# CHAPTER-I

# INTRODUCTION

## 1.1 Background of the Study

Nepal is one of the under developing country with various sectors being under developing phase. Nepal is developing its economy condition through different sectors such as tourism, hydropower, construction etc. For the development of these sectors, financial institutions play a vital role to provide the financial support. Hence, various commercial banks, finance companies, insurance companies etc. are established from both government sector as well as private sector to boost the economy of the country from their perspective. So, the active participation of these financial institutions towards economic development is very important for the country.

Financial Institutions play a major role in the proper functioning and development of the economy of any country. The importance of financial institutions in the developing countries like Nepal is very vast and big. The major roles of financial institutions are following;

- Act as intermediaries between the individuals who lend and who borrow.
- Accept deposits and in turn lend it to people who are in need of financial resources.
- Make the flow of investment easier.
- Pool the scattered funds and mobilize them in productive sector,

So no one can deny the role, financial institutions play in developing an economy of a country. Investment, in its broadest sense, means the sacrifice of current Rupees (Dollars) and resources for the sake of future Rupees (Dollars) and resources. In the other words, it is a commitment of money and other resources that are expected to generate additional money and resources in future.

Investments are made in Assets. Assets generally are of two types;

-Real Assets (Land, Building, Plant, Machineries, Factories etc.)

-Financial Assets (Stocks, Bonds, T-Bills etc.)

Investment in any assets either in real or in financial assets will generate some reward or return for undertaking it. If the return is uncertain, there is some risk in it. So higher the risk higher is the return and lower the risk, lower is the return.

Return in the investment is combination of two components. The first component that usually comes to mind is the periodic cash receipts (either interest or dividend). This cash receipt is also known as Ordinary Gain on investment. The second component is the appreciation (or depreciation) in the price of the asset and it is known as Capital Gain/Loss. So, mathematically the total return is the sum of Capital Gain/Loss and Ordinary Gain.

$$Total\ Return = Capital\ Gain/Loss + Ordinary\ Gain$$

Every shareholders, who invests his/her money expects both capital and ordinary return. That means, the shareholder wants good dividend as well as good value of the share. Otherwise, the shareholder could sell it in the secondary market. So it is necessary for an organization to make an appropriate and convincing dividend policy decision.

Dividend policy is decision regarding distribution of dividend out of net income and retaining the income in the organization. A company has to decide what portion of net income to be distributed to the shareholders and what portion to be retained for reinvestment in future. So, dividend policy is allocating the net income between dividend and retention. Dividend policy may have some impact on the value of stock.

## 1.2 Focus of the Study

The study will mainly focus on the dividend policies of commercial banks. The study will go through different practices and applications of dividend policies in the Nepalese financial business context. The study will go through the method of dividend payment undertaken by the selected companies. With the view on different theories of dividend policy, it is very difficult subject matter to study. The study will also study the impact of dividend policy on the market price of shares of the selected banks and finance companies. With the view on the dividend policy, the study will further focus on the different features of dividend such as Dividend per share (DPS), Earning per share (EPS), Market price per share (MPS) and other relating ratios.

## 1.3 Statement of Problem

In recent years, the over-subscription of ordinary shares in initial public offering showed that the people are diverting towards investing in shares, bonds rather than other traditional assets. It is also due to the high increase in the bullion price. Generally, people are investing their money in the common stocks. Some investors are being more rational towards the investment process. They are studying background, past history and performance of the organization, market demand of the stock, dividend policy undertaken by the organization etc. before investing their money. But still more investors are investing without knowing the basic concept and process of the investment. Most of the investors are not aware of the risk involved in investing on such securities. Investors should be aware of the policies and decisions taken by the company management towards wealth or profit maximization.

Different financial experts have introduces the Dividend payment models which present their view towards Dividend payment. Among them, MM model tells that Dividends are irrelevant to the value of the firm. It believes that earnings should be retained only for getting benefit from investment opportunities. If there is no investment opportunity, all the earnings should be distributed as dividend. James Walter had propounded relevant theory of dividend. He proposed a model for share valuation. According to him, the Dividend policy of the firm affects the value of the shares. His model supports that Dividends are relevant. He argues that the choice of Dividend polices almost always affect the value of an Enterprise. The Investment policy of a firm cannot be separated from its Dividend policies according to him both are interlinked which is just opposite to Modigliani and Miller approach. Walter's model shows clearly the importance of the relationship between the return on a firm's investment or its internal rate of return (r) and its cost of capital or the required rate of return (k) in determining the Dividend policy. As long as the internal rate greater than the cost of capital, the share price will be enhanced by retention and will vary inversely with dividend payment. In this way Walter's model's in also known as "Optimal Theory of Dividend". Dividend policy is the decision to distribute the net income to shareholder or to retain or reinvest in the company.

Common shareholders are considered as real owner of the company. So they look after the return on their shares. So dividend policy directly affects the view of the common shareholders towards the company. If company is distributing the dividend regularly, common stockholders will be more positive towards the company. But if the company cannot make its shareholders satisfy, it will lose the belief from the common shareholders. Different banks have adopted different policies and Dividends are paid in different forms such as cash dividend, stock dividend etc. Nowadays stock dividend is being more popular in Nepal especially in banking sector. But there is no rigid rule for Dividend payment because few Banks are generating profit and they are focusing toward reinvestment opportunities.

