CHAPTER I

INTRODUCTION

1.1 Background of the study

Capital, in the most basic terms, is money. All businesses must have capital in order to purchase assets and maintain their operations. Business capital comes in two main forms: debt and equity. Debt refers to loans and other types of credit that must be repaid in the future, usually with interest. In contrast, equity generally does not involve a direct obligation to repay the funds. Instead, equity investors receive an ownership position which usually takes the form of stock in the company.

Capital is a scarce sources and much more essential to maintain smooth operation of any firm. The available capital and financial sources should be utilized so efficiently that could generate maximum return. Under a financial concept of capital, such as invested money or invested purchasing power, capital is synonymous with the net assets or equity of the entity. It refers to the funds provided by lenders (and investors) to businesses to purchase real capital equipment for producing goods/services. Real Capital or Economic Capital comprises physical goods that assist in the production of other goods and services. According to Weber and Somber, "Capital can be defined as that amount of wealth which is used in making profits and which enters into the accounts."

When a firm expands, it needs capital, and that capital can come from debt or equity. Debt has two important advantages. First, the interest paid is a tax deduction, which lowers debt's effective cost. Second, debt holders get a fixed return, so stock holders do not have to share the profits if the business is extremely successful. However, debt also has disadvantages. First, the higher the debt ratio, the riskier the company, hence the higher it's cost of both debt and equity. Second, if a company falls on hard times and operating income is not sufficient to cover interest charges, its stockholders will have to make up the shortfall, and if they cannot, bankruptcy will result. Companies whose earnings and operating cash flows are volatile should therefore limit their use of debt. On the other hand, companies with less business risk and more stable operating cash flows can take on more debt.

"Financial capital can refer to money used by entrepreneurs and businesses to buy what they need to make their products or provide their services or to that sector of the economy based on its operation, i.e. retail, corporate, investment banking, etc."

<div align="right">-Wikipedia, the Free Encyclopedia</div>

Managers do not make the capital structure decision once and then forget about it. Instead, firms regularly raise capital to invest in assets to support growth, and each time they must choose the mix of equity and debt used to obtain these funds. Many firms also pay dividends, which reduce retained earnings and thus increases the amount they must raise externally to support their operating plans. According to Weston and Brigham "Capital structure of the firm is the permanent financing represented by long term debt, preferred stock and shareholder's equity. Thus, a firm's capital structure is only part of its financial structure." (Weston & Brigham, 2002)

Many factors influence the capital structure decision, and, as you will see, determining the optimal capital structure is not an exact science. Therefore, even firms in the same industry often have quite different capital structures. Firms should first analyze a number of factors, and then establish a target capital structure. This target may change over time as conditions change, but at any given moment, management should have a specific capital structure in mind. If the actual debt ratio is below the target level, expansion capital should generally be raised by issuing debt, whereas if the debt ratio is above the target, equity should generally be issued. For more clear information on capital structure one can go through some of the experts view on the topic. Van Horn (2005) expresses that Capital structure is the mix (or proportion) of a firm's permanent long term financing represented by debt, preferred stock and common stock equity.

Similarly Weston and Brigham have viewed that Capital structure of the firm is the permanent financing represented by long term debt, preferred stock and shareholder's equity. Thus, a firm's capital structure is only part of its financial structure.

On the other hand Solomon says that the optimal capital is the mix of debt and equity which will maximize the market value of the company .If such an optimum exists in two fold. It

maximizes the value of the company and wealth of the owners; it minimizes the company's cost of capital which in turn increases the ability to find new wealth creating investment opportunities.

As mentioned in Wikipedia, the free encyclopedia capital structure refers to the way a corporation finances its assets through some combination of equity, debt, or hybrid securities. A firm's capital structure is then the composition or 'structure' of its liabilities.

In reality, capital structure may be highly complex and include tens of sources. Gearing Ratio is the proportion of the capital employed of the firm which come from outside of the business finance, e.g. by taking a long term loan etc. In each and every country economic development is highly depend on the industrialization for which a massive infrastructure should be prepared by government and only then industrialization can be promoted. The industrialists are the persons who mobilize the idle amount in to the productive field. They use their accumulated amount and some from outsiders in business purpose. Collecting money from outsiders is not an easy job whereas managing it, so that it gives the expected return is the more challenging job than fund collection. Banks are the institutions that give the external funds for industrialists collecting the small amounts from the citizens.

Commercial banks are the suppliers of finance for trade and industry. This plays vital role in the economic and financial life of the country. They help in the formation of capital by investing the saving in productive areas. Commercial banks pool the saving of community and arrange to lend to the entrepreneur in the forms of individual, firms, companies and other organized sector as well. In most of the countries, the commercial banks generally concentrate in urban and semi urban sectors. They neglect rural sector due to low return.

In Nepal, the institutional source of external capital can be gained from the commercial banks, development banks, finance companies etc. According to the report of Nepal Rastra Bank (NRB) till March 2012 altogether 32 commercial banks, 86 development banks, 79 finance companies, 21 microfinance institutions, 16 NRB licensed co-operatives, 36 NRB licensed Non-Government Organizations to undertake limited financial transactions. Out of 32 existing commercial banks six are the joint venture banks which are jointly operated with the foreign banks which are as follows:

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This study covers the all the joint venture commercial banks operating in Nepal. A brief introduction of the banks' as follows:

a. Nabil Bank Limited

Nabil Bank Limited, the first foreign joint venture bank of Nepal, started operations in July 1984. Nabil was incorporated with the objective of extending international standard modern banking services to various sectors of the society. Pursuing its objective, Nabil provides a full range of commercial banking services through its 47 points of representation across the kingdom and over 170 reputed correspondent banks across the globe.

Nabil, as a pioneer in introducing many innovative products and marketing concepts in the domestic banking sector, represents a milestone in the banking history of Nepal as it started an era of modern banking with customer satisfaction measured as a focal objective while doing business.

Operations of the bank including day-to-day operations and risk management are managed by highly qualified and experienced management team. Bank is fully equipped with modern technology which includes ATMs, credit cards, state-of-art, world-renowned software from Infosys Technologies System, Banglore, India, Internet banking system and Telebanking system.

b. Himalayan Bank Limited

Himalayan Bank was established in 1993 in joint venture with Habib Bank Limited of Pakistan. Despite the cut-throat competition in the Nepalese Banking sector, Himalayan Bank has been able to maintain a lead in the primary banking activities- Loans and Deposits.
Legacy of Himalayan lives on in an institution that's known throughout Nepal for its innovative approaches to merchandising and customer service. All Branches of HBL are integrated into Globus (developed by Temenos), the single Banking software where the Bank has made substantial investments. This has helped the Bank provide services like 'Any Branch Banking Facility', Internet Banking and SMS Banking. Living up to the expectations and aspirations of the Customers and other stakeholders of being innovative. HBL has developed exclusive and proprietary online money transfer software- HimalRemitTM. By deputing their own staff with technical tie-ups with local exchange houses and banks, in the

Middle East and Gulf region, HBL is the biggest inward remittance handling Bank in Nepal. All this only reflects that HBL has an outside-in rather than inside-out approach where Customers' needs and wants stand first.

Himalayan Bank Limited holds of a vision to become a Leading Bank of the country by providing premium products and services to the customers, thus ensuring attractive and substantial returns to the stakeholders of the Bank. The Bank's mission is to become preferred provider of quality financial services in the country. There are two components in the mission of the Bank; Preferred Provider and Quality Financial Services; therefore we at HBL believe that the mission will be accomplished only by satisfying these two important components with the Customer at focus. The Bank always strives positioning itself in the hearts and minds of the customers.

c. Nepal SBI Bank Limited

Nepal SBI Bank Limited is a major national level financial services provider engaged in various retail and commercial banking services. We, a team of nearly 580 people, move, lend, invest and protect money for over 350,000 customers nationally and worldwide. Now in its 18th year of operations, Bank is continuously upgrading quality of its service delivery and customer satisfaction with the help of state-of-the-art technology.

Nepal SBI Bank Ltd. (NSBL) is the first Indo-Nepal joint venture in the financial sector sponsored by three institutional promoters, namely State Bank of India, Employees Provident Fund and Agricultural Development Bank of Nepal through a Memorandum of Understanding signed on 17th July 1992. Nepal SBI Bank Limited is a major national level financial services provider engaged in various retail and commercial banking services.

The team of nearly 580 people, moves, lends, invest and protect money of over 300,000 customers nationally and worldwide. Since its inception on July 7, 1993, Bank is continuously upgrading quality of its service delivery and customer satisfaction with the help of state-of-the-art technology. Extending the reach to 27 districts through our 59 physical outlets including 50 branches, 6 extension counters and three administrative offices, NSBL is among largest private banks in Nepal. In addition, it serve its valued customers through e-delivery points like Mobile Banking, ATMs and Online Banking service for both corporate and retail clients.

It is as subsidiary of State Bank of India—India's largest bank in almost any benchmark and business parameters, with over 203 years of history and expertise in banking—which has 55 percent of ownership and rest held by a local partner Employee Provident Fund (15%) and general public (30%).

Over the years, it has grown larger and stronger - in terms of business, geography and resources. This was achieved by relying on the fundamentals. Its achievements are founded on basic banking norms - quality, consistency and transparency of capital base, sound liquidity, a robust risk management framework coupled with the practice of good corporate governance and above all the tireless focus on customer satisfaction. Its Aspiration is "The Banker to Every Nepali" and commitment is "First in Customer Satisfaction"

d. Standard Chartered Bank Nepal Limited

Standard Chartered Bank Nepal Limited has been in operation in Nepal since 1987 when it was initially registered as a joint-venture operation. Today the Bank is an integral part of Standard Chartered Group having an ownership of 75% in the company with 25% shares owned by the Nepalese public. The Bank enjoys the status of the largest international bank currently operating in Nepal.

Standard Chartered has a history of over 150 years in banking and operates in many of the world's fastest-growing markets with an extensive global network of over 1750 branches (including subsidiaries, associates and joint ventures) in over 70 countries in the Asia Pacific Region, South Asia, the Middle East, Africa, the United Kingdom and the Americas. As one of the world's most international banks, Standard Chartered employs almost 75,000 people, representing over 115 nationalities, worldwide. This diversity lies at the heart of the Bank's values and supports the Bank's growth as the world increasingly becomes one market.

With 19 points of representation, 23 ATMs across the country and with more than 425 local staff, Standard Chartered Bank Nepal Ltd. is in a position to serve its customers through an extensive domestic network. In addition, the global network of Standard Chartered Group gives the Bank a unique opportunity to provide truly international banking services in Nepal.

The Bank has been the pioneer in introducing 'customer focused' products and services in the country and aspires to continue to be a leader in introducing new products in delivering superior services. It is the first Bank in Nepal that has implemented the Anti-Money Laundering policy and applied the 'Know Your Customer' procedure on all the customer accounts. Some of the recent awards achieved by standard chartered bank Nepal limited are as follows:

- November 2009 - "Bank of the Year 2009 Nepal" by 'The Banker' of the Financial Times.
- March 2006 - 'Best Commercial Bank 2004-05'- awarded by The Boss Magazine-Speciality Media Private Limited
- March 2006 - Manager of the Year Award - awarded by Management Association of Nepal (MAN) on the occasion of their Silver Jubilee Program
- April 2005 - A Citation for Outstanding Performance amongst all the Commercial Banks, awarded by Nepal Rastra Bank on the occasion of its Golden Jubilee celebration
- April 2005 - FNCCI National Excellence Award 2003-2004 awarded by The Federation of Nepalese Chambers of Commerce & Industry (FNCCI)
- March 2005 - Best Commercial Bank for the year 2003-2004, awarded by The Boss Magazine- Speciality Media Private Limited.

e. Nepal Bangladesh Bank Limited

Nepal Bangladesh Bank Ltd was established in the year 1994 with IFIC Bank Ltd of Bangladesh with the goal to become "The Bank for Everyone". Over the years bank has been successful to increase the paid up capital to Rs 2 Billion. Its Head Office is situated at New Baneswor, Bijuli Bazar, Kathmandu.

The prime objective of this bank is to render hospitality to the valued customer. With a network of 19 branches and a corporate office, bank has been providing the extensive services to the valued customer. To facilitate the valued customer bank had successfully install 16 ATMs and holiday banking for their convenience.

The bank has earned the glory of making available the services for almost all the top business houses. Top exporter and importers of the country have established banking relationship with the bank with a substantial volume of foreign business which has enhanced the bank's popularity in the international trade font.

With the continuous support of its valued customers the bank has made all round progress in every sphere of its operation. This is the first bank to launch the special deposit product for women introducing "Grihini Bachat Khata". It ensure its valued customer to deliver the innovative products and services as per requirement which will be highly beneficial to create the value.

f. Everest Bank Limited

Everest Bank Limited (EBL) started its operations in 1994 with a view and objective of extending professionalized and efficient banking services to various segments of the society. The bank is providing customer-friendly services through its Branch Network. All the branches of the bank are connected through Anywhere Branch Banking System (ABBS), which enables customers for operational transactions from any branches.

With an aim to help Nepalese citizens working abroad, the bank has entered into arrangements with banks and finance companies in different countries, which enable quick remittance of funds by the Nepalese citizens in countries like UAE, Kuwait, Bahrain, Qatar, Saudi Arabia, Malaysia, Singapore and U K.

Joint Venture Partner Punjab National Bank (PNB), our joint venture partner (holding 20% equity in the bank) is the largest nationalized bank in India. With its presence virtually in all the important centers at India, Punjab National Bank offers a wide variety of banking services which include corporate and personal banking, industrial finance, agricultural finance, financing of trade and international banking. Among the clients of the Bank are Indian conglomerates, medium and small industrial units, exporters, non-resident Indians and multinational companies. The large presence and vast resource base have helped the Bank to build strong links with trade and industry.

Some of the achievements of EBL are as follows:
- The bank has been conferred with "Bank of the Year 2006, Nepal" by the banker, a publication of financial times, London.
- The bank was bestowed with the "NICCI Excellence award" by Nepal India chamber of commerce for its spectacular performance under finance sector

Pioneering achievements by EBL

Recognizing the value of offerings a complete range of services, we have pioneered in extending various customer friendly products such as Home Loan, Education Loan, EBL Flexi Loan, EBL Property Plus (Future Lease Rental), Home Equity Loan, Vehicle Loan, Loan Against Share, Loan Against Life Insurance Policy and Loan for Professionals.

EBL was one of the first bank to introduce Any Branch Banking System (ABBS) in Nepal.

EBL has introduced Mobile Vehicle Banking system to serve the segment deprived of proper banking facilities through its Birtamod Branch, which is the first of its kind.
EBL has introduced branchless banking system first time in Nepal to cover unbanked sector of Nepalese society.

EBL is first bank that has launched e-ticketing system in Nepal. EBL customer can buy yeti airlines ticket through internet.

1.2 Statement of Problem

The capital and assets structure of any organization can be effective if evaluated on the basis of Balance Sheet, Profit and Loss Account, size and type of the organization. Every organization can benefit if optimal capital mix is maintained. Very few organization only use debt capital, some use only debt capital and some use both debt and equity capital. Generally higher the debt more is the risk to the company even though high debt has its own advantage on the other hand. Balance capital is one of the important factors for the success of a firm. Hence the study will be focused on the following problems related to the subject matter:

1. Whether the present condition of the banking industry is going on sound condition or not.
2. Explore the present capital structure management in the JVCBs of Nepal and determining if that is optimal capital structure mix or not.
3. Finding the relationship of the total capital of the banks with respect to the total deposit collection and loan mobilization.
4. Determining the current profit trend of the JVCBs of Nepal and estimation of the future profit trend based on the past performance.

1.3 Objectives of the Study

The main objective of the study is to analyze the pattern and effect capital structure in profitability of selected banks and determining the optimal capital structure for JVCBs. The

study is based on 5 years financial data from F.Y 2006 A.D to 2010 A.D of selected JVCBs of Nepal to evaluate, compare and examine their capital structure. The objectives of the study are as follows:

a. To trace out the present trend of operating profit and net profit trend as well as forecasting the future trend for joint venture commercial banks of Nepal.

b. To examine relationship of the capital, deposit collection and loan mobilization of the joint venture commercial banks of Nepal.

c. To examine the present capital structure of the JVCBs of Nepal optimal or not and determining the optimal capital structure mix for the JVCBs of Nepal.

1.4 Significance of the study

First of all, it is the fact that this study is undertaken to apply the theoretical concept and knowledge of optimal capital structure to the practical aspect as a partial fulfillment of the requirement of Master of Business Study (MBS) under faculty of Management, Tribhuvan University. This study would contribute an overall look at the coming up new capital policies to be taken by the bank and the factors that should be taken in consideration while preparing the next year's policy.

This study is also important for owners, creditors and potential investors to make their attitude on investment. The study have significance for management, policy maker, stakeholder of the banks and others those having interest on capital structure decision.

） Individual who will carryout further research work in capital structure management of any banking and financial sectors.

） All the stakeholders of commercial banks especially stakeholders of joint venture commercial banks of Nepal.

） Individuals who have keen interest in Nepalese banking & financial sector and institutions related to the topic.

1.5 Limitations of the Study:

Almost all the study & task is conducted under some constraints and limitations. Likewise this study is also limited by some common constraints as the thesis is prepared for partial

fulfillment of MBS degree which has to be finished within a short span of time and under different strains. Some of the basic limitations are as follows:

a. The study is mainly based on secondary data; therefore, the accuracy of results and conclusions highly depends upon the reliability of these data.

b. As the title specifies the study covers about optimal capital structure analysis subject only other factors beside it is not covered by the study.

c. Due to constraints, the study covers only past five years [F.Y 2006 A.D to 2010 A.D] & selected sample banks.

1.6 Organization of the work

The thesis proposal is the initial stage of the research work and thesis writing. It gives the way to the successfully completion of the research project It is the blue print of the research to be done or a small model of the research report that to be prepared on the completion of the research on the selected topic. Finally after completion of the research work, thesis prepared divided into five chapters:

Chapter I – This is the introduction section that covered the background of the study, the introduction to sample institutions selected for study, objectives & limitations as well as statement of problem and rationale of the study which gives the importance, area coverage and strengths & weakness of the selected topic.

Chapter II – This section literature review, which covered the citation of the previously conducted research work on the same field as well as review of the books, articles related to the capital structure.

Chapter III – This section is named as research methodology which gives the brief introduction of the methods that are applied for research work in order to get the result of the study.

Chapter IV – In this section of research report contains the data presentation, analysis, interpretation related to the research problem based on the annual reports of joint venture commercial banks of Nepal.

Chapter V – Last but not the least, the final section of the research report included summary, conclusion and recommendation on which the total findings of the study is summarized point wise as well as the conclusion of the research work and recommendations if any.

CHAPTER II

CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURE

The purpose of literature review is to find what research studies have been conducted in one's area of study and what remains to be done. It provides foundation to the study. As per the objective of the study, emphasis is given to the review of major related literature on the capital structure and other related literatures to the study. The primary objective of this study is to focus on optimal capital structure analysis that helps the organization to employee different sources of capital in appropriate mix so that the cost of capital is minimized. Therefore, this chapter deals basically to the theoretical aspects of capital, capital structure management, and optimal capital structure, theories on capital structure management, related journals, articles and past thesis on the research problem. It provides significant knowledge in the field of research. Thus, the review of books, research studies and articles has been used to make clear about the concept of capital structure management.

2.1 Conceptual Framework

What Does Capital Mean?

You often hear corporate officers, professional investors, and analysts discuss a company's capital structure. You may not know what a capital structure is or why you should even concern yourself with it, but the concept is extremely important because it can influence not only the return a company earns for its shareholders, but whether or not a firm survives in a recession or depression. Sit back, relax, and prepare to learn everything you ever wanted to know about your investments and the capital structure of the companies in your portfolio!

The term capital structure refers to the percentage of capital (money) at work in a business by type. Broadly speaking, there are two forms of capital: equity capital and debt capital. Each has its own benefits and drawbacks and a substantial part of wise corporate stewardship and management is attempting to find the perfect capital structure in terms of risk / reward payoff for shareholders. This is true for Fortune 500 companies and for small business owners trying to determine how much of their startup money should come from a bank loan without endangering the business.

The composition of capital structure can be presented as shown below

a. **Equity Capital:** This refers to money put up and owned by the shareholders (owners). Typically, equity capital consists of two types: 1.) contributed capital, which is the money that was originally invested in the business in exchange for shares of stock or ownership and 2.) retained earnings, which represents profits from past years that have been kept by the company and used to strengthen the balance sheet or fund growth, acquisitions, or expansion.

    Many consider equity capital to be the most expensive type of capital a company can utilize because its "cost" is the return the firm must earn to attract investment. A speculative mining company that is looking for silver in a remote region of Africa may require a much higher return on equity to get investors to purchase the stock than a firm such as Procter & Gamble, which sells everything from toothpaste and shampoo to detergent and beauty products.

b. **Debt Capital:** The debt capital in a company's capital structure refers to borrowed money that is at work in the business. The safest type is generally considered long-term bonds because the company has years, if not decades, to come up with the principal, while paying interest only in the meantime.

    Other types of debt capital can include short-term commercial paper utilized by giants such as Wal-Mart and General Electric that amount to billions of dollars in 24-hour loans from the capital markets to meet day-to-day working capital requirements such as payroll and utility bills. The cost of debt capital in the capital structure depends on the health of the company's balance sheet - a triple AAA rated firm is going to be able to borrow at extremely low rates versus a speculative company with tons of debt, which may have to pay 15% or more in exchange for debt capital.

c. **Other Forms of Capital:** There are actually other forms of capital, such as vendor financing where a company can sell goods before they have to pay the bill to the vendor, that can drastically increase return on equity but don't cost the company anything. This was one of the secrets to Sam Walton's success at Wal-Mart. He was often able to sell Tide detergent before having to pay the bill to Procter & Gamble, in effect, using PG's money to grow his retailer. In the case of an insurance company, the policyholder "float" represents money that doesn't belong to the firm but that it gets to use and earn an

investment on until it has to pay it out for accidents or medical bills, in the case of an auto insurer. The cost of other forms of capital in the capital structure varies greatly on a case-by-case basis and often comes down to the talent and discipline of managers.

(Source: Joshua Kennon, http://beginnersinvest.about.com)

What Does Capital Structure Mean?

A firm can raise its required funds by the issue of various types of financial instruments. Investors hold different claims on the firm's assets and cash flows thus they are exposed to different degree of risk. Creditors and debt holders have priority claim over the firm's assets and cash flows. The firm is under a legal obligation to pay interest and principle. Debt holders are however exposed to the risk of default. Since, the firm's cash flow is uncertain, there is possibility that it may default in its obligation to pay interest and principle.

A distinction is usually made between financial structure and capital structure. Financial structure refers to all source (both short term and long term) that are used to finance the entire assets of a firm whereas capital structure is taken as the capitalization part of firms total financing which includes only the long term source such as long term debt and equity. Thus, the capital structure can be determined by considering relevant factors and is a part of financial structure.

The nature of capital structure could differ from one company to the other, which is directly guided, regulated and controlled by the management of the company. However a reasonable satisfactory capital structure can be determined by considering relevant factors and analyzing the impact of alternative financing proposals on EPS.

One of the financial managers' principal goals is to maximize the value of the firm's securities. For that purpose, the firm should select a proper financial mix considering financial leverage. Given the objective of the firm to maximize the value of the equity share, the firm should select a financial mix capital structure which will help in achieving the objective of financial management.

Capital structure or capitalization of the firm is the permanent financing represented by long term debt, preferred stock and shareholders' equity. The capital structure is the firm's various sources of funds used to finance its overall operations and growth, combination of a company's long-term debt, common equity, and preferred equity. The proportion of short-

term and long-term debt is considered in analyzing a firm's capital structure. When people refer to capital structure, they most likely are talking about a firm's debt/equity ratio, which provides insight into how risky a company is. Usually a company financed heavily by debt poses greater risks because it is highly leveraged.

Thus, the capital structure involves long term financing decision or choice between debt or equity capital. Selection of appropriate mix of debt and equity capital minimizes cost of capital and maximizes value of the firm or shareholder's wealth. The cost of capital and the value of the firm vary with the changes in capital structure. The cost of capital and capital structure are interrelated and has a joint impact upon the value of a firm. Moreover, capital structure affects financial risks of the firm. Using more debt in capital structure leads to increase the financial risk of the firm. It is a significant financial decision, since it affects the financial risks and return and consequently market value per share.

Therefore, a firm should determine appropriate capital structure, which minimize the overall cost of capital and maximizes the value of the firm. On the other hand, appropriate capital structure (optimal capital structure) maximizes its share value in a reasonable level of risk.

Thus capital structure is a rational judicious mix of debt, preferred stock and common stock. It remarks that a sound capital structure depends upon the efficiency of the management on the rational estimation of capital mix. The financial manager should adhere in proper mixing of debt and equity that can maximize the value and minimize the overall cost of capital of the firm.

Factors Affecting Capital Structure Management (CSM)

Firms should first analyze a number of factors, and then establish a target capital structure. This target may change over time as conditions change, but at any given moment, management should have a specific capital structure in mind. If the actual debt ratio is below the target level, expansion capital should generally be raised by issuing debt, whereas if the debt ratio is above the target, equity should be issued.

Capital structure policy involves a trade-off between risk and return:

ʃ Using more debt raises the risk borne by stockholders.

ʃ However, using more debt generally leads to a higher expected rate of return.

Higher risk tends to lower a stock's price, but a higher expected rate of return raises it. Therefore, the optimal capital structure must strike a balance between risk and return so as to maximize the firm's stock price. Four primary factors influencing capital structure decisions are:

1. **Business Risk** or the riskiness inherent in the firm's operations if it used no debt. The greater the firm's business risk, the lower its optimal debt ratio.

2. **The firm's tax position**, a major reason for using debt is that interest is deductible, which lowers the effective cost of debt. However, if most of a firm's income is already sheltered from taxes by depreciation tax shields, by interest on currently outstanding debt, or by tax loss carry-forwards, its tax rate will be low, so additional debt will not be as advantageous as it would be to a firm with a higher effective tax rate.

3. **Financial flexibility** or the ability to raise capital on reasonable terms under adverse conditions. Corporate treasures know that a steady supply of capital is necessary for stable operations, which is vital for long-run success. They also know that when money is tight in the economy, or when a firm is experiencing operation difficulties, suppliers of capital prefer to provide funds to companies with strong balance sheets. Therefore, both the potential future need for funds and the consequences of a funds and the consequences of funds shortage influence the target capital structure – the greater the probable future need for capital, and the worse the consequences of a capital shortage, the stronger the balance sheet should be.

4. **Managerial conservation or aggressiveness**, some managers are more aggressive than others, hence some firms are more inclined to use debt in an effort to boost profits. This factor does not affect the true optimal, or value-maximizing, capital structure, but it does influence the manager determined target capital structure.

These four points largely determine the target capital structure, but operating conditions can cause the actual capital structure to vary from the target. In addition to the types of analysis discussed above, firms generally consider the following factors when making capital structure decisions.

1. *Sales Stability*: A firm whose sales are relatively stable can safely take on more debt and incur higher fixed charges than a company with unstable sales. Utility companies,

because of their stable demand have historically been able to use more financial leverage than industrial firms.

2. *Asset Structure*: Firms whose assets are suitable as security for loans tend to use debt rather heavily. General-purpose assets that can be used by many businesses make good collateral, whereas special-purpose assets do not. Thus, real estate companies are usually highly leveraged, whereas companies involved in technological research are not.

3. *Operating Leverage*: Other things same, a firm with less operating leverage is better able to employ financial leverage because it will have less business risk.

4. *Growth Rate*: The faster-growing firms must rely more heavily on external capital. Further, the flotation costs involved in selling common stock exceed those incurred when selling debt, which encourages rapidly growing firms to rely more heavily on debt. At the same time, however, these firms often face greater uncertainty, which tends to reduce their willingness to use debt.

5. *Profitability*: One often observes that firms with very high rates of return on investment use relatively little debt. Although there is not theoretical justification for this fact, one practical explanation is that very profitable firms such as Intel, Microsoft, and Coca-Cola simply do not need to do much debt financing. Their high rates of return enable them to do most of their financing with internally generated funds.

6. *Control*: The effect of debt versus stock on a management's control position can influence capital structure. If management currently has voting control (over 50% of the stock) but is not in a position to buy any more stock, it may choose debt for new financings. On the other hand, management may decide to use equity if the firm's financial situation is so weak that the use of debt might subject it to serious risk of default, because if the firm goes into default, the mangers will almost surely lose their jobs.

7. *Lender and rating agency attitudes*: Regardless of mangers' own analysis of the proper leverage factors for their firms, lenders' and rating agencies' attitudes frequently influence financial structure decisions. In the majority of cases, the corporation discusses its capital structure with lenders and rating agencies and gives much weight to their advice.

8. *The firm's internal condition*: A firm's own internal condition can also have a bearing on its target capital structure. For e.g; suppose a firm has just successfully

completed an R & D program, and it forecasts higher earnings in the immediate future. However, the new earnings are not yet anticipated by investors, hence are not reflected in the stock price. This company would not want to issue stock – it would prefer to finance with debt until the higher earnings materialize and are reflected in the stock price. Then it could sell an issue of common stock, retire the debt, and return to its target capital structure.

What Does Optimal Capital Structure Mean?

A firm finances its activities using funds from debt and equity. Debt refers to loans the firm secures from outside sources. Equity refers money the firm's owners or stockholders invest in the firm. A firm's capital structure is its ratio of long-term debt to equity. An optimal capital structure is the best debt-to-equity ratio for the firm, which minimizes the cost of financing and maximizes the value of the firm.

According to the trade-off theory, the cost of debt is always lower than the cost of equity, because interest on debt is tax-deductible. The cost of equity usually consists of dividends the firm distributes to its owners or shareholders — dividends the firm could delay or reduce. Debt-holders have a prior claim to the firm's funds, and the firm can only pay shareholders after meeting its debt obligations for the period. Debt is cheaper but carries with it the risk of not being able to make payments on time, which could result in bankruptcy. The firm, therefore, has to find an optimal capital structure that minimizes the cost of financing while also minimizing the risk of bankruptcy.

A firm's capital structure can be found mathematically by computing its minimum weighted average cost of capital. For example, if a company uses debt at 4 percent to get 30 percent of its funds and equity at 10.5 percent to get 70 percent of its funds, the firm's weighted average cost of capital is (0.30 X 4 percent) + (0.70 X 10.5 percent) = 8.55 percent. The formula implies that the firm can get a minimum weighted average cost of capital of 4 percent by using debt as its sole source of funds, but it would not be the firm's optimal capital structure because the firm would then face a high risk of bankruptcy.

Other factors also contribute to the unworkable nature of trying to achieve optimal capital structure by using only debt to finance a firm's activities. When a firm increases its debt-to-equity ratio, lenders usually become concerned about the ability of the firm to meet its payments. They then increase the interest rate on the firm's loans. Shareholders also become

concerned about bankruptcy and insist on getting a higher rate of return. Both the cost of debt and equity would increase, increasing the weighted average cost of capital.

