as well as the cost of debt funds, K_i stay the same regardless of the degree of leverage. The required return on equity, however, increases linearly with leverage.

The critical assumption with this approach is that K_o is constant, regardless of the degree of leverage. The market capitalizes the value of the firm as a whole; as a result, the breakdown between debt and equity is unimportant. An increase

in the use of supposedly 'cheaper' debt funds is offset exactly by the increase in the required equity return, K_e . Thus, the weighted average of K_e and K_i remains unchanged for all degree of leverage.

As the firm increases its degree of leverage, it becomes increasingly more risky. As long as K_i remains constant, K_e is a constant linear function of the debt-to-equity ratio. Because the K_o can't be altered through leverage, the NOI approach implies that there is one optimal capital structure.

2.1.7 Traditional Approach (TA)

“The traditional approach to valuation and leverage assumes that there is an optimal capital structure and that the firm can increase the total value of the firm. The traditional approach is also known as intermediate approach. The traditional approach of capital structure has been popularized by Ezra Solomon. This approach is compromise between Net Income (NI) and Net Operating income (NOI) approach.

According to this view, the value of the firm can be increased or the judicious mix of debt and equity capital can reduce the cost of capital. In addition, the cost of capital decreases with the reasonable limit of debt and then increase with leverage. Thus an optimal capital structure exists when the overall capitalization rate is minimum or the value of the firm is maximum.

Under this approach the equity capitalization rate is higher than debt capitalization rate. It means the debt funds are cheaper than equity funds. The total is called overall cost of capital or overall capitalization rate. This rate will be less than the cost of equity and higher than the cost of debt.

According to the traditional position, the manner in which the overall cost of capital reacts to changes in capital structure can be divided in to three stages (Pandey; 1998:236).

▪ **Increasing Value Stage**

This is the first stage in this first stage, the rate at which the shareholders capitalize their net income, i.e. the cost of equity (K_e), remains constant or rises slightly with debt. But when it increases it doesn't increase fast enough to offset the advantage, of low cost debt. During this stage, the cost of debt (K_d) remains constant or rise negligibly. Since, the market views use of debt as a reasonable policy. As a result, the value of the firm (V_f) increases or the overall cost of capital (K_o) fall with increasing leverage.

Under the assumption that ' K_e ' remain constant with the acceptable limit of debt, the value of the firm will be,

$$\begin{aligned}
 V = S + B &= \frac{X - KdB}{K_e} + \frac{KdB}{K_d} \\
 &= \frac{X - KdB}{K_e} + B \\
 &= \frac{X}{K_e} + \frac{(K_e - K_d)B}{K_e} \dots\dots\dots (2.2)
 \end{aligned}$$

Thus, so long as ' K_e and ' K_d ' are constant the value of the firm ' V ' increases at constant rate $(K_e - K_d)/K_e$ as the financial leverage increases.

When equation (2.1) is solved for X/V

$$\text{We get } K_o = X/V = K_e - (K_e - K_d) \times B/V \dots\dots\dots (2.3)$$

Where,

X = Net operating income

B = Bond Value (Debt)

S = Equity Capital

K_d = Cost of debt

K_e = Cost of equity

V = Value of the firm

K_o = Cost of overall Capitalization rate.

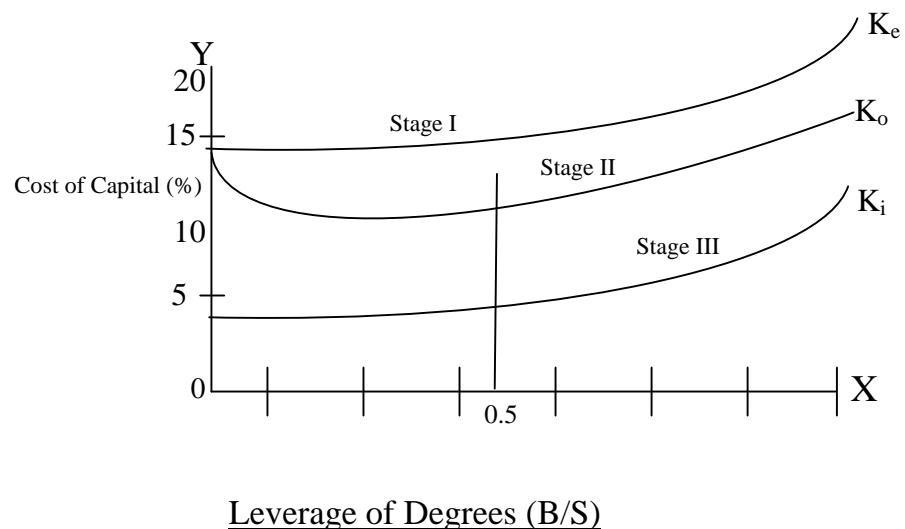
This implies that, with $K_e > K_d$, the average cost of capital will decline with leverage.

- **Optimal Value Stage**

This is the second stage. In the second stage, when the firm has reached to a certain degree of financial leverage, further application of debt will increase the cost of equity due to the added financial risk that offsets the advantages of low cost debt. Hence, the total market value of the firm remains unchanged within the range of such debt level or at a specific point the value of the firm will be maximum or the costs of capital will be minimum.

- **Declining Stage**

In this stage, the value of the firm decreases with leverage or the cost of capital increases with leverage. This happens because, the investors perceive a high degree of financial risk and increase equity capitalization rate by more than to offset the advantage of low cost debt. It can be shown from following figure.



Under such situation, there is a precise at which the cost of capital would be minimum. The precise point would occur at that optimum degree of leverage, at which marginal cost of debt is equal to the overall cost of capital.

2.1.8 Modigliani and Miller Approach (MM)

In 1958, Franco Modigliani and Morton H Miller published a research paper “The cost of capital corporation Finance and theory of Investment” where a comprehensive analysis of capital structure was revealed. It has added a milestone on the theory of capital structure, “The Modigliani-Miller thesis relating to the relationship between the capital structure, cost of capital and valuation is needed to the net operating income (NOI) approach” (Khan and Jain, 1992:484).

M-M proposition supports the degree of leverage at any level of debt equity ratio. M-M theory is based on the following assumptions:

1. Perfect capital markets: This specifically means that investors are free to buy or sell securities.
 - i. They can borrow without restriction at the same terms as the firms do, and
 - ii. They behave rationally. It is also implicit the transaction costs i.e., the cost of buying and selling securities do not exists.
2. Homogenous risk classes: Firms can be grouped in to homogeneous risk classes. Firms would be considered to belong to a homogeneous risk classes if their expected earnings have identical risk characteristic. It is implied under the M-M hypothesis that forms with in same industry constitute a homogeneous class.

3. Risk: The risk of investors is defined in terms of the variability of the net operating income (NOI).
4. No taxes: Originally M-M assumes that no-corporate income taxes exist. This assumption is relaxed later on.
5. Full payout: Firms distribute all net earnings to the shareholders.

M-M theory can be explained two ways.

a. M-M Theory (without taxes) and

b. M-M Theory (with taxes)

a. M-M Theory(without taxes)

Modigliani and Miller (M-M) support the relationship between leverage and cost of capital that explained by NOI approach. They argue that in the absence of taxes, total market value and cost of capital of the firm remain in variant to the cost of capital structure change. “ They make formidable attack on the traditional position by offering behavioral justification for having the cost of capital remains constant throughout all degree of leverage”(Solomon, 1996:92).

M-M contained that the cost of capital is equal to the capitalization rate of pure equity stream on income and the market value is ascertained by capitalizing its expected income at the appropriate discount rate for its risk class. The M-M cost of capital hypothesis can be best expressed in terms of their propositions I and II.

Proposition I

The M-M proposition I, states that the market value of a firm is independent of its capital structure. It is because the value of the firm is determined by capitalizing the net operating income (NOI or EBIT) at a rate appropriate for the firm's risk class. Accordingly, the value of firm is obtained by

$$V = \text{NOI}/K_o$$

Where,

V = value of the firm

NOI = Net operating income

K_o = Risk adjusted capitalization rate.

The M-M proposition I also implies that the weighted average cost of capital (K_o) to any firm i.e., levered or unlevered is completely independent of its capital structure and equal to the cost of equity (K_e) to an unlevered firm in the same risk class. Thus, there is no relationship between the value of a firm and the way its capital structure is made up, nor there is any relationship between the average cost of capital and the capital structure, it is identical to the NOI approach.

Proposition II

The proposition II states the cost of equity rises proportionately with the increase in the financial leverage in order to compensate in the form of premium for bearing additional risk from risk arising from the increased leverage. In other words, for any firm (i.e. levered or unlevered in a given risk class the cost of equity) the cost of equity is equal to the constant average cost of capital and interest. It can be expressed as follows:

$$K_e = K_o + (K_o - K_d) D/E$$

Where,

K_e = cost of equity

K_o = Average cost of capital

K_d = cost of debt or interest rate

D/E = debt equity ratio.

The validity of proposition II depends up on the assumptions that K_d will not increase for any degree of leverage but in practice K_d increases with leverage beyond a certain acceptable level. However, M-M mentions that even if K_d is function of leverage, K_o will remain constant, as well as K_e will increase at a decreasing rate. (Pandey; 1987:40).

Thus, taking both the proposition I and II together, the M-M theory in the absence of taxes contends that the overall cost of capital as well as the value of the firms are independent of capital structure. The theory in a tax free world is identical to the approach. In other words, the value of levered firm (V_L) is equal to the value of unlevered firm (V_U) in the risk class i.e., $V_L = V_u$.

b. M-M Theory(with taxes)

At first, M-M assumes that the corporate tax does not exist and said that cost of capital and the value of firm are independent to the capital structure decision. This assumption was not valid in reality, there exist corporate taxes and interest on debt is deductible for the purpose of the tax calculation. Thus, the value of levered firm will be more by the present value of debt tax shield than that of unlevered firm. In other words, the value of levered firm is equal to the value of unlevered firm plus present value of debt tax shield. This can be shown equation:

$$V_L = V_U + TB$$

Where,

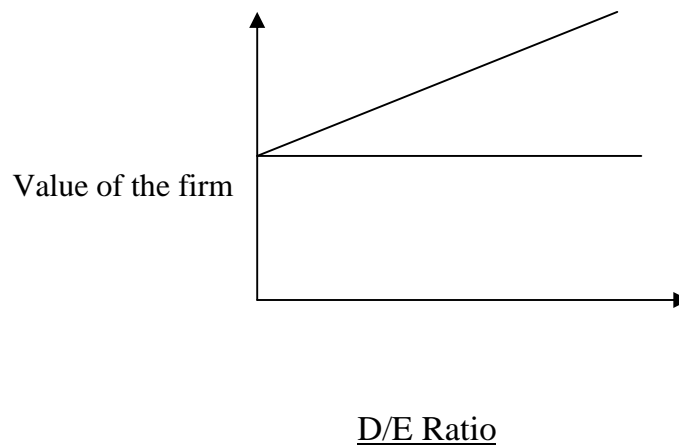
V_L = Value of levered firm

V_U = value of unleveled firm

T= tax rate

B = amount of debt

Thus, M-M proposition I with taxes indicates that $V_L > V_U$ and suggests that a firm's value rises continuously as it moves from zero debt to 100% debt. It can also be presented through the figure below:



Proposition I

“The M-M proposition states that the cost of equity of levered firm rises with leverage ratio to compensate for the additional leverage risk while the cost of debt remains constant because the debt is assumed to be risk less”(Pradhan; 1986:369).

Accordingly the cost of equity is calculated as follows:

$$K_{eL} = K_{eU} + (K_{eU} - K_d) (1-t) D/E$$

Where,

K_{eL} = Cost of equity of levered firm

K_{eU} = Cost of equity of unlevered firm

K_d = Cost of debt

T = tax rate

D/E = Debt equity ratio.

It indicates that the cost of equity increases with D/E ratio. On the other hand, the tax deductibility of interest on debt lowers the cost of debt but still remains constant irrespective of debt equity ratio. This reduction in the cost of debt as result of tax saving outweighs the increased cost of equity, forcing the average cost of capital to increase with every additional unit of debt financing. As such, the theory suggests that it is always better to have maximum debt financing.

Assumption of MM hypothesis

Perfect competition market environment where information relating investment is freely accessible there involves no transaction cost. In addition to this, investors are free to sell and buy the securities and can borrow without any restriction at the same rates as corporation does. All investors are rational and no investor can influence the market.

- The individual investors may have the different views as to the shape of the probability distribution but expected rate of return for all is assumed the same.
- The division of the income between cash dividend and retained earning in any periods is a more detail or dividend payout ratio is 100%.
- There are no income taxes. Modigliani and Miller remove this assumption latter.
- Homogeneous business risk
(Pandey, 1988:240).