In general, the dividend policy will affect the stock price in market. If the dividend policy is shareholder oriented, then the market price of the stock will increase. It's because people want to invest in those stocks, which give more return. But some scholars and experts do not agree with this relationship of dividend and market price of stock. Some experts believe to have a positive relationship whereas others believe to have negative relationship. Thus the controversy exists on impact of dividend policy on stock price. If there are no tax disadvantages associated with dividends and companies can issue stock at no cost to raise equity whenever needed, dividends do not matter, and dividend policy does not affect value. If dividends have a tax disadvantage, dividends are bad, and increasing dividends will reduce value if stockholders like dividends, or dividends operate as a signal of future prospects, dividends are good, and increasing dividends will increase value Moreover; the study will be focused on the following problems regarding the subject chosen for the study.

This study deals with the following issues;
- o Does there exist the positive or negative relationship between dividend and stock price?
- o What kind of dividend policies is following by the commercial banks of Nepal?
- o Is there any consistency between dividend policies followed by commercial banks?
- o Do the Nepalese investors take care about the dividend policies followed by the related companies before investing?

## 1.4  Objectives of the Study

The main objective of the study is to find out the appropriate dividend policies and practices in Nepal. However, following objectives can be considered more specific;

- o To study the prevailing practices and efforts made in dividend policy among the firms.
- o To find the impact of dividend policy on market price of stock.
- o To analyze the uniformity among DPS, EPS, MPS and other relating ratios.
- o To identify the appropriate dividend policy followed by the commercial bank.

## 1.5  Significance of the Study

As dividend is a major and sensitive element in the area of finance and investment. Investors make investment for the purpose of generating future cash inflow to maximize their wealth. Thus it is one of the major factors in every organization and dividend policy decision is one of the most important decisions. It is thus; effective stimuli for the investment and at the same time maintain the goodwill of the company in the market. Similarly, dividend is the external exposure of the company too. Values of the firm, market price of shares, image of the organization etc are affected by the dividend decision. In the midst of these all facts, this study shall be significant to all the stakeholders (shareholders, prospective investors, the company itself, and the regulatory body) to some extent. Moreover, this study will support the future researcher by providing valuable information for these respective firms taken as sample. Besides, the shareholders and financial institutions may also be benefited from this study. Moreover, this study will support the future researcher by providing valuable information. Especially the significance of this study can be summarized in the following points:

- o The study helps to the management and policy maker in setting and making a suitable dividend policy.
- o Reporting the exact relation between dividend and market price of shares empowers the investors towards rationality of making investment in secondary market in general

- The banks under this study will be benefited in the sense that they can formulate the appropriate dividend policy so as to meet the shareholders expectation and to maximize value of the firm

- The dividend policy of the banking and insurance sector plays vital role for socio-economic development in the nation, that is way the study of dividend policy of these sector is needed so far as possible. To raise public awareness about dividend policy and market price of share relation in order to help them for rational decision of their investment.

## 1.6  Limitations of the Study

The study focuses the sensitive part of the Bank which resultants the management a little bit hesitation to come up with open view regarding the Dividend policy and payment procedure. Therefore the study has been conducted on the basis of annual reports of selected banks, published and unpublished material, and NRB publications. Therefore the strength of findings will largely depend upon the correctness of input information. Since the study has been conducted by developing assuming about various factors it has following limitations: The study is based on secondary data like annual reports of the selected companies, reviews, journals, articles, published and unpublished thesis works, and various related material from various websites. Hence, the study does not include primary data. The Balance Sheet, Income Statement and other statements from various published and unpublished reports have been considered as the subject matters of the study.

Therefore, the results depend upon the validity of the data. Due to annual distribution system in Nepal, dividend has not been considered for calculation of holding monthly periodic return. Dividend policy of only financial institutions is taken into account. Dividend Policy of other companies associated with industry, trade, and agriculture is not covered. The study covers the data of previous five years period only. Again, the study is fully based on existing statistical tools; therefore, technical errors possibly may exist with least chance. Among the different aspects of dividend policy only the market price of the stock been selected and only cash dividend is taken for the analysis. The data being taken from secondary source the authentic of the data is dependent on the accuracy of website used.

## 1.7  Organization of the study

The study will be organized into following five chapters listed below;

### Chapter -I: Introduction

This chapter deals with subject matters of the study consisting background of the study, introduction to selected sample companies, statement of problem, objective of the study, significance of the study and Limitation of the study.

### Chapter -II: Review of Literature

This chapter deals with review of the different literature of the study field. Therefore it includes conceptual framework, theoretical review along with the review of major books, journals, and previous research works and thesis reports on the subject matter.

### Chapter- III: Research Methodology

This chapter deals with research methodology and it includes research design, population and sample selection, sources of data, data collection procedure, tools for analysis of the study, and limitations of the methodology.