If a firm knows the cost of equity and debt at all possible levels of debt-to-equity ratio, it could calculate the point at which it gets a minimum weighted average cost of capital, which is its optimal capital structure, according to the trade-off theory. If the firm has a lower debt-to-equity ratio than the optimal level, it would be paying too much for its funds and could decrease the cost of capital by borrowing more money. If it has a higher debt-to-equity ratio than the optimal level, it would also be paying too much for its funds, because lenders and stockholders perceive the firm as being too risky, the firm could decrease the cost of capital paying debt or issuing new equity.

Critics of the trade-off theory disagree that the optimal capital structure can be found using this method. They say that, in real life, shareholders, lenders and managers might not always behave according to the theory. There is an asymmetry of information whereby lenders and shareholders know less about the firm than the managers, who might not act in the firm's best interests.

(Source: http://www.wisegeek.com)

2.2 Review of Related Studies
Theories of Capital Structure
The history presents several theories on capital structure management. In order to analyze the capital structure of any company four theories are to be considered:

(a) Net income approach
(b) Net operating income approach
(c) Traditional approach
(d) Modigliani- Miller's approach

A. Net Income Approach
According to net income approach, the change in capital structure takes place a change in (i) overall cost of capital and also in (ii) total value of firm. To be more precise if financial leverage is increased by raising the ration of debts to equity there will be a decrease in weighted average cost of capital and an increase in the market value of its shares. Conversely

if financial leverage is reduced by lowering the ratio of debts to equity, there will be an increase in weighted average cost of capital and a decrease in the market value of its shares.

The above calculations suggest that net income approach is based on certain assumptions. They are as follows.

1. There are no taxes on companies.
2. The cost of debt (K_d) is less than the cost of equities (K_e).
3. A change in the ration of debts to equity does not affect the degree of risk that the investors bear. In other words whatever may be the ratio of debts to equity the cost of debts as also the cost of equity capital remain constant.

The implication of these assumptions is that with the increase in debts, a less expensive source of capital increases in amount and consequently, weighed average cost of capital falls, while the overall market value of the firm a less moves up. Conversely when debts are reduced expensive source of capital decreases in amount. Consequently weighted average cost of capital rises, while the overall market value of firm moves down. the

Figure - 1
Net Income Approach to CSM
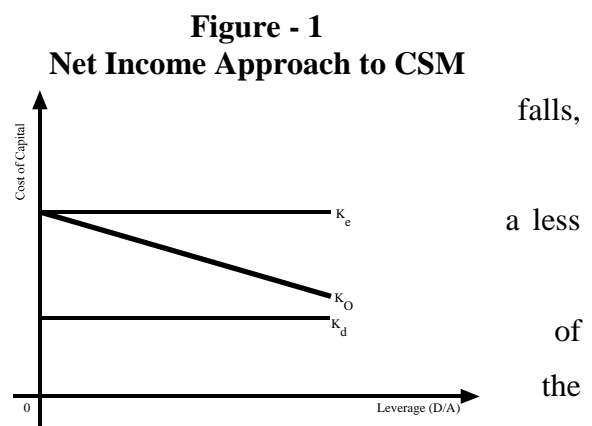
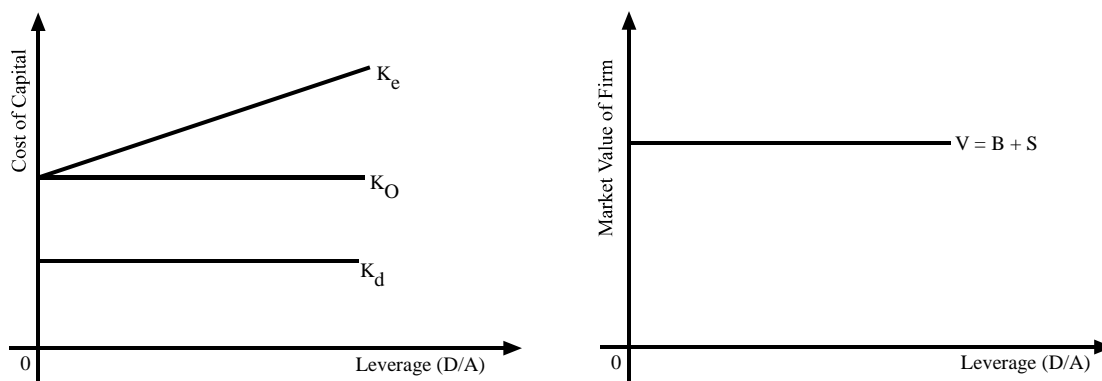## B. Net Operating Income Approach

The second approach as propounded by David Durand, the net operating income approach examines the effects of changes in capital structure in terms of net operating income. In the net income approach discussed above net income available to shareholders is obtained by deducting interest on debentures form net operating income. Then overall value of the firm is calculated through capitalization rate of equities obtained on the basis of net operating income, it is called net income approach. In the second approach, on the other hand overall value of the firm is assessed on the basis of net operating income not on the basis of net income. Hence this second approach is known as net operating income approach.

The NOI approach implies that (i) whatever may be the change in capital structure the overall value of the firm is not affected. Thus the overall value of the firm is independent of the degree of leverage in capital structure. (ii) Similarly the overall cost of capital is not affected

by any change in the degree of leverage in capital structure. The overall cost of capital is independent of leverage.

If the cost of debt is less than that of equity capital the overall cost of capital must decrease with the increase in debts whereas it is assumed under this method that overall cost of capital is unaffected and hence it remains constant irrespective of the change in the ratio of debts to equity capital. The advocates of this method are of the opinion that the degree of risk of business increases with the increase in the amount of debts. Consequently the rate of equity over investment in equity shares thus on the one hand cost of capital decreases with the increase in the volume of debts; on the other hand cost of equity capital increases to the same extent. Hence the benefit of leverage is wiped out and overall cost of capital remains at the same level as before.

Figure - 2
Net Operating Income Approach to CSM

C. Traditional Approach

Traditional approach is an intermediate approach between the net income approach and net operating income approach. According to this approach;

1. An optimum capital structure does exist.
2. Market value of the firm can be increased and average cost of capital can be reduced through a prudent manipulation of leverage.
3. The cost of debt capital increases if debts are increases beyond a definite limit. This is because the greater the risk of business the higher the rate of interest the creditors would ask for. The rate of equity capitalization will also increase with it. Thus there remains no benefit of leverage when debts are increased beyond a certain limit. The cost of capital also goes up.

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Thus at a definite level of mixture of debts to equity capital, average cost of capital also increases. The capital structure is optimum at this level of the mix of debts to equity capital.

The effect of change in capital structure on the overall cost of capital can be divided into three stages as follows;

First stage

In the first stage the overall cost of capital falls and the value of the firm increases with the increase in leverage. This leverage has beneficial effect as debts are less expensive. cost of equity remains constant or increases negligibly. The proportion of risk is less in such firm.

Figure - 3
Traditional Approach of CSM
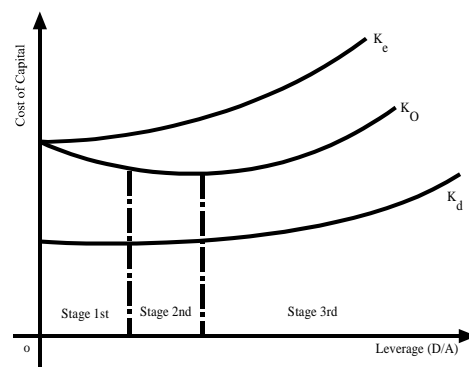
The

a

Second stage

A stage is reached when increase in leverage has no effect on the value or the cost of capital, of the firm. Neither the cost of capital falls nor the value of the firm rises. This is because the increase in the cost of equity due to the assed financial risk offsets the advantage of low cost debt. This is the stage wherein the value of the firm is maximum and cost of capital minimum.

Third stage

Beyond a definite limit of leverage the cost of capital increases with leverage and the value of the firm decreases with leverage. This is because with the increase in debts investors begin to realize the degree of financial risk and hence they desire to earn a higher rate of return on equity shares. The resultant increase in equity capitalization rate will more than offset the advantage of low-cost debt.

It follows that the cost of capital is a function of the degree of leverage. Hence, an optimum capital structure can be achieved by establishing an appropriate degree of leverage in capital structure.

D. Modigliani-Miller Approach

Modern capital structure theory began in 1958, when Italian born American Professor of Economics Franco Modigliani (1918 – 2003) and American Economist Merton Miller (1928 – 200) hereafter MM published what has been called the most influential finance article ever written. MM proved, under a very restrictive set of assumptions, that a firm's value is unaffected by its capital structure, and capital structure is irrelevant. However, MM's study was based on some unrealistic assumptions;

⟩ There are no brokerage costs.

⟩ There are no taxes.

⟩ There are no bankruptcy costs.

⟩ Investors can borrow at the same rate as corporations.

⟩ All investors have the same information as management about the firm's future investment opportunities.

⟩ EBIT is not affected by the use of debt.

Despite the fact that some of these assumptions are obviously unrealistic, MM's irrelevance result is extremely important. By indicating the conditions under which capital structure is irrelevant. MM also provided with clues about what is required for capital structure to be relevant and hence to affect a firm's value. MM's work marked the beginning of modern capital structure research, and subsequent research has focused on relaxing the MM assumptions in order to develop a more realistic theory of capital structure.

MODIGLIANI MILLER THEORY WITHOUT TAXES

M&M Proposition I

Before moving to the MM theory let's move to one interesting case of Yogi Berra which helps to understand MM theory: When a waitress asked Yogi Berra (Baseball Hall of Fame catcher for the New York Yankees) whether he wanted his pizza cut into four pieces or eight. Yogi replied, "Better make it four; I don't think I can eat eight."

Yogi's quip helps convey the basic insight of MM. The firm's choice of leverage "slices" the distribution of future cash flows in a way that is like slicing a pizza. MM recognize that if you fix a company's investment activities, it's like fixing the size of the pizza; no information

costs means that everyone sees the same pizza; no taxes means the IRS gets none of the pie; and no "contracting" costs means nothing sticks to the knife.

So, just as the substance of Yogi's meal is unaffected by whether the pizza is sliced into four pieces or eight, the economic substance of the firm is unaffected by whether the liability side of the balance sheet is sliced to include more or less debt under MM assumptions.

The MM as described on their proposition I that without taxes states that the overall value of the firm is not affected by the capital structure maintains by a firm. One way to illustrate MM proposition I is to imagine two firms that are identical on the left-hand side of the balance sheet. Their assets and operations are exactly the same. The right-hand sides are different because the two firms finance their operations differently. In this case, can view the capital structure question in terms of a "Pie" model. Why choosen this name is apparent from figure below gives two possible ways of cutting p the pie between the equity slice, *E*, and the debt slice, *D*: 30% - 70% and 70% - 30%. However, the size of the pie in figure is the same for both firms because the value of the assets is the same. This is precisely what MM proposition I states: The size of the pie doesn't depend on how it is sliced, how the debt and equity is structured in a corporation is irrelevant. The value of the firm is determined by Real Assets and not its capital structure

Figure - 4
Modigliani Miller Proposition I without taxes

M&M Proposition II

Although changing the capital structure of the firm does not change the firm's total value, it does cause important changes in the firm's debt and equity. Now examine what happens to a firm financed with debt and equity when the debt-equity ratio is changed. M&M Proposition II states that the value of the firm depends on three things:

1) Required rate of return on the firm's assets (R_a)

2) Cost of debt of the firm (R_d)

3) Debt/Equity ratio of the firm (D/E)

If you recall the tutorial on Weighted Average Cost of Capital (WACC), the formula for WACC is:

$$WACC = R_e \mid \frac{E}{V} \Gamma R_d \mid \frac{D}{V}$$

It can be manipulated and written in another form: $R_a = R_e \mid \frac{E}{V} \Gamma R_d \mid \frac{D}{V}$

The above formula can also be rewritten as: $R_e = R_a + (R_a - R_d) \times (D/E)$

Where,

R_e = Required rate of return on equity

R_d = Required rate of return on debt

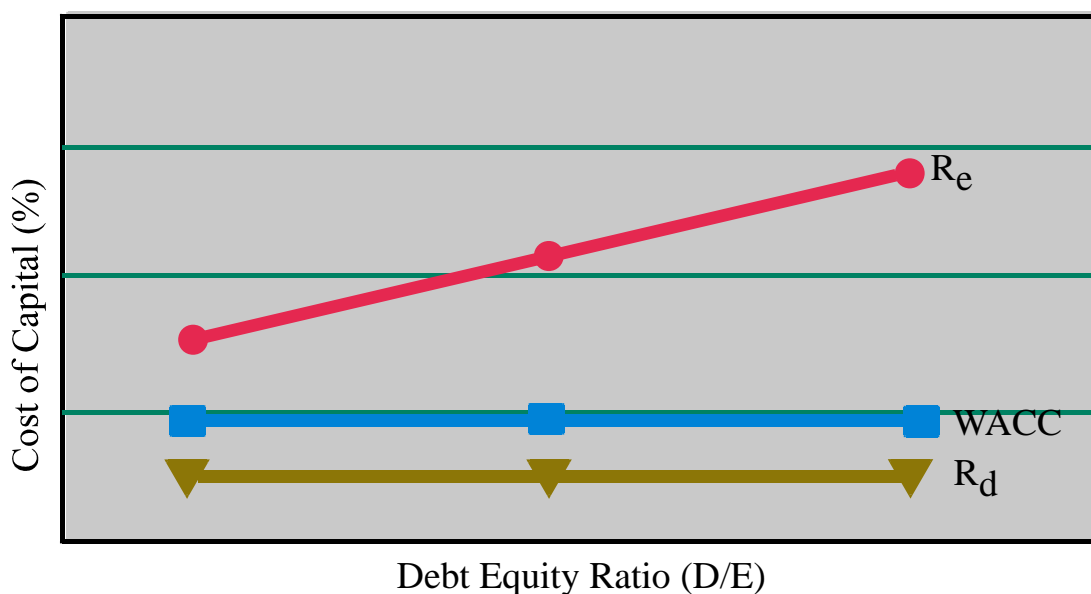R_a = Required rate of return on the firm's overall assets

E = Equity

D = Debt

V = Total value of the firm

This rewritten formula is what M&M Proposition II is all about. It can analyze this more clearly with the help of following graph:

Figure - 5
Modigliani Miller Proposition II without taxes

Cost of Capital (%)

R_e

WACC

R_d

Debt Equity Ratio (D/E)

In the above figure, x- axis represent Debt equity ratio and y-axis cost of capital. It is drawn the required rate of return on debt, equity and overall cost of capital on different levels of Debt equity ratio. It tells us that the Required Rate of Return on the firm (R_e) is a linear straight line with a slope of (R_a - R_d)

Why is R_e linear curved and upwards sloping? This is because as a company borrows more debt (and increases its Debt/Equity ratio), the risk of bankruptcy is even more higher. Since adding more debt is risky, the shareholders demand a higher rate of return (R_e) from the firm's business operations. This is why Re is upwards sloping: So, As Debt/Equity Ratio Increases, Re will Increase (upwards sloping).

Notice that the Weighted Average Cost of Capital (WACC) in the graph is a straight line with no slope. It therefore does not have any relationship with the Debt/Equity ratio. This is the basic identity of M &M Proposition I and II, that the capital structure of the firm does not affect its total value. WACC therefore remains the same even if the company borrows more debt (and increases its Debt/Equity ratio).

MODIGLIANI MILLER THEORY WITH TAXES

MM's original work, published in 1958, assumed zero taxes. In 1963, they published a second article that incorporated corporate taxes. With corporate income taxes, they concluded that leverage will increase a firm's value. This occurs because interest is a tax-deductible expense; hence more of leverage firm's operating income flows through to investors. Here are the MM propositions when corporations are subject to income taxes.

M&M Proposition I

The value of a levered firm is equal to the value of an unlevered firm in the same risk class (V_U) plus the gain from leverage. The gain from leverage is the value of the tax savings, found as the product of the corporate tax rate (T) times the amount of debt the firm uses (D):

$V_L = V_U + T \mid D$

The important point here is that when corporate taxes are introduced, the value of the levered firm exceeds that of the unlevered firm by the amount $T \mid D$. Since the gain from leverage increases as debt increases, in theory a firm's value is maximized at 100 percent debt financing because all cash flows are assumed to be perpetuities, the value of the unlevered

firm can be found by using equation below with zero debt, the value of the firm is its equity

value: $V_U = \dfrac{EBIT \, (1 - T)}{K_{eU}}$

M&M Proposition II

The cost of equity to a levered firm is equal to (i) the cost of equity to an unlevered firm in the same risk class plus (ii) a risk premium whose size depends on the differential between the costs of equity and debt to an unlevered firm, the amount of financial leverage used, and the corporate tax rate.
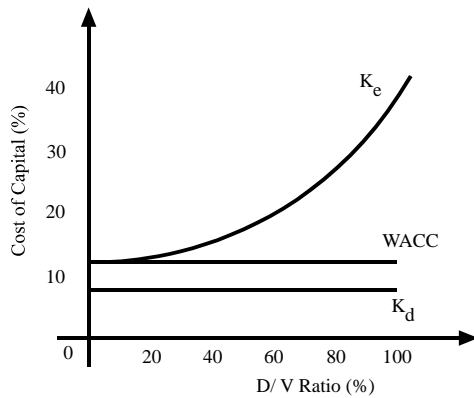
$$K_{eL} = K_{eU} + (K_{eU} - K_d)\,(1 - T)\,(D/S)$$

Note that the above equation given is identical to the corresponding without tax equation given in MM proposition II without taxes rewritten formula except for the term $(1 - T)$. Because $(1 - T)$ is less than 1, corporate taxes cause the cost of equity to rise less rapidly with leverage than it would in the absence of taxes. Proposition II, coupled with the fact that taxes reduce the effective cost of debt, is what produces the proposition I result, namely, that the firm's value increases as its leverage increases.
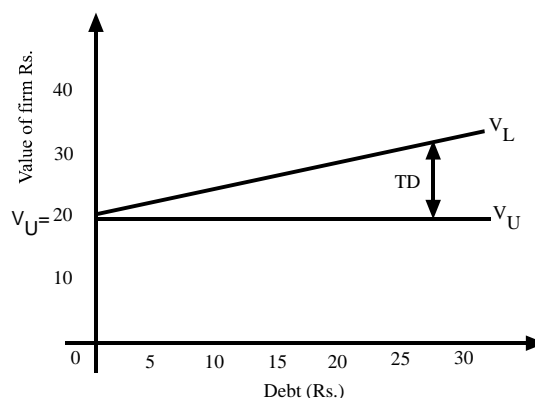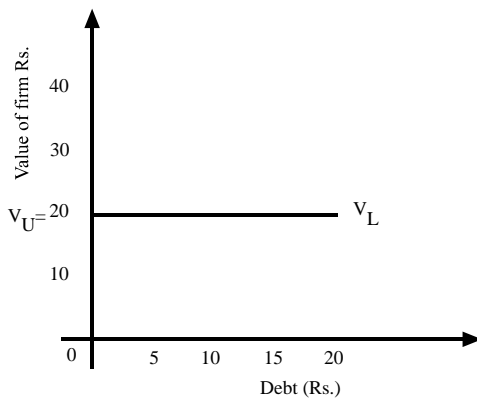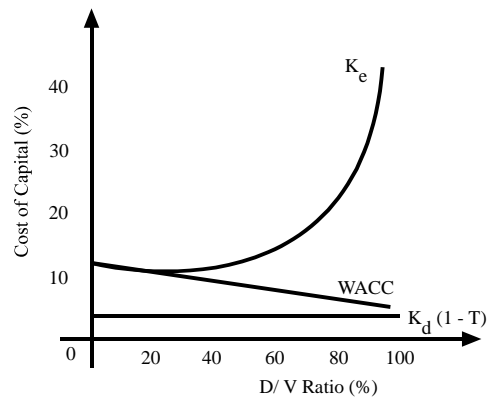
Figure - 6

Modigliani Miller Model with and without taxes

Pannel A: MM Model without taxes

Pannel B: MM Model with taxes

Cost of Capital (%)

40
30
20
10

0   20   40   60   80   100

K_e

WACC

K_d

D/ V Ratio (%)

Cost of Capital (%)

40
30
20
10

0   20   40   60   80   100

K_e

WACC

$K_d (1 - T)$

D/ V Ratio (%)

Value of firm Rs.

40
30
$V_U = 20$
10

0   5   10   15   20

V_L

Debt (Rs.)

Value of firm Rs.

40
30
$V_U = 20$
10

0   5   10   15   20   25   30

V_L

TD

V_U

Debt (Rs.)

2.2.1 Review of Books

THE HAMADA EQUATION

An increase in the debt ratio also increases the risk faced by shareholders, and this has an effect on the cost of equity, K_e. This relationship is harder to quantify, but it can be done. A stock's beta is the relevant measure of risk for diversified investors. Moreover, it has been demonstrated, both theoretically and empirically, that beta increases with financial leverage. Indeed, Robert Hamada developed the following equation to specify the effect of financial leverage on beta.

$$b = b_u \left[1 + (1 - T) (D/E) \right]$$

The Hamada equation shows how increase in the debt/ equity ratio increases beta. Here b_u is the firm's unlevered beta coefficient, that is, the beta it would have if it has no debt. In that case, beta would depend entirely upon business risk and thus be a measure of the firm's "basic business risk". D/E is the measure of financial leverage used in the Hamada Equation. Note that beta is the only variable under management's control in the cost of equity equation, $K_e = K_{rf} + [K_m - K_{rf}] b_i$. Both K_{rf} and K_m are determined by market forces that are beyond

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firm's control. However, b_i is determined (i) by the firm's operating decisions and (ii) by its capital structure decisions as reflected in its D/E ratio.

As a starting point, a firm can take its current beta, tax rate, and debt/ equity ratio and calculate its unlevered beta, b_u by simply transforming equation as follows:

$$b_u = \frac{b}{1 \Gamma (1 Z T)(D/E)}$$

Then, once b_u is determined, the Hamada Equation can be used to estimate how changes in debt/ equity ratio would affect the leveraged beta, b_i and thus the cost of equity K_e.

It can illustrate the procedure with example assuming that

Risk free rate of return $(K_{rf}) = 6\%$

Required rate of return on average stock $(K_m) = 10\%$

Unlevered beta $(b_u) = 1.5$

Now, with b_u, K_{rf}, and K_m specified it can use the CAPM to estimate how much market beta would rise if it began to use financial leverage, hence what its cost of equity would be at different capital structures. Currently based on above data current cost of equity is 12% as calculated below:

Risk premium $= K_m = K_{rf}$

$\qquad = 10\% - 6\%$

$\qquad = 4\%$

$K_e = K_{rf} +$ Risk premium

$\qquad = 6\% + 4\%$ | 1.5

$\qquad = 12\%$

The first 6% is the risk free rate, the second the risk premium. Because firm has currently uses no debt, it has no financial risk. Therefore, the 6 percent is risk premium reflects only its business risk.

If the firm changes its capital structure by adding debt, this would increase the risk stockholders bear. That, in turn, would result in an additional risk premium. Conceptually, this situation would exist:

$K_e = K_{rf} +$ Premium for business risk + Premium for financial risk

Figure - 7
The Hamada Model

The figure alongside describes the firm's required return on equity at different debt ratios. As the figure shows, K_e consists of 6% risk free rate, a constant 6% premium for business risk, and a premium for financial risk that starts at zero but rises at an increasing rate as debt ratio increases.
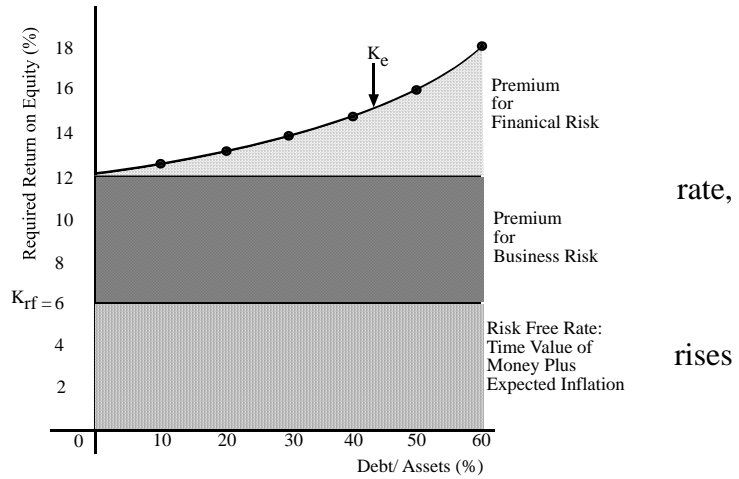

TRADE-OFF THEORY

The trade-off theory of leverage in which firms trade off the benefits of debt financing (favorable corporate tax treatment) against the higher interest rates and bankruptcy costs. A summary of the trade-off theory is expressed graphically in figure. Here are some observations about the figure:

The fact that interest is a deductible expense makes debt less expensive than common or preferred stock. In effect, the government pays part of the cost of debt capital, or, to put it another way, debt provides tax shelter benefits. As a result, using debt causes more of the firm's operating income (EBIT) to flow through to investors. Therefore, the more debt a company uses, the higher its value and stock price. Under the assumptions of the Modigliani-Miller with taxes paper, a firm's stock price will be maximized if it uses virtually 100 percent debt, and the line labeled "MM Result Incorporating the Effects of Corporate Taxation" in figure expresses the relationship between stock prices and debt under their assumptions.

In the real world, firms rarely use 100 percent debt. The primary reason is that firms limit their use of debt to hold down bankruptcy-related costs.

There is some threshold level of debt, labeled D_1 in figure, below which the probability of bankruptcy is so low as to be immaterial. Beyond D_1,

Figure - 8
Trade off theory of CSM

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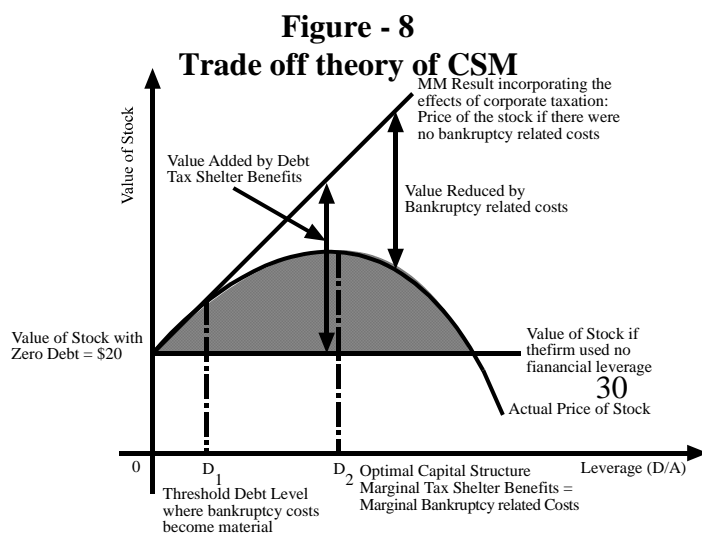
however, bankruptcy-related costs reduce but do not completely offset the tax benefits of debt, so the firm's stock price rises (but at a decreasing rate) as its debt ratio increases. However, beyond D_2 bankruptcy related costs exceed the tax benefits, so from this point on increasing the debt ratio lowers the value of the stock. Therefore, D_2 is the optimal capital structure. Of course, D_1 and D_2 vary from firm to firm, depending on their business risk and bankruptcy costs.

SIGNALING THEORY

MM assumed that investors have the same information about a firm's prospects as its managers- this is called symmetric information. However, in fact managers often have better information than outside investors. This is called asymmetric information, and it has an important effect on the optimal capital structure. To see why, consider two situations, one in which the company's managers know that its prospects are extremely favorable (Firm F) and one in which the managers know that the future looks unfavorable (Firm U).

Suppose, for example, that Firm F's Research & Development labs have just covered a non-patentable cure for the common cold. They want to keep the new product a secret along as possible to delay competitor's entry into the market. New plants must be built to make the new product, so capital must be raise. How should Firm F's management raise the needed capital? If the firm sells stock, then, when profits from the new product start flowing in, the price of the stock would rise sharply, and the purchasers of the new stock would make a bonanza. The current stockholders (including managers) would also do well, but not as well as they would have done if the company had not sold stock before the price increased, because then they would not have had to share the benefits of the new product with the new stockholders. Therefore, one would expect a firm with very favorable prospects to try to avoid selling stock and, rather, to raise any required new capital by other means, including using debt beyond the normal target capital structure.

Now let's consider Firm U. Suppose its managers have information that new orders are off sharply because a competitor has installed new technology that has improved its products' quality. Firm U must upgrade its own facilities, at a high cost, just to maintain its current sales. As a result, its return on investment will fall (but not by as much as if it took no action, which would lead to a 100% loss through bankruptcy). How should Firm U raise the needed capital? Here the situation is just the reverse of that facing Firm F, which did not want to sell

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stock so as to avoid having to share the benefits of future developments. A firm with unfavorable prospects would want to sell stock, which would mean bringing in new investors to share the losses.

The conclusion from all this is that firms with extremely bright prospects prefer not to finance through new stock offerings, whereas firms with poor prospects do like to finance with outside equity. How should you, as an investor, react to this conclusion? You ought to say, "If I see that a company plans to issue new stock, this should worry me because I know that management would not want to issue stock if future prospects looked good. However, management would want to issue stock if things looked bad. Therefore, I should lower my estimate of the firm's value, other things held constant, if it plans to issue new stock."

If you gave the above answer, your views are consistent with those of sophisticated portfolio managers of institutions such as Morgan Guaranty Trust, Prudential Insurance, and so forth. In a nutshell, the announcement of a stock offering is generally taken as a signal that the firm's prospects as seen by its management are not bright.

What are the implications of all this for capital structure decisions? Since issuing stock emits a negative signal and thus tends to depress the stock price, even if the company's prospects are bright, firms should, in normal times, maintain a reserve borrowing capacity that can be used in the event that some especially good investment opportunity comes along. This means firm should, in normal times, use more equity and less debt than is suggested by the tax benefit/ bankruptcy cost trade off model.
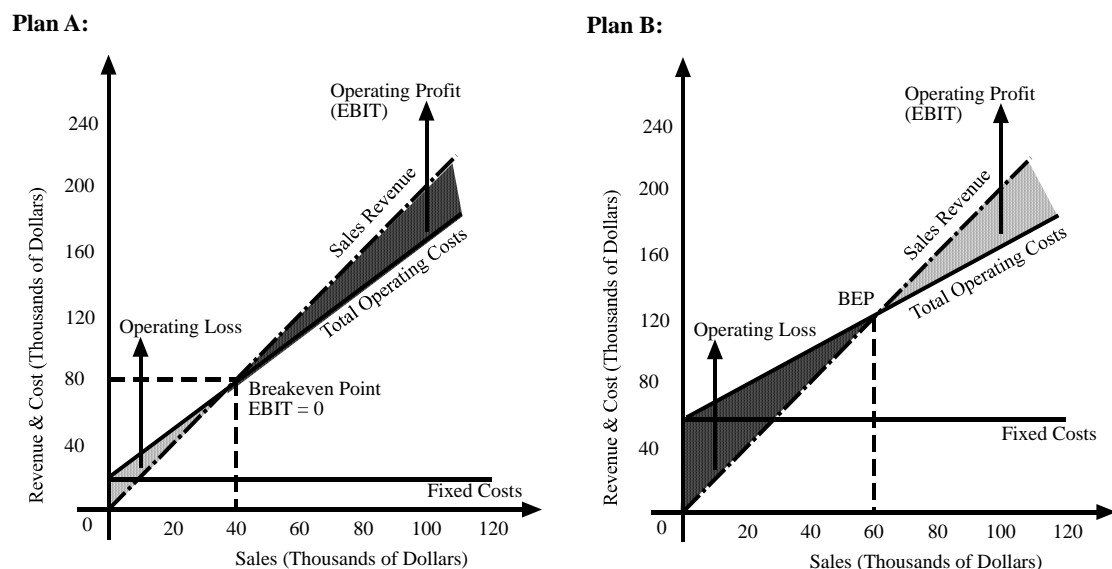
Operating Leverage

Other things held constant, the higher a firm's fixed costs, the greater its business risk. Higher fixed costs are generally associated with more highly automated, capital intensive firms and industries. However, businesses that employ highly skilled workers who must be retained and paid even during recessions also have relatively high fixed costs, as do firms with high product development costs, because the amortization of development costs is an element of fixed costs.