Assumptions of M.M. Hypothesis can be classified in two ways.

- A. M.M Hypothesis with no taxes.
- B. M.M. Hypothesis with taxes.

A: M.M. Hypothesis with no taxes is identical to Net operating income approach, which has already been explained.

B: According to Franco Modigliani and Merton H. Miller hypothesis with taxes, the value of levered firm must be greater than value of unlevered firm by the amount of debt tax shield (Merton H. Miller and Franco Modigliani, 1966)

a) Debt tax shield when corporate tax is given present value of Debt –tax shield =

$$B \times T \dots \dots \dots (2.4)$$

Where,

B= value of debt

T= corporate Tax

b) Debt tax shield when corporate and personal taxes are given.

Present value of debt-tax shield =

$$B \times \left[1 - \frac{(1-t)(1-tcs)}{1-tb} \right]$$

Where,

t = Corporate Tax

t_{cs}= personal tax an common stock

t_b= Marginal personal tax on debt.

Proposition I

According to assumption of M-M hypothesis that for firm in same class business risk, value of the firm is independent of its capital structure i.e. financial leverage. This is their proposition it can be expressed as follows (Pandey, 1988:240).

$$V=(S+B) = X/K_o=NOI/K_o.....(2.6)$$

Proposition I can be stated in an equivalent way in terms of the firms overall cost of capital (K_o), which is the ratio of the market value of all its securities.

That is:

$$\frac{X}{(S+B)} = \frac{X}{V} K_o (2.7)$$

If defining K_d as the expected return on the firms debt and K_e as the expected return on the firm's equity then expected net operating income is given as,

$$X=K_oV=K_oV+K_dB$$

As given in equation (2.7) by definition

$$K = X/V$$

$$K_o = K_e \frac{B}{S+B} + K_d \frac{B}{S+B} (2.8)$$

It can be expressed as follows too,

$$V_L=V_u=X/K_{ou}$$

Where,

K_{ou} = cost of overall capital of unlevered.

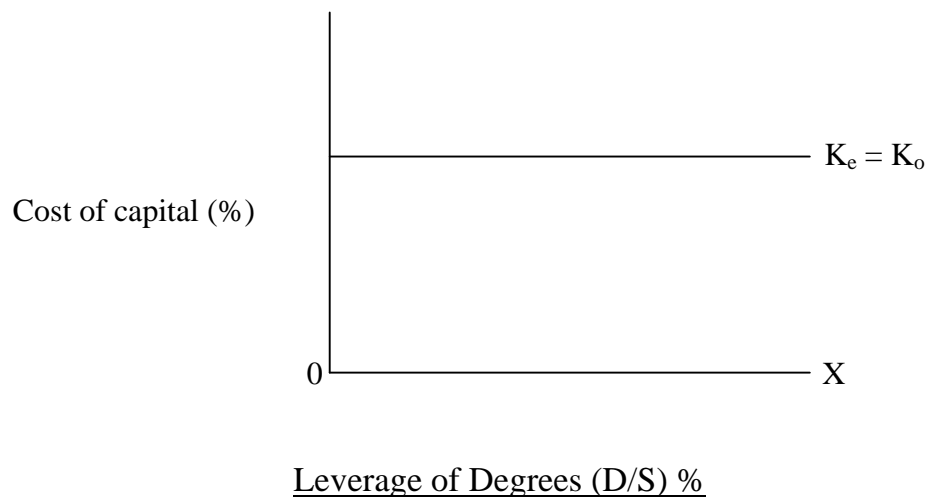
V_L = value of levered firm

V_u = value of unleveled firm.

Thus, under the conditions we have specified, the value of levered firm is equal to the value of unleveled firm. This is the famous capital structure irrelevance or leverage irrelevance of proposition- I of Modigliani-Miller.

M.M. concluded that the total market value of firm is unaffected by financing mix, it follows that the cost of capital is independent of the capital structure and is equal to the capitalization rate of a pure equity stream of its class (Pandey, 1988:241).

The cost of capital functional, as hypothesized by M.M. through proposition-I, is shown in figure 2.5.



It is evident from figure 2.5 that average cost of capital is a constant and is not affected by leverage.

Proposition II

Based on proposition I, M.M. formulated proposition II, which defines the cost of equity is the linear function of the leverage. The equation form of this proposition can be expressed as follows.

$$K_e = K_o - (K_o + K_e) B/S \dots \dots \dots (2.9)$$

Validity of the M.M. proposition II depends up on the assumption of ‘K_e’ constant for only degree of leverage. But in real Business world ‘K_e’ increases with leverage beyond a certain acceptable level of leverage According to this assumption.

$$K_{oL} = K_{ou}$$

K_{oL} = cost to overall capital of levered firm.

K_{ou} = cost to overall capital of unleveled firm.

2.1.9 Determinants of the Capital structure

The initial capital structure should be designed very carefully. The management of company should set a target capital structure and the subsequent financing decision should be made with a view to achieve the target capital structure. The financial manager has also to deal with an existing capital structure. Every time, when the funds have to be procured the financial manager weight the pros and cons of various sources of finance and selects most advantageous sources of capital structure. Generally the following factors should be considered whenever a capital structure decision has to be taken.

- I. **Leverage effect on EPS:** - The use of fixed cost sources of financing such as debt and preference share capital to finance the assets of the company is known as financial leverage. If the assets financed with the use of debt yield a return greater than the cost of debt, the earning per share increase without an increase in the owner's investment, the EPS also increase when the preference share capital is used to acquire assets. But leverage impact is more pronounced in case of debt because the cost of debt is usually lower than the cost of preference share capital and interest paid on debt is tax deductible, because it effects in the EPS. Financial leverage is one of the important considerations in planning the capital structure of a company. The companies with high level of earning before interest and taxes can made profitable use of the high degree of leverage to increase return on the share holder's equity. The firm is able to maximize the EPS when it uses the debt financing. Through the rate of preference dividend is equal to the rate of interest, EPS is high in case of debt financing because the interest charges are tax deductibles while preference dividends aren't. The EBIT-EPS

analysis is an important tool in the hands of the financial manager to get an insight to the firm's capital structure management and the financial manager can consider the possible fluctuations in EBIT and examine their impact on EPS under different financial plans.

- II. **Sales stability and growth:** - Firms whose sales are relatively stable can safely take on more debt and incur higher fixed charges than a company with unstable sales.
- III. **Profitability:-** The capital structure of the company should be most advantageous within the constraints; maximum use of leverage at a minimum cost should be made(Pandey, 1988:259).
- IV. **Taxes:** - Interest is a deductible expense, and deductions are most valuable to firms with high tax rates. Therefore, the higher a firm's tax rate, greater the advantage of debt.
- V. **Management attitude:** - since no one can prove that one capital structure will lead to higher stock prices than another, management can exercise its own judgments about the proper capital structure some management tends to be more conservative than others and thus use less debt than the average firm in their industry, whereas aggressive management use more debt in the quest for highest profits.
- VI. **Lender and rating:-**Lender's and rating agencies attitude frequently influence financial structure decision the loss of control. A very excessive amount of debt can also cause bankruptcy i.e. complete loss of control.
- VII. **Flexibility:** - Flexibility is one of the most serious considerations in setting up the capital structure; it is the firm's ability to adapt its capital structure to the needs of the changing conditions. The capital structure of a firm is flexible if it has no difficulty in changing its

source of funds. The company should be able to raise funds without undue delay and costs. The financing plan of the company should be flexible enough to change the composition of the capital structure. The degree of flexibility in the capital structure of a company depends on the flexibility in fixed charges, the terms of redemption and the debt capacity, although flexibility is most desirable, it is achieved at a cost. A company trying to obtain loans at a easy terms will have to pay interest at a higher rate. Also to obtain the right of refunding, it will compensate creditors by paying a higher rate. Also to obtain the right of refunding, it will compensate the benefits and costs attaining the desired degree of flexibility and balance them properly.

VIII. **Size of the company:** - The size of the company greatly influences the availability of funds from different sources. Generally, a small has great difficulties in raising long term loans. On the other hand, if it is able to obtain some long term loan, it will be available at a higher rate of interest and inconvenient terms. Small companies depend upon share capital and retained earning for their long term funds. The share of small companies are not widely scattered therefore, sometimes the small companies limit the growth of their business to what can easily be financed by retaining the earning. On the other hands, the share of large company is widely distributed and it may difficult to organize and to manage the widely scattered shareholders against the existing management team. A large company has a greater degree of flexibility in designing its capital structure. Such company can obtain the loans at easy terms as well as can sell theirs common stock, preference share and debentures to the public. Because of large size of issues, its cost of distributing any kinds of security is less than that for a small company. Thus a

company should make a best use of its size in planning the capital structure.

- IX. **Marketability:** - It is the readiness of investors to purchase a particular type of security in a given period of time. It doesn't influence the initial capital structure but it is an important consideration to decide about the appropriate timing of security issues and at another time, it may readily accept common shares issues. The capital markets are changing continuously. The market favors debenture issues and at another time, it may readily accept common shares issues. Due to the changing market sentiments the company has to decide whether to raise funds with a common share issue or with a debt issue. Thus, it should be considered in planning the capital structure to the company.
- X. **Flotation Cost:** - It is not a very important factor influencing the capital structure. Flotation cost is incurred only when the funds are raised. Generally, the cost of floating a debt is less than the cost of floating equity issue. This may encourage a company to use debt than issue common shares. If retaining the earning increases the owner's capital, no flotation cost is incurred.

Therefore, the financial manager should consider above mentioned factors in planning their optimal capital structure of the company. If the financial manager ignores any factors, then the capital structure of a company may failure.

2.2 Review of Related Thesis

A number of studies has been conducted in ten various aspects of capital structure in Nepal. They are reviewed here under.

2.2.1 Review of Related Studies under Foreign Context

Milton Haris and Artur Ravis (1991) synthesized the recent literature, summarized the theories of capital structure, related to the known empirical evidence, and suggested promising avenues for future research. First they focus the theory of capital structure, second they arbitrarily exclude theories based primarily on tax consideration. Third they systematically exclude certain topics that, while related to capital structure theory does not have this theory as their control focus. In short, they concentrated on non-tax-drives capital structure theory.

They have identified four categories of determinants of capital structure. These are the desire to:

- Rectify conflicts of interest among various groups with claims to the firm's resources, including managers.
- Convey private information to capital market or mitigate adverse selection effects, in the product/ input market or,
- Affect the outcomes of corporate control contests.

According to them, each of these four categories is discussed in a separate section. The plan of their studies is as follows. In section I they discussed model based on agency cost. Models using asymmetric information are considered in section II Interaction of capital structure with behavior in the product or inputs markets or with characteristics of product or inputs is taken up in section III Section IV surveys models based on corporate control

consideration. In section V, they summarize the theoretical results and compare them with evidence. At last their conclusions are presented in section VI.

They have concluded on their studies that the theories surveyed have identified a great many potential determinants of capital structure (in addition to taxes). That means various variables affect the capital structure (Milton Haris and Autur Raviv; 1991:220).

According to, Weston, Besly and Brigham's study (1996), capital structure theory has been developed along with two main line: (1) tax benefit bankruptcy cost trade-off theory and (2) signaling theory, they said that each firm has an optimal capital structure, defined as that mix of debt, preferred stock and common equity which minimize its weighted average cost of capital (J.Fred Weston; Scott Besly and Eugene F. Brigham 1996).

I.M. Pandey (1998), the professor of Indian institute of management, Ahmedabad had also studies about capital structure. According to him, under favorable economic conditions the earning per share increase with leverage. But leverage also increases the financial risk of shareholders. As a result, it can not be stated definitely whether or not the value of the firm will increase with leverage. Further he has said if the value of the firm can be affected by capital structure which maximizes the market value of the firm. Pandey further added there exist conflicting theories on the relationship between capital structures: Pandey has argued that the capital structure decision of the firm can be characterized as a choice of that combination of debt and equity, which maximize the market value of the firm. He has supported to traditional approach the cost of equity declines with leverage at a acceptable range of debt and then starts to increase with increasing debt in capital. Pandey, 1998:45.