### Chapter -IV: Presentation and Analysis of Data

This chapter deals with analysis and interpretation of collected data using appropriate financial and statistical tools. This chapter will illustrate the collected data into a systematic format. Similarly, analysis and interpretation of these data will also be included in this chapter.

### Chapter-V: Summary, Conclusions and Recommendations

This chapter deals with summary of the entire study. Conclusions of the study will also be included in this chapter. As well as, possible and viable recommendations will also be presented in this chapter.

# CHAPTER-II

# REVIEW OF LITERATURE

This chapter deals with the reviewing of different sources of dividend policy literature such as books, journals, research papers and unpublished thesis. A number of research and study have been made in the field of dividend policy. The objectives, methodologies and the results they have reported are the contents of this chapter along with the related core concepts of dividend. Thus, conceptual framework and review of related studies in national and international levels are two main contents of this chapter.

## 2.1 Conceptual Framework

### 2.1.1  Dividend

"Dividend refers to the part of earnings made by the firm that is distributed to the shareholders as return of their investment over equity share whether those earnings were generated in the current period or in previous periods. In other words, it is the rewards to shareholders for bearing the risk of uncertainty" (*Ghimire; 2002:8*). Once a company makes a profit, it should decide on what to do with the profit. It could continue to retain the profit within the company or it could pay out the profit to the owners of the company in the form of dividend. "Every firm prefers to make somewhat rational balance between these two alternatives. The firm adopts different approaches to distribute dividend according to their objectives. Given the objective of maximization of shareholders wealth, the firm should use net profits for paying dividends to the shareholders. Conversely, the firm should retain profit to finance the investment opportunities if the objective is to expand the business" (*Bhurtel; 2002:16).*

"The objective of a dividend policy should be to maximize the shareholder's return so that value of the investment is maximized" (*Pandey; 1995:739*). Return consists

of two components: dividends and capital gains. Dividend policy has a direct influence on these two components of return. The impact of dividend policy on future capital gain is however complex. Capital gains occur in distant future and therefore, are uncertain. Normally, it is said that the low payout policy accelerates earnings growth; investors of growth companies will realize their return mostly in the form of capital gains. But, it is not certain that low payout policy will lead to higher prices in reality. It is quite difficult to clearly identify the effect of payout on share price. "Share price is a reflection of so many factors that the long-run effect of payout is quite difficult to isolate. A high payout policy means less retained earnings which will consequently result in slower growth and perhaps lower market price per share. A low payout policy will result into higher growth, higher capital gains and perhaps higher market price per share. Capital gains are, however, more uncertain than current dividend but current dividends are taxed more than capital gain. Therefore, it is quite plausible that some investors would prefer high- payout companies while others may prefer low-payout companies. Thus, the relationship between dividend and the value of the share is not clear cut" (*Pandey; 1995:740*). "There is different decision models developed to analyze the situation and come to a conclusion as a decision. However, these decision models are still conflicting. One school of thought argues that dividend payment has no impact on value of the firm whereas other theories of dividend argue it to be an active variable in valuation" (*Bhurtel; 2002:16*).

### 2.1.2 Theories of Dividend

In fact, dividend is the portion of the net earnings which is distributed to shareholders by a company. After successfully completing the business activities of a company, if the financial statement of it shows the net profit, the Board of Directors (BOD) decides to declare dividend to stockholders. Therefore, the payment of corporate dividend is at the discretion of the BOD. Most companies pay dividend quarterly. There are two fundamental theories regarding to dividend:

- o Residual theory
- o Wealth maximization theory

**Residual Theory**

Residual theory is that, in which the first priority is given to the profitable investment opportunities. If there are profitable opportunities, the firm invests those and residual income (if any) is distributed to the stockholders. Residual theory of dividends means, "A theory that suggests the dividend paid by the firm should be the amount left over after all acceptable investment opportunities have been undertaken." (*Gitman, 1988:616*) using this approach the firm would treat the dividend decision in three steps as follows:

**Step 1**

Determine the optimum level of capital expenditure which would be the level generated by the point of intersection of the investment opportunities schedule (IOS) and weighted average cost of capital (WACC) function,

**Step 2**

Using the optimal capital structure proportion, it would estimates the total amount of equity financing needed to support the expenditures generated in step1,

**Step 3**

Because the cost of retained earnings K r is less than the cost of new common stocks K e, retained earnings would be used to meet the equity requirement determined in step 2. If retained earnings are inadequate to meet these needs, new common stock would be sold. If the available retain earnings are in excess to this needs, the surplus amount would be distributed as dividends.

**Wealth Maximization Theory**

Under wealth maximization theory, larger dividends is announced and distributed to shareholders. Basically, it is applicable for those companies which are just established and to those companies it will be beneficial whose financial profits are in decreasing trends. The main purpose of the wealth maximization theory of dividend is to make assurance to the stockholders that they are interesting in the firm, which has not better market value. Keeping these theories into considerations, dividend can be paid in different forms. Among them some are discussed below:

### 2.1.3 Forms of Dividend

The firm can give various types of dividend to the shareholders in the view of the objectives and policies which they implement. Before adopting any dividend policy, the firm must ensure the smooth growth of the firm as well as satisfy the expectation of the shareholders. "The type of dividend that corporation follow is partly a matter of the various circumstances and financial constraints that bound corporate plan and policies."(*Shrestha, 1980; 970*) Some of the major forms of dividends the firms can adopt are discussed below:

### a) Cash dividend

"Cash dividend is simply the dividend paid in cash or the proportion of net earnings which are distributed to shareholders as cash in proportion to their shares of company is known as cash dividend". (*Hasting; 1966*). It is most popular and widely used form of dividend all over the world.