If a high percentage of total costs are fixed, then the firm is said to have a high degree of operating leverage. In business terminology, a high degree of operating leverage, other factors held constant, implies that a relatively small change in sales results in a large change in ROE.

Figure illustrates the concept of operating leverage by comparing the results that firm could expect if it used different degrees of operating leverage. Plan A calls for a relatively small amount of fixed costs, $20,000. Here the firm would not have much automated equipment, so its depreciation, maintenance, property taxed, and so on would be low. However, the total operating costs line has a relatively steep slope, indicating that

Figure - 9
Degree of Operating Leverage

variable costs per unit are higher than they would be if the firm used more operating leverage. Plan B calls for a higher level of fixed costs, $60,000. Here the firm uses automated equipment to a much larger extent. The breakeven point is higher under Plan B 60,000 units versus only 40,000 units under Plan A.

One can calculate the breakeven quantity by recognizing that operating breakeven occurs when ROE = 0, hence when earnings before interest and taxes (EBIT) = 0.

EBIT = PQ – VO – F = 0

Here P is average sales price per unit of output, Q is units of output, V is variable cost per unit, and F is fixed operating costs. If solve for the breakeven quantity, Q_{BE}, can obtain this expression:

$$Q_{BE} \, X \frac{F}{P \, ZV}$$

Thus for Plan A,   Plan B

$$Q_{BE} \, X \frac{\$20,000}{\$2.00 \, Z\$1.50} = 40,000 \text{ units} \qquad Q_{BE} \, X \frac{\$60,000}{\$2.00 \, Z\$1.00} = 60,000 \text{ units}$$

How does operating leverage affect business risk? Other things held constant, the higher a firm's operating leverage, the higher its business risk. This point is demonstrated in figure, where probability distributions for ROE under Plans A and B.

Financial Risk

Financial risk is the additional risk placed on the common stockholders as a result of the decision to finance with debt. Conceptually, stockholders face a certain amount of risk that is inherent in a firm's operations – this is its business risk, which is defined as the uncertainty inherent in projections of future operating income. If a firm uses debt (financial leverage), this concentrates the business risk on common stockholders. To illustrate, suppose ten people decide to form a corporation to manufacture disk drives. There is a certain amount of business risk in the operation. If the firm is capitalized only with common equity, and if each person buys 10 percent of the stock, then each investor shares equally in the business risk. However, suppose the firm is capitalized with 50 percent debt and 50 percent equity, with five of the investors putting up their capital as debt and the other five putting up their money as equity. In this case, the five investors who put up the equity will have to bear all of the business risk, so the common stock will be twice as risky as it would have been had the firm been financed only with equity. Thus, the use of debt, or financial leverage, concentrates the firm's business risk on its stockholders. This concentration of business risk occurs because debt holders, who receive fixed interest payments, bear none of the business risk.

2.2.2 Review of Articles

Binsbergen, Graham & Yang published an article in the journal of applied corporate finance titled "An Empirical Model of Optimal Capital Structure". The summary of the journal can be cited as here: The authors provide a reasonably user-friendly and intuitive model for arriving at a company's optimal, or value-maximizing, leverage ratio that is based on the estimation of company-specific cost and benefit functions for debt financing. The benefit functions are downward-sloping, reflecting the drop in the incremental value of debt with increases in the amount used. The cost functions are upward-sloping, reflecting the increase in costs associated with increases in leverage. The cost functions vary among companies in ways that reflect differences in corporate characteristics such as size, profitability, dividend policy, book-to-market ratio, and asset collateral and redeploy ability.

The authors use these cost and benefit functions to produce an estimate of a company's optimal amount of debt. Just as equilibrium in economics textbooks occurs where supply equals demand, optimal capital structure occurs at the point where the marginal benefit of debt equals the marginal cost. The article illustrates optimal debt choices for companies such as Barnes & Noble, Coca-Cola, Six Flags, and Performance Food Group. The authors also estimate the net benefit of debt usage (in terms of the increase in firm or enterprise value) for companies that are optimally levered, as well as the net cost of being underleveraged for companies with too little debt, and the cost of overleveraging for companies with too much. One critical insight of the model is that the costs associated with overleveraging appear to be significantly higher, at least for some companies, than the costs of being underleveraged.

The review of the journal American Banker is conducted during the literature review period for the thesis. Thomas W. Killian on September 1, 2005 opined in the publication titled "Designing an [Optimal] Capital Structure" that: A number of developments in the past few years have dramatically changed the framework for evaluating capital structure alternatives for U.S. insured depository institutions of all sizes. Most recently, Basel II will permit large, internationally active banks to allocate capital based on a sophisticated assessment of their credit, operating and interest-rate risk rather than assets outstanding.

Executives and boards of directors at non-Basel II-adopting banks should focus on designing an optimal capital structure that provides a cost-effective way to structure Tier 1 capital to lower the weighted average cost of such capital, and help offset some of the competitive advantage Basel II-adopting banks will have. To do this effectively, non-Basel II-adopting banks need a new framework for developing an optimal capital structure, as traditional corporate finance theories, including the Modigliani Miller theorem, are not particularly helpful for evaluating capital structures for insured depository institutions.

This new framework addresses the four central questions surrounding optimal capital structure for bank holding firms: What form of capital should be issued? What is the optimal amount of each type of capital to be issued? How should the capital be issued? And how can non-Basel II banks use capital structure to level the competitive playing field with Basel II adopters?

The type of capital to be issued is very much a function of matching capital needs with the type of capital that most efficiently and cost effectively meets those needs. In addition to meeting key objectives by matching needs with types of capital, another key determinant is the after-tax coupon cost of the capital. This is reasonably straightforward for capital instruments that have a stated coupon payment, since this payment is a function of the size and financial strength of the paying institution.

The determination of the after-tax cost of equity, however, is a bit more challenging. While there are many ways to estimate this figure, three of the most frequently used are the capital asset pricing model, normalized return on equity, and dividend growth methods. In fact, the Federal Reserve uses versions of these three methods to determine the cost of equity when estimating reimbursement of cost of capital amounts for services provided to the Fed.

The most traditional, and widely accepted, academic approach of the three is the CAPM, which states that the cost of equity is equal to the risk-free rate plus a market-risk premium adjusted for the volatility of a particular company relative to the market. As of April, the CAPM cost of equity was about 10.26 percent.

The normalized return on equity method, otherwise known as the comparable-accounting earnings model, is a more practical way to evaluate the implied cost of equity. This approach simply uses the bank's targeted level of ROE as a proxy for the bank's after-tax cost of equity, with the reasoning that every dollar of equity invested has to yield that threshold amount, lest the targeted ROE decline. As of April, and based on the median return on average equity for more than 800 banks with assets of between $100 million and $10 billion, the cost of equity using this method approximated 11.25 percent.

The dividend growth method, otherwise known as the Gordon growth model, is yet another way of estimating the implied cost of equity based on a future series of dividends that grow at a constant rate. This method uses the current dividend yield on the common stock and the expected growth rate in earnings per share. For those banks not paying a dividend, this approach is obviously less helpful in determining an implied cost of equity. As of April, and based on the median dividend yield and growth rate. cost of equity using this method approximated 13.12 percent.

Based on the three methods described above, the after-tax cost of equity ranges from 10.26 percent to more than 13 percent. In this analysis, an assumption of 12 percent was used as a proxy for the after-tax cost of equity for depository financial institutions.

The two most important steps in answering the question of the optimal amount of each type of capital to be issued are to examine the key components of current regulatory capital guidelines and then minimize the weighted average cost of Tier 1 capital. Since trust preferred securities represent the lowest after-tax cost of Tier 1 capital, the optimal amount of such capital would seem to be the maximum amount that an issuer would be permitted to count as Tier 1 capital. However, the analysis is more complicated because for Tier 1 capital calculation purposes.

Since trust preferred represents the lowest after-tax cost form of Tier 1 capital and the permitted issuance amount is limited to 25 percent of core capital elements, the optimal amount to issue may be simplified as (1/3) x core capital elements. Similarly, since non-cumulative perpetual preferred represents the next lowest cost form of Tier 1 capital, the calculation for the optimal amount may be simplified as non-cumulative perpetual preferred = (1/4) x (common equity + goodwill - deferred tax liability). By combining this framework for amounts of each type of capital with a calculation of the after-tax coupon cost and after-tax cost of equity, small- and mid-sized banks can develop an optimal capital mix that results in a lower weighted average cost of Tier 1 capital. By lowering the weighted average while complying with the Fed's capital rules to remain well-capitalized, a banking company can increase its competitiveness and the value of cash flow available to shareholders.

In issuing subordinate debt, trust preferred or non-cumulative perpetual preferred stock, there are three primary forms of market access for financial institutions to raise capital: public market, pooled market and private market.

Public-market access is generally only available to issuers with asset sizes greater than $5 billion, securities ratings of at least investment grade BBB- and at least five years or more of satisfactory operating experience. Consequently, the pooled market has rapidly emerged as the preferred option for middle-market banks-those with between $100 million and $5 billion in assets. This market is generally available to issuers with investment-grade financial strength ratings and at least four to five years of satisfactory operating history. For those

issuers that require a rapid turnaround, have less than $100 million in assets, or insufficient operating history or financial results, the private market can be an attractive alternative.

Large, internationally active bank holding companies that adopt Basel II, and lower their risk-weighting of assets accordingly, can potentially gain a pricing advantage over non-adopting banks. With the adoption of Basel II on the horizon, the time for small to mid-sized bank executives and boards of directors to develop optimal capital structures is now. Clearly, the ACB and the ICBA are very concerned about the competitive landscape, given their testimony on the potential anti-competitive impact of Basel II. It is now critically important that all bankers understand the linkage between weighted average cost of capital and risk-based capital ratio, and also realize the opportunity to enhance competitiveness with optimal capital management.

Large banks historically have had more options at their disposal than small and mid-sized banks in developing optimal capital structures, but thankfully this is changing. Mid-sized banks, for example, now can use the pooled market for trust preferred securities or the recently developed pooled market for non-cumulative perpetual preferred securities. By carefully selecting the appropriate mix of trust preferred, non-cumulative perpetual preferred and common stock, a financial institution can lower its weighted average cost of Tier 1 capital and, as a result, increase its franchise valuation. Surely, this is something all constituents of bank holding companies-from executives and shareholders to regulators-should and will welcome.

In this paper, The Journal of Nepalese Business Studies Vol. I Number 1 Dec 2004 issue associate professor Dr. Keshar J. Baral has wrote an article entitled "Determinants of Capital structure: A Case Study of Listed Companies of Nepal". An attempt has been made to examine the determinants of capital structure -size, business risk, growth rate, earning rate, dividend payout, debt service capacity, and degree of operating leverage-of the companies listed to Nepal Stock Exchange Ltd. as of July 16, 2003. Eight variables multiple regression model has been used to assess the influence of defined explanatory variables on capital structure. In the preliminary analysis, manufacturing companies, commercial banks, insurance companies, and finance companies were included. However, due to the unusual sign problem in the constant term of the model, manufacturing companies were excluded in

final analysis. This study shows that size, growth rate and earning rate are statistically significant determinants of capital structure of the listed companies.

In Finance, the most debatable topic is capital structure. The main issue of debate revolves around the optimal capital structure. There are two schools of thought in this regard. One school pleads for optimal capital structure and other does against it. Former school argues that judicious mixture of debt and equity capital can minimize the overall cost of capital and maximize the value of the firm. Hence, this school considers capital structure decision as relevant. Latter school of thought led by Modigliani and Miller contends that financing decision does not affect the value of the firm. Since value of the firm depends on the underlying profitability and risk of investment (Van Horne 2002). In this study, determinants of capital structure in Nepalese context are examined with reference to capital structure theories.

Out of seven examined explanatory variables-size, business risk, growth, earning rate, dividend payout, debt service capacity and degree of operating leverage, three–size, growth and earning rate-are statistically significant determinants of financial leverage. Beta coefficients associated with corporate size, corporate growth and earning rate are statistically significant at .01 level. These variables explain around 72% of variation in financial leverage. The remaining variables incorporated in the model explain only 5% of the variation. These facts conclude that corporate size, growth rate, and profitability play a major role in determination of the financial leverage in financial institutions; and business risk, dividend payout ratio, debt service capacity, and degree of operating leverage do a dismal role. Further, statistically insignificant coefficients associated with business risk, and debt service capacity; and significant coefficient associated with size, and growth imply that financial institutions do not care of their debt service capacity but do care of the expansion of their business. This may, if not monitored by concerned authority properly and timely, invite the crisis in financial sector in future.

Milken (2009) opines in his article entitled "Why Capital Structure Matters: Companies that repurchased stock two years ago are in a world of hurt." 35 years ago business publications were writing that major money-center banks would fail, and quoted investors who said, "I'll never own a stock again!" Meanwhile, some state and local governments as well as utilities

seemed on the brink of collapse. Corporate debt often sold for pennies on the dollar while profitable, growing companies were starved for capital.

If that all sounds familiar today, it's worth remembering that 1974 was also a turning point. With financial institutions weakened by the recession, public and private markets began displacing banks as the source of most corporate financing. Bonds rallied strongly in 1975-76, providing underpinning for the stock market, which rose 75%. Some high-yield funds achieved unleveraged, two-year rates of return approaching 100%.

The accessibility of capital markets has grown continuously since 1974. Businesses are not as dependent on banks, which now own less than a third of the loans they originate. In the first quarter of 2009, many corporations took advantage of low absolute levels of interest rates to raise $840 billion in the global bond market. Just as in the 1974 recession, investment-grade companies have started to reliquify. Once that happens, the market begins to open for lower-rated bonds. Thus BB- and B-rated corporations are now raising capital through new issues of equity, debt and convertibles.

The late Nobel laureate Merton Miller and I, although good friends, long debated whether this kind of capital-structure management is an essential job of corporate leaders. Miller believed that capital structure was not important in valuing a company's securities or the risk of investing in them.

My belief -- first stated 40 years ago in a graduate thesis and later confirmed by experience -- is that capital structure significantly affects both value and risk. The optimal capital structure evolves constantly, and successful corporate leaders must constantly consider six factors:

a) The company and its management
b) Industry dynamics
c) The state of capital markets
d) The economy
e) Government regulation
f) Social trends.

When these six factors indicate rising business risk, even a dollar of debt may be too much for some companies.

Over the past four decades, many companies have struggled with the wrong capital structures. During cycles of credit expansion, companies have often failed to build enough liquidity to survive the inevitable contractions. Especially vulnerable are enterprises with unpredictable revenue streams that end up with too much debt during business slowdowns. It happened 40 years ago, it happened 20 years ago, and it's happening again.

Issuing new equity can of course depress a stock's value in two ways: It increases the supply, thus lowering the price; and it "signals" that management thinks the stock price is high relative to its true value. Conversely, a company that repurchases some of its own stock signals an undervalued stock. Buying stock back, the theory goes, will reduce the supply and increase the price. Dozens of finance students have earned Ph.D.s by describing such signaling dynamics. But history has shown that both theories about lowering and raising stock prices are wrong with regard to deleveraging by companies that are seen as credit risks.

Two recent examples are Alcoa and Johnson Controls each of which saw its stock price increase sharply after a new equity issue last month. This has happened repeatedly over the past 40 years. When a company uses the proceeds from issuance of stock or an equity-linked security to deleverage by paying off debt, the perception of credit risk declines, and the stock price generally rises. The decision to increase or decrease leverage depends on market conditions and investors' receptivity to debt. The period from the late-1970s to the mid-1980s generally favored debt financing. Then, in the late '80s, equity market values rose above the replacement costs of such balance-sheet assets as plants and equipment for the first time in 15 years. It was a signal to deleverage.

The current recession started in real estate, just as in 1974. Back then, many real-estate investment trusts lost as much as 90% of their value in less than a year because they were too highly leveraged and too dependent on commercial paper at a time when interest rates were doubling. This time around it was a combination of excessive leverage in real-estate-related financial instruments, a serious lowering of underwriting standards, and ratings that bore little relationship to reality. The experience of both periods highlights two fallacies that seem to recur in 20-year cycles: that any loan to real estate is a good loan, and that property values always rise. Fact: Over the past 120 years, home prices have declined about 40% of the time.

History isn't a sine wave of endlessly repeated patterns. It's more like a helix that brings similar events around in a different orbit. But what we see today does echo the 1970s, as

companies use the capital markets to push out debt maturities and pay off loans. That gives them breathing room and provides hope that history will repeat itself in a strong economic recovery.

It doesn't matter whether a company is big or small. Capital structure matters. It always has and always will.

An article by Joshua Kennon entitled "The Three Primary Types of Financial Capital" provides the three different sources of capital and its advantages. The summary of the article is cited as follows:

There are three categories of financial capital that are important for you to know when analyzing your business or a potential investment. They each have their own benefits and characteristics.

A. Equity Capital

Otherwise known as "net worth" or "book value", this figure represents assets minus liabilities. There are some businesses that are funded entirely with equity capital (cash written by the shareholders or owners into the company that have no offsetting liabilities.) Although it is the favored form for most people because you cannot go bankrupt, it can be extraordinarily expensive and require massive amounts of work to grow your enterprise. Microsoft is an example of such an operation because it generates high enough returns to justify a pure equity capital structure.

B. Debt Capital

This type of capital is infused into a business with the understanding that it must be paid back at a predetermined future date. In the meantime, the owner of the capital (typically a bank, bondholders, or a wealthy individual), agree to accept interest in exchange for you using their money. Think of interest expense as the cost of "renting" the capital to expand your business; it is often known as the cost of capital. For many young businesses, debt can be the easiest way to expand because it is relatively easy to access and is understood by the average American worker thanks to widespread home ownership and the community-based nature of banks. The profits for the owners is the difference between the return on capital and the cost of capital; for example, if you borrow $100,000 and pay 10% interest yet earn 15% after taxes, the profit of 5%, or $5,000, would not have existed without the debt capital infused into the business.

C. Specialty Capital

This is the gold standard. There are a few sources of capital that have almost no economic cost and can take the limits off of growth. They include things such as a negative cash conversion cycle (vendor financing), insurance float, etc.

) **Negative Cash Conversion (Vendor Financing):**

Imagine you own a retail store. To expand your business, you need $1 million in capital to open a new location. Most of this is the result of needing to go out, buy your inventory, and stock your shelves with merchandise. You wait and hope that one day customers come in and pay you. In the meantime, you have capital tied up in the business in the form of inventory.

Now, imagine if you could get your customers to pay you before you had to pay for your merchandise. This would allow you to carry far more merchandise than your capitalization structure would otherwise allow. AutoZone is a great example; it has convinced its vendors to put their products on its shelves and retain ownership until the moment that a customer walks up to the front of one of AutoZone's stores and pays for the goods. At that precise second, the vendor sells it to AutoZone which in turn sells it to the customer. This allows them to expand far more rapidly and return more money to the owners of the business in the form of share repurchases (cash dividends would also be an option) because they don't have to tie up hundreds of millions of dollars in inventory. In the meantime, the increased cash in the business as a result of more favorable vendor terms and / or getting your customers to pay you sooner allows you to generate more income than your equity or debt.

) **Float**

Insurance companies that collect money and can generate income by investing the funds before paying it them out in the future in the form of policyholder payouts when a car is damaged, or replacing a home when destroyed in a tornado, are in a very good place. As Buffett describes it, float is money that a company holds but does not own. It has all of the benefits of debt but none of the drawbacks; the most important consideration is the cost of capital – that is, how much money it costs the owners of a business to generate float. In exceptional cases, the cost can actually be negative; that is, you are paid to invest other people's money plus you get to keep the income from the investments.

(Source: http://beginnersinvest.about.com)

2.2.3 Review of Thesis

Yadav S. (2007) in his thesis entitled "The Capital Structure Management of Buddha Air Private Limited" states objectives of the study are to analyze and examine the capital structure of Buddha Air Private Limited, analyze trading on equity, find out the profitability position, analyze the assets utilization. The study mainly used secondary data for the analysis. The methodology used includes financial tools such as Ratio Analysis and Statistical tools such as Correlation Co-efficient and Probable Error. The study has found that Buddha Air is very highly levered. Debt capital is proportionately higher than the equity capital. This higher debt capital is a serious implication from the firm's point of view. In this condition, the capital structure will lead to inflexibility in the operation of the firm as creditors would exercise pressure and interfere with management. Buddha Air has raised debt from different commercial banks and has to pay heavy portion of profit as interest, so the payment of the interest will be hazardous when profit is declining. So, it is suggested that Buddha Air Private Limited should decrease its debt capital as far as possible, and company should increase the equity proportion in financing its assets to be in a safe mode against liquidation.

Ghimire C. (2007) in her thesis entitled "A study on Capital Structure Management on Commercial Banks of Nepal (special reference to EBL, NIBL, and HBL)" states basic objective of the study made by Mr. Chandra Ghimire was to analyze the capital structure in terms of debts to shareholders equity, total debts to total assets, interest coverage, return on capital employed, and return on shareholder's equity of selected commercial banks and provide suggestions to overcome various issues and gaps.

The study used primary data as well as secondary data for the analysis. And the study has used Financial Tools such as Ratio Analysis, EBIT- EPS Analysis, overall capitalization rate, equity capitalization rate, total value calculation etc. and Statistical Tools such as Karl Pearson's correlation coefficient and probable errors.

The study concluded that all the commercial banks are using high percentage of total debt in raising the assets and all the banks are able to pay interest. The study suggested that the bank must reduce the level of debt by increasing equity level future years to compensate the capital of debt. And Nepal Investment Bank Ltd. must reduce its debt level for procurement of the assets. It is also suggested to bear low risk so that additional return on capital and equity could be realized. This is essential from investor attraction point of view. The bank needs to

reduce its higher operational expenses and control fluctuations in the earnings per share (EPS) to improve its market price per share.

Shakya P. (2006) on her thesis entitled "a study on Capital Structure of Nepalese Commercial Banks (with special reference to Bank Of Kathmandu Ltd., Nepal Investment Bank Ltd. and HBL)" was to analyze the interrelationship of capital structure with various important variables such as earning per share, dividend per share and net worth of the commercial banks and to provide suggestions to overcome various issues and gaps.

The study used primary data as well as secondary data. It used Financial Tool ratio analysis and Statistical Tools Karl Pearson's correlation coefficient and probable errors. The study concluded that all of the sample banks have fluctuating trend of long term debt to total debt ratio. All the sample banks do not have appropriate ratio of long term debt to capital employed and all the samples banks are able to cover the interest but as higher interest coverage ratio is better. The study suggested that the banks should follow the theoretical aspects of the capital structure management or give a bit more attention in this matter and try to manage the activities accordingly. All these banks should plan their capital structure well analyzing the possible financial alternatives considering high return and least risk. And the banks should minimize the financial and other expenses so the interest coverage ratio could be increased. Researcher recommended to use less cost debt, improve strategy of promotion activities, analyze and evaluate before making investments, and to increase the return and decrease risk.

Malik A. (2009) on her thesis "Capital Structure Management in Nepal with reference with Nabil, NIBL, NTC, NEA and HGICL" was prepared with the objectives of analyzing the return on equity and assets, value of the firm, relation between assets and liability etc. It has used secondary data for the study covering the 5 years period from F.Y 2003 to 2007. It has used financial tool ratio analysis and statistical tools correlation, trend analysis and regression analysis for drawing the conclusion of the study.
The profit trend of the NTC is found in increasing trend which is followed by Nabil and NIBL too. On the other hand, NEA is in heavy loss trend with HGICL declining profit trend. Correlation between deposit and credit of banks seems to be approximately +1 whereas of NEA and NTC is approximately -1 and researcher has not disclosed of HGICL. Similarly, the values of the firms are highest of NTC and followed by NEA, Nabil, NIBL and HGICL.

Return on capital employed is satisfactory of all selected samples as well as return on shareholders' equity. On the same way other ratios calculated are also found satisfactory.

It discovered that the firms are using more debt and recommended to acquire optimal level of capital structure. NEA has negative degree of financial leverage due to heavy losses it has occurred and high level of fixed costs in comparison to others and need to seek for profit for long run survive as well as sound financial plan. Last but not the least it has disclosed that the firms have not considered the capital structure decisions which ultimately leads to the increase in the value of the firm.

Even though the study tried a lot to discover the facts related to the capital structure and its importance using different tools, the study failed to match the study with its objectives mentioned in the thesis. The conclusion of the study is not drawn whereas findings of the study are not able to relate the objectives. It has well reviewed the literature but still it failed to formulate the proper research design which helps to guide the study in shaping the study with objectives of the thesis.

Kandel U. (2008) entitled "A comparative analysis of capital structure of commercial banks with reference to HBL and BOK" with a long history of banking world as well as Nepal formulated the objectives of the study as to evaluate the role of capital structure on growth of commercial banks in Nepal, examine present capital structure of commercial banks of Nepal and to state a relationship of capital structure with EPS, DPS and net worth. Out of 25 listed commercial banks of Nepal, 2 banks are selected as samples for the study and study is based on cent percent secondary data of the sample banks. With well research design it focused on the various tools such as ratio analysis, leverage analysis, traditional analysis, capital structure analysis and MM analysis on the study.

From the study it was found that the commercial banks of Nepal are not using large portion of debt in their capital structure which is shown by finding of the study the long term debt to total assets ratio 0.046 of HBL and 0.060 of BOK in average and its interest coverage ratio is satisfactory. The return on shareholders' equity of HBL is 22% and 21% of BOK which is good indication and EPS of Rs.53.26 HBL and Rs.32.50 also shows the same. It has tried to test the MM proposition that value of firm is affected by the use of debt in capital structure by using MM model which has given mixed result that increase in debt causes increase in value

of firm in some years whereas in some years increase in debt caused decrease in value of the firm. On the correlation analysis it found the relation between long term debt and EPS is insignificant but the relationship between EBIT and DPS is significant.

Researcher recommends having knowledge on capital structure and minimizing risk of the shareholders' even though they are having high return in present policy. The thesis mentioned lots of tools for analysis on research design but fail to use them on thesis whereas the conclusion on relevant or irrelevant of capital structure on value of firm is still not able to find. The findings of the thesis will be difficult to indicated for the whole commercial banks of Nepal as the thesis title suggest because the sample size is not sufficient which represent only 8% of the total population which is so much far below the total population.

Shrestha C. (2010) entitled "A study on Capital Structure Management of listed manufacturing companies with special reference to JSML, BNL, NLOL and NLL" MBS thesis submitted in Khwopa College prepares her undergoing thesis subject capital structure management of listed manufacturing companies. The thesis is prepared with the main objective to know the existing capital structure of manufacturing companies optimal or not with other objective to analyze the cost of capital and profitability and access the debt servicing capacity of the selected Nepalese manufacturing companies. With the help of secondary data of selected samples using the ratio analysis, correlation and regression analysis tried to draw the conclusion according to her research design describes.

She has concluded the thesis with the major findings that the listed manufacturing industries have in an average positive degree of operating leverage as well as financial leverages. Some manufacturing industries found to be used 82.82% long term debt and some haven't at all. The calculation of profit margin ratio found out that less than 5% only in average profit is making according to the sample study of four manufacturing companies of Nepal taken for study. Due to high use of leverage the EPS also not satisfactory and book value per share of these industries is less than their face value. Only negligible companies are distributing dividend on irregular basis but most of haven't given dividend since a long time. In the correlation and regression analysis also found similar results indicating the need of restructure of capital of the manufacturing industries and need of proper management system to let survive the existing manufacturing industries of Nepal except some of can be counted in fingers.

2.3 Research Gap

Research gap is the deviation in the researches. During literature review, it found very few Number of thesis prepared on the topic optimal capital structure analysis. But large number of other thesis is found on similar topic related to study. Still the researcher has selected the topic optimal capital structure analysis in order to clear concept of capital structure and optimal capital structure. Researcher believes to do additional study & research in the area of study with additional features that makes the researcher's work unique and different from prior thesis conducted on the similar topics. In the previous thesis most of the thesis is prepared on capital structure management with no unique objectives, applying same methods, & twins types. It found most of the thesis has just replaced some of the words and no any specific additional features performed by researchers.

Due to the following research gap in the previous researches, the researcher has attempted to perform additional research on the topic optimal capital structure management.

a) The prior thesis presented simply the numerical figures. There were not any analysis of researcher on the reason and solution for the problem.

b) There was no single thesis related to the study of optimal capital structure management of JVCBs of Nepal even though it found lots of thesis on the similar topic capital structure management for different sectors besides JVCBs of Nepal.

c) The copy paste trend of thesis preparation. No self creativity on mimicry and dumping.

CHAPTER III
RESEARCH METHODOLOGY

This chapter deals about research methodology which is used for research purpose. Research is a system enquiry for seeking facts and methodology is the method of doing research in well manner. So, research methodology means the analysis of specific topic by using proper method.

The term research methodology refers to the various segmental steps to be adopted by a researcher in studying a problem with certain objectives in a view. It describes the methods and process applied in the entire aspect of study. This process of investigation involves a series of well thought out activities of gathering, recording, analyzing and interpreting the data with the purpose of finding answers to the problem. Thus the entire process by which attempt to solve problems is called research.

"This process of investigation involves a series of well thought out activities of gathering, recording, analyzing and interpreting the data with the purpose of finding answers to the problem. Thus the entire process by which we attempt to solve problems is called research." (Wolff and Pant, 2000)

It is significant to have appropriate choice of research methodology that helps to make the research study meaningful and more scientific. Therefore, appropriate methodology has been followed to meet the objectives of the study. So, the methodologies of this research include the research design, research question, period covered, selection of enterprises, types and sources of data, data processing procedures, presentation of data and method of analysis.

3.1 Research Design

The term "research" refers to the systematic and organized effort to investigate a specific problem that needs a solution. "Design" means planning to carry out investigation conceived to obtain an answer to research question. Thus research design is a plan, structure and strategy of investigation conceived to obtain possible solution to the research problem in one's area of study.

Selection of appropriate research design is necessary to meet the study objectives. The main objective of the study is to analyze existing capital structure of the selected sample JVCBs of Nepal and determining optimal capital structure level. It emphasizes on descriptive plus analytical study of collected data of Profit & Loss Account and Balance Sheet over the period of time from different sources. Comparatively this study has been designed as a descriptive cum analytical design. This study is concluded with the measurable suggestion to strengthen or improve performance of the organization through maintaining the optimal level of capital structure.