James C.Van (1999), Horne has also presented controversial decision about capital structure. According to him, financial signaling occurs when capital structure changes convey information to security holders. It assumes symmetric information between management and stock holders. Management behavior results in debt issue being regarded as good news by investors and stock issues as bad news (James C.Horne; 1999; 314)

2.2.2 Related Articles under Foreign Context

There are various studies accepted on capital structure management of various state owned and public limited companies of Nepal. Most of the Studies indicates that a sound principle of capital structure and its management have not been followed by the enterprise in Nepal. The studies also observed defects in capital structure. As for example in many enterprises, their debt capital was comparatively higher than equity. So, the company was regarded as highly levered company. But with the progress of time, there have been a very few signs of recovery. Some measures were taken to bring down the amount of debt capital. Despite the company's performance have not better signs of recovery. The defective capital structure shown in the studies induced the researcher for the further study on the subject. The researcher may feel comfort, if the gap created by the previous studies can be filled up. Further , this study will help research student to carry further studies as well as, it will be helpful to the interested groups in the selected companies such as investors creditors etc. to analyze their position at a present and search for the prospective investors.

The following are the articles related to capital structure management of manufacturing company.

Garvin Cassar (2003) published an article entitled “**capital structure and financing of SMEs and is the evidence of Australia**”. The article is about the investigation of determinants of capital structure and use of financing for small and medium sized enterprises. This paper investigates the determinants of capital structure and the use of developed to explain capital structure. With empirical evidence based upon large listed firms tending to support these theories. Institutional differences in the types of financial organizations, their pre-dominance and the traditional markets they serve, vary the way investment and capitals are allocated. For example, different investor groups may use investor groups exist, the allocation decisions may differ due to regulatory.

Toru yoshikawa and Philip H. phan (2005) published an article entitled **“The effects of ownership and capital structure on board composition and strategic diversification in Japanese corporations”** investigates the relationships between ownership and board structure with the diversification strategy of large Japanese firms.

The results show that corporate nominee directors are associated with lower of product diversification of their invested firms. This suggests that nominee directors in large Japanese corporations see themselves representing specific interests and therefore investors should pay attention to board composition in order to assess the level of protection they can expect to receive. Even without any apparent agency problem with management, there remains a potential “principal- principal”.

2.2.3 Review of related studies under Nepalese context

Karki (2008) has conducted a research in the related topic as **“A study of capital structure of manufacturing companies in Nepal”**. The objective of this research were:

- To the composition structure and characteristics of capital structure of the sampled manufacturing companies.
- To make financial analysis of selected sample companies.
- To compute the correlation between long term debt and capital
- To analyze the impact of debt financing on profitability.
- To provide recommendations on the basis of the study.

The major findings of his study are as follows.

- Debt Equity ratio analysis shows that debt equity ratio of UNL and NLOL are zero. These companies are highly unlevered. The average of debt equity ratio of BNL is 0.369 which indicate that BNL has lower long term Debt and the average debt equity ratio of MSML is 3.018 which indicates that JSML has higher long term debt and the average debt equity ratio of RJML is 0.3238 which indicates that RJML has

lower long term debt. At the same time C.V analysis helps us to conclude that three companies have consistent debt equity ratio.

- As far as Long term debt to Total Capital ratio, UNL and NLOL have zero. The average value is 0.2698 which shows that equity value of BNL is lower long tem debt. It means BNL is facing low risk. The average value is 0.7506 which shows that equity value of MSML is lower and higher long tem debt. It means JSML is facing more risk. But in case of RJML, The average value i.e. 0.239 shows that RJML, is using more equity than long term debt. C.V analysis concludes that JSML is more consistent than RJML and BNL.
- The data of Debt to Net worth ratio shows that average debt to net worth ratio of BNL is 0.389 which is very low. It has used only short term debt. Similarly UNL and NLOL have used only short term debt. C.V of BNL and NLOL shows its ratio is consistent in nature but the C.V of UNL shows consistent in nature. The average debt equity ratio of JSML (4.0556) is very high but of RJML (0.855) is very low. C.V shows that debt equity. C.V shows that debt equity ratio of both companies are consistent in nature.
- On the basis Interest coverage ratio, the average interest coverage ratio of BNL, UNL, NLOL, JSML and RJML are 2327.478, 96.356,2.272,0.867 and 0.654 respectively. The interest coverage ratio of BNL is very high in comparison with other four manufacturing companies. C.V analysis shows that BNL and UNL are more consistent in nature and other NLOL, JSML and RJML are also consistent in nature.
- Return on total assets ratio shows that the average ratio of JSML (-0.0162), which indicates that the financial condition of JSML is the worst among five manufacturing companies, C.V analysis also shows that the ratio is more inconsistent in nature. Rest of four manufacturing companies has also low return on total assets ratio which indicates that other companies have also not good financial condition. C.V analysis

shows that BNL, UNL and RJML are consistent in nature but NLOL is more inconsistent in nature.

- The average profit margin ratio of BNL, UNL, NLOL and RJML are 0.0578, 0.098, 0.0246 and 0.0034 respectively which are very low. Therefore BNL, UNL and NLOL have to increase its LTD to increase their profit. JSML has negative (-0.0196) profit margin ratio which indicates worst condition of company among five companies. C.V analysis shows that BNL, UNL and RJML are consistent in nature but NLOL and JSML are inconsistent in nature.
- The average return on equity of UNL (1.528) is the highest among five manufacturing companies. BNL and NLOL have almost satisfactory result to the return to the equity share holders. But RJML (0.0046) has low return on equity. JSML has negative (-0.064) return on equity which indicates that the shareholders of JSML are facing worst situation. C.V analysis shows that BNL, UNL and RJML are consistent in nature but NLOL and JSML are inconsistent in nature.
- As far as over capitalization rate is concerned, data related to UNL shows that its average overall capitalization rate is very high i.e. 334.784. BNL, NLOL, JSML and RJML have low overall capitalization rate.
- The data of Equity capitalization analysis shows that average equity capitalization rate of UNL is very high (277.722) but JSML and RJML has negative (-21.079 & -10.024) equity capitalization rate. The other three BNL and NLOL also have low equity capitalization rate.
- UNL and NLOL have not long term debt, so we can not calculate the correlation and probable error between long term debt and net worth. The data of correlation coefficient of BNL between Long term debt and net worth is 0, which shows that there is low degree of relationship and insignificant. The data of correlation coefficient of JSML between long term debt and net worth is -0.36, which shows correlation coefficient between long term debt and net worth is -0.1182 which indicates that

correlation between long term debt and net worth is low degree of negative relationship and insignificant.

- The average of financial leverages of UNL and NLOL are 1.0532 and 3.2042 respectively. These two companies have not used long term debt and hence they have not been able to get the advantage of leverage firm. BNL has used the long term debt in year 2006/2007. JSML has negative financial leverage which has high proportion of long term debt and short term debt. C.V analysis shows that BNL and UNL are consistent in nature but NLOL, JSML and RJML are inconsistent in nature.
- As far as the simple regression analysis of BNL, long term debt on shareholders equity is concerned beta coefficient is zero. The sample regression analysis of JSML, long term debt on shareholders equity is concerned beta coefficient is negative. Similarly for RJML, beta coefficient of long term debt on shareholders equity indicates that long term debt decreases with the increase of shareholders equity.
- From the regression analysis of EBIT on interest , beta coefficient of NLOL, JSML and RAJML have positive but BNL and UNL has negative. The positive beta coefficient of EBIT on interest of NLOL, JSML and RJML indicate that increase in interest leads to increase in EBIT but in case of BNL and UNL increase in interest leads to decrease in EBIT.

Timalsina (2009) has conducted a research on “*capital structure management of manufacturing company listed in NEPSE*”

The objective of this research were:

- To examine the capital structure of sample companies.
- To analyze cost of capital and return on capital in relation to the capital employed.
- To assess the debt servicing capacity of the samples companies.

The major findings of his study are as follows.

- The overall analysis of four manufacturing companies, BNL, ULNL, NLOL and AVUL shows different leverage position for each company.
- By analyzing the trend of debt to equity ratio it is found that all the firms are attempting towards equity based capital structure. The reason for this is yet to be studied.
- While analyzing total debt to total assets ratio of BNL, ULNL, NLOL and AVUL, it is found that, BNL has the highest interest coverage ratio than others. Here the average interest coverage ratio of BNL, ULNL, NLOL and AVUL are 2322.72, 65.49, 20.04 and 0.148 times respectively. The interest coverage ratio of last three companies indicates the poor debt serving capacity but for BNL has good debt serving capacity than other firms.
- Analyzing the profit margin ratio, BNL has the highest ratio than other three manufacturing companies which means, it has the highest profit earning capacity.
- The average interest coverage ratio of BNL, ULNL, NLOL and AVUL are 2322.72, 65.49, 2.04 and 0.148 times respectively. The interest coverage ratio of last three companies indicates the poor debt serving capacity but for BNL has good debt serving capacity than other firms.
- By analyzing the correlation coefficient and respective probable errors it is found that the total debt and shareholders equity BNL shows the negative correlation and not significant relationship but other three companies have positive correlation ULNL has significant relationship

and NLO and AVUL has not significant relation between total debt and shareholder's equity.

- Over viewing the Du- point analysis ULNL has the highest ROA and ROE than other three manufacturing companies. Here average ROA BNL, ULNL, NLOL and AVUL are 3.64, 13.85, 2.238 and 5.81 times respectively. Likewise ROE of BNL, ULNL, NLOL and AVUL are 17.63, 152.91, 13.79 & (23.72) respectively.

Sharma (2005) has conducted a research on “A Study on Capital Structure Management of Manufacturing Companies listed in Npse”.

The objective of this research were :

- To examine the capital structure of selected companies
- To analysis return on equity and assets.
- To find out the ratio between debt and equity of selected companies.
- To recommend the companies to maintain the capital structure.

The major findings of his study are as follows.

- Average DOL for JSML is negative, which shows the inefficient earning of the firm. In the case of NLL and NLOL is positive DOL. For NLOL and NLL, DOL is higher, which shows the risky of the company. The NLL and NLOL should try to manage its DOL, whereas JSML should try to increase their sales volume to improve operating position of the company due to negative DOL.
- The average DFL of JSML, NLL AND NLOL is higher than one. JSML has highest DFL among all companies. There is o any consistency in the DOL AND DFL for the same type of manufacturing industry.
- Debt – equity ratio for JSML is positive. The JSML and NLOL is a levered firm but NLL has not long term debt. So NLL is unleveled firm.
- The average ratio between shareholders equity and total assets for JSML is negative value of shareholders equity. This indicates that all the assets

have financed out of debt capital, which is not good. The NLOL & NLL have the ratio below 50%, which indicates that more than 50% assets are financed through outsiders' fund.

- The profit margin of the company doesn't show the satisfactory figure during the study period. The average ratio is the negative for the JSML; The company is occurring loss during all the study period. The profit margin for NLL is quite good than other studied companies.
- The ROE for NLL is the highest. The investors of the NLL are getting more return from their investment. For JSML, ROE is positive due to double negative, it is not so good. The ROE for NLOL is good than JSML.
- The average return on assets for JSML is negative, which indicates that the assets of this company are not generating profit. The average ROA for NLL is highest, indicating the good production power of assets. The NLOL average is good than JSML.
- Earning per share for NLL seems to highest among the three companies, so the investor can be attracting by proposal of NLL. The earnings per share for JSML is negative indicates the worst situation of the company. The EPS for NLOL is positive but it is poor than NLL.
- The average P/E ratios are 0.41472, 19.75 & 0.857 for JSML, NLL & NLOL respectively. The higher value of P/E ratio indicates the greater confidence of investors with its future. In the selected companies NLL has the highest value of the P/E ratio.

2.3 Research Gap

Capital structure involves long term loans, financing decisions or choice between debt and equity capital. The cost of capital and value of the firm varies with changes in capital structure. Capital structure represents the relationship among different kinds of long term sources of capital and their amount.

There is very limited study on capital structure management of listed manufacturing companies. Most of the studies re concern with the research title “capital structure management”. Some researcher have selected varies manufacturing companies for the research and some have concentrated in only the company.

So, the research has chosen this topic throw light on capital structure management of listed manufacturing companies. Researcher has used financial as well as statistical tools like: ratio analysis, leverage ratio, interest coverage ratio, Profitability ratio, Mean regression, correlation analysis. Almost all the ratio has been applied to cover analytical part and fulfill the objectives of this study. It involves more recent date of listed companies for five year (2006/07-2010/011) probable this study may be first research of its kind in the area.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction

It is known as a path from which the researcher can systematically solve the research problem. In order to accomplish the objectives at this study the research methodologies have been designed on the basis of secondary data by using useful financial and statistical tools. The research methodologies adopted in this study are discussed in the following manner. This chapter is composed of five sections.

- Research design
- Populations and samples
- Selection of enterprises
- Nature and sources of data
- Method of analysis and interpretation

3.2 Research Design

The main objective of the study is to analyze the relationship between debt and equity of listed company and provide recommendation on the basis of funding to fulfill this purpose. The study follows the analytical and descriptive research design. In order to achieve the objective of the study secondary data has been used.