Generally, stockholders have strong preference for cash dividend. Both the total assets and net worth of the company are reduced by same amount when the cash dividend is announced or distributed. Moreover, the need is that, the firm should have sufficient fund for the distribution of the cash dividend among shareholders or if the firm does not have sufficient fund for the distribution it should borrow from any source. For the better cash dividend stability cash planning, budgeting and control mechanism are suggested or required.

Cash dividend has the direct impact on the shareholders wealth. It is one of the most interesting matters of the study and the volume of the cash dividend depends upon earnings of the firms and on the management attitude or policy. Cash dividend has the psychological value for stockholders. Each and everyone like to collect their return in cash rather than non-cash means. So cash dividend is not only a way to earning distribution but also a way of perception improvement in the capital market. The objectives of the cash dividend are:

- To distribute the earning to shareholders as they hold the proportion of the shares.
- To build an image in the capital market so as to create favorable condition to raise the fund at the needs.
- To make distribution easy and to account easily.

**b) Stock Dividend and Stock Split**

A Stock Dividend is the distribution of additional shares of stock to existing shareholders. "A Stock Dividend is paid in additional shares of stock instead of in cash and simply involves a book-keeping transfer from retained earnings to the capital stock account." *(Weston and Copeland,1992 ; 680)* There is no cash involved in a stock dividend. Net worth remains unchanged and the number of shares is increased. When firm needs to retain high percentage of earnings, they issue stock so that the shareholders of the firm are not disgruntled. "With the stock split, the number of share is increased through a proportional reduction in par value of the stock *(Van Horne, 2000; 325)*. A 10% Stock dividend means that one share of stock for every ten shares already owned is given to each shareholder. In case of 2 for 1 stock split, each shareholder would be given one additional share of stock for every share already owned by each of the shareholder. The stock spilt does not involve any cash payment, only additional certificates representing new shares are issued. The effect of a Stock Dividend or a Stock Spilt can be summarized as follows:

a) There is no change in the firm's assets or liabilities or in shareholder equity. (Assets less liabilities)
b) There is fall in per share earnings, book value and market price and an offsetting rise in the number of shares held by each shareholder.

**c) Reverse Spilt**

A method that is used to raise the market price of a firm's stock by exchanging certain number of outstanding share for one new share of stock. The effect of Reserve Spilt is a decrease in the number of shares outstanding and an increase in a par or stated value of the shares. The total net worth of the firm remains unchanged. The Reverse Spilt does not involve any cash payments only additional certificates representing new shares are issued.

**d) Bond Dividend**

Companies/firms can give dividend in the form of bonds. Bond Dividend helps to postpone the payment of cash. These are given when the firms unable to take the burden of interest of loans. In other words, firms declared dividend in the form of its own bond with a view to avoid cash outflow.

### e) Scrip Dividend

Dividend paid in promissory notes is called Scrip Dividend. When earning of the firms justify dividend but the company's cash position is temporarily weak and does not permit cash dividend. It may declare dividend in the form of Scrip "Scrip dividends are those paid in the company's promises to pay instead of cash."*(Encyclopedia Americana, 1997; 539)*. Scrip dividends may bear a definite maturity date or it may be left to the directors. Such dividends may be interest bearing or non-interest bearing.

### f) Share Repurchase

Share repurchase is a method in which a firm buys shares of its own stock in cash from the surplus cash. Share repurchase is often viewed as an alternative to paying dividends. A company can reduce the number of shares by repurchasing the shares. The Stock price must rise after the stock repurchase if the price earnings ratio remains unchanged. "If a firm has excess cash and insufficient investment opportunities to justify the use of these funds, it is in the shareholders interest to distribute the funds. The distribution can be accomplished either by the repurchase of stock or by paying the funds are in increased dividends." *(Van Horne,2000: 330)* Thus, repurchase of stock is considered as an alternative to payment of dividend. Share price for repurchase or the equilibrium price is calculated from the following equation:

$$\text{Repurchase Price } (p*) = \frac{S \times Pc}{N - n}$$

Where,

S = Total number of shares outstanding.

Pc = Current market price per share.

N = Total number of outstanding shares.

n = Number of shares to be repurchased

### g) Interim Dividend

Generally dividend is declared at the last of financial year. This is called is regular dividend whereas directors can declare the dividend before the end of the financial year, this is called interim dividend. Payment of interim dividend is made by the firms which has more certain earning and wants to address the shareholders expectation. This form of dividend payment is rarely used.

### h) Property Dividend

Instead of cash, dividend can be given in the form of property. This method of paying dividend is rarely used. This form of dividend may be followed wherever there are assets that are no longer necessary in the operation of the business.