3.2 Sources of Data

The research needs data to draw its conclusion regarding objectives of study. The data may be qualitative or quantitative. Generally the quantitative data give clear information for the conclusion drawn from the study rather than qualitative data. Quantitative data are based on arithmetical figures so that they give clear and true information. Either qualitative or quantitative data that needed to be collected for any research study which can be gathered through either primary source or secondary source.

The primary source is the first hand data that is directly collected by researcher using own skill and different techniques of data collection method. It needs lots of time and dedication to collect primary data. On the other hand, secondary source is the 2nd hand data that are collected by others besides the researcher related to research study.

Mainly, the study is conducted on the basis of secondary data. The required data are extracted from balance sheets, profit and loss accounts and different financial schedules of sample banks' annual reports, websites. Other supplementary data are collected from a number of institutions and regulation authorities like Nepal Rastra Bank, Nepal Stock Exchange Ltd., security exchange board, etc. and from related websites. The research study is based on the past 5 years (F.Y 2006 to 2010) data of the sample banks provided on their annual reports and websites.

3.3 Population and Sample

Population here means set of data consisting of all conceivable observations of a certain phenomenon. The total number of observations that comes under the research study is called population. Generally population will be large and study of whole population will be almost

all impossible such as checking the blood where to take all and test that is impossible. So that it is use to take some samples only of the population that represent the whole population and study will be fast and easy. In this research study the population represents the total number of joint venture commercial banks operating in Nepal till date. The total number of joint venture commercial banks operating in Nepal till the study period is six. So total population of the study is not so big and neither small for MBS thesis study.

A Sample contains only part of these observations. In statistics, a sample is a subset of a population. Typically, the population is very large, making a census or a complete enumeration of all the values in the population impractical or impossible. The sample represents a subset of manageable size. Samples are collected and statistics are calculated from the samples so that one can make inferences or extrapolations from the sample to the population. This process of collecting information from a sample is referred to as sampling. For research purpose five joint venture banks operating in Nepal are selected on the basis of their capital structure difference rather than using a particular method of sampling technique in order to get the exact situation of capital structure of joint venture commercial banks of Nepal.

Population	**Sample Banks**
1. Nabil Bank Ltd.	
2. Standard Chartered Bank Nepal Ltd.	1. Himalayan Bank Ltd.
3. Himalayan Bank Ltd.	2. Everest Bank Ltd.
4. Nepal SBI Bank Ltd.	3. Nepal Bangladesh Bank Ltd.
5. Nepal Bangladesh Bank Ltd.	4. Nepal SBI Bank Ltd.
6. Everest Bank Ltd.	5. Nabil Bank Ltd.

3.4 Tools for Analysis

Method of analysis is an important part in research work. The careful study of available facts for proper understanding of data and extraction of the conclusion from them on the basis of established principles and sound logic is Analysis.

The optimal capital structure indicates the best debt-to-equity ratio for a firm that maximizes its value. Putting it simple, the optimal capital structure for a company is the one which

proffers a balance between the idyllic debt-to-equity ranges thus minimizing the firm's cost of capital. Theoretically, debt financing usually proffers the lowest cost of capital because of its tax deductibility. However, it is seldom the optimal structure for as debt increases, it increases the company's risk.

3.4.1 Financial Tools for Analysis

To evaluate the performance of any organization financial tools are very useful to determine the strengths and weakness of a firm as well as its historical performance and current financial condition. Ratio is an important analytical tool to summarize the large quantities of data and to make quantitative judgments about organization. The financial tools employed in this study basically represent ratio analysis.

Debt capacity ratio

This ratio is called "Time Interest Earned Ratio (TIE Ratio)." This ratio indicates the ability of the company to meet its annual interest costs or it measures the debt servicing capacity of the firm. In other words, it measures the debt servicing capacity of a firm in so far as the fixed interest on the total loan is concerned. It is determined by dividing the operating profit or Earnings Before Interest and Taxes (EBIT) by the fixed interest (I) change on loan. Thus, in the calculation of Interest Coverage Ratio, IC-Ratio in times is expresses as.

$$\text{Debt Capacity Ratio (in Times)} = \frac{\text{Operating Profit}}{\text{Interest Charge (I)}}$$

This ratio is very useful in determining whether a borrower is going to be able to service interest payment on a loan. This ratio is also known to determine whether a firm has the ability to meet its long-term obligations. From the creditors point of view the larger the coverage the greater the ability the firm to handle charges.

Operating Income to Total Capital Ratio

The amount of profit realized from a business's operations after taking out operating expenses - such as COGS or wages - and depreciation. Operating income takes the gross income (revenue minus COGS) and subtracts other operating expenses and then removes depreciation. These operating expenses are costs which are incurred from operating activities and include things such as office supplies and heat and power. Operating Income is typically a synonym for earnings before interest and taxes (EBIT) and is also commonly referred to as "operating profit" or "recurring profit".

It shows the efficiency of the organization on its operation. Higher the operating income to total capital indicates the firm has better mobilized its operating system. It can be calculated using following formula:

$$\text{Operating Income to Total Capital Ratio} = \frac{\text{Operating Profit}}{\text{Total Capital}}$$

The Operating Income to Total Capital (OITC) ratio gives the picture of the efficiency of the management on effective management of the entire operation. Increasing the OITC ratio is preferred.

Net Income to Total Capital Ratio

Net income is the residual income of a firm after adding total revenue and gains and subtracting all expenses and losses for the reporting period. Net income can be distributed among holders of common stock as a dividend or held by the firm as an addition to retained earnings. The items deducted will typically include tax expense, financing expense (interest expense), and minority interest. Likewise, preferred stock dividends will be subtracted too, though they are not an expense. The net income to total capital ratio can be calculated using following formula:

$$\text{Net Income to Total Capital (NITC) Ratio} = \frac{\text{Net Income}}{\text{Total Capital}}$$

Net income is the most essential term in reference to the study of optimal capital structure because the stakeholder of the firm analyzes the Net income rather than operating income. So, every firm always tries to maximize the net income. Higher the NITC ratio shows the better position of the firm.

Return on Shareholders' Equity

Shareholders are the owners of the company. To measure the return of shareholders, can use return on shareholders' equity. This ratio analyze if the company has been able to provide higher return on investment to the owners or not. It is calculated as:

$$\text{Return on Shareholders' Equity (ROSE)} = \frac{\text{Net Profit After Tax}}{\text{Shareholders' Equity}}$$

A company's owners always prefer higher ratio of return on shareholders' equity. And higher ratio represents the higher profitability of the firm and vice versa.

3.4.2   Statistical Tools for Analysis

In course of data study and analysis related to the study different statistical tools are often employed as well as interpretation of data taking consideration to the objectives of the study. Following statistical tools are used during the data presentation and analysis section of the thesis.

- Trend Analysis
- Average
- Co-efficient of correlation

Trend Analysis:

Today, trend analysis often refers to the science of studying changes in social patterns, including fashion, technology and the consumer behavior. The term "trend analysis" refers to the concept of collecting information and attempting to spot a pattern, or trend, in the information. Trend analysis is a mathematical technique that uses historical results to predict future outcome. In another words, an aspect of technical analysis that tries to predict the future movement based on past data. Trend analysis is based on the idea that what has happened in the past gives traders an idea of what will happen in the future.

A widely and most commonly used method to describe the trend is the method of least square. Under this method, a trend line is fitted to the data satisfying the following two conditions:

(i) $\Sigma(y - y_c) = 0$ (ii) $\Sigma(y - y_c)^2$ is least where y is the actual value and y_c the computed value of y. As $\Sigma(y - y_c)^2$ is least, hence the name method of least square. The line obtained by this method is known as the line of best fit.

Let the trend line between the dependent variable y and the independent variable x (i.e time) be represented by

$$Y = a + bx - \quad - \quad - \quad (i)$$

Then for any given value of independent variable x, the estimated value of y denoted by y_c given by above equation is

$$y_c = a + bx$$

a = y intercept or value of y when x = 0

b = slope of the trend line or amount of change that comes in y for a unit change in x.

To determine the straight line trend, it has to determine the values of and b. To find the values of a and b, solve the following two equations:

$$\sum y = na + b\sum x \qquad - \qquad - \qquad - \qquad (ii)$$

And $\quad \sum xy = a\sum x + b\sum x^2 \qquad - \qquad - \qquad - \qquad (iii)$

Where n is the number of periods or years for which the data are given.

The equation (ii) is obtained by taking sum on both sides of equation (i) the equation (iii) is obtained by multiplying equation (i) by x and taking sum on both sides. The values of and b obtained by solving (ii) and (iii) are substituted in equation (i) gives the equation of the trend line. To make calculation easier, the deviation of the independent variable (i.e time) are taken from the middle of the time period so that $\sum x = 0$. Then the above two equations change to:

$$\sum y = na \qquad \qquad \therefore a = \frac{\sum y}{n}$$

And $\sum xy = b\sum x^2 \qquad \qquad \therefore b = \frac{\sum xy}{\sum x^2}$

a gives the average of y and b, the rate of change.

Here, the operating profit and net profit trend of the JVCBs of Nepal is tried to explore if it is moving upward or downward trend. Whether the profit of the JVCBs of Nepal following the past trend or fluctuating trend? It helps to predict the future trend of the profit for the JVCBs of Nepal on the basis of the past profit record that will work as the guidance for the management and team of the JVCBs of Nepal to make plans and policies for maintaining the required level of profit by the firm so that the shareholder so the firm can be returned well & sufficiently on their investment.

Average (Mean)

In the most common case, the data set is a list of numbers. The average of a list of numbers is a single number intended to typify the numbers in the list. If all the numbers in the list are the same, then this number should be used. If the numbers are not the same, the average is calculated by combining the numbers from the list in a specific way and computing a single number as being the average of the list.

Simply, average is the quotient obtained from the sum of observations divided by the nuber of observations. It is the arithmetic mean. It gives the average of the total observations given for the study. Since the calculation is based upon the historical data rather than based on probability, the arithmetic mean is represented by the average that can be expressed as:

$$\text{Average Yearly Collection } (\overline{X}) = \frac{X}{n}$$

Where,

X = Yearly Tax Collection

n = Numer of observations

Coefficient of correlation

The correlation is one of the most common and most useful statistics. A correlation is a single number that describes the degree of relationship between two variables. Correlation is a statistical technique that can show whether and how strongly pairs of variables are related. For example, height and weight are related; taller people tend to be heavier than shorter people. The main result of a correlation is called the correlation coefficient (or "r"). It ranges from -1.0 to +1.0. The closer r is to +1 or -1, the more closely the two variables are related. If r is close to 0, it means there is no relationship between the variables. If r is positive, it means that as one variable gets larger the other gets larger. If r is negative it means that as one gets larger, the other gets smaller (often called an "inverse" correlation).

In case of simple correlation, it studies the degree of relationship between two variables: independent and dependent variables. But in real life so many independent variables do affect the dependent variable and the study on degree of relationship between a single dependent variable and a number of independent variables in combination is called multiple correlation analysis which is denoted by R1.23 where the subscript left to the dot is the dependent variable and to right is the independent variables. Let us consider three variables for this thesis that X_1, X_2 and X_3 then

$R_{1.23}$ = Correlation coefficient between dependent variable X_1 and joint effect of the independent variables X_2 and X_3 on X_1.

The formula for the calculation of multiple correlation coefficients can be expressed in terms of r_{12}, r_{23} and r_{13} as follows:

$$R_{1.23} \ X \sqrt{\frac{r_{12}{}^2 \ \Gamma r_{13}{}^2 \ Z2 \mid r_{12} \mid r_{23} \mid r_{13}}{1 Z r_{23}{}^2}}$$

The square of multiple correlation coefficients is known as the coefficient of multiple determinations and is used to interpret the value of multiple correlation coefficients. It is the

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fraction that represents the proportion of total variation of dependent variable that is explained by regression plan. Coefficient of multiple determination measures how well the multiple regression plan fits the data. For e.g: If $R_{1.23} = 0.9$ then coefficient of multiple determination $R^2_{1.23} = 0.81$. This tells us that 80% of the total variation in X_1 is due to the variables X_2 and X_3 and remaining is due to the other factors.

3.4.3 Other Tools for Analysis

Optimal capital structure analysis focuses on developing an understanding of an appropriate debt/ equity structure that succeeds in lowering a company's overall weighted average cost of capital, usually as a result of tax efficiencies, while prudently avoiding the risks of incurring financial distress.

Further, optimal capital structure analysis significantly enhances the understanding of the firm's overall cash needs and can be a key strategic planning tool for corporations seeking to understand a key component of their growth prospects or acquisitions flexibility.

The outcome of an optimal capital structure analysis would usually include:

a) a recommendation on a prudent level of debt that a firm, public or private, could sustain within its current   plans;

b) a peer group comparison of your competitor's book and market debt/equity positions;

c) a firm specific cost of equity estimate as well as a cost of equity peer group comparison;

d) an estimated cost of debt, if the recommended level of debt was higher than the current level of debt; and

e) explanatory notes about the strategic and risk implications of various capital structure   alternatives.

The optimal capital structure is a level of capital employed from different sources, when the WACC of these sources of capital for a mix will be at a minimum level. The WACC found by combining the cost of the firm's equity with the cost of its debt in proportion to the relative weight of each in the firm's optimal long-term financial structure. More specifically:

$$WACC = W_d \mid K_d \, (1\text{-}t) \, \Gamma \, W_{pr} \mid K_{pr} \, \Gamma \, W_e \mid K_e$$

Where,

WACC = Weighted Average Cost of Capital

W_d = Weight of debt capital

K_d = Cost of debt

t = Corporate tax rate

W_{pr} = Weight of Preferred stock

K_{pr} = Cost of preferred stock

W_e = Weight of equity capital

K_e = Cost of equity

CHAPTER IV
DATA PRESENTATION AND ANALYSIS

The purpose of analyzing data is to obtain usable and useful information. The analysis, irrespective of whether the data is qualitative or quantitative, may:

- ⟩ describe and summarize the data
- ⟩ identify relationships between variables
- ⟩ compare variables
- ⟩ identify the difference between variables
- ⟩ forecast outcomes.

A misconception, and source of confusion for many people, is the belief that qualitative research generates just qualitative data (text, words, opinions, etc) and that quantitative research generates just quantitative data (numbers). Sometimes this is the case, but both types of data can be generated by each approach. For instance, a postal questionnaire or structured 'interview (quantitative research) will often gather factual information, for example, age, salary, length of service (quantitative data) – but may also seek opinions and attitudes (qualitative data).

A second misconception is that statistical techniques are only applicable for quantitative data. Once again, this is not so. There are many statistical techniques that can be applied to qualitative data, such as ratings scales, that has been generated by a quantitative research approach.

To make the research analytical, the presented data are analyzed, using different appropriate tools, and the findings are tried to synthesize to the objectives of the study. It is the systematic disclosure of the data related to the study and analysis of the data in a corrective way drawing the conclusion of analysis and finally matching it with the statement of problems of the research study. Here attempt has been made to analyze the data collected from HBL, EBL, NBBL, NSBL and Nabil related to this study with systematic presentation so that descriptive and analytical research design can be applied effectively and reviewers' can grasp the gist of the study easily in a convenience way.

4.1 Determination of Optimal Capital Structure for JVCBs of Nepal

It is not an easy job to determine the optimal capital structure. Some economic expert and financial experts say there is no optimal level of capital structure, whereas some view that 100 percent is the optimal capital structure where it can get the minimum overall cost of capital. Some regarded existence of optimal capital structure with the rational mix of debt proportion and equity capital. According to Oxford dictionary, optimal means the best possible or producing the best possible results. This study calculates for the optimal capital structure. It means concentrate focus to determine optimum level of the mix of debt and equity in formation capital structure that maximizes the value of the firm whereas reduces the overall cost of capital of the firm.

The Brigham and Ehrhardt on their book Financial Management: Theory and Practice given a model to calculate the optimal capital structure. Here also applied same model and try to find optimal level of capital structure for joint venture commercial banks of Nepal as follows:

Table - 1

Optimal Capital Structure Test for JVCBs of Nepal

W_d	W_{pr}	W_e	K_d (1-T)	(K_{pr})	(K_e)	WACC	Remark
-	-	1.00	3.60	0.00	8.55	8.55	
0.10	-	0.90	4.95	0.00	8.56	8.20	
0.20	-	0.80	4.16	0.00	8.58	7.70	
0.30	-	0.70	3.60	0.00	8.60	7.10	
0.40	-	0.60	3.60	0.00	8.63	6.62	
0.50	-	0.50	3.90	0.00	8.68	6.29	
0.60	-	0.40	4.20	0.00	8.74	6.02	
0.70	-	0.30	4.80	0.00	8.85	6.01	**Optimal**
0.80	-	0.20	5.70	0.00	9.06	6.37	
0.90	-	0.10	6.90	0.00	9.71	7.18	
0.17	-	0.83	4.80	0.00	8.57	7.93	**HBL**
0.19	0.10	0.71	3.60	7.00	8.58	7.48	**EBL**
-	-	1.00	0.00	0.00	8.55	8.55	**NBBL**
0.09	-	0.91	3.60	0.00	8.56	8.11	**NSBL**
0.13	-	0.87	5.10	0.00	8.57	8.11	**Nabil**

[Source: Annex 20}

The table presented is the summary only extracted from the annex 20 where detail calculations can be studied. It has presented Weight of debt (W_d), Weight of Preference

Capital (W_{pr}), Weight of Equity Capital (W_e), Cost of debt (K_d), Cost of Preference Share (K_{pr}), Cost of Equity (K_e) and calculated weighted average cost of capital (WACC).The table presented that with increase in debt proportion in capital structure mix, the WACC goes on decreasing upto certain level. Thereafter addition to the debt mix increases the WACC instead of reducing the WACC. In the table upto 70% debt mix, the WACC is reduced but thereafter the increase in debt mix also increased the WACC.

So, the optimal capital structure mix for the JVCBs of Nepal is 70% debt and 30% Equity in present context which WACC will be 6.01%. But if one has given single glance at the present capital structure mix of selected JVCBs of Nepal can easily grasp if they are employing optimal capital structure mix or not. The answer is obviously not. The WACC of the HBL is 7.93% which is 1.92% higher than optimal capital structure mix. On the same way, the EBL's current WACC is 1.47% higher than industry optimal capital structure mix. Out of five selected sample banks, NBBL has highest of 8.55% WACC. It can reduce its WACC by 2.54% employing debt capital in its present capital structure mix. The NSBL and Nabil has of same 8.11% WACC eventhough its capital structure mix is differ to each other which is 2.1% higher cost than industry optimal capital structure.

From the above optimal capital structure analysis for selected JVCBs of Nepal, it can be concluded that the present capital structure mix of the JVCBs of Nepal are not optimal. They have not employed optimal level of debt capital in their capital structure mix. They can reduce their WACC with addition of debt capital in their present capital structure mix. The JVCBs of Nepal had not considered the WACC concept and optimal capital structure mix during its capital structure formation. They might have seen only less risky and easy type of capital structure rather than best capital source. So, in order to maximize the value of the firm and minimize the cost of capital, the JVCBs of Nepal have to study the different foreign banks capital structure mix and policies and revise their present capital structure mix.

4.2 Profit Trend of JVCBs of Nepal

Trend Analysis is the practice of collecting information and attempting to spot a pattern, or trend, in the information. In some fields of study, the term "trend analysis" has more formally-defined meanings. In project management trend analysis is a mathematical technique that uses historical results to predict future outcome. This is achieved by tracking

variances in cost and schedule performance. In this context, it is a project management quality control tool.

**4.2.1 Operating Profit Trend of JVCBs of Nepal**

The profit earned from a firm's normal core business operations. This value does not include any profit earned from the firm's investments (such as earnings from firms in which the company has partial interest) and the effects of interest and taxes. Also known as "earnings before interest and tax" (EBIT).

Operating income, or operating profit as it is sometimes called, is the total pre-tax profit a business generated from its operations. It is what is available to the owners before a few other items need to be paid such as preferred stock dividends and income taxes. Operating income can be used to gauge the general health of a company's core business or businesses. All else being equal, it is one of the most important figures that everyone will ever need to know. The operating profit trend of the selected sample banks are presented as below:

4.2.1.1 Operating Profit Trend of HBL

The operating profit trend of HBL based on past five years data from F.Y 2006 to 2010 shows that the HBL has increasing profit trend. The actual profit in F.Y 2006 is below the trend line. The below figure presented the actual operating profit trend and estimated profit trend till the F.Y 2014. In F.Y 2007 and 2008, the actual operating profit is more than its trend. But in F.Y 2009 the actual operating profit trend line lied below the forecasted trend. However, in F.Y 2010 again, the actual operating profit is more than its forecasted trend. In conclusion, even though the operating profit of HBL trend is to be in increasing trend, the actual trend is little bit fluctuative.

Figure - 10
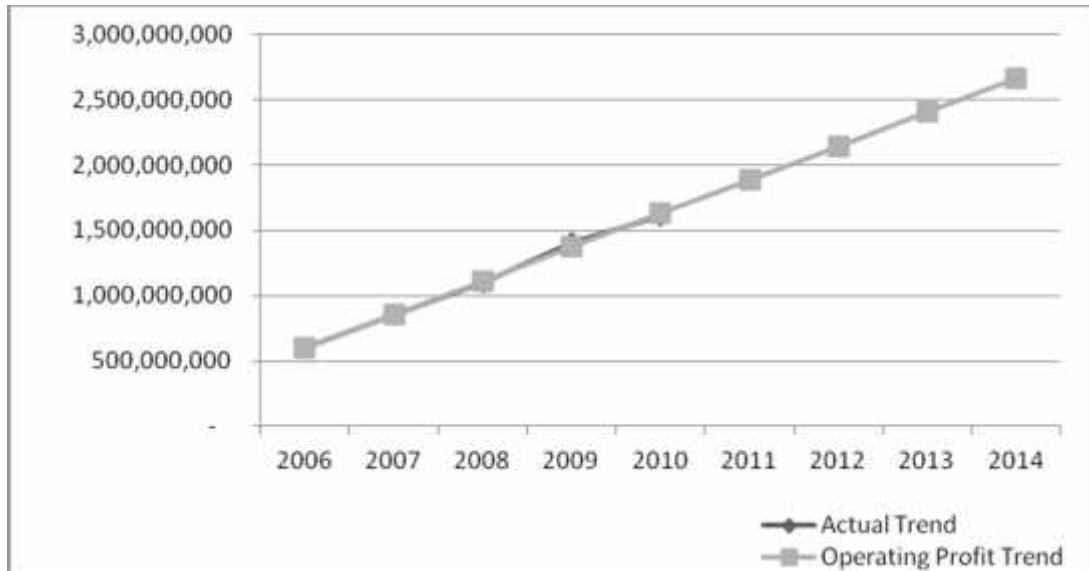**Operating Profit Trend of HBL**
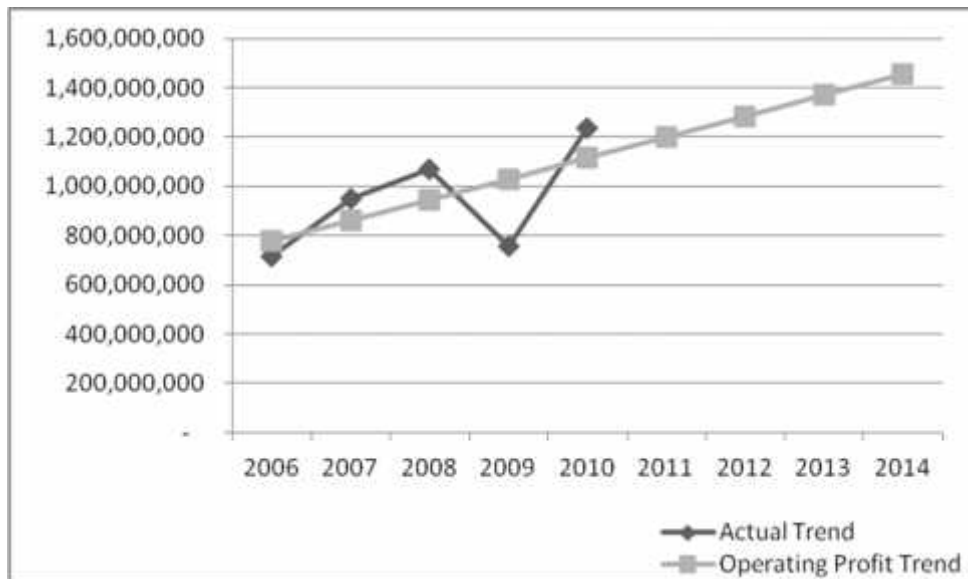
4.2.1.2 Operating Profit Trend of EBL

The operating profit from F.Y 2006 to 2010 and estimated profit trend of EBL is presented as below in line graph.

Figure - 11
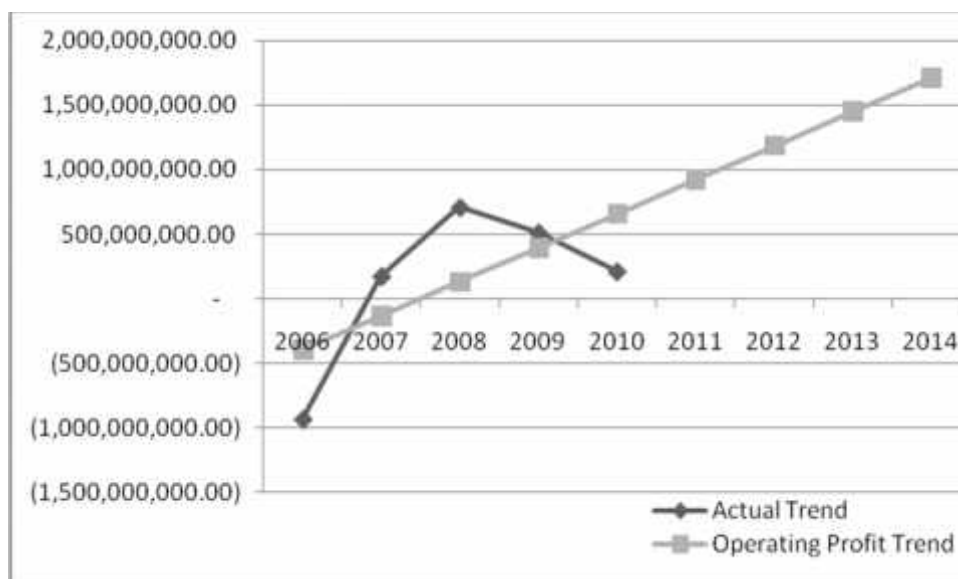**Operating Profit Trend of EBL**

The figure shows that the EBL meet its estimated operating profit trend almost. In initial of the study period the actual trend is above the estimated trend. But in recent years, the actual profit is below the trend line. It shows that the EBL has decreasing its operating profit.

4.2.1.3 Operating Profit Trend of NBBL

The actual operating profit of F.Y 2006 to 2010 are plotted in below figure in line graph with its operating profit trend line based on the study period for upto F.Y 2014..

Figure - 12
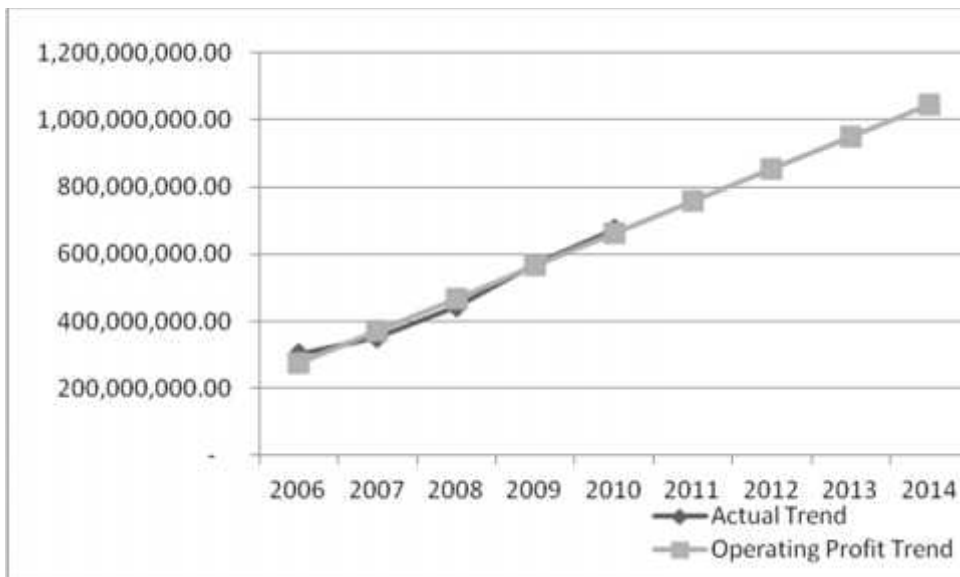**Operating Profit Trend of NBBL**

The above figure shows that in F.Y 2006 & 2007, the organization was in loss. But thereafter it has maintained to earn profit. Thereafter in F.Y 2007, 2008 and 2009, its actual operating profit is above the trend. But in F.Y 2010, the operating profit declined below the trend line. In conclusion, the operating profit is unstable in NBBL.

4.1.1.4 Operating Profit Trend of NSBL

The figure below presented the operating profit trend of NSBL and actual profit. The trend line drawn using least square method shows that the bank has increasing profit trend. But in fact besides in F.Y 2006, the bank was not able to meet its operating profit trend. It can be observed if one goes the below figure carefully where the thin line represent the operating profit trend and the thick line represent the actual operating profit trend of NSBL. In summary, it can be opined that, the bank has not able to maintain its operating profit trend. It should focus on reduction of operating costs in order to go along with its profit trend shown in below figure.

Figure - 13
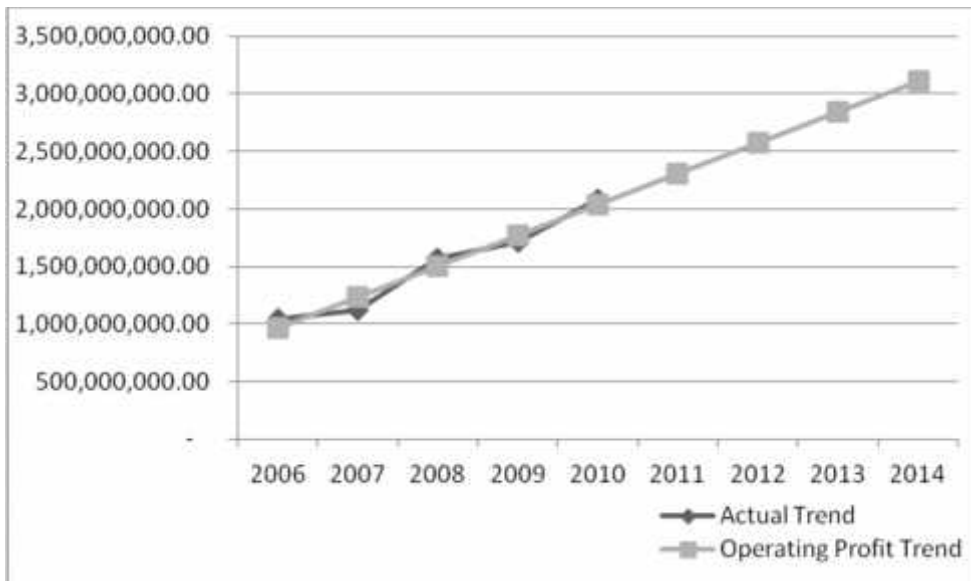**Operating Profit Trend of NSBL**

4.1.1.5 Operating Profit Trend of Nabil

The actual operating profit of F.Y 2006 to 2010 and operating profit trend from F.Y 2006 to 2014 are plotted in below figure:

Figure - 14
Operating Profit Trend of Nabil

It can be concluded from the above figure that even though the trend shows the increasing trend, the bank is not able to maintain stable operating profit. Its operating profit is fluctuative in nature.