3.3 Sources of data

The study is based on secondary data. Thus secondary data are extensively used in this study. The raw secondary raw data are modified to some extent for the study purpose mostly; data are collected from the balance sheet, income statement and profit and Loss account of Bottlers Nepal limited and Nepal Lube Oil Limited. Some other necessary data used in this study have also been supplemented from auditor general reports and various related journals in a management and other publications.

3.4 Population and Samples

All listed manufacturing companies in NEPSE are considered as total population. Sample drawn from target population is judgmental sampling from 38 manufacturing companies. Out of them two manufacturing companies have been chosen. The samples manufacturing selected are as follows:

1. Nepal lube oil Limited (NLOL)
2. Bottlers Nepal Limited (BNL)

3.5 Method of Analysis and Interpretation

The main purpose of analyzing the data is to change it from an unprocessed form to an understandable presentation. The method of analysis employed in this study consist of two types of analytical tool and technique.

- Financial tools
- Statistical tools

3.5.1 Financial tools

The Financial tools employed in this study represent ratio analysis, leverage analysis, EBIT-EPS analysis and others.

3.5.1.1 Ratio analysis

Ratio analysis is the powerful tool of financial ratio, which represents the relationship between two accounting figures, expressed mathematically. Ratio analysis is defined as the systematic use of ratio to interpret the financial statements so that the strengths and weaknesses of a firm as well as its historical performance and current financial conditions can be determined, like other tools of financial management, ratio analysis involves two types of comparison. First, it is employed to compare present ratio with past and expected figure ratio for same corporation. Second the comparison is done to see the difference exist between ratios of one corporation with industries

average of the same period. The required financial ratios for this study are enables in details as follows:-

D) Leverage ratios

Leverage ratio measures the contributing of financing by owners compared with financing provided by the outsiders. They also provide some measure of the risk of debt financing by the calculation of the coverage of fixed charges. In this study, following leverage ratios have been calculated.

- **Long-term debt to equity ratio**

Long debt to equity ratio reflects the relative claims of creditors and a shareholder against the assets of the firms. It is calculated as:-

$$\text{D/E ratio} = \frac{\text{long - term debt}}{\text{shareholder's equity}}$$

A high debt equity ratio indicates that the claims of creditors are greater then that of the owners and vice-versa.

- **Debt to capital ratio**

The debt to total capital ratio is the relationship between creditors funds and owners capital ratio. One approach is to relate the long term debt to the permanent capital of the firm. I t is calculated as:

$$\text{Debt to Total Capital Ratio} = \frac{\text{long term debt}}{\text{permanent capital}}$$

‘Permanent Capital’ consists of shareholders equity as well as long-term debt.

- **Total Debt to total Assets Ratio**

The total debt of the firm comprises long-term debt plus current liabilities while total assets consist of permanent capital plus current liabilities. Thus, it can be calculated as:

$$\text{TD/TA ratio} = \frac{\text{Total debt}}{\text{Total Assets}}$$

This ratio however gives somewhat similar indications as the debt equity ratio.

- **Interest Coverage Ratio**

This is also known as 'time interest earned ratio'. This ratio, easier the debt servicing capacity of a firm in so far as fixed interest on long term loan is concerned. It is calculated as:

$$\text{Interest coverage ratio} = \frac{\text{EBIT}}{\text{Interest}}$$

Larger the coverage ratio the greater the liability of the firm to handle fixed charge. Liabilities and the more assured the payment of interest to the creditors. However, too high a ratio may imply unused debt capacity.

II) **Profitability Ratio**

Profitability ratios give final answers about how effectively the firm is being managed. In this study following profitability ratios are calculated:

- **Profit margin on sales**

The profit margin on sales is computed by dividing net income after taxes by sales.

$$\text{Profit margin on sales} = \frac{\text{Net Income}}{\text{Sales}}$$

- **Return on total assets**

It is also known as return to investment.

$$\text{Return on total assets} = \frac{EBIT}{Total\ Assets}$$

While an after tax basis, because of the tax shatters benefit of interest. We add the after tax interest expenses to net income for numerator of the ratio.

$$\text{Return on total assets ratio (ROA)} = \frac{Net\ Income + Interest(1-T)}{Total\ Assets}$$

- **Return on net worth(ordinary shareholder equity)**

The ratio on net profit after taxes to net worth measure the rate of return on the stockholders investment. It is computed by dividing EAT with net worth. Here net worth represents only equity capital.

It approximates the net benefit that the stock holders have received from investing their capital in the bank.

$$\text{Return on equity (ROE)} = \frac{Net\ Income}{Common\ equity}$$

- **Return on Assets(ROA)**

It is the ratio of banks net after tax income divided by its total assets. ROA ratio is primarily an indicator of managerial efficiency. It indicates how capably the management of the bank has been convening the institutions assets in to net earnings.

$$\text{Return on Assets (ROA)} = \frac{Net\ Income}{Total\ Assts}$$

- **Dividend Payout Ratio**

Dividend refers to the portion of net income paid out to shareholders. It is paid in cash and or stock for making investment and bearing risk.

Dividend decision of the firm is yet another crucial area of financial management as it affects shareholders wealth and the value of the firm. The percentage of earning paid out in form of cash dividend is another as DPS.

$$\text{Dividend Payout Ratio (DPR)} = \frac{\text{Dividend per share (DPS)}}{\text{Earning per share (EPS)}}$$

- **Price Earning Ratio**

The P/E ratio shows how much investor is willing to pay per rupees of reported profits. The P/E ratio is calculated by dividing market price per share by earnings per share. The EPS is calculated by dividing net income by number of common share outstanding.

$$\text{Price earning ratio (P/E)} = \frac{\text{Market price per share}}{\text{Earning per share}}$$

3.5.2 Statistical tools

Many statistical tools are often employed in the analysis and interpretation of data as in aid to management and managerial decisions. Following statistical tools are used more systematically in this chapter.

- Mean
- Regression
- Correlation analysis
- Standard analysis
- Coefficient of variation

- **Mean**

The most popular and widely used measure of representing the entire data by one value is what most laymen call an “average” and what the statisticians call the arithmetic mean. Its value is obtained by adding together all items and by dividing this total by the number of items. The mean value of ratios of study period all the manufacturing companies have been calculated to compare their results. The formula used for calculating mean is as follows:

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

Where $\sum X$ = Sum of values

N = Number of observations

- **Regression**

Regression analysis studies the statistical relationship between the variables. The main objective of regression analysis is to predict or estimate the value of dependent variable corresponding to a given value of independent variables. Regression lines expressed in terms of mathematical relations are known as regression equation.

Regression equation of Y on X,

$$Y = a+bx$$

Where,

Y = Dependent Variable

X = Independent Variable

a= Intercept of the line

b= Slope of line (It measures the rate of relationship)

- **Correlation Analysis**

The most important of measuring the correlation between the two variables is Karl Pearson's coefficient of correlation. Thus, it is the mathematical method of measuring the degree of association between the two variables. The formula for calculation simple correlation coefficient(r) by Karl Pearson's method is:

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

Where,

N= Number of period observations

X, Y= Financial variables

- **Standard Deviation(SD)**

The standard deviation is used to measure the risk. It shows the deviation of actual mean with average mean. The standard deviation measures the absolute dispersion of variability of a distribution. The greater the variability or dispersion the greater would be the magnitude of the deviation of the value from their mean. The smaller the deviation is useful in judging the representative ness of the mean. The formula of standard deviation is as follows.

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

Where,

S.D. = Standard deviation

X= value of the variable

n= Number of years

- **Coefficient of variation(CV)**

Coefficient of variation is the corresponding relative measure of dispersion. The series for which the coefficient of variation is greater is said to be more variable or conversely less consistent or less uniform. The formula of coefficient of variance is as follows.

Coefficient of variance (CV) = **s.d/mean**

Where,

SD () = Standard Deviation

X = Mean

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

4.1 Introduction

Data analysis and presentation chapter deals with the main body of this thesis study i.e. analysis and findings of the collected data. The first section of this chapter deals with the determination of relevant financial and technical tools and explained the results. The available information are changed and adjusted in to required data for analyzing. This chapter first proceeds with financial analysis is done through presentation of data and calculating various financial ratios that reflect the relationship variable affecting capital structure used total assets, net worth current liabilities and current assets other related variable are also used.

In this chapter, we firstly analyze the variables of capital structure of manufacturing companies by classifying manufacturing companies according to their usage of leverage. After that, we analyze the value of manufacturing companies relating with capital structure variables by correlation analysis to empirically analyze the data of manufacturing companies taken for study.

4.2 Leverage Ratio

Leverage ratios are also known as capital structure ratio. The capital structure ratio judges the long-term financial position of the firm. The ratio indicates funds provided by owner and lenders. As the general rule, there should be an appropriate mix of debt and owner equity in financing the firm's assets. Leverage ratios have a number of implications. First, is between the debt and shareholders equity. The company has legal obligation to pay the interest to debtors. Second, shareholders have advantages in employment of debt in two ways.

1. They can retain control of company with the limited shop, and
2. Their return is magnified if the company's interest rate on debt is lower than rate of return on total capital employed. Shareholder return can be magnified through an employment of debt on the other hand if the cost of debt is higher than rate of return on overall capital employed, shareholder return is reduced in employment of debt and there is a threat of insolvency. Through use of debt magnified shareholders' returns as well as increase the risk of liquidation. Third creditors treat equity as margin of safety, if owner has provided only a small proportion of total financing. The creditors and financial institution. Though leverage ratio helps to measure the financial risk and the ability of company in closing debt, for the benefit of shareholders.

Leverage ratio may be calculated from the balance sheet item and determined the extent to which borrowed funds have been used to finance the company. Leverage ratios from the income statement measure the risk of debt. Leverage ratio can be analyzed on the following way:

4.2.1 Analysis of Long Term Debt and Shareholder's Equity

The ratio of borrowed and owners' capital is a popular measure of the long-term financial solvency of the firm. In usual version, the debt/equity is the ratio of long-term debt to total equity. Although, short-term debt and accruals provide leverage just as long-term debt, current liabilities are usually omitted. From the ratio, the firm is assumed able to adjust the short-term part of capital structure rapidly. When the rate of return on assets declines. Thus, the debt considered here is exclusive of current liabilities. Thus, in the following table long term debt to equity ratio is presented in quantitative terms to show the movement of the trend from the year 2006/2007 to 2010/2011 of Nepal Lube Oil Limited and Bottlers Nepal Limited.

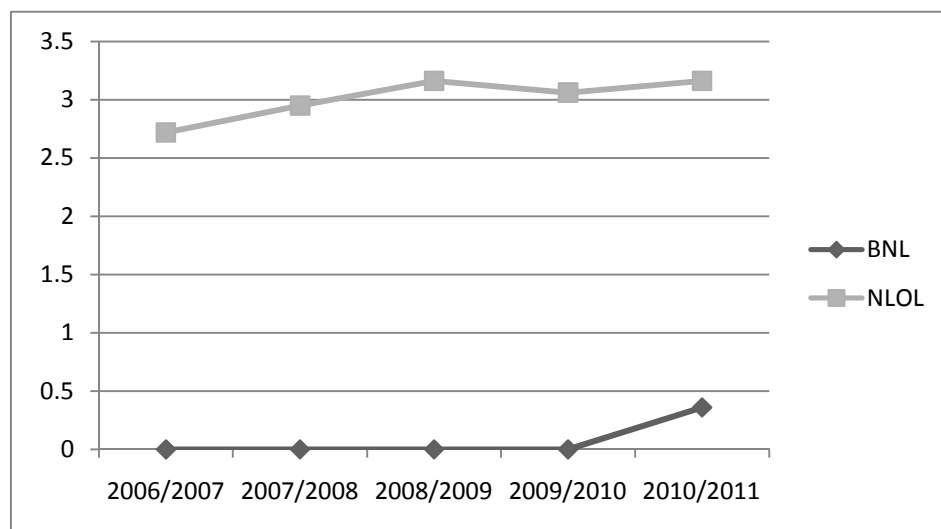
Table 4.1

Years	BNL	NLOL
2006/2007	-	2.72
2007/2008	-	2.95
2008/2009	-	3.16
2009/2010	-	3.06
2010/2011	0.36	3.16
Average	0.072	3.01
S.D.(6)	0.14	0.16
C.V. (%)	2%	0.05

Debt Equity Ratio

Table 4.1 BNL has not used any long-term debt on its capital structure until 2010/2011. To maximize the profit companies have to use LTD on its capital structure.