### 2.1.4 Dividend policy

The policy, which decides on how much of the earnings a firm, should retain for reinvestment and how much it should pay to shareholders as dividend is known as dividend policy. It is the third major decision of a firm which aims at maximization of shareholders wealth." Dividend policy determines the division of earnings between reinvestment in the firm and payments to shareholders. Retained earnings are one of the significant for financing corporate growth but dividends refer to the cash flow that accrues to shareholders" (*Weston and Copeland; 1991:657*).

The third major decision of the firm is its dividend policy, the percentage of earnings it pays in cash to its stockholders. Dividend payout, of course, reduces the amount of earnings retain in the firm and affect the total amount of internal financing. "The dividend payout ratio obviously depends on the way earnings are measured for ease of explosion, we use account net earnings but assume that these earnings can form true economic earnings. In practice, net earnings may not conform and may not be an appropriate major of the ability of firm to pay dividends." (*Horne, 2000:* 305)

Dividend policy refers to the issue of how much of the total profit a firm should pay to its stockholders and how much to retain for investment so that the combined present and future benefits maximize the wealth of stockholders. The dividend policy not only specifies the amount of dividend, but also shows the form of dividend, payment procedure etc.

In general, dividend policy is concerned with the following matters:

- Amount of dividend to be paid- the policy outlines the basis to determine the amount of dividend to be paid,

- Form of dividend- Cash dividend and / or stock dividend,

- Payment procedure

- Stock repurchase and stock splits (*Pradhan, 1992 : 376*)

Stability or regularity of dividends is considered as a desirable policy by the management of companies. Three of the more commonly used dividend policies are:

### a) Constant Dividend Payment Policy

Constant dividend policy is based on the payment of a fixed rupees dividend in each year/period. A number of companies follow the policy of paying fixed amount per share as dividend every year without considering the fluctuation in the earning of the company. The policy does not imply that the dividend per share of dividend rate will never be increased. When the company reaches at new level of earnings and expects to maintain it, the annual dividend per share may be increased. Investors who have dividends as the only source of their income prefer the constant dividend policy.

### b) Constant Payout Ratio Policy

The ratio of dividend to earning is known as dividend payout ratio. When fixed percentage of earnings is paid as dividend in every year, the policy is called constant payout ratio. Since earning fluctuates, following this policy necessarily means that the amount of dividend will fluctuate though the payout ratio remains almost constants. It ensures that dividends are paid when profits are earned and avoided when it incurs losses, regardless of the desire of the share holders.

### c) Low Regular Dividend Plus Extra Payment Policy

The low regular dividend plus extra payment policy is a compromise between the first two. It gives the firm flexibility but it leaves investors somewhat uncertain about what their dividend income will be. If a firm's earnings are quite volatile, however, this policy is appropriate. A minimum amount will be given regularly. When the company earns more, it gives additional amount as dividend and when company earns less, only minimum payment will be made. Basically, this policy would be appropriate when the earning of the company is not stable and constantly growing.

### 2.1.5  Factors Influencing Dividend Policy

Many considerations may affect a firm's decision about its dividend policy. Dividend is that decision which is influenced by many internal as well as external

factors. Management has to consider economic and non economic factors before establishing dividend policy. Some of them are unique to that company and some of the more general considerations. In practice, the financial executives consider the following factors when approaching with dividend decision.

### a) Desire of Shareholders

Shareholders may be interested either in dividend income or capital gains. Wealthy shareholders in a high income tax bracket may be interested in capital gains as against current dividends. A retire and old aged person, whose sources of income is regular dividend in a closely held company prefer high dividend payment. Management usually knows the desires of shareholders and accordingly adopts a dividend policy that satisfies all shareholders. But in a widely held company, numbers of shareholders is very large and they have diverse desires regarding dividends and capital gains. Some shareholders want cash dividends, while other prefers bonus share.

### b) Stability of Earning

A firm that has a stable earnings trend will generally pay a larger portion of its earnings in dividends. If earnings fluctuate significantly, a larger amount of the profits may be retained to ensure that enough money is available for investment projects when needed. Therefore, firms having stable earnings more likely to pay out higher earnings or higher percentage of its earnings than the firm with fluctuating.

### c) Liquidity position

The cash or liquidity positions of the firm influence its ability to pay dividends. A firm may have sufficient retained earnings but if they are invested in fixed assets, cash may not be available to make dividend payment. Thus, even if a firm has a record of earning, it may not be able to pay cash dividends because of liquidity position. Therefore, the firm must have adequate cash available as well as retained earnings to pay dividends.

### d) Past dividend

A firm with record of past dividend payments strive to maintain the same in the future. Dividends are habit forming. If the market does not receive its expected dosage, the stock price will suffer. "The majority of firms surveyed indicated they would maintain their current dividend payments even if they are operating at a net loss for an interim period".

### e) Need to repay debt

When a firm has issued debt to finance expansion or to substitute for other form of financing, it is faced with two alternatives. It can refund the debt at maturity by replacing it with another form of security or it can make a provision of paying off debt. If the decision is to retire the debt, this will generally require the retention of earnings. It decreases cash flow to pay dividend. In such a case also the dividend decision will be effected.