4.2.2 Net Income Trend of JVCBs of Nepal

Net income is the residual income of a firm after adding total revenue and gains and subtracting all expenses and losses for the reporting period. Net income can be distributed among holders of common stock as a dividend or held by the firm as an addition to retained earnings. As profit and earnings are used synonymously for income, net earnings and net profit are commonly found as synonyms for net income. The items deducted will typically include tax expense, financing expense (interest expense), and minority interest. Likewise, preferred stock dividends will be subtracted too, though they are not an expense. The individual net income trend of selected sample banks are presented below:

4.2.2.1 Net Income Trend of HBL

The net profit for the F.Y 2006 to 2010 based on annual reports of the HBL are plotted in the below figure with its estimated net profit trend line drawn using least square method.

Figure - 15
Net Income Trend of HBL
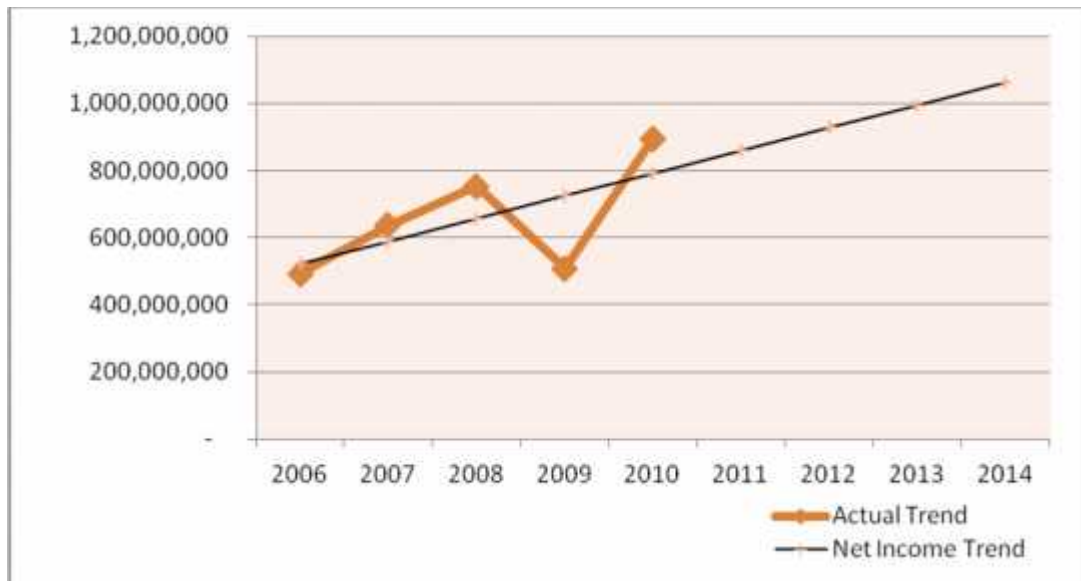
In the above figure, it presented the comparative trend of net income of HBL. In F.Y 2006 the actual net income is Rs.29,562,400 less than the expected trend of Rs.521,385,400. In the F.Y 2007 and 2008 the actual net income trend is higher than the estimation. But in the F.Y 2009 again the actual is Rs.215,241,300 less than the estimation. However the bank's actual trend line in F.Y 2010 is above the estimated net income trend line. In Summary, the net income of HBL is volatile in nature.

4.2.2.2 Net Income Trend of EBL

In order to know the net income trend of the EBL, using least square method based on past five years' net income record, the net income trend line is drawn for upto F.Y 2014 which is figured below:

Figure - 16
Net Income Trend of EBL
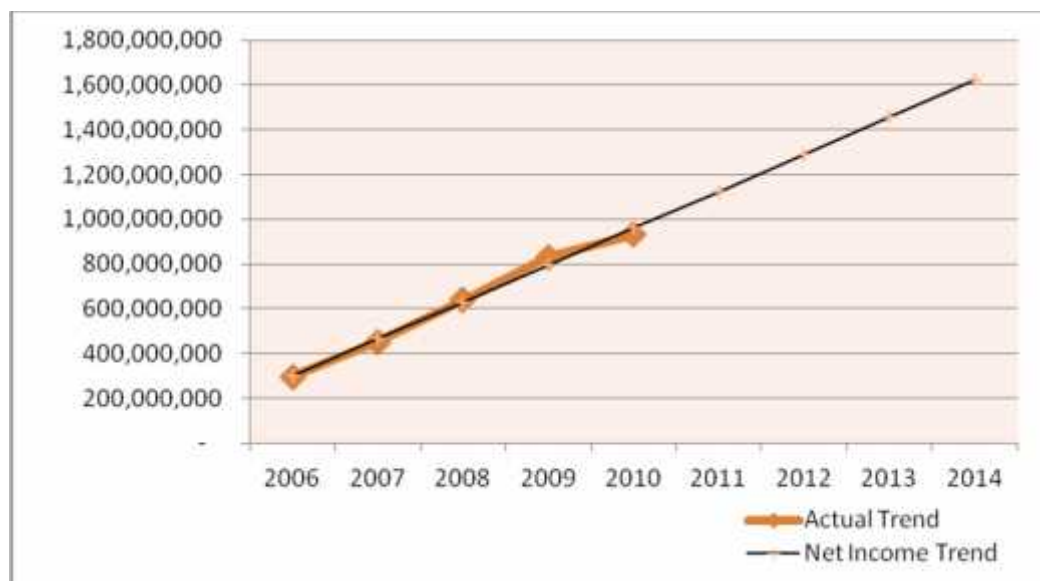
The chart above gives trend of net income of EBL. The actual net income trend line of EBL is below the estimated net income trend line in F.Y 2006 and 2007. Thereafter in F.Y 2008 and 2009 it lied above the trend line. In these years it has Rs.8,740,000 and Rs. 36,900,000 more actual net income than the trend line showing. Whereas again in F.Y 2010, it was below the estimated trend line. The reason behind the decline in net income below trend line may be due to increase in interest expenses in bonds & debentures, increase in loan loss provision. So, the management has to make effort to maintain its past history record of achieving higher net income than its estimated. For this, the loan recovery should make strong to prevent from loan being default. On the same way, the higher cost bonds 7 debentures can be redemption or replace by issue of new lower cost bonds 7 debentures.

4.2.2.3 Net Income Trend of NBBL

The NBBL's actual net income for the F.Y 2006 to 2010 and estimated trend line of net income are plotted in line graph as below:
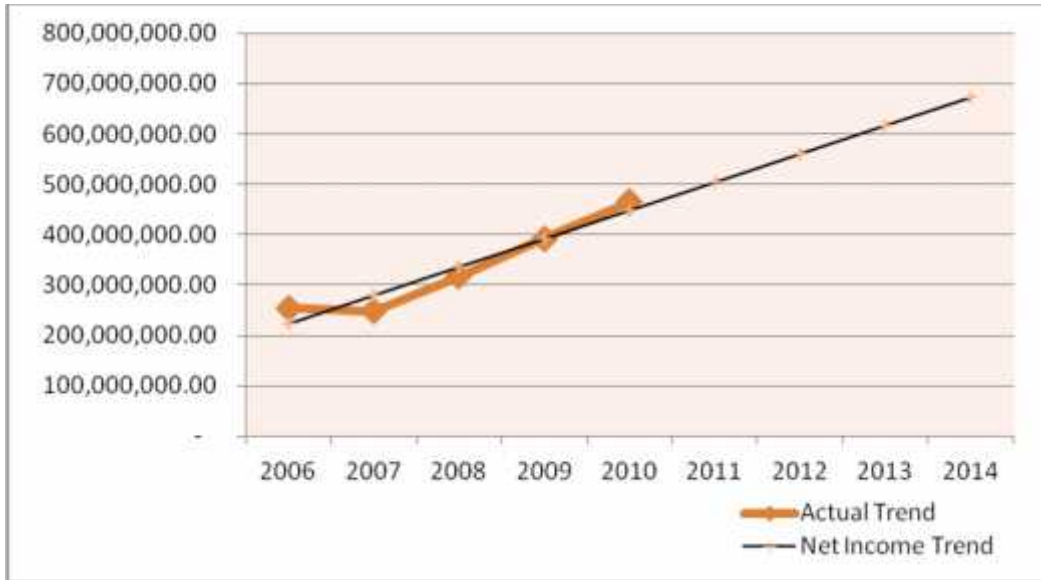
Figure -17
Net Income Trend of NBBL
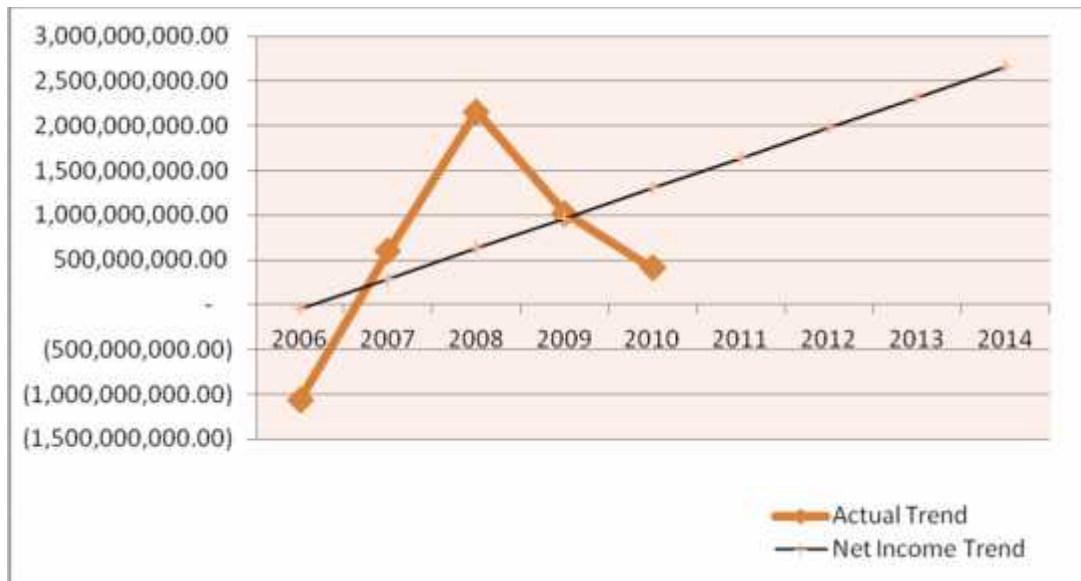
Since, the bank has loss of Rs.1,061,579,502 in F.Y 2006, the actual net income line is below the trend line. However it has recovered from this situation and in F.Y 2007, 2008 and 2009 it was able to make Rs. 308,413,886.80, Rs.1,532,123,995.20 and Rs.57,492,911.60 more than its estimation respectively. However it was not able to maintain its net income stable in F.Y 2010 where it deficit by Rs.886,285,153.00 than estimated net income. The loss in F.Y 2006 is may be due to increase in loan loss provision and the achievement of higher net income in consecutive years is due to recovery of the past default loans. So, management has to focus on selection of good loan and makes loan recovery strong team.

4.2.2.4 Net Income Trend of NSBL

The net income of NSBL is Rs. 254,909,000 in F.Y 2006. In F.Y 2007, it reduced to Rs. 247,771,000. But it increased thereafter to Rs.316,373,000, Rs.391,742,000 & Rs.464,565,000 in F.Y 2008, 2009 and 2010 respectively. Looking at this data, it can be said that the net income is moving towards increasing trend in recent years. Furthermore, it can be plotted in graph with estimated net income trend for NSBL for the study as follows:

Figure - 18
Net Income Trend of NSBL

In the above figure, it is clear that in F.Y 2006 the actual net income is higher than its estimated trend. But in F.Y 2007 it declined than estimation which lasts till F.Y 2008. But in recent F.Y 2009 and 2010, NSBL's actual net income is more than its estimated net income. Management should make some efforts to increase net income.

4.2.2.5 Net Income Trend of Nabil

The net income trend line with actual net income of Nabil is plotted in figure below:

Figure - 19
Net Income Trend of Nabil
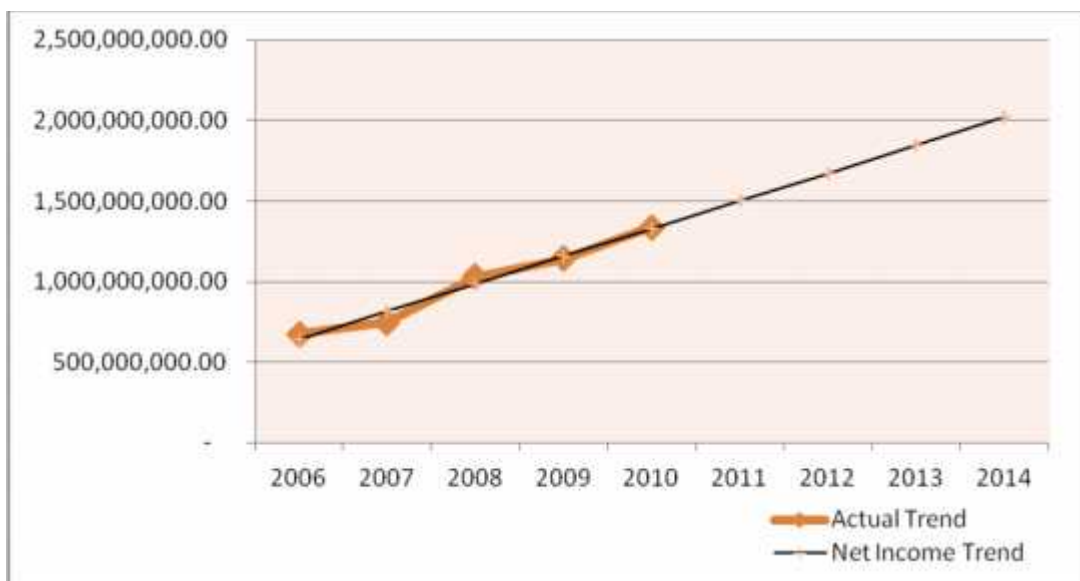
In the above figure, the thin line is the net income trend line drawn using least square method base on past five years net income from F.Y 2006 to 2010. The thick line represents the actual net income of Nabil. The net income is more by Rs. 32,335,200 then estimated value in F.Y 2006. But in F.Y 2007, the actual net income is Rs.67,372,100 lower than its estimation. Again the actual net income in F.Y 2008 exceeded estimated net income by Rs.44,997,600. It could not meet in F.Y 2009 and deficit by Rs.17,219,700. But in F.Y 2010 it again exceeded the actual net income Rs. 7,259,000 to estimated net income trend.

From the study of above operating profit trend and net income trend of selected sample JVCBs of Nepal, it can be concluded that the trend line of profit for these banks show increasing trend. But the banks are not able to meet its trend. Most of the banks have fluctuating trend of profit. So, in order to manage stable profit trend, the management have to focus on loan timely recovery and employ the low cost capital sources.

4.3 Financial Analysis

Financial analysis refers to an assessment of the viability, stability and profitability of a business, sub-business or project. It is performed by professionals who prepare reports using ratios that make use of information taken from financial statements and other reports. These reports are usually presented to top management as one of their bases in making business decisions.

Financial Analysis is the process of evaluating businesses, projects, budgets and other finance-related entities to determine their suitability for investment. Typically, financial analysis is used to analyze whether an entity is stable, solvent, liquid, or profitable enough to be invested in. When looking at a specific company, the financial analyst will often focus on the income statement, balance sheet, and cash flow statement. In addition, one key area of financial analysis involves extrapolating the company's past performance into an estimate of the company's future performance.

Here attempt has made to evaluate some capital related ratios that help to identify the strength and capability of the banks to handle the debt on its capital structure and related to it.

4.3.1 Interest Coverage Ratio

A metric used to measure a company's ability to meet its debt obligations. It is calculated by taking a company's earnings before interest and taxes (EBIT) and dividing it by the total

interest payable on bonds and other contractual debt. It is usually quoted as a ratio and indicates how many times a company can cover its interest charges on a pretax basis. Failing to meet these obligations could force a company into bankruptcy. Also referred to as "interest coverage ratio" and "fixed-charged coverage."

Ensuring interest payments to debt holders and preventing bankruptcy depends mainly on a company's ability to sustain earnings. However, a high ratio can indicate that a company has an undesirable lack of debt or is paying down too much debt with earnings that could be used for other projects. The rationale is that a company would yield greater returns by investing its earnings into other projects and borrowing at a lower cost of capital than what it is currently paying to meet its debt obligations.

Table - 2

Comparative TIE Ratio of Sample JVCBs of Nepal

Banks F.Y	HBL	EBL	NBBL	NSBL	Nabil
2006	23.44	33.22		25.07	0.00
2007	31.01	47.43	No Debenture and Bonds Issued	29.44	55.04
2008	15.11	60.97		36.86	61.58
2009	18.89	77.92		47.52	67.02
2010	30.94	89.78		56.19	81.62
Average	**23.88**	**61.86**		**39.02**	**53.05**

The above table presented the calculated TIE ratio for the sample JVCBs of Nepal selected for the study. Out of five selected sample banks, NBBL has not issued any bonds & debentures. Since, no bonds & debentures, no interest expenses to be bear and TIE ratio is infinite. Others four JVCBs have employed several cost bearing bonds & debentures in different weights.

The HBL's average TIE ratio is 23.88 times. In F.Y 2006, 2008 and 2009, the calculated TIE ratio is below the average. It has only in F.Y 2007 and 2010 only the TIE ratio more than average. As the higher the TIE ratio is better, bank should try to maintain TIE ratio to at least its average.

While analyzing the TIE ratio of EBL, the average TIE ratio for the study period is 61.86 times. It has better TIE ratio than HBL. In F.Y 2006, 2007 & 2007 the bank's TIE ratio is below average but in recent years it was more than average. Effort should be focused on maintain of current TIE ratio in future too.

From the study of interest & operating profit, the TIE ratio in F.Y 2006 is 25.07 which is below the average followed by 29.44 in F.Y 2007 and 36.86 in F.Y 2008 too. But in recent F.Y 2009 & 2010, the TIE ratio of NSBL is above the average of 39.02. It shows that the bank has sound interest coverage ratio. Debenture holders & Bond holders are safe for their return on investment.

Nabil bank has not issued any bonds & debentures till F.Y 2006. In F.Y 2007, bank has issued Rs.240,000,000 of 8.5% debenture and further more added issue of debenture in F.Y 2008 worth Rs.60,000,000 of same rate. The average TIE ratio of Nabil calculated for the study period is 53.05 times. Besides in F.Y 2008, the bank was able to maintain TIE ratio more than its average TIE ratio.

From the study of above TIE ratio of selected sample JVCBs, it can be concluded that the TIE ratio of JVCBs are very good. They have good interest bearing capacity and issuance of low cost new bonds & debentures can be made easily for lowering cost of capital and maintaining optimal capital structure.

4.3.2   Operating Income to Total Capital

The OITC ratio is the sum total of operating income divided by total capital. It shows how many percentage the operating profit is of total capital. The operating income is the income from the operating remains after deduction of all the operating expenses. On the other hand, the total capital here refers to the sum total of the equity share capital, preference capital and Bonds & Debentures. The OITC ratio calculated for the selected sample JVCBs of Nepal can be presented and analyzed individually one after another as follows:

4.3.2.1 OITC Ratio of HBL

The Operating profit and total capital of the HBL is presented below in the figure along with the calculated OITC ratio for the study period from F.Y 2006 to 2010.

Table - 3

OITC Ratio HBL

Year	Operating Profit	Total Capital	OITC Ratio
2006	717,403,000	810,810,000	88.48%
2007	948,839,000	1,013,513,000	93.62%
2008	1,066,606,000	1,216,215,000	87.70%
2009	755,727,000	1,600,000,000	47.23%
2010	1,237,734,000	2,000,000,000	61.89%
Average OITC Ratio of HBL			75.78%

In the table above the average OITC ratio of HBL for the study period is 75.78%. In the past 2006, 2007 and 2008, the OITC ratio of the HBL is more than its average but in the recent two years 2009 & 2010, the OITC ratio is below the average. The above table can be presented in the bar graph as below:

Figure - 20

Bar Graph of Operating profit to Total Capital of HBL
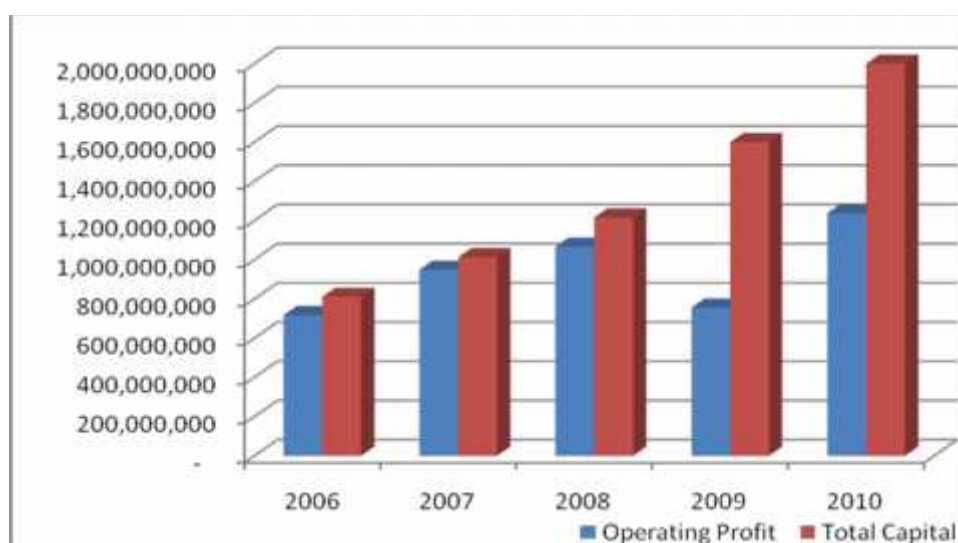
The bar graph shows the total operating profit and total capital of HBL from F.Y 2006 to 2010. The lower the height distance between two bars means more return in the capital invested. As in F.Y 2006 to 2008 the height of two bars are very low, the OITC ratio calculated for them are ranges from 87.70% to 93.62%. But as the height of the two bars distance is increased, the OITC ratio calculated is decreased as in F.Y 2009 & 2010.

4.3.2.2 OITC Ratio of EBL

The operating profit and the total capital of the EBL as per annual reports of EBL are present here in table below with calculated OITC ratio.

Table - 4

OITC Ratio EBL

Year	Operating Profit	Total Capital	OITC Ratio
2006	597,900,000	818,000,000	73.09%
2007	853,700,000	1,131,400,000	75.46%
2008	1,097,400,000	1,138,821,000	96.36%
2009	1,402,500,000	1,330,467,300	105.41%
2010	1,616,000,000	1,579,609,490	102.30%
Average OITC Ratio of EBL			**90.53%**

In the table above, the average OITC ratio of the EBL for the study period is 90.53%. In the F.Y 2006 and 2007, the OITC calculated are below the average. Thereafter from F.Y 2008, the OITC ratio is more than average. If one looks in depth the given table, it can be observed that with increase in total capital the operating profit also increased. It can be presented in bar graph as below:

Figure - 21

Bar Graph of Operating profit to Total Capital of EBL
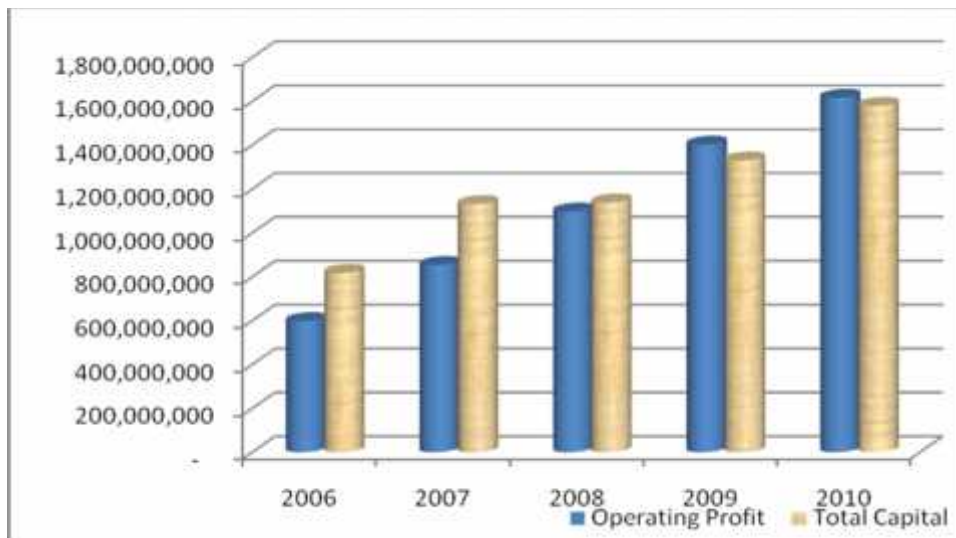
In the graph, the x-axis represents the fiscal years and y-axis represents the amount in Rs. Higher the height of the Operating profit indicates more the return on the capital invested. In F.Y 2009 & 2010, the operating profit bar's height is above the total capital. It shows more than 100% return on total capital.

4.3.2.3 OITC Ratio of NBBL

The operating profit and total capital of NBBL along with OITC ratio calculated for F.Y 2006 to 2010 is tabulated as below:

Table - 5

OITC Ratio NBBL

Calculation of OITC Ratio of NBBL			
Year	Operating Profit	Total Capital	OITC Ratio
2006	(935,858,946)	719,852,000	**-130.01%**
2007	174,453,224	744,126,000	**23.44%**
2008	710,301,319	1,860,315,000	**38.18%**
2009	513,175,957	1,860,315,000	**27.59%**
2010	212,041,000	2,009,396,000	**10.55%**
Average OITC Ratio of NBBL			**-6.05%**

The table shows that in F.Y 2006, NBBL has occurred loss of Rs.935,858,946. Due to it on that year the OITC ratio is -130.01%. Even though thereafter the operating profit is increased massively, the effect of loss in F.Y 2006 has pictured by -6.05% OITC average in study period. The data of above table can be presented in graph as below:

Figure - 22

Bar Graph of Operating profit to Total Capital of NBBL
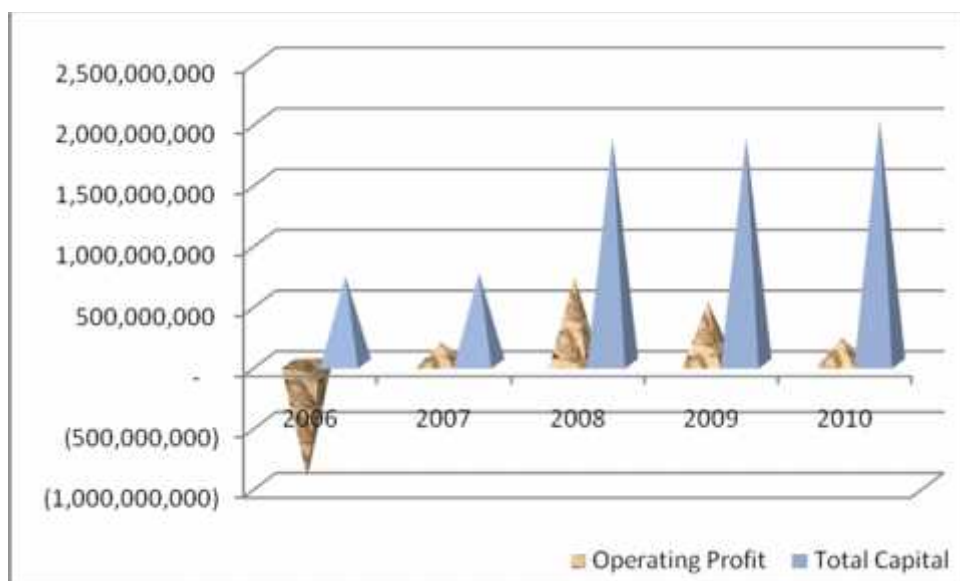
In the figure, the fallen down pyramid represents the loss in F.Y 2006. The greater the distance between the total capital pyramid and operating profit pyramid signifies that there is lower level of return only in the bank. Thereafter F.Y 2006, the bank was able to earn profit significantly but very lower height of operating profit pyramid in F.Y 2010 indicates the bank has not concentrated on increasing profit.

raph, the x-axis represents the fiscal years and y-axis represents the amount in Rs. Higher the height of the Operating profit indicates more the return on the capital invested. In F.Y 2009 &

2010, the operating profit bar's height is above the total capital. It shows more than 100% return on total capital.