Diagram 4.1



4.2.2 Analysis of Total Debt to Net worth Ratio

This ratio is also known as debt equity ratio the relationship between lenders contributions is shown by debt. Equity ratio and it reflect the relative claims of creditors and shareholders against the assets of the company. This ratio is calculated by dividing the total debt by net worth. Net worth consists of the entire share capital reserve and surplus of the company and total debt consists of all types of long-term debt and current liabilities. This total debt to net worth ratio is composed using following formula.

$$\text{Debt to Net worth Ratio} = \frac{\text{TotalDebt}}{\text{NetWorth}}$$

Table 4.2
Total Debt to Net worth Ratio

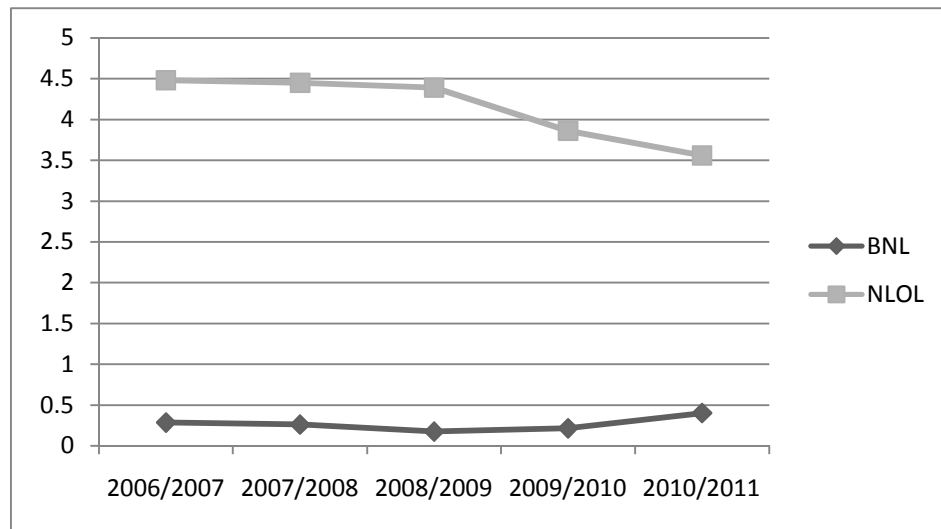
Years	BNL	NLOL
2006/2007	0.285	4.48
2007/2008	0.260	4.45
2008/2009	0.174	4.39
2009/2010	0.215	3.86
2010/2011	0.401	3.56
Average	0.267	4.14
S.D.	0.076	0.36
C.V (%)	0.28	0.08

Source: Annual Reports of Shareholders (2006/2007-2010/2011)

A high ratio shows the large share of financing by creditors would suffer more in times of distress than the owner. The standard ratio 2:1. The long-term debt to net worth ratio of BNL is very lower. During the study period, the average total debt to net worth ratio is 0.267, which is very lower. This ratio suggests

that BNL must be increased in debt. S.D. and C.V. on BNL is 0.076 and 0.28 respectively. Average total debt to net worth ratio of NLOL during the study period is 4.14, which is higher than standard ratio. The company should reduce the total debt on its capital structure. The S.D. and C.V. of NLOL is 0.36 and 0.08 respectively.

Diagram 4.2
Total Debt to Net worth Ratio



4.2.3 Analysis of Interest Coverage Ratio

Interest ratio is design to relate the interest charge of a firm to its ability to service them. It is simply the ratio of earning before interest and taxes for the particular reporting period to the amount of interest charge for the period. This ratio measures the debt servicing capacity of a company. It is computed by dividing net profit before interest and tax by interest;

$$\text{Interest Coverage Ratio} = \frac{\text{NetprofitBeforeInteres tan dTax}}{\text{Interest}}$$

This ratio is also known as time earn ratio. A high ratio is a sign of low burden of boring the business and lower utilization or borrowing capacity. The large the coverage is the greater the ability of the company to make the payment of interest to creditors. The comparative picture of manufacturing companies for interest coverage ratio has been presented in the following table.

Table 4.3
Interest Coverage Ratio

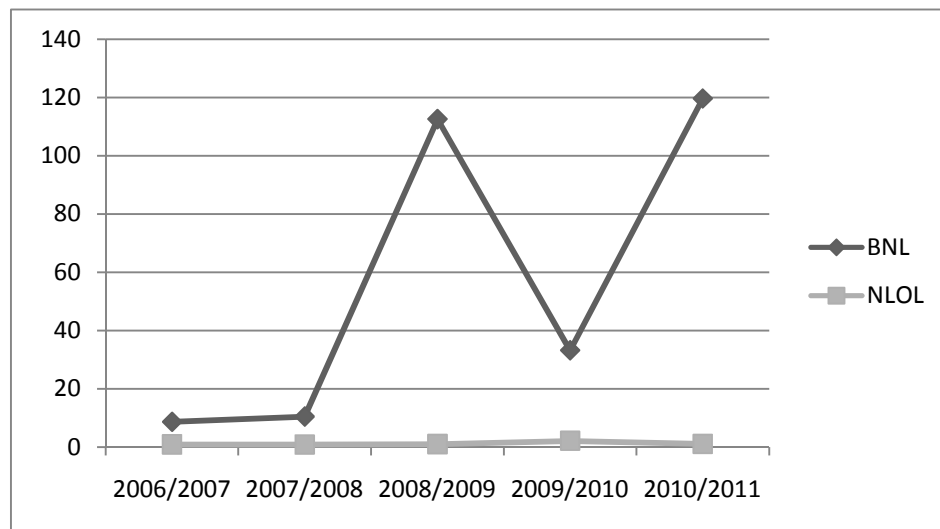
Years	BNL	NLOL
2006/2007	8.66	0.90
2007/2008	10.47	0.86
2008/2009	112.5	1.01
2009/2010	33.20	2.12
2010/2011	119.55	1.04
Average	56.87	0.46
S.D.(6)	49.11	0.38
C.V.	0.86	1.18

Source: Annual Reports of Shareholders (2006/2007-2010/2011)

The interest coverage ratios of manufacturing companies during the study period are presented in the above table. The insert average of BNL re 8.66, 10.47, 112.5, 33.20 and 119.5 for the year 2006/2007 to 2010/2011 respectively. Similarly, the interest coverage ratios for NLOL are 0.90, 0.86, 1.01, 2.12 and 1.04 for the year 2006/2007 to 2010/2011 respectively. Which are very low. The average interest ratio is 1.18 times.

This ratio is more fluctuated during the year 2008/2009 and 2009/2010. However, in the other study period the interest coverage ratio is very high. It is not good sign.

Diagram 4.3



4.3 Profitability Ratio

4.3.1 Analysis of Return on total Assets.

Return on total assets is computed simply by dividing after tax by total assets on after tax basis. However, earning after tax (EAT) represents only residual income for shareholder. Therefore, it is conceptually on sound to use EAT to calculate return on total assets. Thus, here after tax an interest expense is added to EAT for the numerator of the ratio. This ratio measures the profitability of the total funds of manufacturing company. Thus, the ratio of return on total assets is calculated by taking five years balance sheet and P/L account of there manufacturing company as given below.

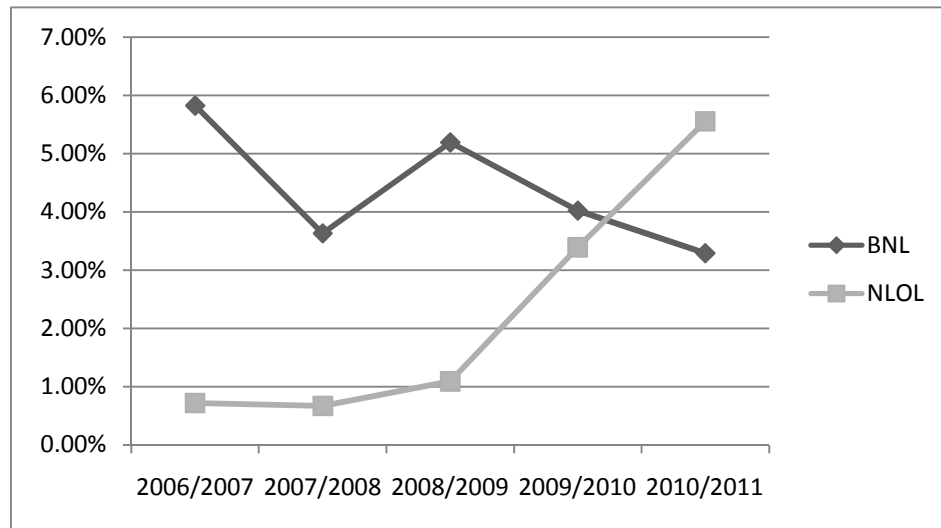
Table 4.4
Return On Total Assets

Years	BNL	NLOL
2006/2007	5.82%	0.72%
2007/2008	3.63%	0.67%
2008/2009	5.19%	1.09%
2009/2010	4.02%	3.39%
2010/2011	3.29%	5.55%
Average	4.39%	1.728%
S.D	0.95%	2.43%
C.V	0.21%	1.41%

Table No. 4.4 shows the return on total assets ratio of three manufacturing companies. The return on total assets ratio of BNL are 5.82, 3.63, 5.19, 4.02, 3.29 in year 2006/2007, 2007/2008, 2008/2009, 2009/2010, 2010/2011 respectively. The ratio shows that the net profit of the company is very low as compared to its total assets. The average return on total assets ratio of BNL is 4.39. The SD and CV are 0.95 and 0.21 respectively.

The return on total assets ratio of NLOL is 0.72, 0.67, 1.09, 3.39 and 5.55 in the year 2006/2007, 2007/2008, 2008/2009, 2009/2010 and 2010/2011 respectively. The company has lower return as respectively to total assets. The company suffering loss in year 2006/2007, 2007/2008. The S.D and C.V of NLOL are 2.43 and 1.41 respectively.

Diagram 4.4



4.3.2 Analysis Profit Margin On Sales

Net profit margin on sales is computed simply by dividing net profit after tax by amount of sales. Net profit is obtained by subtracting operation expenses and income tax. From the gross profit, net profit after tax is given on the profit and loss account of each manufacturing company. This ratio of profit margin on sale indicates the firm capacity to with stand adverse economic condition. A manufacturing company with a high profit margin ratio would be advantageous position to service in the face of falling selling prices, rising cost of production or declining demand for the production and vice verse. However, to analysis the position of profit margin on sales of the manufacturing company the following table is constructed.

Table No. 4.5
Profit Margin Ratio

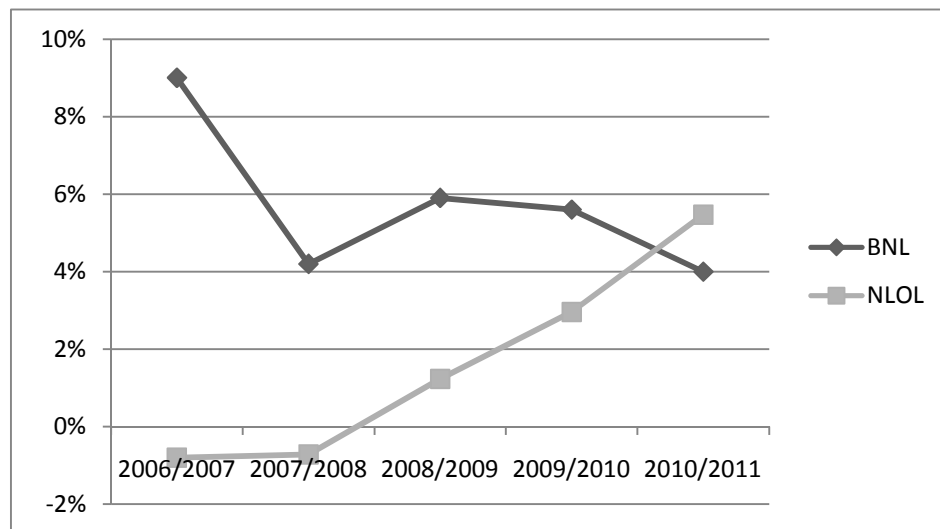
Years	BNL	NLOL
2006/2007	9%	-.80%
2007/2008	4.20%	-.72%
2008/2009	5.90%	1.23%
2009/2010	5.60%	2.96%
2010/2011	4%	5.47%
Average	5.74%	1.63%
S.D	1.79%	2.37%
C.V	.31%	1.45%

Source: Annual Reports of Shareholders (2006/2007-2010/2011)

Table No. 4.5 show that the profit margin ratio of three manufacturing companies during the current study period. The average sales margin ratio of BNL is 5.74% .The Company must try to increase its profit. SD and CV are 1.79% and 0.31% respectively.

The average sales margin ratio of NLOL has negative, which indicate the company financial position is not good during the study period SD and CV of NLOL are 2.37% and 1.45% respectively.