### f) Profit Rate

A high rate of profit on net worth makes it desirable to retain earnings rather than to pay them out if the investors will earn less on them.

### g) Rate of Asset Expansion

There is need of more financing if a firm is growing rapidly. A high rate of asset expansion creates a need to retain funds rather than to pay dividends.

### h) Restrictions in debt contract

Debt contracts, especially when long-term debt is involved, often confine a firm's ability to pay cash dividends. In other words, restrictions in debt contracts may specify that dividends my be paid only out of earnings generated after signing the loan agreement and only when net working capital is above a specified amount. Similarly preferred stock agreements generally state that no cash dividends can be paid on the common stock until all accrued preferred dividends have been paid. These types of limitations persuade the dividend policy of the firm.

**i) Tax position of shareholders**

The tax position of stockholders also affects dividend policy. Corporations owned by large taxpayers have high income tax brackets tend towards lower dividend payout where as corporations owned by small investors tend towards higher dividend payout.

**j) Access to capital market**

A firm's access to capital market will be influenced by the age and size of the firm. A large and well established firm with a record of profitability and stability of earning has easy access to capital market and other forms of external financing. In contrast, a small and new firm's ability to raise equity or debt funds from capital market is restricted. So a small and new firm must retain more earning to finance its operation. Therefore, a well-established firm is likely to have a higher payout ratio than a smaller newer firm.

**k) Legal Rules**

The legal rules constrain dividend payment on certain conditions as follows:

- o Capital impairment rule states that dividend should not be paid out of paid up capital, which causes adverse effect on security of creditors and preference shareholders.
- o The new profit rule state that dividend must be paid from present profit and or past- retained earnings.
- o The insolvency rules state that when liabilities exceed assets, no dividend can be paid.

**l) Control**

For many small firms and certain large ones, maintaining the controlling vote is very important. These shareholders would prefer the use of debt and retained profits to finance new investments rather than issue new stock. If the current shareholders cannot or do not subscribe the new shares, new stockholders can dilute their controlling interest in the firm. Thus shareholders who are very sensitive to a potential loss of control prefer a low dividend payment policy.

**m) Inflation**

In indirect way inflation also pay decisive role in dividend decision. Our accounting system is based on historical cost. Depreciation is charged on the basis of original costs at which assets were acquired. When the price increases, funds saved on account of depreciation would not be adequate to replace assets or to keep the capital intact. Consequently, the company may have to retain high percentage of earning to maintain the capital intact or replace equipment.

**n) Investment Opportunity**

Dividend policy is greatly influenced by the financial needs of the company. A growing firm gives preference to the retention of earnings over the payment of dividends in order to finance its expanding activities. Thus investment opportunities of firm also influence dividend policy.

**o) Dividend policy of competitive concerns**

Another important factor, which influences the dividend policy, is the dividend policy of other competitive concerns in the market. If the other competing concerns are paying higher rate of dividend than this concern, the shareholders may prefer to invest their money in those concerns rather than in this concerns. Hence, every company will have decided its dividend policy by keeping in view the dividend policy of other competitive concerns in the market.

**2.1.6 Dividend Policy and market price of share (MPS)**

"Dividend policy of a firm should be to maximize the value of the shareholders wealth. The payment of dividends conveys to shareholders that the company is profitable and financially strong. The growth of the dividends with the growth of earnings of matured companies will communicate very convincing information and consequently the MPS will significantly influence." *(Pande; 1997: 689)* MPS is that value which can be obtained by a firm from the market. Market value is one of the variables, which is affected by the dividend per share, earning per share of the firm. If the earning per share and dividend value is high, the market per share will also be high. Market values of the share may be high or low than the book values. If the firm is growing concern and its earning power is greater than the cost of capital, the market value of the share will be higher than the book value. If the firm's earning

capacity is lower than cost of capital MPS will also be lower. MPS is determined by capital market.

Market price of the stock usually fluctuated by the adequate information. No one can earn more in the inefficiency and inefficiency is legally prohibited in order to regulate the security in every nation. But being focused in this study, dividend policy and its impact on market price of stock, there should be discussion on different models and practices, which have significant effects in MPS or not. So MPS and security valuation are integral parts. Without valuation no one can quote the price and without price there is no chance of trading.

Greater the perfection availing in the stock market, the higher will be the relevancy of dividend policy over the market price. The cash dividend of the normal firm will have significant effect on the market price since the company is viewed as a firm of the future prospects and growth. The following framework will clear the relationship between the variables.

**TABLE: 2.1**
**MPS Variables**

| Independent Variables | Dependent Variable |
|---|---|
| Cash dividend | Market price of share |
| Stock Dividend | |
| Earnings Per Share | |
| Dividend Yield | |
| Retention Rate | |

"Share valuation is an economic process, which generates rational securities prices. Although the price fluctuation may appear to be chaotic, they are random fluctuation that results from the random arrival of the new information." *(Francis; 1990; 207).* Market price of the stock (MPS) is the trading price of the stock listed in authorized or legal stock exchanges. Dividend policy and MPS has always correlation, if the

company pays high dividend the MPS increases and vice- versa. But in some cases out of this interrelation, the price may remain constant or decrease too. Therefore, the information lack or flow is also vital in the analysis of MPS. In the context of Nepal, MPS is the price that is quoted for purchasing or selling under Nepal Stock Exchange Act or related laws and regulations on the stock exchange.