4.3.2.4 OITC Ratio of NSBL

For the calculation of OITC ratio the presentation of operating profit and total capital in tabular form makes easy. So, the tabulated operating profit and total capital for the F.Y 2006 to 2010 is presented as below:

Table - 6

OITC Ratio NSBL

Calculation of OITC Ratio of NSBL			
Year	Operating Profit	Total Capital	OITC Ratio
2006	300,790,000	847,798,000	35.48%
2007	353,325,000	1,074,528,000	32.88%
2008	442,366,000	1,424,339,000	31.06%
2009	570,290,000	2,061,324,000	27.67%
2010	674,252,000	2,302,966,000	29.28%
Average OITC Ratio of NSBL			31.27%

The table shows that the average OITC ratio of NSBL is 31.27%. During the study period only in F.Y 2006 & 2007, the OITC ratio is above the average. Thereafter in F.Y 2008 it is below the calculated average. The OITC ratio for the F.Y 2006 is 35.48%, 32.88% in F.Y 2007 and so on. The NSBL management has not seriously taken this matter now days. It can be presented in figure as follows:

Figure - 23

Bar Graph of Operating profit to Total Capital of NSBL
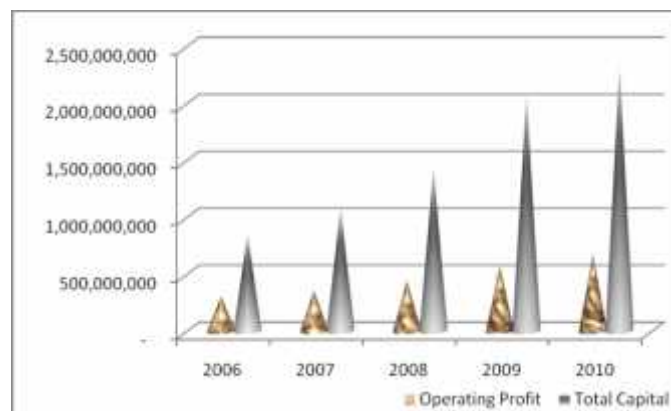
In the above figure, it clearly indicated that the operating profit cone is always very low than cone representing total capital. The higher the difference between two bars shows the lower OITC ratio. It can be seen in F.Y 2006, 2007 and 2008/

4.3.2.5 OITC Ratio of Nabil

The Nabil's operating profit and total capital can be shown in table form as given below;

Table - 7

OITC Ratio NSBL

Year	Operating Profit	Total Capital	OITC Ratio
2006	1,037,607,000	491,654,000	211.04%
2007	1,122,714,000	929,216,000	120.82%
2008	1,570,205,000	1,265,747,000	124.05%
2009	1,709,119,000	2,328,774,000	73.39%
2010	2,081,190,000	2,329,769,000	89.33%
Average OITC Ratio of Nabil			123.73%

In the table presented above, the OITC ratio in F.Y 2006 is 211.04% which is 87.31% more than the average calculated for the study period. But, in the F.Y 2007, the OITC ratio is only 120.82% lies below the average. Even though, in F.Y 2008 it is above average OITC thereafter it is below the average. The above table can be presented in bar graph as below:

Figure - 24

Bar Graph of Operating profit to Total Capital of Nabil
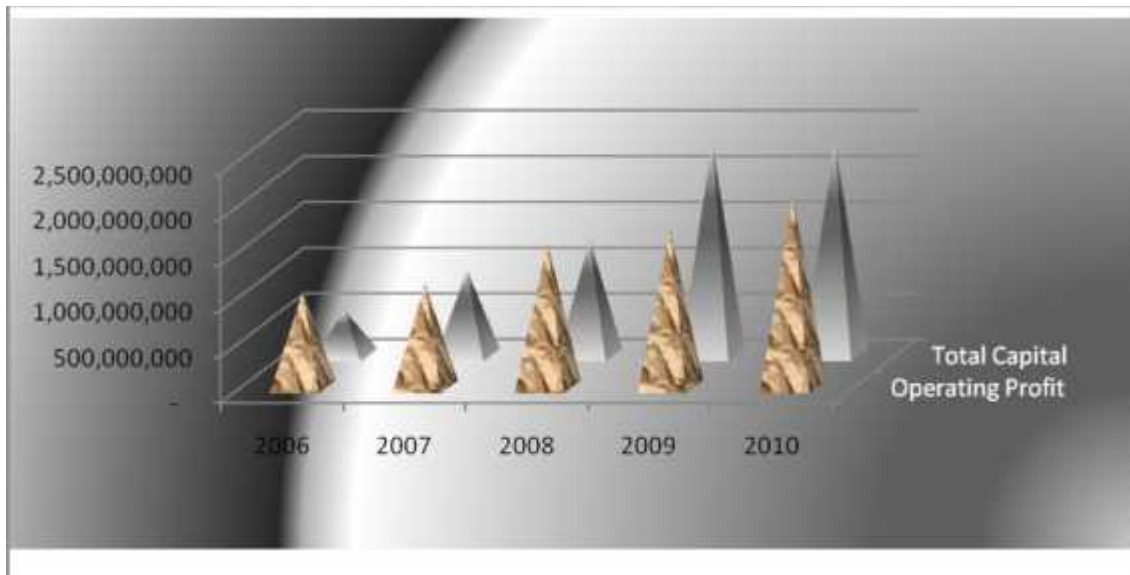
In the figure above, the front one pyramid represents the operating profit and the back side one pyramid is total capital. In F.Y year 2006 to 2008, the operating profit pyramid height is more than total capital profit pyramid. In these three years, the OITC is more than 100.00%. But in F.Y 2009 and 2010, the operating profit dominated by total capital profit. It shows that increase in total capital does not ensure the increase in profit.

Finally, in conclusion, the OITC ratios of JVCBs are very good. They ensured the more return in capital.

4.3.3 Net Income to Total Capital

Net income is the operating profit minus interest expenses in bonds & debentures. The net income divided by total capital gives the NITC ratio. It shows the net return on total capital. The calculated NITC ratio for the selected sample JVCBs of Nepal are presented in table form as below:

Table - 8

Comparative Net Income to Total Capital of Sample Banks

Banks / F.Y	HBL	EBL	NBBL	NSBL	Nabil
2006	60.66%	36.23%	-147.47%	30.07%	137.08%
2007	62.74%	39.88%	80.16%	23.06%	80.33%
2008	61.90%	56.08%	116.01%	22.21%	81.46%
2009	31.80%	62.52%	54.90%	19.00%	49.00%
2010	44.66%	58.96%	20.68%	20.17%	57.42%
Average NITC Ratio	**52.35%**	**50.73%**	**24.86%**	**22.90%**	**81.06%**

[Source: Annex 13]

The table presented the calculated NITC ratio for the five selected sample JVCBs of Nepal for the study period of F.Y 2006 to 2010. In F.Y 2006, HBL has average NITC ratio of 52.35%, EBL has 50.73%, NBBL 24.86%, NSBL 22.90% and Nabil 81.06%. From the analysis of average NITC ratio, it can be observed that the NITC ratios of JVCBs of Nepal are good. The Nabil has the highest NITC ratio and NSBL has the lowest.

The HBL has above the average NITC in F.Y 2006 to 2008 but it was not able to maintain this stability of NITC ratio in F.Y 2009 and thereafter. In case of EBL even though it has below average in F.Y 2006 & 2007, it has above the average from F.Y 2008. The NBBL has negative NITC ratio in F.Y 2006 but it recovered in F.Y 2007 with 80.16%, 116.01% in F.Y 2008 and 54.90% in F.Y 2009. The NSBL's NITC ratio is not so much volatile. It ranged from 19.00% to 30.07%. It has good stability of NITC ratio in comparison to other banks. On the other hand, Nabil has unstable NITC ratio of ranging from 49.00% to 137.08%.

The calculated NITC ratio of the selected sample JVCBs of Nepal stated above in the table can be presented in the graph as below:

Figure - 25

NITC ratio of the selected sample JVCBS of Nepal
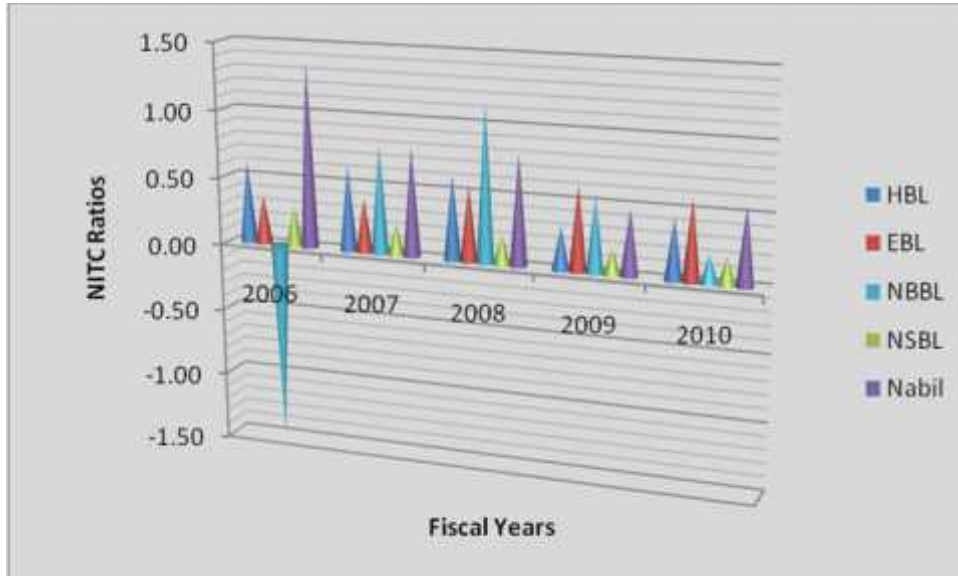
In the above chart, In F.Y 2006 NBBL has negative NITC ratio and Nabil has the highest. In F.Y 2007, Nabil has the highest followed by NBBL. NBBL has the greatest NITC ratio in F.Y 2008 among the sample banks. In F.Y 2009, the EBL has the highest NITC ratio and NSBL has the lowest. In F.Y 2010, EBL has the highest ratio and NSBL has the lowest NITC ratio among the sample JVCBs selected for eth study. From the chart, it can be concluded that, JVCBs have better NITC ratio. The analysis of NBBL shows that even in some years it was in loss it can be recovered by the team effort & desire to do.

4.3.4 Return on Shareholders' Equity

The return on shareholders' equity is "annual net profit divided by year-end shareholders' equity," where shareholders' equity is "a balance sheet item showing a company's net worth. Represents the sum of common and preferred equity including redeemable preferred. The calculated ROSE for the sample banks can be presented as below:

Table - 9

Return on Shareholders' Equity of Sample Banks

Banks F.Y	HBL	EBL	NBBL	NSBL	Nabil
2006	22.91%	19.57%	-147.47%	21.91%	32.76%
2007	25.30%	21.36%	80.16%	17.51%	30.63%

2008	24.13%	24.36%	194.03%	18.47%	32.94%
2009	14.79%	26.25%	47.87%	15.99%	29.74%
2010	22.35%	2.26%	15.52%	16.13%	29.29%
Average ROSE	**21.90%**	**18.76%**	**38.02%**	**18.00%**	**31.07%**

The table presented the ROSE calculated for the HBL, EBL, NBBL, NSBL and Nabil. HBL has annual average 21.90% return. Besides in F.Y 2009, HBL has its ROSE above the average. The EBL has increasing trend upto F.Y 2009 where it increased from 19.57% to 26.25%. But in F.Y 2010, it has decreased by 23.98%. Form the table above it can be observed that NBBL has negative ROSE of -147.47% in F.Y 2006. It turned into 80.16% in F.Y 2007 and increased to 194.03% in F.Y 2008. Thereafter it has decreasing ROSE. The NSBL has unpredictable nature ROSE that it decreased in F.Y 2007 than 2006 whereas it increased in F.Y 2008 and again decreased in F.Y 2009 and finally in F.Y 2010 it increased and reached 16.13%. Nabil has non volatile nature ROSE which ranged between 29% to 33%. In F.Y 2008, it has highest ROSE achieving 32.94%.

From the study of above table it can be said that the ROSE of the JVCBs of Nepal are fluctuating in nature. But in overall, the return on shareholder's equity of the JVCBs of Nepal is found satisfactory. The average ROSE of selected sample JVCBs are presented in pie chart as below:

Figure - 26

ROSE of sample JVCBS of Nepal
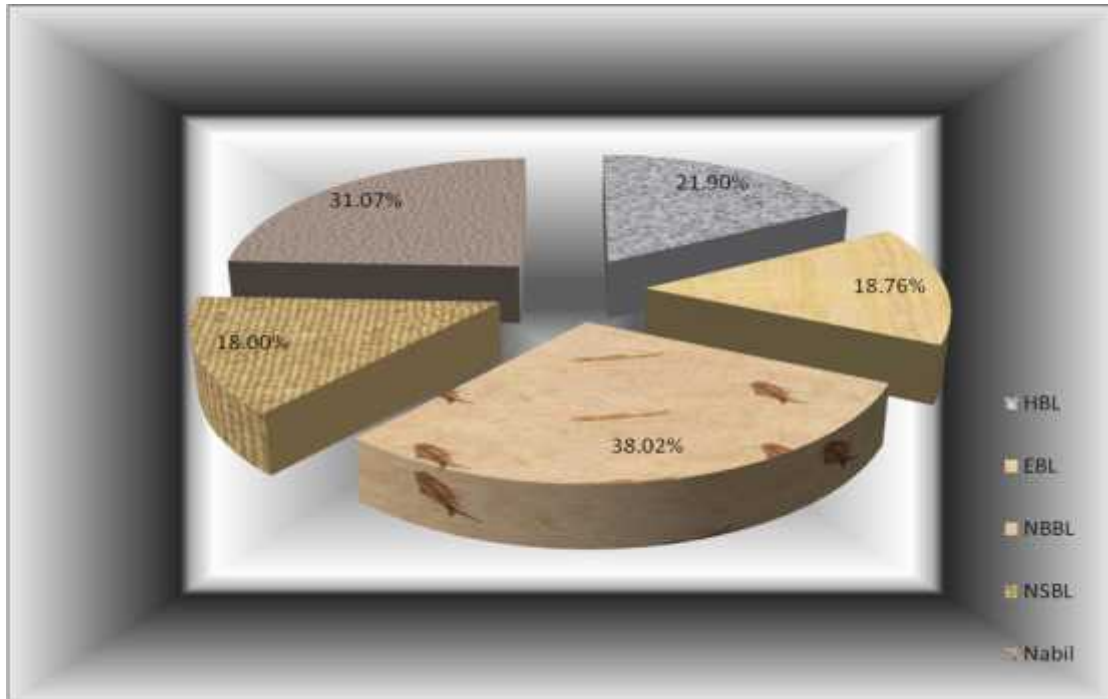
In the figure above, it presented the average annual ROSE of sample JVCBs of Nepal taken for the study. Out of 5 sample banks the highest average ROSE is of Nabil with 38.02%. NBBL stood in 2nd rank with 31.07% annual average ROSE. The next is with 21.90%, HBL ranked in 3rd place out of 5 sample banks. EBL has the 18.76% annual average ROSE. The NSBL has the lowest ROSE among the sample banks taken for the study with 18.00%. The chart shows that the ROSE of JVCBs are ranged from 18.00% to 38.02%, the return from the JVCBs of Nepal are satisfactory.

4.4 Statistical Analysis

Statistical analysis refers to a collection of methods used to process large amounts of data and report overall trends. Statistical analysis is particularly useful when dealing with noisy data. Statistical analysis provides ways to objectively report on how unusual an event is based on historical data.

Our server uses statistical analysis to examine the tremendous amount of data produced every day by the stock market. We usually prefer statistical analysis to more traditional forms of technical analysis because statistical analysis makes use of every print.

Statistical analysis is fundamental to all experiments that use statistics as a research methodology. Most experiments in social sciences and many important experiments in natural science and engineering need statistical analysis. Statistical analysis is also a very

useful tool to get approximate solutions when the actual process is highly complex or unknown in its true form.

4.4.1 Multiple Coefficients of Correlation

In statistics, multiple correlation is a linear relationship among more than two variables. It is measured by the coefficient of multiple determinations, denoted as R^2, which is a measure of the fit of a linear regression. A regression's R^2 falls somewhere between zero and one; a higher value indicates a stronger relationship among the variables, with a value of one indicating that all data points fall exactly on a line in multidimensional space and a value of zero indicating no relationship at all between the independent variables collectively and the dependent variable.

The multiple correlations show the relationship of a dependent variable with multiple independent variables that affects the dependent one. In this study related to optimal capital structure the total capital is taken as depended variable whereas the two variables deposit collection and loan mobilization are independent variable. It shows how close relationship they have with each others and change in total capital with changes in deposit collection and loan mobilization of the firm.

Table - 10

Multiple Correlation Co-efficient of HBL

Year	Total Capital (X_1)	Deposit Collection (X_2)	Loan Mobilization (X_3)	Correlation (r)
2006	810,810,000	30,048,418,000	17,793,724,000	
2007	1,013,513,000	31,842,789,000	20,179,613,000	
2008	1,216,215,000	34,681,345,000	25,519,519,000	$r_{12} = 0.96$
2009	1,600,000,000	37,611,202,000	29,123,755,000	$r_{13} = 0.98$ $r_{23} = 0.95$
2010	2,000,000,000	40,920,627,000	32,968,270,000	$r_{1.23} = 0.9845$
Total	6,640,538,000	175,104,381,000	125,584,881,000	

[Source: Annex 15]

The above table presents the data of past five years Total Capital, Deposit collection, Loan mobilization of HBL and calculated correlation of Total capital with Deposit collection, total capital with Loan mobilization and Deposit collection with Loan mobilization. The multiple

correlation of Total capital with Deposit collection and Loan mobilization also finally calculated with help of simple correlations which is given in annex part of the thesis.

The Total capital is noted as X_1, Deposit collection as X_2 and Loan mobilization as X_3 for making calculation work easier and convenience. The calculated correlation between Total capital and Deposit collection (r_{12}) is 0.96, Total capital and Loan mobilization (r_{13}) is 0.98 and Deposit collection and Loan mobilization (r_{23}) is 0.95. It shows that Total capital and Deposit collection has high positive relationship. On the same way the relationship between total capital and loan mobilization is also highly positive as r_{13} is 0.98. The deposit collection and loan mobilization relationship also high shown by r_{23} of 0.95.

The multiple correlations ($r_{1.23}$) of 0.9845 show the positive relationship of deposit collection and loan mobilization with Total capital. It means the change in deposit collection or loan mobilization changes the total capital of the HBL. There is high degree of relationship of total capital with deposit collection and loan mobilization. The calculated multiple coefficient of determinant (square of $r_{1.23}$) that makes the work easier for interpretation of the data and findings is $(0.9845)^2$ i.e 0.9692. The multiple coefficient of determinant 0.9692 states that the 96.92% of total variation in Total capital of HBL is influenced by the variables deposit collection and loan mobilization rest 3.08% variation in the total capital of HBL is influenced by other factors rather than the deposit collection and loan mobilization financed by the bank. The significant of multiple correlations is calculated by using probable error as follows:

$$\text{Probable Error (PE)} = 0.6745 \ \frac{1\text{Z}r^2}{\sqrt{n}}$$

$$= 0.6745 \ | \ \frac{1\text{Z}(0.9845)^2}{\sqrt{5}}$$

$$= 0.2923$$

Then,

PE	6 PE	r	Result
0.2923	1.7538	0.9845	
		r < 6 PE	Insignificant

It is well known fact that if r < PE the correlation is insignificant, if r > 6 PE only then the calculated correlation will be significant. And if PE < r < 6 PE nothing can be calculated. In the above calculation, r < 6PE < r so, the calculated correlation coefficient is insignificant.

Table - 11

Multiple Correlation Co-efficient of EBL

Year	Total Capital (X_1)	Deposit Collection (X_2)	Loan Mobilization (X_3)	Correlation (r)
2006	818,000,000	18,186,200,000	14,082,700,000	
2007	1,131,400,000	23,976,300,000	18,836,400,000	
2008	1,138,821,000	33,322,900,000	24,469,600,000	
2009	1,330,467,300	36,932,300,000	28,156,400,000	$r_{12} = 0.93$ $r_{13} = 0.95$ $r_{23} = 0.96$
2010	1,579,609,490	41,127,900,000	31,661,800,000	
Total	5,998,297,790	153,545,600,000	117,206,900,000	$r_{1.23} = 0.9543$

[Source: Annex 16]

AS per the annex 6 for calculation of correlation coefficient for total capital and deposit collection (r_{12}) is 0.93, total capital and loan mobilization (r_{13}) is 0.95 and deposit collection and loan mobilization (r_{23}) is 0.96 given in above table.

The multiple correlations $(r_{1.23})$ of 0.9543 for the EBL showed the positive relationship of deposit collection and loan mobilization with total capital. Here calculated multiple coefficient of determinant (square of $r_{1.23}$) is $(0.9543)^2$ i.e 0.9107. It means out of the overall variation in Net Income of EBL 91.07% is due to the factors deposit collection and loan mobilization. Remaining 8.93% variation on the total capital is caused by due to other factors besides the deposit collection and loan mobilization. The significant of multiple correlations can be calculated by using probable error based on the above calculated multiple correlations for the EBL as follows:

Probable Error (PE) $= 0.6745 \dfrac{1 Z r^2}{\sqrt{n}}$

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$$= 0.6745 \mid \frac{1 Z (0.9543)^2}{\sqrt{5}}$$

$$= 0.0269$$

Then,

PE	6 PE	r	Result
0.0269	0.16163	0.9543	
		r > 6 PE	**Significant**

If,

   r < PE the correlation is insignificant

   r > 6 PE only then the calculated correlation will be significant.

   PE < r < 6 PE nothing can be calculated.

So, the calculated correlation coefficient is significant.

Table - 12

Multiple Correlation Co-efficient of NBBL

Year	Total Capital (X_1)	Deposit Collection (X_2)	Loan Mobilization (X_3)	Correlation (r)
2006	719,852,000	9,385,949,552	4,409,013,042	
2007	744,126,000	10,883,652,582	8,457,808,829	
2008	1,860,315,000	9,997,697,430	6,704,943,114	$r_{12} = 0.33$
2009	1,860,315,000	10,052,182,377	7,809,544,311	$r_{13} = 0.52$ $r_{23} = 0.95$
2010	2,009,396,000	11,511,677,000	10,237,455,000	$r_{1.23} = 0.7391$
Total	**7,194,004,000**	**51,831,158,941**	**37,618,764,296**	

[Source: Annex 17]

The multiple correlation coefficients for total capital with reference to deposit collection and loan mobilization ($r_{1.23}$) is 0.7391 calculated in annex 7. It gives the positive relationship between total capital and deposit collection, loan mobilization. The increment in deposit and loan mobilization of NBBL causes positive change in total capital of NBBL. For more clear information on relation of deposit collection and loan mobilization with total capital here is coefficient of multiple determination which is the square of correlation denoted by $R_{1.23}$.

The coefficient of multiple determination of NBBL is $R_{1.23} = (0.7391)^2$ i.e 0.5462. It states that the variation on total capital of NBBL is 54.62% caused by the factors deposit collection and loan mobilization; and 45.38% variation is caused by other factors rather than deposit collection and loan mobilization. The significant of multiple correlations can be calculated by using probable error as follows:

$$\text{Probable Error (PE)} = 0.6745 \ \frac{1Zr^2}{\sqrt{n}}$$

$$= 0.6745 \ | \ \frac{1Z(0.7391)^2}{\sqrt{5}}$$

$$= 0.1369$$

Then,

PE	6 PE	r	Result
0.1369	0.8214	0.7391	
		r < 6 PE	**Insignificant**

If,

  r < PE   = correlation insignificant

  r > 6 PE   = correlation significant

  PE < r < 6 PE = nothing can be calculated.

As per the calculation above the multiple correlation is less than six times Probable Error which indicated the calculated multiple correlation for NBBL is insignificant.

Table - 13

Multiple Correlation Co-efficient of NSBL

Year	Total Capital (X_1)	Deposit Collection (X_2)	Loan Mobilization (X_3)	Correlation (r)
2006	847,798,000	11,445,286,000	9,460,451,000	
2007	1,074,528,000	13,715,395,000	12,113,698,000	$r_{12} = 0.98$
2008	1,424,339,000	27,957,221,000	15,131,748,000	$r_{13} = 0.82$ $r_{23} = 0.83$
2009	2,061,324,000	34,896,424,000	17,480,548,000	$r_{1.23} = 0.9802$
2010	2,302,966,000	42,415,443,000	42,415,443,000	

	Total	7,710,955,000	130,429,769,000	96,601,888,000	

The table above presented the total capital, deposit collection and loan mobilization of NSBL for the F.Y 2006 to 2010. The correlation calculated with help of these data are shown on the last column of the table. With help of simple correlations the multiple correlation of total capital with deposit collection and loan mobilization is obtained as of $r_{1.23}$ of 0.9802. It shows that the high positive correlation of total capital with deposit collection and loan mobilization.

For the convenient interpretation coefficient of multiple determination is calculated as $R_{1.23} = (0.9802)^2$ i.e 0.9608. The calculated coefficient of multiple determinations gives that the 96.08% change in total capital is caused by two factors deposit collection and loan mobilization. The negligible 3.92% variation on total capital is due to other factors.

The significant of multiple correlations can be calculated by using probable error as follows:

$$\text{Probable Error (PE)} = 0.6745 \ \frac{1Zr^2}{\sqrt{n}}$$

$$= 0.6745 \ \mid \ \frac{1Z(0.9802)^2}{\sqrt{5}}$$

$$= 0.0118$$

Then,

PE	6 PE	r	Result
0.0118	0.0709	0.9802	
		r > 6 PE	**Significant**

As per the calculation above the multiple correlation is greater than six times Probable Error which indicated the calculated multiple correlation significant.

Table - 14

Multiple Correlation Co-efficient of Nabil

Year	Total Capital (X₁)	Deposit Collection (X₂)	Loan Mobilization (X₃)	Correlation (r)
2006	491,654,000	23,342,285,000	15,545,779,000	
2007	929,216,000	31,915,047,000	21,365,053,000	
2008	1,265,747,000	37,348,256,000	27,589,933,000	$r_{12} = 0.98$
2009	2,328,774,000	46,410,701,000	32,268,873,000	$r_{13} = 0.96$ $r_{23} = 0.99$
2010	2,329,769,000	49,696,113,000	38,034,098,000	$r_{1.23} = 0.9848$
Total	7,345,160,000	188,712,402,000	134,803,736,000	

[Source: Annex 19]

In the table, the total capital is denoted by X_1, deposit collection is X_2 and loan mobilization is X_3 for making the statistical calculation work easier. Based on the five years data from F.Y 2006 to 2010, the correlation among these three variables are calculated whose detail is given in annex 9. The $r_{12} = 0.98$ shows that high positive correlation between total capital and deposit calculation. $r_{13} = 0.96$ gives that highly positive correlation of total capital with loan mobilization and the $r_{23} = 0.99$ states the highly positive correlation between deposit collection and loan mobilization of the Nabil. The multiple correlation $r_{1.23} = 0.9848$ shows that the correlation of total capital with deposit collection and loan mobilization of Nabil is highly positive. The calculation of coefficient of multiple determination $R_{1.23}$ can be calculated taking the square of the $r_{1.23}$ which will be $(0.9848)^2$ i.e 0.9698.

The significant of multiple correlations can be calculated by using probable error as follows:

Probable Error (PE) $= 0.6745 \dfrac{1 Z r^2}{\sqrt{n}}$

$$= 0.6745 \mid \frac{1 Z (0.9848)^2}{\sqrt{5}}$$

$$= 0.0091$$

Then,

PE	6 PE	r	Result
0.0091	0.0546	0.9848	
		r > 6 PE	Significant

If,

r < PE = correlation insignificant

r > 6 PE = correlation significant

PE < r < 6 PE = nothing can be calculated.

As per the calculation above the multiple correlation is greater than six times Probable Error which indicated the calculated multiple correlation for Nabil is significant.

Among the five JVCBs of Nepal selected for the study Nabil has the highest degree of positive correlation of total capital with deposit collection and loan mobilization upto 0.9848 whereas the NBBL has lowest of 0.7391. The HBL has 0.9845 2nd highest positive high degree of relationship. NSBL has 0.9802 multiple correlation and EBL has 0.9543. Finally, Conclusion can be drawn based on the above study of the multiple correlation of total capital with deposit collection and loan mobilization for the JVCBs of Nepal that JVCBs of Nepal have got higher degree of positive relationship between deposit collection and loan mobilization with total capital. More of the variation on the total capital of JVCBs of Nepal is due to the two factors deposit collection and loan mobilization. So, the management team of the JVCBs of Nepal should keep in mind this high degree of positive relationship and make capital structure decision.

4.5 Findings of the Study

The data presentation and analysis using different financial and statistical tools found out the followings:

a. The optimal capital structure mix for the JVCBs of Nepal is 70% debt and 30% Equity in present context which WACC will be 6.01%. And the present capital structure mix of the JVCBs of Nepal taken for the study is not optimal.

b. Even though the operating profit of HBL trend is to be in increasing trend, the actual trend is little bit fluctuative.

c. Although in initial period the actual trend is above the estimated trend, in recent years, the actual profit is below the trend line of EBL.

d. The operating profit is unstable in NBBL.

e. It can be opined that, NSBL has not able to maintain its operating profit trend.

f. Even though the trend shows the increasing trend, Nabil is not able to maintain stable operating profit. Its operating profit is fluctuative in nature.

g. The net income of HBL is volatile in nature.

h. Initially the Net income of EBL is below the trend line but middle two years has above trend line and in recent it has again deficit of actual net income than its estimated net income.

i. NBBL has even though loss in F.Y 2006 it was able to recover the loss maintained net income later.

j. NSBL's net income is moving towards the above trend line in these recent years, efforts should continue for this trend.

k. The net income of Nabil is fluctuating around the estimated trend line. Management has to make effort to bring the actual net income trend line above the estimated net income trend line.

l. The TIE ratio of HBL is 2.88, EBL is 61.86, NSBL is 39.02 and Nabil is 53.05. Whereas since NBBL has no bonds & debentures, it has infinite times TIE ratio.

m. The OITC ratio is highest of Nabil with 123.73%, EBL 90.53%, HBL 75.78%, NSBL with 31.27% and NBBL with -6.05% in average for the study period.

n. The NITC ratio of NBBL is 24.86% in average even though its average OITC ratio is negative. 81.06% NITC of Nabil rank 1st among selected five sample JVCBs of Nepal. 52.35% of HBL, 50.73% of EBL, and 22.90% of NSBL.

o. The ROSE shows that NBBL has the highest among sample selected for the study of 38.02%. Nabil followed NBBL with 31.07% and thereafter 21.90% HBL, 18.76% EBL and 18.00% NSBL respectively.

p. The HBL multiple correlations ($r_{1.23}$) of 0.9845 show the positive relationship of deposit collection and loan mobilization with Total capital.

q. The multiple correlations ($r_{1.23}$) of 0.9543 for the EBL showed the positive relationship of deposit collection and loan mobilization with total capital.

r. The multiple correlation coefficients for total capital with reference to deposit collection and loan mobilization ($r_{1.23}$) of NBBl is 0.7391 that gives the positive relationship.

s. It shows that the NSBL has high positive correlation of total capital with deposit collection and loan mobilization.

t. The multiple correlation $r_{1.23}$ = 0.9848 shows that the correlation of total capital with deposit collection and loan mobilization of Nabil is highly positive.

CHAPTER V

5. SUMMARY, CONCLUSION AND RECOMMENDATION

The final chapter of the thesis is summary, conclusion and recommendation. This chapter is divided into three sections: Summary, Conclusions and Recommendations. In this chapter, the summary section contains the summarized form of the whole thesis, the conclusion of the study based on the findings from the study and some useful recommendations to improve the banking performance and manage capital structure of the JVCBs of Nepal in a more effective way.

5.1 Summary of the study

Capital, in the most basic terms, is money. All businesses must have capital in order to purchase assets and maintain their operations. Capital is a scarce sources and much more essential to maintain smooth operation of any firm. The available capital and financial sources should be utilized so efficiently that could generate maximum return. Capital structure or capitalization of the firm is the permanent financing represented by long term debt, preferred stock and shareholders' equity. The thesis tried to explore present capital structure mix, profit trend and relation of dependency of total capital on deposit collection and loan mobilization of JVCBs of Nepal with the following major objectives:

a. To trace out the present trend of operating profit and net profit trend as well as forecasting the future trend for joint venture commercial banks of Nepal.

b. To examine relationship of the capital, deposit collection and loan mobilization of the joint venture commercial banks of Nepal.

c. To examine the present capital structure of the JVCBs of Nepal optimal or not and determining the optimal capital structure mix for the JVCBs of Nepal.

d. To provide the suggestions and recommendations based on the above study.