Diagram 4.5



4.3.3 Analysis Returns on Equity (Return on Net Worth)

$$ROE = \frac{Net\ Worth}{Common\ Equity\ (Net\ Worth)} \times 100\%$$

The return or net worth ratio is the measure of productivity of shareholders fund. It carries the relationship of return to shareholders equity. The shareholder equity includes common share capital, preference share capital, reserve and surplus. The ratio is regarded as very important measure because it reflects exclusively the return on the other. As the common shareholders are residual owners in the real sense of the world. They assumed the maximum rise and have the highest stake in company. So to judge whether the firm has earned a satisfactory return for its common shareholders or not, following table is constructed.

Table 4.6
Return on Equity (ROE)

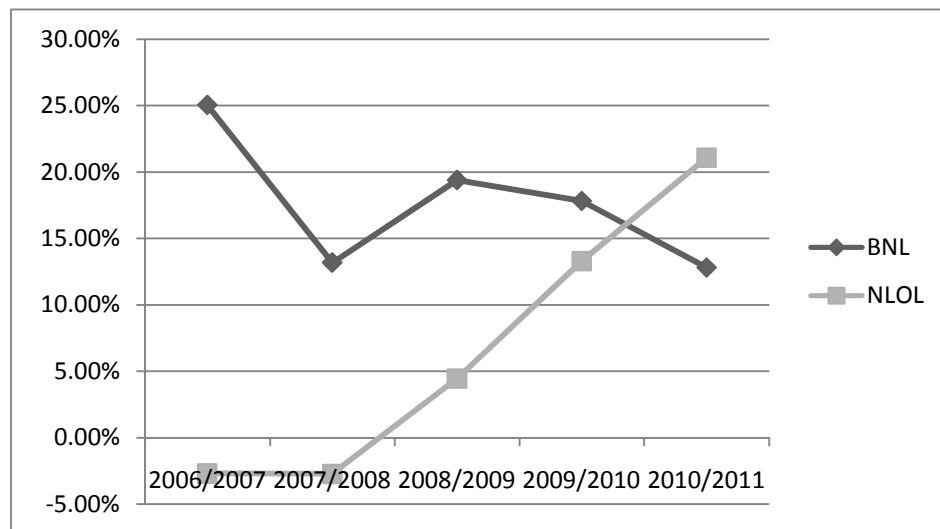
Years	BNL	NLOL
2006/2007	25.05%	-2.69%
2007/2008	13.17%	-2.72%
2008/2009	19.39%	4.45%
2009/2010	17.82%	13.30%
2010/2011	12.80%	21.08%
Average	17.64%	6.71%
S.D.	4.50%	9.29%
C.V.	0.25	1.38

Source: Annual Reports of Shareholders (2006/2007-2010/2011).

Table 4.6 show that the return on net worth ratio of BNL is 25.05, 13.17, 19.39, 17.82 and 12.80 in the year of 2006/2007, 2007/2008, 2008/2009, 2009/2010 and 2010/2011 respectively. The average net profit to net worth ratio is 17.64, which indicate the sound financial position on BNL, SD and CV are 4.50% and 0.25 respectively.

The net profit to net worth ratio on NLOL is not better. The average net profit to net worth is 6.71. SD and CV are 9.29% and 1.38 respectively. CV is very high. This value clearly shows that the company is earning profit very low during the period 2006/2007 and 2007/2008.

Diagram 4.6



4.4 Regression Analysis

a. To, show the degree of relationship between Net profit(NP) and Total debt(TB), net profit is assumed to dependent(Y) up on total debt as follows:-

$$Y = a + bx \text{ or } NP = a + Btd$$

Regression Analysis between NP and TB

Table 4.7

Company	Regression Equation of	Regression equation	Value of constant 'a'	Coefficient 'b'
BNL	N.P.(Y) on TD	$Y = 569.17 - 2.85x$	569.17	-2.85
NLOL	N.P.(Y) on TD	$Y = 3425.67 - 4.27x$	3425.67	-4.27

The above table shows the regression coefficient 'b' is negative BNL which shows that one million increase in total debt leads to decrease in net profit by 2.85 millions. The value of constant 'a' i.e. 569.17 shows that net profit will be Rs 569.17 millions when total debt is zero.

The regression coefficient 'b' is negative i.e. -4.27 of NLOL which indicates that one million increase in total debt leads to decrease in net profit by Rs 4.27 millions. The value of constant 'a' i.e. 3425.67 shows that net profit will be Rs. 3425.67 millions when total debt is zero.

b. To show the degree of relationship between ROE and debt ratio, ROE is assumed to dependent (Y) upon debt ratio (X). The regression line of ROE on debt ratio as follows:-

Regression analysis between ROE and debt ratio.

Table 4.8

Company	Regression equation of	Regression equation	Value of constant 'a'	Coefficient 'b'
BNL	N.P.(Y) on TD	$Y=17.65-0.008x$	17.65	-0.008
NLOL	N.P.(Y) on TD	$Y=6.83-0.036x$	6.83	-0.036

The above table shows the regression coefficient 'b' is negative i.e. -0.008 of BNL which indicates that one million increase in debt ratio leads to average decrease ROE by Rs. 0.008 millions. The value of constant 'a' i.e. 17.65 shows that ROE will be Rs 17.65 million when debt ratio is zero.

In the case of NLOL , the regression coefficient 'b' is negative i.e. -0.036 which indicates one million increases in debt ratio leads to average decrease in ROE by Rs. 0.036 million. The value of constant 'a' i.e. 6.83 shows that ROE will be Rs. 6.83 millions when debt ratio is zero.

c. To show the degree of relationship between N.P. and LTD, N.P. is assumed to dependent (Y) up on LTD (X). the regression line of N.P. on LTD as follows
 $N.P. = a + bLTD$

$$Y = a + bx$$

Table 4.9

company	Regression equation of	Regression equation	Value of constant 'a'	Coefficient 's'
BNL	N.P.(Y) on LTD(X)	$Y=49.59-1.06x$	49.59	-1.06
NLOL	N.P.(Y) on LTD(X)	$Y=-974.11+170x$	-974.11	170

The above table shows regression coefficient 'b' is negative i.e. -1.06 of BNL which indicates that one million increase in LTD leads to average decrease in N.P. by Rs. 1.06 million when LTD is zero.

Similarly, the regression coefficient 'b' is positive i.e. 1.70 of NLPL which indicates in net profit by Rs 1.70 million. The constant 'a' -974.11 shows that net profit will be Rs -974.11 million when LTD is zero.

4.5 Major Findings

The major findings of the study with respect to capital structure of the manufacturing companies are as follows.

1. As the manufacturing companies has low debt equity ratio, it implies greater claims of owner than creditors. A high portion of equity provides a large margin of safety for them. The prospectus of company says that the debt equity ratio of the manufacturing company will not be more than 1:1. NLOL has more debt equity ratio. From the shareholder point of view, it is not better. Some companies who are not using debt in their capital structure will have to pay a large amount as tax as they do not get the opportunity of tax benefit on interest that will definitely decrease their profit also.

2. Total debts to net worth ratio of BNL are considerable position. However, NLOL has high long-term debt, to earn maximum profit in future.
3. Interest coverage ratio of NLOL has very low, but also in increasing trend. Moreover, interest coverage ratio of BNL has very high. It can improve the financial position. It has been improving its interest year by year. However, NLOL is unable to pay its interest from EBIT. Interest coverage ratio of measures the ability of the firm to meet its annual interest payments. So highest ratio shows that a firm can pay the interest easily. Therefore, the increasing ratio is favorable.
4. ROA measures the return on all the firms' assets after interest and taxes increasing ratio is favorable. Average return on assets of NLOL has low ratio, which indicates that, the assets of these companies generating low profit.
5. Profit margin on sales is the ratio of net income available to common stockholders on sales. Profit margin ratio for BNL is 5.74% on average. It shows that net profit is fluctuating and the profit margin ratio also decreasing whereas the sales on increasing. This indicates the company should make such policy to earn high amount of profit from the sale revenue by increasing operating efficiency.
6. The ROE for BNL is higher than NLOL. The investors of the BNL are getting more returns from their investments. NLOL has lowest ROE on average, it means, it cannot give return to investors.
7. There is negative relationship between NP and TD, NP and LTD and ROE and Debt ratio. So, the manager should maintain proper management of capital structure

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 SUMMARY

Financial matter is at the center of each organization whether it is trading concern or an industry, the combination of sources of financing structure and cost of capital are measure factor affecting the calculation profitability and its financial strength. Capital structure is considered as that mix of debt and equity and to operate in long run prospect. A firm must concentrate in its proportion. A firm can raise required fund by issuing various types of financial instrument. Investors and creditors being the key supplier of capital, they hold greater degree of risk and hence have claims over firms assets and cash flow. Similarly, debt holders are also a source of financial fund, they have risk considering firm's cash flow is uncertain, and there is probability that it may default in its obligations to pay off its interest and principle.

As per the objective of this study, it tries to analyze the relationship between debt and shareholders equity of manufacturing companies to provide suggestion based on findings. To fulfill this purpose, the study follows the analytical and descriptive research design. The research has been under taken to study and analyzed the capital structure of BNL and NLOL. All these three manufacturing company are facing excess leverage ratio and low profitability. The research package has been divided into five parts or the chapter as introduction, Review of literature, Research methodology, Presentation and analysis of data and summary, conclusion and recommendation.

The first chapter comprises as focus of the study, statement of the problem, need pf the study, statement of the study, objective of the study, limitation of the study and organization of the study.

The second chapter includes review of literature present of review of related articles, empirical study, and review of the thesis to this study.

In the third chapter, research methodology has been explained for the purpose of this study. The sources of data, population and sample of the study have also been described including procedure follows in data processing. For the purpose of the study, secondary data has been used.

In the fourth chapter, various financial tools and technique have been used to identify the position of capital structure management of the manufacturing companies. In this chapter ratio, analysis has been computed ad the identification of capital structure of manufacturing companies.

In the last chapter, summary of analysis and conclusion derived from the study and some workable suggestion are also provided for improving the capital structure management of BNL and NLOL respectively.

5.2 Conclusion

This research is concerned with the study of capital structure management of two selected manufacturing companies, vij, Nepal Lube Oil Limited and Bottlers Nepal Limited. The term capital structure refers to the long-term funds like debt and equity. The mix of capital structure, which leads to the maximum value and minimum cost of capital optim al capital structure. As the Manufacturing companies has low debt equity ratio, it implies greater claims of owner than creditors. However, BNL has no long-term debt. Total financing if done by equity share. A high portion of equity provides a large margin of safety for them.

Profit margin on sales if the ratio of net income available to common stockholders on sales. Profit margin ratio for BNL is 74% on average. It shows that the net profit is fluctuating and profit margin ratio is decreasing where as sales is increasing. This indicates the company should make such policy to earn

high amount of profit from the sales revenue by increasing operation efficiency.

Thus, this research is conducted with the major objective of highlighting capital structure management of three manufacturing companies. The detailed observation is done by analysis of capital structure in terms of debt to shareholders equity ratio. Total debt to assets ratio, interest coverage ratio and other relevant financial ratios.

Interest coverage ratio of NLOL has low but also in increasing trend. Moreover, interest coverage ratio of BNL has very high. It can improve the financial position. It has been improving its interest from EBIT, interest coverage ratio of measures the ability of the firm to meet its annual interest payments. Therefore, highest ratio shows that a firm can pay the interest easily. The average return on assets of NLOL has low ratio, which indicates that, the assets of these companies generating low profit.

Total debt to net worth ratio of Butlers Nepal Limited is in considerable position. However, Nepal Lube Oil Limited has high long-term debt to earn maximum profit on future.

The Nepal Lube Oil Limited has lowest return on equity on average it means it cannot give return to investors.

As per objective of this study, it tries to analysis the relationship between debt and shareholders equity of manufacturing companies to provide suggestion based on findings. To fulfill this, purpose the study follows the analytical and descriptive research design. The research has been undertaken to study and analyzed the capital structure of BNL and NLOL. All these manufacturing companies are facing excess/average ratio and low profitability.

5.3 Recommendation

Finally, after having an overall analysis of capital structure management of Bottlers Nepal Limited and Nepal Lube Oil Limited respectively. Following recommendation is made for the future handling and improvement of the companies.