## 2.2 Review of Related Studies

### 2.2.1 Review of Major International Studies

**Modigliani and Miller's Study** (1961)

Modigliani and Miller for the first time in the history of finance advocated that dividend policy does not affect the value of firm i.e. dividend policy has no effect on the share price of the firm. They argued that the value of the firm depends on the firm's earnings which depend on its investment policy. Therefore, as per MM Theory, a firm's value is independent of dividend policy.

According to MM, market value of share is not enhanced due to dividend policy. They argue that the value of the firms **depends** on the earning power of the firm's assets or its investment policy and that the manner in which he earnings is split between dividend and retained earnings do not affect this value. Splitting the earnings into packages of retentions and dividends does not influence the value of equity share. In other words, the division of earnings between dividend and retained earnings is irrelevant from shareholders viewpoint. In general, the argument supporting the irrelevance of dividend valuation is that dividend policy of the firm is a part of its financing decisions. As a part of the financing decision of the firm, the dividend policy of the firm is a residual decision and the payment of cash as dividends are passive residual.

The MM approach of irrelevance dividend is based on the following critical assumptions:

i. The firms operate in perfect capital market where all investors are rational. Information is freely available to all. Securities are infinitely divisible and no investor is large enough to influence the market price of securities.

ii. The firm has a fixed investment policy which is not subject to change.

iii. Perfect capital market is friction can be purchased and sold without payment of any commission or brokerage etc.

iv. There are no taxes.

v. There is no risk of uncertainty. Investors can certainly predict future dividend and future market value.

vi. The required rate of return (r) is always equal to discounting rate (k) i.e. $r = k = kt$ for all time.

MM has provided some proof about their argument in the following manner.

## Step-1

The Market price of share in the beginning of the period ($P_0$) is always equal to the present value of dividends paid at the period plus the market price of the share at the end of the period.

Symbolically,

$P_0 = D_1 + p_1 / 1 + k_e$ …………………………….. (i)

Where,

$p_0 =$ Current market price of the share at the beginning of the year,

$k_e =$ the cost of equity capital (Assumed constant)

$D_1 =$ the dividend per share to be received at the end of period one.

$p_1 =$ the market price of the share at the end of the period one.

## Step -2

Assuming no external financing, the market value of firm is simply the number of shares (n) multiplied with market price of share in the beginning of the period.

Such that,

$np_0 = n(D_1 + p_1) / 1 + k_e$ ................................(ii)

**Step-3**

If the firm issues or sells number of new shares (m) to finance the new investment needs of the fund at a price of p1, the value of the firm at time zero will be,

$$np_0 = \{nD_1 + (n+m)\,p_1 - mp_1\}/\,1+k_{e\ldots}\ldots\ldots s\ (iii)$$

Where,

n = no. of shares at the beginning

m = no. of new equity shares issued at the end of the period.

**Step-4**

If the firm were to finance all investment proposals, it may finance either by retained earnings or by the issuance of new shares or both. Thus, total value of the newly issued stock will be as follows.

$$mp_1 = I - (E - nD_1)$$

$$\text{or, } mp1 = I - E + nD1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(iv)$$

Where,

I = Total investment amount required

E = Total amount of Earning

$nD_1$ = Total amount of dividend Paid

$(E - nD_1)$ = Amount of Retained Earning.

$mp_1$ = Value of newly issued stock.

**Step – 5**

By substituting the value of mP1 from equation (iv) to equation (iii), we have

$$np_0 = \{nD_1 + (n+m)\,p_1 - I + E - nD_1)\}/\,1+k_e$$

$$np_0 = \{(n+m)\,p_1 - I + E\}/1+k_e \ldots\ldots\ldots\ldots(v)$$

This implies that market value of the firm in the beginning is equal to the present value of total value of stock plus firm's profit after investment requirement for the project.

**Step – 6**

Since dividend does not appear directly in expression and E, I, (n+m) p $_1$ and k $_e$ are assumed to be independent of dividend. In other words, MM reach into conclusion that dividend does not matter and hence irrelevant. Therefore, dividend policy of firm has no impact on market value of the firm.

MM concludes that dividend policy is irrelevant and dividend policy has no effect in the value of the firm. A firm that pays dividends will have to raise funds externally to finance its investment plans. MM hold that when the firm pays dividends, external financing offsets its advantage. It does not seem so relevant to apply MM approach in Nepalese context because when we apply this approach, the assumptions supposed by MM are significantly deviated:

In Nepal, we are unable to find the rational investors as well as perfect capital market, which are considered by MM. It does not seem so sound to neglect the flotation cost transaction cost and tax effect on capital gain as neglected by MM. Arbitrage arguments as explained by MM applies only when there are very sensitive investors and which are lacking in Nepal. A conscious investor always finds different between dividend and retained earnings. Thus, MM proposition is not relevant in the case of Nepal.