Before the study and during the study, the researcher has been through several books, journals, websites, articles, dissertations related to the thesis problem in order to have detailed knowledge on research topic and the findings of previous researches. Researcher has been through review of the four capital structure related theories:

    (a) Net income approach   (c) Net operating income approach

    (b) Traditional approach   (d) Modigliani- Miller's approach

Similarly, the review on leverage, signaling theory, trade off theory related to capital structure is also done in the section literature review part of the study. Several journals and articles published are also reviewed in the same section. Finally the most useful review of past thesis and dissertations completed by the students of Tribhuvan University in different academic years in partial fulfillment of MBS degree related to capital structure are studied and reviewed.

The one of the most guideline of the thesis research design is prepared in the 3rd section of thesis. The thesis used analytical plus descriptive research design using financial tools ratio analysis, statistical tools: average, multiple correlations, trend analysis etc. The research is based on completely secondary data available in the websites of sample banks. It has been selected five sample JVCBs: HBL, EBL, NBBL, NSBL and Nabil out of six JVCBs of Nepal which is 83.00% of the total population.

The real talent of the researcher is described through the fourth chapter of the thesis which is called data presentation and analysis. This unit comprised of the systematic presentation of data related to the study and analysis to draw the conclusion related to the objectives of the study. Researcher has given his best effort to present the necessary and related data only as far as attractive and convincing way that helps to easy grasp the concerned material by the others. Simple tables and attractive diagrams of various types suitable to the study are used on this section. The analysis is made using appropriate analysis technique with details in annex is done. The reference of every analysis is given in descriptive form in annex which definitely help who will go through this thesis to get step by step knowledge on the analysis made by researcher. Finally the findings of the study are summarized at the end of this section as well as the major findings which are related to the thesis objective is presented.

Last but not the least, the final chapter of the study presented the overall summary of the thesis in a brief. The next of this section are the conclusions drawn by the researcher from the study with some useful recommendations based on study.

5.2 Conclusion of the study

Finally the outcome of the thesis conclusion is presented as below based on the study made by researcher and results obtained in the data presentation and analysis part of the thesis. Based on the findings, and the researcher's analysis the conclusions of the study are:

a. The trend line drawn using least square method based on past five years data from F.Y 2006 to 2010 for the selected sample banks shown that the operating profit and net income trend is increasing. But the actual operating profit and net income trend of none single JVCB has increasing trend. Mostly have fluctuating trend. They do not have stable operating & net income trend. The graph shown that it is difficult to predict the operating & net income trend of JVCBs of Nepal. It needs microscopic study and regular watch on the profit trend of JVCBs of Nepal. Moreover, study can be made with a bit large size historical data.

b. The study of multiple correlation of total capital with deposit collection and loan mobilization for the five selected sample JVCBs shown that there is high degree of positive correlation of total capital with deposit collection and loan mobilization. The significance of the study test shows that majority of the multiple correlation calculated are insignificant. It needs further more study to be carried on in this multiple correlation analysis.

c. The present capital structure of the JVCBs of Nepal are not following the optimal capital structure and WACC. They have employed the capital in hunch and easily available source only. Because last few years trend shows that banks & financial institutions are raising their additional capital through the right share & bonus share whose cost is comparatively high than debt financing and less risky. The optimal capital structure for JVCBs of Nepal are 70% debt and 30% equity. The present JVCBs of Nepal has very lower proportion of debt financing only. So that they are not able to reduce their cost of capital and achieve optimal capital structure.

So in the conclusion, the present capital structure of the JVCBs is dominated by the equity portion.

5.3 Recommendations of the Study

Recommendations are the suggestions for the organizations to solve the existing problems in the organization. Here based on the analysis made in chapter IV, findings of the study and

conclusion drawn from the study the researcher has little effort made to provide some recommendations that will be beneficiary for the JVCBs of Nepal on their cost of capital reduction and increment of profit and overall efficiency of the joint venture commercial banks of Nepal.

a. The operating profit trend of the JVCBs of Nepal is to be in increasing trend but single banks could not have increasing trend. They have fluctuating and volatile nature operating profit trend. For this, the operation cost to be reduced and the resources should be utilized maximum that helps in cost reduction. The next is the income from the loan amount to be recovered timely.

b. The net income trend of JVCBs of Nepal is little bit good than operating profit trend. It may be due to use of negligible volume of debt in capital structure. But as we came to know that debt has low cost of capital and is a good source of capital that will help to reduce WACC of the firm, the effort of the management should be stable increasing net income trend even though it includes debt portion in its present capital structure mix.

c. The ratio analysis shows that TIE ratio is high for almost all JVCBs of Nepal and from the optimal capital structure analysis it found the contain of debt capital in capital structure decreases WACC, JVCBs of Nepal have to go for increasing portion of debt capital in its current capital structure mix.

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Annex : 1 Calculation of operating profit trend using least square method for HBL

Let the straight line trend be,

$$y = a + b x \quad - \quad - \quad - \quad (i)$$

Year (X)	Operating Profit (X)	x = X-2008	x^2	xy	Y = a + b x
2006	717,403,000.0	- 2.00	4.00	-1,434,806,000.00	775,751,800
2007	948,839,000.00	- 1.00	1.00	-948,839,000.00	860,506,800
2008	1,066,606,000.00	-	0.00	0.00	945,261,800
2009	755,727,000.00	1.00	1.00	755,727,000.00	1,030,016,800
2010	1,237,734,000.00	2.00	4.00	2,475,468,000.00	1,114,771,800
	y = 4,726,309,000.00		x^2 = 10.00	xy = 847,550,000.00	

Where,

n = No. of years

Since $x = 0,$

$$a = \frac{y}{n} = \frac{4,726,309,000}{5} \quad \text{i.e} \qquad 468,204,600.00$$

$$b = \frac{xy}{x^2} = \frac{47,550,0000}{10} \quad \text{i.e} \qquad 84,755,000.00$$

Substituting the values of a and b in (i), the equation of the trend line is:

  $y = 468,204,600.00 + 84,755,000.00 \text{ x}$

For Trend Values when;
x = -2 y = 468,204,600.00 + 84,755,000.00 | (-2)   i.e   **775,751,800**
x = -1 y = 468,204,600.00 + 84,755,000.00 | (-1)   i.e   **860,506,800**
x = 0   y = 468,204,600.00 + 84,755,000.00 | 0   i.e   **945,261,800**
x = 1   y = 468,204,600.00 + 84,755,000.00 | 1   i.e   **1,030,016,800**
x = 2   y = 468,204,600.00 + 84,755,000.00 | 2   i.e   **1,114,771,800**

Forecasting for F.Y;

2011   x = 3   y = 468,204,600.00 + 84,755,000.00 | 3 i.e   **1,199,526,800**
2012   x = 4   y = 468,204,600.00 + 84,755,000.00 | 4 i.e   **1,284,281,800**
2013   x = 5   y = 468,204,600.00 + 84,755,000.00 | 5 i.e   **1,369,036,800**
2014   x = 5   y = 468,204,600.00 + 84,755,000.00 | 6 i.e   **1,453,791,800**

Annex : 2 Calculation of operating profit trend using least square method for EBL

Let the straight line trend be,

$$y = a + b x \quad - \quad - \quad - \quad (i)$$

Year (X)	Operating Profit (y)	x = X-2008	x^2	xy	Y = a + b x
2006	597,900,000.00	- 2.00	4.00	-1,195,800,000.00	596,500,000
2007	853,700,000.00	- 1.00	1.00	-853,700,000.00	855,000,000
2008	1,097,400,000.00	-	0.00	0.00	1,113,500,000
2009	1,402,500,000.00	1.00	1.00	1,402,500,000.00	1,372,000,000
2010	1,616,000,000.00	2.00	4.00	3,232,000,000.00	1,630,500,000
	y = 5,567,500,000.00		x^2 = 10.00	xy = 2,585,000,000.00	

Where,

      n = No. of years

Since $x = 0$,

$$a = \frac{y}{n} = \frac{5,567,500,000}{5} \quad \text{i.e} \qquad 1,113,500,000.00$$

$$b = \frac{xy}{x^2} = \frac{2,585,000,000}{10} \quad \text{i.e} \qquad 258,500,000.00$$

Substituting the values of a and b in (i), the equation of the trend line is:

   $y = 1,113,500,000.00 + 258,500,000.00 \; x$

For Trend Values when;
$x = -2$ $y = 1,113,500,000.00 + 258,500,000.00 \;|(-2)$ i.e **596,500,000**
$x = -1$ $y = 1,113,500,000.00 + 258,500,000.00 \;|(-1)$ i.e **855,000,000**
$x = 0$ $y = 1,113,500,000.00 + 258,500,000.00 \;| 0$ i.e **1,113,500,000**
$x = 1$ $y = 1,113,500,000.00 + 258,500,000.00 \;| 1$ i.e **1,372,000,000**
$x = 2$ $y = 1,113,500,000.00 + 258,500,000.00 \;| 2$ i.e **1,630,500,000**

Forecasting for F.Y;

2011 $x = 3$ $y = 1,113,500,000.00 + 258,500,000.00 \;| 3$ i.e **1,889,000,000**
2012 $x = 4$ $y = 1,113,500,000.00 + 258,500,000.00 \;| 4$ i.e **2,147,500,000**
2013 $x = 5$ $y = 1,113,500,000.00 + 258,500,000.00 \;| 5$ i.e **2,406,000,000**
2014 $x = 5$ $y = 1,113,500,000.00 + 258,500,000.00 \;| 6$ i.e **2,664,500,000**

Annex : 3 Calculation of operating profit trend using least square method for NBBL

Let the straight line trend be,

$$y = a + b x \quad - \quad - \quad - \quad (i)$$

Year (X)	Operating Profit (y)	x = X-2008	x^2	xy	Y = a + b x
2006	(935,858,946.00)	- 2.00	4.00	1,871,717,892.00	(392,082,014.20)
2007	174,453,224.00	- 1.00	1.00	(174,453,224.00)	(128,629,647.40)
2008	710,301,319.00	-	-	-	134,822,719.40
2009	513,177,000.00	1.00	1.00	513,177,000.00	398,275,086.20
2010	212,041,000.00	2.00	4.00	424,082,000.00	661,727,453.00
	y = 674,113,597.00		x^2 = 10.00	xy = 2,634,523,668.00	

Where,

n = No. of years

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Since $x = 0$,

$$a = \frac{y}{n} = \frac{674{,}113{,}597}{5} \text{ i.e } 134{,}822{,}719.40$$

$$b = \frac{xy}{x^2} = \frac{3{,}379{,}070{,}036}{10} \text{ i.e } 263{,}452{,}366.80$$

Substituting the values of a and b in (i), the equation of the trend line is:

   y = 134,822,719.40 + 263,452,366.80 x

For Trend Values when;
x = -2 y = 134,822,719.40 + 263,452,366.80 x |(-2) i.e **-392,082,014.20**
x = -1 y = 134,822,719.40 + 263,452,366.80 x |(-1) i.e **-128,629,647.40**
x = 0   y = 134,822,719.40 + 263,452,366.80 x | 0   i.e **134,822,719.40**
x = 1   y = 134,822,719.40 + 263,452,366.80 x | 1   i.e **398,275,086.20**
x = 2   y = 134,822,719.40 + 263,452,366.80 x | 2   i.e **661,727,453.00**

Forecasting for F.Y;
2011   x = 3   y = 134,822,719.40 + 263,452,366.80 x | 3 i.e   **925,179,819.80**
2012   x = 4   y = 134,822,719.40 + 263,452,366.80 x | 4 i.e **1,188,632,186.60**
2013   x = 5   y = 134,822,719.40 + 263,452,366.80 x | 5 i.e **1,452,084,553.40**
2014   x = 5   y = 134,822,719.40 + 263,452,366.80 x | 6 i.e **1,715,536,920.20**

Annex : 4 Calculation of operating profit trend using least square method for NSBL

Let the straight line trend be,

$$y = a + b x \quad - \quad - \quad - \quad (i)$$

Year (X)	Operating Profit (y)	x = X-2008	x^2	xy	Y = a + b x
2006	300,790,000.00	(2.00)	4.00	- 601,580,000.00	275,426,800
2007	353,325,000.00	(1.00)	1.00	- 353,325,000.00	371,815,700
2008	442,366,000.00	-	-	-	468,204,600
2009	570,290,000.00	1.00	1.00	570,290,000.00	564,593,500
2010	674,252,000.00	2.00	4.00	1,348,504,000.00	660,982,400
2011	y = 2,341,023,000.00	3.00	x^2 = 10.00	xy = 963,889,000.00	

Where,

     n = No. of years

Since $\quad x = 0$,

$$a = \frac{y}{n} \quad = \frac{2{,}341{,}023{,}000}{5} \quad \text{i.e} \qquad 468{,}204{,}600.00$$

$$b = \frac{xy}{x^2} \quad = \frac{963{,}889{,}000}{10} \quad \text{i.e} \qquad 96{,}388{,}900.00$$

Substituting the values of a and b in (i), the equation of the trend line is:

$\qquad$ y = 468,204,600.00 + 96,388,900.00 x

For Trend Values when;
x = -2 y = 468,204,600.00 + 96,388,900.00 | (-2)   i.e   **275,426,800**
x = -1 y = 468,204,600.00 + 96,388,900.00 | (-1)   i.e   **371,815,700**
x = 0   y = 468,204,600.00 + 96,388,900.00 | 0   i.e   **468,204,600**
x = 1   y = 468,204,600.00 + 96,388,900.00 | 1   i.e   **564,593,500**
x = 2   y = 468,204,600.00 + 96,388,900.00 | 2   i.e   **660,982,400**

Forecasting for F.Y;

2011   x = 3   y = 468,204,600.00 + 96,388,900.00 | 3 i.e   **757,371,300**
2012   x = 4   y = 468,204,600.00 + 96,388,900.00 | 4 i.e   **853,760,200**
2013   x = 5   y = 468,204,600.00 + 96,388,900.00 | 5 i.e   **950,149,100**
2014   x = 5   y = 468,204,600.00 + 96,388,900.00 | 6 i.e   **1,046,538,000**

Annex : 5 Calculation of operating profit trend using least square method for Nabil

Let the straight line trend be,

$$y = a + b x \quad - \quad - \quad - \quad (i)$$

Year (X)	Operating Profit (y)	x = X-2008	x^2	xy	Y = a + b x
2006	1,037,607,000.00	- 2.00	4.00	- 2,075,214,000.00	969,452,800
2007	1,122,714,000.00	- 1.00	1.00	- 1,122,714,000.00	1,236,809,900
2008	1,570,205,000.00	-	-	-	1,504,167,000
2009	1,709,119,000.00	1.00	1.00	1,709,119,000.00	1,771,524,100
2010	2,081,190,000.00	2.00	4.00	4,162,380,000.00	2,038,881,200
	y = 7,520,835,000.00		x^2 = 10.00	xy = 2,673,571,000.00	

Where,

n = No. of years

Since $x = 0$,

$$a = \frac{y}{n} = \frac{7,520,835,000}{5} \text{ i.e} \quad 1,504,167,000.00$$

$$b = \frac{xy}{x^2} = \frac{2,673,571,000}{10} \text{ i.e} \quad 267,357,100.00$$

Substituting the values of a and b in (i), the equation of the trend line is:

$$y = 1,504,167,000.00 + 267,357,100.00 \text{ x}$$

For Trend Values when;

x = -2 y = 1,504,167,000.00 + 267,357,100.00 |(-2) i.e   **969,452,800**
x = -1 y = 1,504,167,000.00 + 267,357,100.00 |(-1) i.e   **1,236,809,900**
x = 0   y = 1,504,167,000.00 + 267,357,100.00 | 0   i.e   **1,504,167,000**
x = 1   y = 1,504,167,000.00 + 267,357,100.00 | 1   i.e   **1,771,524,100**
x = 2   y = 1,504,167,000.00 + 267,357,100.00 | 2   i.e   **2,038,881,200**

Forecasting for F.Y;

2011   x = 3   y = 1,504,167,000.00 + 267,357,100.00 | 3 i.e   **2,306,238,300**
2012   x = 4   y = 1,504,167,000.00 + 267,357,100.00 | 4 i.e   **2,573,595,400**
2013   x = 5   y = 1,504,167,000.00 + 267,357,100.00 | 5 i.e   **2,840,952,500**
2014   x = 5   y = 1,504,167,000.00 + 267,357,100.00 | 6 i.e   **3,108,309,600**

Annex : 6 Calculation of Net Income trend using least square method for HBL

$$b = \frac{xy}{x^2} = \frac{675,513,000}{10} \text{ i.e} \quad 67,551,300.00$$

Let the straight line trend be,

$$y = a + b x \quad - \quad - \quad - \quad (i)$$

Substituting the values of a and b in (i), the equation of the trend line is:

$$y = 335,072,000.00 + 67,551,300.00 \, x$$

$$Y = a + b x$$

Year (X)	Net Income (y)	x = X-2008	x^2	xy	Y = a + b x
2006	491,823,000.00	- 2.00	4.00	- 983,646,000.00	521,385,400.00
2007	635,869,000.00	- 1.00	1.00	- 635,869,000.00	588,936,700.00
2008	752,835,000.00	-	0.00	-	335,072,000.00
2009	508,798,000.00	1.00	1.00	508,798,000.00	724,039,300.00
2010	893,115,000.00	2.00	4.00	1,786,230,000.00	791,590,600.00
2011	$y = 3,282,440,000.00$	3.00	$x^2 =10.00$	$xy = 675,513,000.00$	

For Trend Value when;

x = -2	y = 335,072,000.00 + 67,551,300.00 (-2)	i.e	521,385,400.00
x = -1	y = 335,072,000.00 + 67,551,300.00 (-1)	i.e	588,936,700.00
x = 0	y = 335,072,000.00 + 67,551,300.00 | 0	i.e	335,072,000.00
x = 1	y = 335,072,000.00 + 67,551,300.00 | 1	i.e	724,039,300.00
x = 2	y = 335,072,000.00 + 67,551,300.00 | 2	i.e	791,590,600.00

Where,

   n = No. of years

Forecasting for F.Y;

2011	x = 3	y = 335,072,000.00 + 67,551,300.00 | 3 i.e	859,141,900.00
2012	x = 4	y = 335,072,000.00 + 67,551,300.00 | 4 i.e	926,693,200.00
2013	x = 5	y = 335,072,000.00 + 67,551,300.00 | 5 i.e	994,244,500.00
2014	x = 5	y = 335,072,000.00 + 67,551,300.00 | 6 i.e	1,061,795,800.00

Since $x = 0$,

$$a = \frac{y}{n} = \frac{3,282,440,000}{5} \text{ i.e} \quad 335,072,000.00$$

Annex : 7 Calculation of Net Income trend using least square method for EBL

Let the straight line trend be,

$$y = a + b x \quad - \quad - \quad - \quad (i)$$

Year (X)	Net Income (y)	x = X-2008	x^2	xy	Y = a + b x
2006	296,400,000.00	- 2.00	4.00		
2007	451,200,000.00	- 1.00	1.00		
2008	638,600,000.00	-	0.00		
2009	831,800,000.00	1.00	1.00		
2010	931,300,000.00	2.00	4.00		

$$y = 3{,}149{,}300{,}000.00 \qquad x^2 = 10.00$$

2011   x = 3   y = 629,860,000.00 + 165,040,000.00 | 3 i.e   **1,124,980,000.00**
2012   x = 4   y = 629,860,000.00 + 165,040,000.00 | 4 i.e   **1,290,020,000.00**
2013   x = 5   y = 629,860,000.00 + 165,040,000.00 | 5 i.e   **1,455,060,000.00**
2014   x = 5   y = 629,860,000.00 + 165,040,000.00 | 6 i.e   **1,620,100,000.00**

$$xy = 1{,}650{,}400{,}000.00$$

Where,

n = No. of years

Since $x = 0$,

$$a = \frac{y}{n} = \frac{3{,}149{,}300{,}000}{5} \quad \text{i.e} \qquad 629{,}860{,}000.00$$

$$b = \frac{xy}{x^2} = \frac{1{,}650{,}400{,}000}{10} \quad \text{i.e} \qquad 165{,}040{,}000.00$$

Substituting the values of a and b in (i), the equation of the trend line is:

y = 629,860,000.00 + 165,040,000.00 x

For Trend Values when;
x = -2   y = 629,860,000.00 + 165,040,000.00 | (-2)   i.e   **299,780,000.00**
x = -1   y = 629,860,000.00 + 165,040,000.00 | (-1)   i.e   **464,820,000.00**
x = 0   y = 629,860,000.00 + 165,040,000.00 | 0   i.e   **629,860,000.00**
x = 1   y = 629,860,000.00 + 165,040,000.00 | 1   i.e   **794,900,000.00**
x = 2   y = 629,860,000.00 + 165,040,000.00 | 2   i.e   **959,940,000.00**

Forecasting for F.Y;

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Annex : 8 Calculation of Net Income trend using least square method for NBBL

Let the straight line trend be,

$$y = a + b x \quad - \quad - \quad - \quad (i)$$

Year (X)	Net Income (y)	x = X-2008	x^2	xy	Y = a + b x
2006	- 1,061,579,502.00	- 2.00	4.00	2,123,159,004.00	- 49,833,861.40
2007	596,487,029.00	- 1.00	1.00	-596,487,029.00	288,073,142.20
2008	2,158,104,141.00	-	0.00	-	625,980,145.80
2009	1,021,380,061.00	1.00	1.00	1,021,380,061.00	963,887,149.40
2010	415,509,000.00	2.00	4.00	831,018,000.00	1,301,794,153.00
	y = 3,129,900,729.00		x^2 = 10.00	xy = 3,379,070,036.00	

Where,

n = No. of years

Since $\quad x = 0$,

$$a = \frac{y}{n} \quad = \frac{3,129,900,729}{5} \text{ i.e} \qquad 625,980,145.80$$

$$b = \frac{xy}{x^2} \quad = \frac{3,379,070,036}{10} \text{ i.e} \qquad 337,907,003.60$$

Substituting the values of a and b in (i), the equation of the trend line is:

$\quad$ y = 625,980,145.80+ 337,907,003.60 x

For Trend Values when;
x = -2 y = 625,980,145.80+ 337,907,003.60 | (-2)   i.e **- 49,833,861.40**
x = -1 y = 625,980,145.80+ 337,907,003.60 | (-1)   i.e   **288,073,142.20**
x = 0   y = 625,980,145.80+ 337,907,003.60 | 0   i.e   **625,980,145.80**
x = 1   y = 625,980,145.80+ 337,907,003.60 | 1   i.e   **963,887,149.40**
x = 2   y = 625,980,145.80+ 337,907,003.60 | 2   i.e **1,301,794,153.00**

Forecasting for F.Y;
2011   x = 3   y = 625,980,145.80+ 337,907,003.60 | 3 i.e **1,639,701,156.60**
2012   x = 4   y = 625,980,145.80+ 337,907,003.60 | 4 i.e **1,977,608,160.20**
2013   x = 5   y = 625,980,145.80+ 337,907,003.60 | 5 i.e **2,315,515,163.80**
2014   x = 5   y = 625,980,145.80+ 337,907,003.60 | 6 i.e **2,653,422,167.40**

Annex : 9 Calculation of Net Income trend using least square method for NSBL

Let the straight line trend be,

$$y = a + b x \qquad - \qquad - \qquad - \qquad (i)$$

Year (X)	Net Income (y)	x = X-2008	x^2	xy	Y = a + b x
2006	254,909,000.00	- 2.00	4.00	- 509,818,000.00	222,415,400.00
2007	247,771,000.00	- 1.00	1.00	- 247,771,000.00	278,743,700.00
2008	316,373,000.00	-	0.00	-	335,072,000.00
2009	391,742,000.00	1.00	1.00	391,742,000.00	391,400,300.00
2010	464,565,000.00	2.00	4.00	929,130,000.00	447,728,600.00
2011	y = 1,675,360,000.00	3.00	x^2 = 10.00	xy = 563,283,000.00	

Where,

n = No. of years

Since $x = 0$,

$$a = \frac{y}{n} = \frac{1,675,360,000}{5} \text{ i.e} \qquad 335,072,000.00$$

$$b = \frac{xy}{x^2} = \frac{563,283,000}{10} \text{ i.e} \qquad 56,328,300.00$$

Substituting the values of a and b in (i), the equation of the trend line is:

$y = 335,072,000.00 + 56,328,300.00 \ x$

For Trend Values when;

$x = -2$ $y = 335,072,000.00 + 56,328,300.00 \ |(-2)$ i.e **222,415,400.00**

$x = -1$ $y = 335,072,000.00 + 56,328,300.00 \ |(-1)$ i.e **278,743,700.00**
$x = 0$ $y = 335,072,000.00 + 56,328,300.00 \ | \ 0$ i.e **335,072,000.00**
$x = 1$ $y = 335,072,000.00 + 56,328,300.00 \ | \ 1$ i.e **391,400,300.00**
$x = 2$ $y = 335,072,000.00 + 56,328,300.00 \ | \ 2$ i.e **447,728,600.00**

Forecasting for F.Y;

2011 $x = 3$ $y = 335,072,000.00 + 56,328,300.00 \ | \ 3$ i.e **504,056,900.00**
2012 $x = 4$ $y = 335,072,000.00 + 56,328,300.00 \ | \ 4$ i.e **560,385,200.00**
2013 $x = 5$ $y = 335,072,000.00 + 56,328,300.00 \ | \ 5$ i.e **616,713,500.00**
2014 $x = 5$ $y = 335,072,000.00 + 56,328,300.00 \ | \ 6$ i.e **673,041,800.00**

Annex : 10 Calculation of Net Income trend using least square method for Nabil

Let the straight line trend be,

$$y = a + b\ x \quad - \quad - \quad - \quad (i)$$

Year (X)	Net Income (y)	x = X-2008	x^2	xy	Y = a + b x
2006	673,960,000.00	- 2.00	4.00	- 1,347,920,000.00	641,624,800.00
2007	746,468,000.00	- 1.00	1.00	- 746,468,000.00	813,840,100.00
2008	1,031,053,000.00	-	0.00	-	986,055,400.00
2009	1,141,051,000.00	1.00	1.00	1,141,051,000.00	1,158,270,700.00
2010	1,337,745,000.00	2.00	4.00	2,675,490,000.00	1,330,486,000.00
	y = 4,930,277,000.00		x^2 = 10.00	xy = 1,722,153,000.00	

Where,

n = No. of years

Since $x = 0$,

$$a = \frac{y}{n} = \frac{4{,}930{,}277{,}000}{5} \text{ i.e} \qquad 986{,}055{,}400.00$$

$$b = \frac{xy}{x^2} = \frac{1{,}722{,}153{,}000}{10} \text{ i.e} \qquad 172{,}215{,}300.00$$

Substituting the values of a and b in (i), the equation of the trend line is:

$$y = 986{,}055{,}400.00 + 172{,}215{,}300.00 \; x$$

For Trend Values when;   641,624,800.00
x = -1 y = 986,055,400.00 + 172,215,300.00 |(-1)   i.e   **813,840,100.00**
x = 0   y = 986,055,400.00 + 172,215,300.00 | 0   i.e   **986,055,400.00**
x = 1   y = 986,055,400.00 + 172,215,300.00 | 1   i.e   **1,158,270,700.00**
x = 2   y = 986,055,400.00 + 172,215,300.00 | 2   i.e   **1,330,486,000.00**

Forecasting for F.Y;

2011   x = 3   y = 986,055,400.00 + 172,215,300.00 | 3 i.e **1,502,701,300.00**
2012   x = 4   y = 986,055,400.00 + 172,215,300.00 | 4 i.e **1,674,916,600.00**
2013   x = 5   y = 986,055,400.00 + 172,215,300.00 | 5 i.e **1,847,131,900.00**
2014   x = 5   y = 986,055,400.00 + 172,215,300.00 | 6 i.e
2,019,347,200.00Annex : 11 Calculation of TIE Ratio

Calculation of TIE Ratio of HBL

Year	Operating Profit	Interest	TIE Ratio
2006	717,403,000	100,000	**7174.03**
2007	948,839,000	50,000	**18976.78**
2008	1,066,606,000	100,000	**10666.06**
2009	755,727,000	100,000	**7557.27**
2010	1,237,734,000	100,000	**12377.34**
Average TIE Ratio of HBL			**11350.30**

Calculation of TIE Ratio of EBL			
Year	Operating Profit	Interest	TIE Ratio
2006	597,900,000	18,000,000	**33.22**
2007	853,700,000	18,000,000	**47.43**
2008	1,097,400,000	18,000,000	**60.97**
2009	1,402,500,000	18,000,000	**77.92**
2010	1,616,000,000	18,000,000	**89.78**
Average TIE Ratio of EBL			**61.86**

Calculation of TIE Ratio of NBBL			
Year	Operating Profit	Interest	TIE Ratio
2006	(935,858,946)	-	**-**
2007	174,453,224	-	**-**
2008	710,301,319	-	**-**
2009	513,175,957	-	**-**
2010	212,041,000	-	**-**
Average TIE Ratio of NBBL		**-**	
Calculation of TIE Ratio of NSBL			

Year	Operating Profit	Interest	TIE Ratio
2006	300,790,000	12,000,000	25.07
2007	353,325,000	12,000,000	29.44
2008	442,366,000	12,000,000	36.86
2009	570,290,000	12,000,000	47.52
2010	674,252,000	12,000,000	56.19
Average TIE Ratio of NSBL			39.02

Calculation of TIE Ratio of Nabil			
Year	Operating Profit	Interest	TIE Ratio
2006	1,037,607,000	-	0.00
2007	1,122,714,000	20,400,000	55.04
2008	1,570,205,000	25,500,000	61.58
2009	1,709,119,000	25,500,000	67.02
2010	2,081,190,000	25,500,000	81.62
Average TIE Ratio of Nabil			53.05

For E.g: Calculation of TIE ratio of HBL for 2006

$$\text{TIE ratio} = \frac{\text{Interest}}{\text{Operating Profit}}$$

$$= \frac{100,000}{717,403,000}$$

$$= 7174.03 \text{ times and so on for others.}$$

Annex : 12 Calculation of OITC Ratio

Calculation of OITC Ratio of HBL			
Year	Operating Profit	Total Capital	OITC Ratio
2006	717,403,000	810,810,000	0.88
2007	948,839,000	1,013,513,000	0.94
2008	1,066,606,000	1,216,215,000	0.88
2009	755,727,000	1,600,000,000	0.47
2010	1,237,734,000	2,000,000,000	0.62
Average OITC Ratio of HBL			0.76

Calculation of OITC Ratio of EBL			
Year	Operating Profit	Total Capital	OITC Ratio
2006	597,900,000	818,000,000	0.73
2007	853,700,000	1,131,400,000	0.75
2008	1,097,400,000	1,138,821,000	0.96
2009	1,402,500,000	1,330,467,300	1.05
2010	1,616,000,000	1,579,609,490	1.02
Average OITC Ratio of EBL			0.91

Calculation of OITC Ratio of NBBL			
Year	Operating Profit	Total Capital	OITC Ratio
2006	(935,858,946)	719,852,000	-1.30
2007	174,453,224	744,126,000	0.23
2008	710,301,319	1,860,315,000	0.38
2009	513,175,957	1,860,315,000	0.28

2010	212,041,000	2,009,396,000	**0.11**
Average OITC Ratio of NBBL			**-0.06**

Calculation of OITC Ratio of NSBL

Year	Operating Profit	Total Capital	OITC Ratio
2006	300,790,000	847,798,000	**0.35**
2007	353,325,000	1,074,528,000	**0.33**
2008	442,366,000	1,424,339,000	**0.31**
2009	570,290,000	2,061,324,000	**0.28**
2010	674,252,000	2,302,966,000	**0.29**
Average OITC Ratio of NSBL			**0.31**

Calculation of OITC Ratio of Nabil

Year	Operating Profit	Total Capital	OITC Ratio
2006	1,037,607,000	491,654,000	**2.11**
2007	1,122,714,000	929,216,000	**1.21**
2008	1,570,205,000	1,265,747,000	**1.24**
2009	1,709,119,000	2,328,774,000	**0.73**
2010	2,081,190,000	2,329,769,000	**0.89**
Average OITC Ratio of Nabil			**1.24**

For E.g: Calculation of OITC ratio of NBBL for 2010

$$\text{TIE ratio} = \frac{\text{Operating Income}}{\text{Total Capital}}$$

$$= \frac{212,041,000}{2,009,396,000}$$

= 0.11 times and so on for others.