1. Between two companies, Bottlers Nepal Limited does not use long-term debt. For the operation of a manufacturing company, long-term debt is required. The company has to use long-term debt. In the year 2010/2011, BNL has used LTD. It is good systems for the operation. Nepal Lube Oil Limited has maximum long-term debt. Financial risk will be created by long-term debt. Therefore, this company has to reduce in long-term debt. Therefore, it is suggested that BNL should increase the long-term debt.
2. It is suggested that NLOL and BNL should increase the equity proportion in financing its assets to be in safe mode against liquidation.
3. The profit for BNL is not corresponding increasing as per the increase in sales. The BNL should make policy to earn high amount of profit from the sales revenue by increasing operating efficiency.
4. Some of the Nepalese manufacturing companies are incurring loss. One of causes for it is high operating cost of production. The management should give attention towards the minimization of administrative and operating expenses. The unskilled workers, overstaffing, unsystematic purchase of raw materials, unnecessary expenses, misuse of facilities, heavy expenses on overhead etc are major causes for high operating cost. The management company should eradicate these causes.
5. Capital structure is not consistent so the management should try to make capital structure more consistent.

BIBLIOGRAPHY

Books

- Gautam, Rishi Raj and Thapa, Kiran (2006).** *Capital Structure management.* Kathmandu Ashmita books published and Distributers.
- Harries, Milton and Arthur, Raviv (1991).** *The theory of Capital Structure.* Journal of Finance, Vol. (40), No.1.
- Igbal, Mathur. (1979).** *Introduction of financial management.* New York: Mac Millan publishing Co. .
- Khan, M.Y and Jain, P.K. (1992).** *Financial management.* New Delhi: Tata Mc Grew Hill publishing Co. Ltd.
- Khan. M.Y. (1995).** *Financial management.* New Delhi: Tata McGraw Hill
- Kothari.C.R. (1990).** *Research methodology: method and techniques.* New Delhi: Wishwa prakashan.
- Kulkarni, P.V (1983).** *Financial management.* Bombay: Himalaya Publishing House.
- Modigliani. F and Miller, M.H (1985).** *The cost of capital corporation finance and theory of investment.* American Economic Review. Vol. (40), No.4
- Pandey, I.M (1985).** *Financial management.* New Delhi: Vikash Publishing House.
- Pandey, I.M (1987).** *Financial management.* New Delhi: Vikash Publishing House Private Limited.
- Pandey, I.M (1994).** *Financial management, (7th edition).* New Delhi: Vikash Publishing House Pvt. Ltd.
- Pradhan, Radhe S.(1986).** *Management of working capital.* New Delhi: Nation Book Organization.
- Shrestha, M.K.(1988).** *An analysis of capital structure of selected public enterprises.* The Nepalese Journal of Public Administration.

Solomon, Ezra. (1996). *Theory of financial management*. Columbia University Press.

Van Horne, James C. (1994). *Financial management and Policy*. New Delhi: Prentice-Hall of India Pvt. Ltd.

Weston, J Fred; Brigham. (1978) *Managerial finance* (6th edition), Chicago: The Dryden Press.

Wolff, Howard K. and Pant Prem Raj(1999), *Social science research and thesis writing*, and (2nd edition) Kathmandu: Buddha Academic Enterprises .

Journals

Hargis, Kent (1999), Book Review, *The Journal of Finance*, Vol. 54 (1).

John Graham and Campbell Harvey, (2002), How Do CFOs Make Capital Structure Decision: *Journal of Applied Corporate Finance*. Duke University.

Pradhan, Radhe S. (1993), Stock Market behavior in a small capital market: case of Nepal. *The Nepalese Management Review*, Vol.9, No. 1, PP 23-49.

Shrestha, M.K. Capital Market in Nepal: Changing Dimension and strategies, *KOSH 39*, EPF Publication, Kathmandu, PP 7-18.

Thesis

Sharma, Indra (2005) *A study on capital structure management of manufacturing companies listed in NPESE*. An Unpublished Masters Degree Thesis. Shanker Dev Campus. Tribhuwan University, Kathmandu.

Karki, Dupu (2008) *A study of capital Structure of management of manufacturing companies in Nepal.* An Unpublished Masters Degree Thesis. Shankerdev Campus. Tribhuwan University, Kathmandu.

Timalsine, kalpana (2009) *capital structure management of manufacturing companies listed in NPESE.* An Unpublished Masters Degree Thesis. Shanker Dev Campus. Tribhuwan University, Kathmandu.

Reports:

Bottlers Nepal Limited. Annual Reports (2006/2007 to 2010/2011).

Nepal Lube Oil Limited. Annual Reports (2006/2007-2010/2011).

Nepal stock Exchange Ltd. (2006/2007-2010/2011). *Financial statement of listed companies,* Kathmandu.

Website :

www.nepalsharemarket.com

www.nepalstock.com

www.nrb.org.np

Appendix 1

Bottlers Nepal Limited

	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
Equity	194	194.88	194.88	194.88	194.88
Long term debt					
Short term debt	189.99	184.1	117.19	164.39	210.7
Total debt	189.99	184.1	117.19	164.39	210.7
Current Assets	506	544.18	447.83	453.21	436.04
Fixed Assets	416	377.39	326.09	409.42	323.57
Current Liabilities	189.9	184.09	117.19	164.39	210.7
Net Worth	695.93	705.59	679.11	761.88	704.57
Sales	535.49	609.65	632.11	614.73	621.82
Interest	6.63	2.84	0.4	1.329	0.27
EBIT	57.47	29.75	45	44.13	32.28
EAT	48.61	25.67	37.8	34.73	24.96
Profit	48.61	25.67	37.8	34.73	24.96

Appendix 2
Nepal Lube Oil Ltd

	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
Equity	193.84	193.84	193.84	190.78	190.19
Long term debt	528.87	573.75	614.47	584.37	602.37
Short term debt	339.64	289.67	237.91	153.91	74.72
Total debt	868.51	863.42.	852.38	738.28	677.09
Current Assets	240.1	264.23	278.56	291.35	278.49
Fixed Assets	540.21	501.75	476.02	450.18	436.35
Total Assets	722.71	787.57	808.32	747.82	721.71
Current Liabilities	339.64	289.67	237.91	153.91	74.72
Net Worth	193.84	193.84	193.84	190.78	190.19
Sales	646.74	725.03	718.94	855.32	730.88
Interest	104.83	137.01	109.03	60.16	57.22
EBIT	94.83	117.88	110.35	127.76	60
EAT	-5.21	-5.29	8.81	25.36	40.09
Profit	-5.21	-5.29	8.81	25.36	40.09

Appendix 3

A. Calculation of long term debt to shareholders equity ratio of BNL

Year	Long term debt	Shareholders equity	Ratio
2006/2007	-	194	-
2007/2008	-	194.88	-
2008/2009	-	194.88	-
2009/2010	-	194.88	-
2010/2011	72	194.88	0.37

Calculation of SD and CV of BNL

Year	Ratio(x)	X ²
2006/2007	-	-
2007/2008	-	-
2008/2009	-	-
2009/2010	-	-
2010/2011	0.37	0.129
Total	Σx =0.37	Σx ² =0.129

Using Formula:

$$S.D (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.14$$

$$C.V. = \frac{S.D.}{\bar{X}} \times 100\%$$

$$= 2\%$$

B. Calculation of long term debt to shareholders equity ratio of NLOL

Year	Long term debt	Shareholders equity	Ratio
2006/2007	528.87	193.84	2.73
2007/2008	573.75	193.84	2.96
2008/2009	614.47	193.84	3.17
2009/2010	584.37	190.78	3.06
2010/2011	602.37	190.19	3.16

Calculation of S.D and C.V of NLOL

Year	Ratio(x)	X ²
2006/2007	2.73	7.39
2007/2008	2.96	8.7
2008/2009	3.17	9.98
2009/2010	3.06	9.36
2010/2011	3.17	9.98
Total	∑x = 15.09	∑x ² = 45.41

Using Formula:

$$S.D (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.14$$

$$\begin{aligned} C.V &= \frac{S.D.}{\bar{X}} \times 100\% \\ &= 4.62\% \end{aligned}$$

Appendix 4

A. Total Debt to Net worth Ratio of BNL

Year	Total debt	Net worth	Ratio
2006/2007	189.99	695.93	0.27
2007/2008	184.1	705.59	0.26
2008/2009	117.19	671.11	0.17
2009/2010	164.39	761.88	0.22
2010/2011	282.87	704.57	0.40

Calculation of S.D and C.V of BNL

Year	Ratio(x)	X ²
2006/2007	0.27	0.073
2007/2008	0.26	0.068
2008/2009	0.17	0.029
2009/2010	0.22	0.048
2010/2011	0.40	0.160
Total	$\sum x =$ 1.32	$\sum x^2 =$ 0.378

Using Formula:

$$S.D (\sigma) = \frac{\sum X^2}{n} - \left(\frac{\sum X}{n} \right)^2 = 0.076$$

$$C.V. = \frac{S.D.}{\bar{X}} \times 100\% \\ = 28\%$$

C. Total Debt to Net worth Ratio f NLOL

Year	Total debt	Net worth	Ratio
2006/2007	868.51	193.84	4.48
2007/2008	863.42	193.84	4.45
2008/2009	852.38	193.84	4.40
2009/2010	738.28	190.78	3.87
2010/2011	677.09	190.19	3.56

Calculation of S.D and C.V of NLOL

Year	Ratio(x)	X ²
2006/2007	4.48	20.070
2007/2008	4.45	19.803
2008/2009	4.40	19.360
2009/2010	3.87	14.977
2010/2011	3.56	12.674
Total	$\sum x = 20.76$	$\sum x^2 = 86.883$

Using Formula:

$$S.D (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.36$$

$$\begin{aligned} C.V. &= \frac{S.D.}{\bar{X}} \times 100\% \\ &= 8.69\% \end{aligned}$$

Appendix 5

A. Calculation of Interest Coverage Ratio of BNL

Year	EBIT	Interest	Ratio
2006/2007	57.47	6.63	8.67
2007/2008	29.75	2.84	10.48
2008/2009	45	0.4	112.50
2009/2010	44.13	1.32	33.43
2010/2011	32.28	0.27	119.56

Calculation of S.D and C.V of BNL

Year	Ratio(x)	X ²
2006/2007	8.67	75.17
2007/2008	10.48	109.83
2008/2009	112.50	12656.25
2009/2010	33.43	1117.56
2010/2011	119.56	14292.20
Total	$\sum x =$ 284.64	$\sum x^2 =$ 28235.3

Using Formula:

$$S.D (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.49$$

$$C.V. = \frac{S.D.}{\bar{X}} \times 100\% \\ = 86.35\%$$

B. Calculation of Interest Coverage Ratio of NLOL

Year	EBIT	Interest	Ratio
2006/2007	94.83	104.83	0.90
2007/2008	117.88	137.01	0.86
2008/2009	110.35	109.03	1.01
2009/2010	127.76	60.16	2.12
2010/2011	60	57.22	1.05

Calculation of S.D and C.V of NLOL

Year	Ratio(x)	X ²
2006/2007	0.90	0.81
2007/2008	0.86	0.74
2008/2009	1.01	1.02
2009/2010	2.12	4.49
2010/2011	1.05	1.10
Total	$\sum x = 5.94$	$\sum x^2 = 81.67$

Using Formula:

$$S.D (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.46$$

$$\begin{aligned} C.V. &= \frac{S.D.}{\bar{X}} \times 100\% \\ &= 38.98\% \end{aligned}$$

Appendix 6

A. Calculation of Return to Assets Ratio of BNL

Year	EAT	Total Assets	Ratio
2006/2007	48.61	834.51	0.06
2007/2008	25.61	705.5	0.04
2008/2009	37.8	727.15	0.05
2009/2010	34.73	862.63	0.04
2010/2011	24.96	759.61	0.03

Calculation of S.D and C.V of BNL

Year	Ratio(x)	X ²
2006/2007	0.06	0.00
2007/2008	0.04	0.00
2008/2009	0.05	0.00
2009/2010	0.04	0.00
2010/2011	0.03	0.00
Total	∑x = 0.22	∑x ² =0

Using Formula:

$$S.D (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.067$$

$$C.V. = \frac{S.D.}{\bar{X}} \times 100\%$$

$$= 42\%$$

Calculation of Return to Assets Ratio of NLOL

Year	EAT	Total Assets	Ratio
2006/2007	-5.21	722.71	-0.01
2007/2008	-5.29	787.57	-0.01
2008/2009	8.81	808.32	0.01
2009/2010	25.36	747.82	0.03
2010/2011	40.49	721.71	0.06

Calculation of S.D and C.V of NLOL

Year	Ratio(x)	X ²
2006/2007	-0.01	0
2007/2008	-0.01	0
2008/2009	0.01	0
2009/2010	0.03	0.001
2010/2011	0.06	0.003
Total	Σx = 0.08	Σx ² = 0.004