Annex : 13 Calculation of NITC Ratio

Calculation of NITC Ratio of HBL

Year	Net Income	Total Capital	NITC Ratio
2006	491,823,000	810,810,000	**0.61**
2007	635,869,000	1,013,513,000	**0.63**
2008	752,835,000	1,216,215,000	**0.62**
2009	508,798,000	1,600,000,000	**0.32**
2010	893,115,000	2,000,000,000	**0.45**
Average NITC Ratio of HBL			**0.52**

Calculation of NITC Ratio of EBL

Year	Net Income	Total Capital	NITC Ratio
2006	296,400,000	818,000,000	**0.36**
2007	451,200,000	1,131,400,000	**0.40**
2008	638,600,000	1,138,821,000	**0.56**
2009	831,800,000	1,330,467,300	**0.63**
2010	931,300,000	1,579,609,490	**0.59**
Average NITC Ratio of EBL			**0.51**

Calculation of NITC Ratio of NBBL

Year	Net Income	Total Capital	NITC Ratio
2006	(1,061,579,502)	719,852,000	**-1.47**

Year	Net Income	Total Capital	NITC Ratio
2007	596,487,029	744,126,000	**0.80**
2008	2,158,104,141	1,860,315,000	**1.16**
2009	1,021,380,061	1,860,315,000	**0.55**
2010	415,509,000	2,009,396,000	**0.21**
Average NITC Ratio of NBBL			**0.25**

Calculation of NITC Ratio of NSBL			
Year	Net Income	Total Capital	NITC Ratio
2006	254,909,000	847,798,000	**0.30**
2007	247,771,000	1,074,528,000	**0.23**
2008	316,373,000	1,424,339,000	**0.22**
2009	391,742,000	2,061,324,000	**0.19**
2010	464,565,000	2,302,966,000	**0.20**
Average NITC Ratio of NSBL			**0.23**

Calculation of NITC Ratio of Nabil			
Year	Net Income	Total Capital	NITC Ratio
2006	673,960,000	491,654,000	**1.37**
2007	746,468,000	929,216,000	**0.80**
2008	1,031,053,000	1,265,747,000	**0.81**
2009	1,141,051,000	2,328,774,000	**0.49**
2010	1,337,745,000	2,329,769,000	**0.57**
Average NITC Ratio of Nabil			**0.81**

For E.g: Calculation of NITC ratio of Nabil for 2009

$$\text{TIE ratio} = \frac{\text{Net Income}}{\text{Total Capital}}$$

$$= \frac{1,141,051,000}{2,329,769,000}$$

$= 0.57$ times and so on for others.

Annex : 14 Calculation of ROSE

Average ROSE of NBBL	0.38

Calculation of ROSE of HBL

Year	Net Income	Shareholders' Equity	ROSE
2006	491,823,000	2,146,500,000	0.23
2007	635,869,000	2,512,992,000	0.25
2008	752,835,000	3,119,881,000	0.24
2009	508,798,000	3,439,205,000	0.15
2010	893,115,000	3,995,478,000	0.22
		Average ROSE of HBL	0.22

Calculation of ROSE of NSBL

Year	Net Income	Shareholders' Equity	ROSE
2006	254,909,000	1,163,291,000	0.22
2007	247,771,000	1,414,645,000	0.18
2008	316,373,000	1,712,607,000	0.18
2009	391,742,000	2,450,554,000	0.16
2010	464,565,000	2,879,293,000	0.16
		Average ROSE of NSBL	0.18

Calculation of ROSE of EBL

Year	Net Income	Shareholders' Equity	ROSE
2006	296,400,000	1,514,700,000	0.20
2007	451,200,000	2,112,700,000	0.21
2008	638,600,000	2,621,600,000	0.24
2009	831,800,000	3,169,100,000	0.26
2010	931,300,000	41,127,900,000	0.02
		Average ROSE of EBL	0.19

Calculation of ROSE of Nabil

Year	Net Income	Shareholders' Equity	ROSE
2006	673,960,000	2,057,050,000	0.33
2007	746,468,000	2,437,000,000	0.31
2008	1,031,053,000	3,130,000,000	0.33
2009	1,141,051,000	3,837,000,000	0.30
2010	1,337,745,000	4,566,517,000	0.29
		Average ROSE of Nabil	0.31

Calculation of ROSE of NBBL

Year	Net Income	Shareholders' Equity	ROSE
2006	(1,061,579,502)	719,852,000	-1.47
2007	596,487,029	744,126,000	0.80
2008	2,158,104,141	1,112,242,484	1.94
2009	1,021,380,061	2,133,572,976	0.48
2010	415,509,000	2,676,674,000	0.16

For E.g: Calculation of NITC ratio of Nabil for 2009

$$TIE\ ratio = \frac{Net\ Income}{Shareholders'\ Equity}$$

$$= \frac{1,141,051,000}{3,837,000,000}$$

$= 0.30$ times and so on for others.

Annex : 15 Calculation of Multiple Correlation of HBL

	Calculation of Correlation coefficient between Total Capital (X_1) and Deposit Collection Capital (X_2) of HBL				
Year	Total Capital (X_1)	Deposit Collection(X_2)	X_1X_2	X_1^2	X_2^2
2006	810,810,000	30,048,418,000	24,363,557,798,580,000,000	657,412,856,100,000,000	902,907,424,302,724,000,000
2007	1,013,513,000	31,842,789,000	32,273,080,607,757,000,000	1,027,208,601,169,000,000	1,013,963,211,298,520,000,000
2008	1,216,215,000	34,681,345,000	42,179,972,009,175,000,000	1,479,178,926,225,000,000	1,202,795,691,009,020,000,000
2009	1,600,000,000	37,611,202,000	60,177,923,200,000,000,000	2,560,000,000,000,000,000	1,414,602,515,884,800,000,000
2010	2,000,000,000	40,920,627,000	81,841,254,000,000,000,000	4,000,000,000,000,000,000	1,674,497,714,073,130,000,000
Total	**6,640,538,000**	**175,104,381,000**	**240,835,787,615,512,000,000**	**9,723,800,383,494,000,000**	**6,208,766,556,568,200,000,000**

	Calculation of Correlation coefficient between Total Capital (X_1) and Share Capital (X_2) of HBL				
Year	Total Capital (X_1)	Loan Mobilization (X_3)	X_1X_3	X_1^2	X_3^2
2006	810,810,000	17,793,724,000	14,427,329,356,440,000,000	657,412,856,100,000,000	316,616,613,788,176,000,000
2007	1,013,513,000	20,179,613,000	20,452,300,110,469,000,000	1,027,208,601,169,000,000	407,216,780,829,769,000,000
2008	1,216,215,000	25,519,519,000	31,037,221,800,585,000,000	1,479,178,926,225,000,000	651,245,849,991,361,000,000
2009	1,600,000,000	29,123,755,000	46,598,008,000,000,000,000	2,560,000,000,000,000,000	848,193,105,300,025,000,000
2010	2,000,000,000	32,968,270,000	65,936,540,000,000,000,000	4,000,000,000,000,000,000	1,086,906,826,792,900,000,000
Total	**6,640,538,000**	**125,584,881,000**	**178,451,399,267,494,000,000**	**9,723,800,383,494,000,000**	**3,310,179,176,702,230,000,000**

	Calculation of Correlation coefficient between Deposit Collection Capital (X_2) and Share Capital (X_3) of HBL				
Year	Deposit Collection(X_2)	Loan Mobilization (X_3)	X_2X_3	X_2^2	X_3^2
2006	30,048,418,000	17,793,724,000	534,673,256,528,632,000,000	902,907,424,302,724,000,000	316,616,613,788,176,000,000
2007	31,842,789,000	20,179,613,000	642,575,158,860,657,000,000	1,013,963,211,298,520,000,000	407,216,780,829,769,000,000
2008	34,681,345,000	25,519,519,000	885,051,242,673,055,000,000	1,202,795,691,009,020,000,000	651,245,849,991,361,000,000
2009	37,611,202,000	29,123,755,000	1,095,379,432,303,510,000,000	1,414,602,515,884,800,000,000	848,193,105,300,025,000,000
2010	40,920,627,000	32,968,270,000	1,349,082,279,505,290,000,000	1,674,497,714,073,130,000,000	1,086,906,826,792,900,000,000

| Total | 175,104,381,000 | 125,584,881,000 | 4,506,761,369,871,140,000,000 | 6,208,766,556,568,200,000,000 | 3,310,179,176,702,230,000,000 |

Correlation (r)			
Total Capital and Deposit Collection		r_{12}	0.96
Total Capital and Loan Mobilization		r_{13}	0.98
Deposit Collection and Loan Mobilization		r_{23}	0.95
Multiple Correlation			
$R_{1.23} =$	**0.9845**		

Then,

$$R_{1.23} = \sqrt{\frac{r_{12}^{\;2} \Gamma r_{13}^{\;2} \, Z2 \mid r_{12} \mid r_{23} \mid r_{13}}{1 Z r_{23}^{\;2}}}$$

$$= \sqrt{\frac{(0.96)^2 \, \Gamma (0.98)^2 \, Z2 \mid 0.96 \mid 0.98 \mid 0.95}{1 Z (0.95)^2}}$$

$$= \sqrt{\frac{0.0945}{0.0975}} \text{ i.e } \mathbf{0.9845}$$

Finally,

Coefficient of Determination $(R_{1.23})^2 = (0.9845)^2$

$$= 0.9692$$

Annex : 16 Calculation of Multiple Correlation of EBL

	Calculation of Correlation coefficient between Total Capital (X_1) and Deposit Collection Capital (X_2) of EBL				
Year	Total Capital (X_1)	Deposit Collection(X_2)	X_1X_2	X_1^2	X_2^2
2006	818,000,000	18,186,200,000	14,876,311,600,000,000,000	669,124,000,000,000,000	330,737,870,440,000,000,000
2007	1,131,400,000	23,976,300,000	27,126,785,820,000,000,000	1,280,065,960,000,000,000	574,862,961,690,000,000,000
2008	1,138,821,000	33,322,900,000	37,948,818,300,900,000,000	1,296,913,270,041,000,000	1,110,415,664,410,000,000,000
2009	1,330,467,300	36,932,300,000	49,137,217,463,790,000,000	1,770,143,236,369,290,000	1,363,994,783,290,000,000,000
2010	1,579,609,490	41,127,900,000	64,966,021,143,771,000,000	2,495,166,140,898,060,000	1,691,504,158,410,000,000,000
Total	5,998,297,790	153,545,600,000	194,055,154,328,461,000,000	7,511,412,607,308,350,000	5,071,515,438,240,000,000,000

	Calculation of Correlation coefficient between Total Capital (X_1) and Share Capital (X_2) of EBL				
Year	Total Capital (X_1)	Loan Mobilization (X_3)	X_1X_3	X_1^2	X_3^2
2006	818,000,000	14,082,700,000	11,519,648,600,000,000,000	669,124,000,000,000,000	198,322,439,290,000,000,000
2007	1,131,400,000	18,836,400,000	21,311,502,960,000,000,000	1,280,065,960,000,000,000	354,809,964,960,000,000,000
2008	1,138,821,000	24,469,600,000	27,866,494,341,600,000,000	1,296,913,270,041,000,000	598,761,324,160,000,000,000
2009	1,330,467,300	28,156,400,000	37,461,169,485,720,000,000	1,770,143,236,369,290,000	792,782,860,960,000,000,000
2010	1,579,609,490	31,661,800,000	50,013,279,750,482,000,000	2,495,166,140,898,060,000	1,002,469,579,240,000,000,000
Total	5,998,297,790	117,206,900,000	148,172,095,137,802,000,000	7,511,412,607,308,350,000	2,947,146,168,610,000,000,000

	Calculation of Correlation coefficient between Deposit Collection Capital (X_2) and Share Capital (X_3) of EBL				
Year	Deposit Collection(X_2)	Loan Mobilization (X_3)	X_2X_3	X_2^2	X_3^2
2006	18,186,200,000	14,082,700,000	256,110,798,740,000,000,000	330,737,870,440,000,000,000	198,322,439,290,000,000,000
2007	23,976,300,000	18,836,400,000	451,627,177,320,000,000,000	574,862,961,690,000,000,000	354,809,964,960,000,000,000
2008	33,322,900,000	24,469,600,000	815,398,033,840,000,000,000	1,110,415,664,410,000,000,000	598,761,324,160,000,000,000
2009	36,932,300,000	28,156,400,000	1,039,880,611,720,000,000,000	1,363,994,783,290,000,000,000	792,782,860,960,000,000,000
2010	41,127,900,000	31,661,800,000	1,302,183,344,220,000,000,000	1,691,504,158,410,000,000,000	1,002,469,579,240,000,000,000
Total	153,545,600,000	117,206,900,000	3,865,199,965,840,000,000,000	5,071,515,438,240,000,000,000	2,947,146,168,610,000,000,000

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Correlation (r)			
Total Capital and Deposit Collection		r_{12}	0.93
Total Capital and Loan Mobilization		r_{13}	0.95
Deposit Collection and Loan Mobilization		r_{23}	0.96
Multiple Correlation			
$R_{1.23} =$	0.9543		

Then,

$$R_{1.23} = \sqrt{\frac{r_{12}{}^{2} \; \Gamma \; r_{13}{}^{2} \; Z2 \mid r_{12} \mid r_{23} \mid r_{13}}{1 Z r_{23}{}^{2}}}$$

$$= \sqrt{\frac{(0.93)^{2} \; \Gamma \; (0.95)^{2} \; Z2 \mid 0.93 \mid 0.95 \mid 0.96}{1 Z (0.96)^{2}}}$$

$$= \sqrt{\frac{0.0714}{0.0784}} \quad \text{i.e } \mathbf{0.9543}$$

Finally,

Coefficient of Determination $(R_{1.23})^{2} = (0.9543)^{2}$

$$= 0.9107$$

Annex : 17 Calculation of Multiple Correlation of NBBL

Year	Total Capital (X_1)	Deposit Collection(X_2)	X_1X_2	X_1^2	X_2^2
		Calculation of Correlation coefficient between Total Capital (X_1) and Deposit Collection Capital (X_2) of NBBL			
2006	719,852,000	9,385,949,552	6,756,494,556,906,300,000	518,186,901,904,000,000	88,096,048,992,689,000,000
2007	744,126,000	10,883,652,582	8,098,808,861,233,330,000	553,723,503,876,000,000	118,453,893,525,675,000,000
2008	1,860,315,000	9,997,697,430	18,598,866,494,490,500,000	3,460,771,899,225,000,000	99,953,953,901,828,600,000
2009	1,860,315,000	10,052,182,377	18,700,225,658,668,800,000	3,460,771,899,225,000,000	101,046,370,540,469,000,000
2010	2,009,396,000	11,511,677,000	23,131,517,717,092,000,000	4,037,672,284,816,000,000	132,518,707,352,329,000,000
Total	**7,194,004,000**	**51,831,158,941**	**75,285,913,288,390,800,000**	**12,031,126,489,046,000,000**	**540,068,974,312,991,000,000**

Year	Total Capital (X_1)	Loan Mobilization (X_3)	X_1X_3	X_1^2	X_3^2
		Calculation of Correlation coefficient between Total Capital (X_1) and Share Capital (X_2) of NBBL			
2006	719,852,000	4,409,013,042	3,173,836,856,309,780,000	518,186,901,904,000,000	19,439,396,004,526,100,000
2007	744,126,000	8,457,808,829	6,293,675,452,688,450,000	553,723,503,876,000,000	71,534,530,187,910,300,000
2008	1,860,315,000	6,704,943,114	12,473,306,249,120,900,000	3,460,771,899,225,000,000	44,956,262,161,976,000,000
2009	1,860,315,000	7,809,544,311	14,528,212,424,918,000,000	3,460,771,899,225,000,000	60,988,982,345,472,500,000
2010	2,009,396,000	10,237,455,000	20,571,101,127,180,000,000	4,037,672,284,816,000,000	104,805,484,877,025,000,000
Total	**7,194,004,000**	**37,618,764,296**	**57,040,132,110,217,100,000**	**12,031,126,489,046,000,000**	**301,724,655,576,910,000,000**

Year	Deposit Collection(X_2)	Loan Mobilization (X_3)	X_2X_3	X_2^2	X_3^2
		Calculation of Correlation coefficient between Deposit Collection Capital (X_2) and Share Capital (X_3) of NBBL			
2006	9,385,949,552	4,409,013,042	41,382,773,986,322,100,000	88,096,048,992,689,000,000	19,439,396,004,526,100,000
2007	10,883,652,582	8,457,808,829	92,051,852,899,808,200,000	118,453,893,525,675,000,000	71,534,530,187,910,300,000
2008	9,997,697,430	6,704,943,114	67,033,992,539,134,000,000	99,953,953,901,828,600,000	44,956,262,161,976,000,000
2009	10,052,182,377	7,809,544,311	78,502,963,695,434,800,000	101,046,370,540,469,000,000	60,988,982,345,472,500,000
2010	11,511,677,000	10,237,455,000	117,850,275,262,035,000,000	132,518,707,352,329,000,000	104,805,484,877,025,000,000
Total	**51,831,158,941**	**37,618,764,296**	**396,821,858,382,734,000,000**	**540,068,974,312,991,000,000**	**301,724,655,576,910,000,000**

Correlation (r)			
Total Capital and Deposit Collection		r_{12}	0.33
Total Capital and Loan Mobilization		r_{13}	0.52
Deposit Collection and Loan Mobilization		r_{23}	0.95
Multiple Correlation			
$R_{1.23} =$	0.7391		

Then,

$$R_{1.23} = \sqrt{\frac{{r_{12}}^2 \; \Gamma \; {r_{13}}^2 \; Z2 \mid r_{12} \mid r_{23} \mid r_{13}}{1 Z {r_{23}}^2}}$$

$$= \sqrt{\frac{(0.33)^2 \; \Gamma \; (0.52)^2 \; Z2 \mid 0.33 \mid 0.52 \mid 0.95}{1 Z (0.95)^2}}$$

$$= \sqrt{\frac{0.5326}{0.0975}} \quad \textbf{i.e 0.7391}$$

Finally,

Coefficient of Determination $(R_{1.23})^2 = (0.7391)^2$

$$= 0.5462$$

Annex : 18 Calculation of Multiple Correlation of NSBL

	Calculation of Correlation coefficient between Total Capital (X_1) and Deposit Collection Capital (X_2) of NSBL				
Year	Total Capital (X_1)	Deposit Collection(X_2)	X_1X_2	X_1^2	X_2^2
2006	847,798,000	11,445,286,000	9,703,290,580,228,000,000	718,761,448,804,000,000	130,994,571,621,796,000,000
2007	1,074,528,000	13,715,395,000	14,737,575,958,560,000,000	1,154,610,422,784,000,000	188,112,060,006,025,000,000
2008	1,424,339,000	27,957,221,000	39,820,560,201,919,000,000	2,028,741,586,921,000,000	781,606,206,042,841,000,000
2009	2,061,324,000	34,896,424,000	71,932,836,305,376,000,000	4,249,056,632,976,000,000	1,217,760,407,987,780,000,000
2010	2,302,966,000	42,415,443,000	97,681,323,103,938,000,000	5,303,652,397,156,000,000	1,799,069,804,886,250,000,000
Total	7,710,955,000	130,429,769,000	233,875,586,150,021,000,000	13,454,822,488,641,000,000	4,117,543,050,544,690,000,000

	Calculation of Correlation coefficient between Total Capital (X_1) and Share Capital (X_2) of NSBL				
Year	Total Capital (X_1)	Loan Mobilization (X_3)	X_1X_3	X_1^2	X_3^2
2006	847,798,000	9,460,451,000	8,020,551,436,898,000,000	718,761,448,804,000,000	89,500,133,123,401,000,000
2007	1,074,528,000	12,113,698,000	13,016,507,684,544,000,000	1,154,610,422,784,000,000	146,741,679,235,204,000,000
2008	1,424,339,000	15,131,748,000	21,552,738,814,572,000,000	2,028,741,586,921,000,000	228,969,797,535,504,000,000
2009	2,061,324,000	17,480,548,000	36,033,073,125,552,000,000	4,249,056,632,976,000,000	305,569,558,380,304,000,000
2010	2,302,966,000	42,415,443,000	97,681,323,103,938,000,000	5,303,652,397,156,000,000	1,799,069,804,886,250,000,000
Total	7,710,955,000	96,601,888,000	176,304,194,165,504,000,000	13,454,822,488,641,000,000	2,569,850,973,160,660,000,000

	Calculation of Correlation coefficient between Deposit Collection Capital (X_2) and Share Capital (X_3) of NSBL				
Year	Deposit Collection(X_2)	Loan Mobilization (X_3)	X_2X_3	X_2^2	X_3^2
2006	11,445,286,000	9,460,451,000	108,277,567,383,986,000,000	130,994,571,621,796,000,000	89,500,133,123,401,000,000
2007	13,715,395,000	12,113,698,000	166,144,152,980,710,000,000	188,112,060,006,025,000,000	146,741,679,235,204,000,000
2008	27,957,221,000	15,131,748,000	423,041,622,952,308,000,000	781,606,206,042,841,000,000	228,969,797,535,504,000,000
2009	34,896,424,000	17,480,548,000	610,008,614,760,352,000,000	1,217,760,407,987,780,000,000	305,569,558,380,304,000,000
2010	42,415,443,000	42,415,443,000	1,799,069,804,886,250,000,000	1,799,069,804,886,250,000,000	1,799,069,804,886,250,000,000
Total	130,429,769,000	96,601,888,000	3,106,541,762,963,610,000,000	4,117,543,050,544,690,000,000	2,569,850,973,160,660,000,000

Correlation (r)			
Total Capital and Deposit Collection		r_{12}	0.98
Total Capital and Loan Mobilization		r_{13}	0.82
Deposit Collection and Loan Mobilization		r_{23}	0.83
Multiple Correlation			
$R_{1.23} =$			

Then,

$$R_{1.23} = \sqrt{\dfrac{r_{12}{}^2 \; \Gamma \; r_{13}{}^2 \; Z2 \mid r_{12} \mid r_{23} \mid r_{13}}{1 \, Z \, r_{23}{}^2}}$$

$$= \sqrt{\dfrac{(0.98)^2 \; \Gamma \; (0.82)^2 \; Z2 \mid 0.98 \mid 0.82 \mid 0.83}{1 \, Z \, (0.83)^2}}$$

$$= \sqrt{\dfrac{0.2989}{0.3111}} \quad \textbf{i.e 0.9802}$$

Finally,

Coefficient of Determination $(R_{1.23})^2 = (0.9802)^2$

$$= 0.9608$$

Annex : 19 Calculation of Multiple Correlation of Nabil

	Calculation of Correlation coefficient between Total Capital (X₁) and Deposit Collection Capital (X₂) of Nabil				
Year	Total Capital (X_1)	Deposit Collection(X_2)	X_1X_2	X_1^2	X_2^2
2006	491,654,000	23,342,285,000	11,476,327,789,390,000,000	241,723,655,716,000,000	544,862,269,021,225,000,000
2007	929,216,000	31,915,047,000	29,655,972,313,152,000,000	863,442,374,656,000,000	1,018,570,225,012,210,000,000
2008	1,265,747,000	37,348,256,000	47,273,442,987,232,000,000	1,602,115,468,009,000,000	1,394,892,226,241,540,000,000
2009	2,328,774,000	46,410,701,000	108,080,033,810,574,000,000	5,423,188,343,076,000,000	2,153,953,167,311,400,000,000
2010	2,329,769,000	49,696,113,000	115,780,463,487,897,000,000	5,427,823,593,361,000,000	2,469,703,647,308,770,000,000
Total	**7,345,160,000**	**188,712,402,000**	**312,266,240,388,245,000,000**	**13,558,293,434,818,000,000**	**7,581,981,534,895,140,000,000**

	Calculation of Correlation coefficient between Total Capital (X₁) and Share Capital (X₂) of Nabil				
Year	Total Capital (X_1)	Loan Mobilization (X_3)	X_1X_3	X_1^2	X_3^2
2006	491,654,000	15,545,779,000	7,643,144,428,466,000,000	241,723,655,716,000,000	241,671,244,716,841,000,000
2007	929,216,000	21,365,053,000	19,852,749,088,448,000,000	863,442,374,656,000,000	456,465,489,692,809,000,000
2008	1,265,747,000	27,589,933,000	34,921,874,924,951,000,000	1,602,115,468,009,000,000	761,204,402,944,489,000,000
2009	2,328,774,000	32,268,873,000	75,146,912,451,702,000,000	5,423,188,343,076,000,000	1,041,280,164,690,130,000,000
2010	2,329,769,000	38,034,098,000	88,610,662,463,362,000,000	5,427,823,593,361,000,000	1,446,592,610,673,600,000,000
Total	**7,345,160,000**	**134,803,736,000**	**226,175,343,356,929,000,000**	**13,558,293,434,818,000,000**	**3,947,213,912,717,870,000,000**

	Calculation of Correlation coefficient between Deposit Collection Capital (X₂) and Share Capital (X₃) of Nabil				
Year	Deposit Collection(X_2)	Loan Mobilization (X_3)	X_2X_3	X_2^2	X_3^2
2006	23,342,285,000	15,545,779,000	362,874,003,965,015,000,000	544,862,269,021,225,000,000	241,671,244,716,841,000,000
2007	31,915,047,000	21,365,053,000	681,866,670,652,491,000,000	1,018,570,225,012,210,000,000	456,465,489,692,809,000,000
2008	37,348,256,000	27,589,933,000	1,030,435,880,706,850,000,000	1,394,892,226,241,540,000,000	761,204,402,944,489,000,000
2009	46,410,701,000	32,268,873,000	1,497,621,016,409,970,000,000	2,153,953,167,311,400,000,000	1,041,280,164,690,130,000,000

2010	49,696,113,000	38,034,098,000	1,890,146,832,061,070,000,000	2,469,703,647,308,770,000,000	1,446,592,610,673,600,000,000
Total	**188,712,402,000**	**134,803,736,000**	**5,462,944,403,795,400,000,000**	**7,581,981,534,895,140,000,000**	**3,947,213,912,717,870,000,000**

Correlation (r)			
Total Capital and Deposit Collection		**r₁₂**	0.98
Total Capital and Loan Mobilization		**r₁₃**	0.96
Deposit Collection and Loan Mobilization		**r₂₃**	0.99
Multiple Correlation			
R₁.₂₃ =	**0.9848**		

Then,

$$R_{1.23} = \sqrt{\frac{r_{12}^{2}\ \Gamma r_{13}^{2}\ Z2\mid r_{12}\mid r_{23}\mid r_{13}}{1Zr_{23}^{2}}}$$

$$= \sqrt{\frac{(0.98)^{2}\ \Gamma(0.96)^{2}\ Z2\mid 0.98\mid 0.96\mid 0.99}{1Z(0.99)^{2}}}$$

$$= \sqrt{\frac{0.0193}{0.0199}}\ \textbf{i.e 0.9848}$$

Finally,

Coefficient of Determination $(R_{1.23})^2 = (0.9848)^2$

$$= 0.9698$$

Annex : 20 Optimal Capital Structure Test for JVCBs of Nepal

Weight of Debt	Weight of Pref. Share	Weight of Equity	K_d	K_d (1-T)	Estimated Beta (b)	K_{pr}	$K_e = K_{rf} + (K_m - K_{rf})$ b	WACC	Remark
-	-	1.00	6.00	3.60	1.80	0.00	8.55	8.55	
0.10	-	0.90	8.25	4.95	1.92	0.00	8.56	8.20	
0.20	-	0.80	6.94	4.16	2.07	0.00	8.58	7.70	
0.30	-	0.70	6.00	3.60	2.26	0.00	8.60	7.10	
0.40	-	0.60	6.00	3.60	2.52	0.00	8.63	6.62	
0.50	-	0.50	6.50	3.90	2.88	0.00	8.68	6.29	
0.60	-	0.40	7.00	4.20	3.42	0.00	8.74	6.02	
0.70	-	0.30	8.00	4.80	4.32	0.00	8.85	6.01	Optimal
0.80	-	0.20	9.50	5.70	6.12	0.00	9.06	6.37	
0.90	-	0.10	11.50	6.90	11.52	0.00	9.71	7.18	
0.17	-	0.83	8.00	4.80	2.02	0.00	8.57	7.93	HBL
0.19	0.10	0.71	6.00	3.60	2.09	7.00	8.58	7.48	EBL
-	-	1.00	0.00	0.00	1.80	0.00	8.55	8.55	NBBL
0.09	-	0.91	6.00	3.60	1.91	0.00	8.56	8.11	NSBL
0.13	-	0.87	8.50	5.10	1.96	0.00	8.57	8.11	Nabil

Where,

K_d = Cost of Debt

T = Tax Rate

K_e = Cost of Equity

K_{pr} = Cost of Preference Share

K_{rf} = Risk Free Rate of Return

WACC = Weighted Average Cost of Capital

Assumptions:

a) The beta of unlevered firm is 1.80.

b) Risk free rate of return (K_{rf}) is 8.33% as per NRB Newsletter.

c) On going market interest rate (K_m) is 8.45% as per NRB Newsletter.

d) Corporate Tax Rate (T) is 40%.

Now,

Estimate beta of HBL (b_L) = b_U [1 + (1 − T) (D/E)]

$$= 1.80 \,[1 + (1 - 0.4) \mid 0.20$$

$$= 2.02 \text{ and so on for others.}$$

Cost of equity for Nabil (K_e) = K_{rf} + (K_m - K_{rf}) b

$$= 8.33\% + (8.45\% - 8.33\%) \mid 1.96$$

$$= 8.57\% \text{ and so on for others.}$$

WACC for EBL = $W_d \mid K_d$ (1- t) Γ W_{pr} $\mid K_{pr}$ Γ W_e $\mid K_e$

= 0.19 | 3.60 + 0.10 | 7.00 + 0.71 | 8.58

= 7.48% and so on for others.

As the minimum WACC is 6.01%, the optimal capital structure is obtained at 70% Debt and 30% Equity. The existing JVCBs of Nepal have employed very low level of debt in their capital financing. They can minimize the overall cost of capital by increasing the debt portion whose cost of capital is comparatively low than of the issue of equity.