Using Formula:

$$S.D. (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.024$$

$$C.V. = \frac{S.D.}{\bar{X}} \times 100\%$$

$$= 141\%$$

Appendix 7

A. Calculation of Profit Margin on Sales of BNL

Year	Profit	Sales	Ratio
2006/2007	48.61	535.49	0.09
2007/2008	25.67	609.65	0.04
2008/2009	37.8	632.11	0.06
2009/2010	34.73	614.73	0.06
2010/2011	24.96	621.82	0.04

Calculation of S.D and C.V of BNL

Year	Ratio(x)	X ²
2006/2007	0.09	0.0081
2007/2008	0.04	0.0017
2008/2009	0.06	0.0034
2009/2010	0.06	0.0031
2010/2011	0.04	0.0016
Total	Σx = 0.29	Σx ² = 0.018

Using Formula:

$$S.D (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.0179$$

$$C.V. = \frac{S.D.}{\bar{X}} \times 100\%$$

$$= 31\%$$

Calculation of Profit Margin on Sales of NLOL

Year	Profit	Sales	Ratio
2006/2007	-5.21	646.74	-0.01
2007/2008	-5.29	725.03	-0.01
2008/2009	8.81	718.94	0.01
2009/2010	25.36	855.32	0.03
2010/2011	40.09	730.88	0.05

Calculation of S.D and C.V of NLOL

Year	Ratio(x)	X ²
2006/2007	-0.01	0.000064
2007/2008	-0.01	0.000051
2008/2009	0.01	0.00015
2009/2010	0.03	0.00087
2010/2011	0.05	0.003
Total	$\sum x = 0.07$	$\sum x^2 = 0.004$

Using Formula:

$$S.D (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.023$$

$$C.V. = \frac{S.D.}{\bar{X}} \times 100\%$$

$$= 141.10\%$$

Appendix 8

A. Analysis of Return on Equity on BNL

Year	Net Income	Shareholders equity	Ratio
2006/2007	48.61	194	0.25
2007/2008	25.67	194.88	0.13
2008/2009	37.8	194.88	0.19
2009/2010	34.73	194.88	0.18
2010/2011	24.96	194.88	0.13

Calculation of S.D. and C.V. of BNL

Year	Ratio(x)	X ²
2006/2007	0.25	0.062
2007/2008	0.13	0.0173
2008/2009	0.19	0.0375
2009/2010	0.18	0.0317
2010/2011	0.13	0.0163
Total	Σx = 0.88	Σx ² = 0.1648

$$S.D. (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.045$$

$$C.V. = \frac{S.D.}{\bar{X}} \times 100\%$$

$$= 25\%$$

B. Analysis of Return on Equity of NLOL

Year	Net Income	Shareholder's equity	Ratio
2006/2007	-5.21	193.84	-0.03
2007/2008	-5.29	193.84	-0.03
2008/2009	8.81	193.84	0.05
2009/2010	25.36	190.78	0.13
2010/2011	40.49	190.19	0.21

Calculation of S.D. and C.V. of NLOL

Year	Ratio(x)	X ²
2006/2007	-0.03	0.00
2007/2008	-0.03	0.00
2008/2009	0.05	0.00
2009/2010	0.13	0.02
2010/2011	0.21	0.04
Total	∑x = 0.33	∑x ² = 0.07

$$S.D.(\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = 0.09\%$$

$$C.V. = \frac{S.D.}{\bar{X}} \times 100\%$$

$$= 138\%$$

Appendix 9
Calculation of Simple Regression Analysis

1. Relationship between Net Profit and Total debt of Nepal Lube Oil Limited

Year	T.D.(X)	N.P.(Y)	X = (X - \bar{X})	X ² (X- \bar{X}) ²	Y = (Y - \bar{Y})	Y ² = (Y- \bar{Y}) ²	Xy
2006/20 07	223.21	42.60	-340.31	115810.90	-711.28	505919.24	242055.7
2007/20 08	426.45	93.16	-137.07	18788.18	-660.72	436550.92	90564.89
2008/20 09	543.70	140.78	-19.82	392.83	-613.1	375891.61	12151.64
2009/20 10	882.02	189.19	318.5	101442.25	-564.69	318874.80	-179853.77
2010/20 11	742.23	288.15	178.71	31937.26	-465.73	216904.43	-83230.61
Total	$\sum x =$ 2817.61	$\sum Y =$ 753.88		$\sum x^2 =$ 268371.42		$\sum y^2 =$ 1854141	$\sum xy =$ 81687.85

Using Formula

Now,

For total debt

$$\bar{X} = \frac{\sum X}{N} = \frac{2817.6}{5} = 563.52$$

150.776

For Net Profit

$$\bar{Y} = \frac{\sum Y}{N} = \frac{753.88}{5} =$$

Calculation of Standard deviation

$$\sigma_x = \sqrt{\frac{\sum (X - \bar{X})^2}{N}}$$

$$\sigma_y = \sqrt{\frac{\sum (Y - \bar{Y})^2}{N}}$$

$$= \sqrt{\frac{268371.42}{5}}$$

$$= 231.68$$

$$= \sqrt{\frac{1854141}{5}}$$

$$= 608.97$$

Calculation of correlation coefficient

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

$$= \frac{81687.85}{\sqrt{268371.42 \times 1854141}}$$

$$= \frac{81687.85}{705406.59}$$

$$= 0.12$$

Calculation of Regression equation between total debt and N.P.

$$Y - \bar{Y} = b_{xy} (X - \bar{X})$$

$$\text{Or } Y - 753.88 = 0.046 (X - 563.52)$$

$$\text{Or } Y - 753.88 - 25.6965 + 0.046X$$

$$\text{Or } Y = 728.18 + 0.046X$$

2. Relationship between Net Profit and Total debt of Bottlers Nepal Limited

Year	T.D. (X)	N.P.(Y)	X=(X- \bar{X})	X ² =(X- \bar{X}) ²	Y = (Y- \bar{Y})	Y ² =(Y- \bar{Y}) ²	Xy
2006/2007	189.99	48.61	2.32	5.38	14.26	203.35	33.08
2007/2008	184.10	25.67	-3.57	12.75	-8.68	75.34	30.99
2008/2009	177.19	37.80	-70.48	4967.43	3.45	11.90	-243.16
2009/2010	164.39	34.73	-23.28	541.96	0.38	0.14	-8.85
2010/2011	282.7	24.96	95.03	9030.70	-9.39	88.17	-892.33
	$\sum X =$ 938.37	$\sum Y =$ 171.77		$\sum x^2 =$ 14558.22		$\sum Y^2 = 378.90$	$\sum xy =$ -

							1080.27
--	--	--	--	--	--	--	---------

Using Formula

Now,

For total debt

$$\bar{X} = \frac{\sum X}{N} = \frac{938.37}{5} = 187.67$$

For Net Profit

$$\bar{Y} = \frac{\sum Y}{N} = \frac{171.77}{5} = 34.35$$

Calculation of Standard Deviation

$$\begin{aligned} \sigma_x &= \sqrt{\frac{\sum (X - \bar{X})^2}{N}} \\ &= \sqrt{\frac{14558.22}{5}} \\ &= 53.96 \end{aligned}$$

$$\begin{aligned} \sigma_y &= \sqrt{\frac{\sum (Y - \bar{Y})^2}{N}} \\ &= \sqrt{\frac{378.90}{5}} \\ &= 8.71 \end{aligned}$$

Calculation of correlation coefficient

$$\begin{aligned} r &= \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} \\ &= \frac{-1080.27}{\sqrt{14558.22 \times 378.90}} \\ &= \frac{-1080.27}{2348.64} \\ &= -0.46 \end{aligned}$$

Calculation of Regression equation between total debt and N.P.

$$Y - \bar{Y} = b_{xy} (X - \bar{X})$$

$$\text{Or } Y - 34.35 = -0.46 \frac{53.96}{8.71} (X - 187.67)$$

$$\text{Or } Y - 34.35 = -2.85(X - 187.67)$$

$$\text{Or } Y - 534.82 + 34.35 = -2.85X$$

$$\text{Or } Y = 569.17 - 2.85X$$

Appendix 10

1. Relation between Net profit and Long-term debt of Nepal Lube Oil Limited

Year	LTD(X)	N.P.(Y)	X=(X- \bar{X})	X ² =(X- \bar{X}) ²	y=(Y- \bar{Y})	Y ² =(Y- \bar{Y}) ²	xy
2006/2007	528.87	-5.21	-51.9	2693.61	-17.96	322.56	932.12
2007/2008	573.75	-5.29	-7.02	49.28	-18.04	325.44	126.64
2008/2009	614.47	8.81	33.7	1135.69	-3.94	15.52	-132.778
2009/2010	584.37	25.36	3.6	12.96	12.61	159.01	45.40
2010/2011	602.37	40.09	21.6	466.56	466.56	747.48	590.54
	$\Sigma X =$ 2903.83	$\Sigma Y =$ 63.76		$\Sigma x^2 =$ 4358.1	$\Sigma y =$	$\Sigma y^2 =$ 1570.01	Σxy =2666.08

Using Formula

Now,

For total debt

$$\bar{X} = \frac{\sum X}{N} = \frac{2903.83}{5} = 580.77$$

For Net Profit

$$\bar{Y} = \frac{\sum Y}{N} = \frac{63.67}{5} = 12.75$$

Calculation of standard deviation

$$\begin{aligned} \sigma_x &= \sqrt{\frac{\sum (X - \bar{X})^2}{N}} \\ &= \sqrt{\frac{4358.1}{5}} \\ &= 29.52 \end{aligned}$$

$$\begin{aligned} \sigma_y &= \sqrt{\frac{\sum (Y - \bar{Y})^2}{N}} \\ &= \sqrt{\frac{1570.01}{5}} \\ &= 17.72 \end{aligned}$$

Calculation of correlation of coefficient

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

$$= \frac{2666.08}{\sqrt{4358.1 \times 1570.01}}$$

$$= \frac{2666.08}{2615.77}$$

$$= 1.02$$

Calculation of Regression equation between Net Profit and long-term debt

$$Y - \bar{Y} = b_{xy}(X - \bar{X})$$

$$\text{Or } Y - 12.75 = 1.02 \frac{29.52}{17.72} (X - 580.77)$$

$$\text{Or } Y - 12.75 = 1.70X - 986.86$$

$$\text{Or } Y = 12.75 - 986.68 + 1.70X$$

$$\text{Or } Y = -974.11 + 1.70X$$

2. Relation between Net profit and long-term debt of Bottlers Nepal Limited

Year	LTD(X)	N.P(Y)	$X = (X - \bar{X})$	$X^2 = (X - \bar{X})^2$	$y = (Y - \bar{Y})$	$Y^2 = (Y - \bar{Y})^2$	xy
2006/2007	-	48.61	14.4	207.36	14.26	203.35	205.34
2007/2008	-	25.67	14.4	207.36	-8.68	75.34	-124.99
2008/2009	-	37.80	14.4	207.36	3.45	11.90	49.68
2009/2	-	34.73	14.4	207.36	0.38	0.14	5.47

010							
2010/2 011	72.00	24.96	57.6	3317.76	-9.39	88.17	-540.86
	$\sum X =$ 72.00	$\sum Y =$ 171.77		$\sum x^2$ =1417.2		$\sum y^2 = 378.9$	$\sum xy = -$ 405.36

Using Formula

Now,

For total debt

$$\bar{X} = \frac{\sum X}{N} = \frac{72}{5} = 14.4$$

For Net Profit

$$\bar{Y} = \frac{\sum Y}{N} = \frac{171.77}{5} = 34.35$$

Calculation of standard deviation

$$\begin{aligned}\sigma_x &= \sqrt{\frac{\sum (X - \bar{X})^2}{N}} \\ &= \sqrt{\frac{4147.2}{5}} \\ &= 28.8\end{aligned}$$

$$\begin{aligned}\sigma_y &= \sqrt{\frac{\sum (Y - \bar{Y})^2}{N}} \\ &= \sqrt{\frac{378.9}{5}} \\ &= 8.71\end{aligned}$$

Calculation of correlation coefficient

$$\begin{aligned}r &= \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} \\ &= \frac{-405.36}{\sqrt{4147.2 \times 378.9}} \\ &= \frac{-405.36}{1253.55} \\ &= -0.32\end{aligned}$$

Calculation of Regression equation between Net profit and long-term debt

$$Y - \bar{Y} = b_{xy}(x - \bar{X})$$

$$\text{Or } Y-34.35 = -0.32 \frac{28.8}{8.71} (X-14.4)$$

$$\text{Or } Y = -1.06(X-14.4) + 34.35$$

$$\text{Or } Y = -1.06X + 15.24 + 34.35$$

$$\text{Or } Y = 49.95 - 1.06X$$