**Gordon's Study** (1962)

Gordon explained that the dividend policy of a firm influences the value of a share. He said, a corporation's share price is not independent of the dividend rate. "Investor value the present dividend more than future capital gains", was the focus of this study. That is to say current dividend is considered certain and risks less. Therefore, this theory is preferred by rational investors as compared to deferred in future as future is uncertain and the investors avoid uncertainty.

He emphasized his argument that an increase in dividend payout ratio leads to increase in the share prices for the reason that investors consider the dividend yield ($D_1/p_0$) is less risky than the expected capital gain. Gordon's theory is also based on some assumptions:

i. The firm is all equity firms and there is no leverage in its capitalization,

ii. There is no outside financing and corporate goal is expected to derive from retained earnings,

iii. The internal rate of return, ( R ) of the firms remain constant,

iv. The cost of capital (K) for the firm remain constant,

v. Corporate tax does not exist,

vi. Retention ratio (b) once decided will remain constant,

vii. The cost of capital for the firm is greater than the growth rate i.e. k e >g.

Applying the assumptions just prescribed, Gordon also presented an equation in order to find out market value per share as following:

P = E (1-b)/ Ke -b*r

Where:
P = market value per share
E = earnings per share

b = retention ratio or % of retained earning

(1-b) = dividend payout ratio

$K_e$ = cost of capital

b*r = g or growth rate in r

E (1-b) = dividend per share

In Conclusion:
- Investors give more value to the current dividend than the future capital gain,
- Investors pose these views because they do not want to bear the future uncertainty rather than enjoying the current earnings (dividend) and

Payment of more dividends increases the market value of the share (i.e. investors find more dividend yield).

**Walter's Study** (1966)

Walter conducted a study on dividend and stock prices in 1966. He proposed a model for share valuation. According to him, the dividend policy of the firm affects the value of the shares. So, the dividends are relevant.

He argues that the choice of dividend policies always affect the value of enterprise. His argument is just the opposite of what Modigliani and miller said. The relationship between firm's internal rate of return and cost of capital is determining factors to retain profit or distribute dividends. As long as the inter rate is greater than cost of capital, the stock price will be enhanced by retention and will vary inversely with dividend payout. The assumptions of the Walter's model are as follows:

a) The firm finances all investment through retained earnings; that is debt or new equity is not issued.

b) The firm's internal rate of return r and its cost of capital k are constant.

c) All earnings are either distributed as dividends or reinvested internally immediately.

d) Beginning earnings and dividends never change. The values of the earnings per share, EPS, and the dividend per share DPS may be changed in the model to determine results, but any given values of EPS/DPS are assumed to remain constant forever in determining a given value.

e) The firm has a very long or infinite life.

Based on these assumptions, Walter has given following formula for valuation of equity share.

$$P = \frac{\{DPS + r/Ke\,(EPS\text{-}DPS)\}}{Ke}$$

Where,

P = Market price per share

DPS = Dividend per share

EPS = Earning per share

r = Internal rate of return

Ke = Cost of capital or Capitalization rate

According to the Walter's model, the optimum dividend policy depends on the relationship between the firm's internal rate of return (r) and its cost of capital (k). Walter referred dividend policy for different types of firm, which can be summarized as follows:

### a. Growth Firm (r>k)

If the firm's internal rate of return exceeds the cost of capital, such firms are known as growth firm. Growth firms are those firms which expand rapidly because of ample investment opportunities yielding return (*r)* higher than the opportunity cost of capital (k). So firm's having r>k is referred as growth firms which are able to reinvest earning at a rate which is higher than the rate expected by shareholders. They will maximize the value per share if they follow a policy of retaining all earnings for internal investment. Thus, the correlation between dividend and stock price is negative and the optimum payout ratio for a growth firm is zero. The market value per share (p) increases as payout ratio declines when r>k.

### b. Normal firm (r=k)

If the internal rate of return is equal to capital, the dividend payout does not affect the value of shares i.e. dividends are indifferent from stock prices. In other words, there is no role of dividends on stock prices. Such a firm can be called as normal firm. Whether the firm retains the earnings or distributes as dividend, it is a matter of indifference for a normal firm. The market price of share will remain constant for different dividend payout ratio from zero to 100 percent. Thus, there is no unique optimum payout ratio for a normal firm.

### c. Declining firm (r<k)

If the firm's internal rate of return is less than cost of capital such firms are referred to as declining firm. This kind of firm does not have profitable investment opportunities so the shareholders will be better off its earning is paid of them so as the shareholders can earn a higher return by investing elsewhere. By distributing the entire earning as dividend, the value of share will be at optimum level. In other worlds, the market value per share of a declining firm will be higher when it does not retain earnings at all. The relationship between dividends and stock price is positive i.e. increase in dividend per share result increase in stock prices. Here the optimum payout ratio will be 100% and market value per share increase as payout ratio increase for declining firm. Thus, in this model, the dividend policy of the firm depends on the availability of investment opportunities and the relationship between the firm's internal rate of

return and it cost of capital. The firm should use earning to finance investments. If r>k, should distributes all earnings when r<k and the Walter model implies that:

a) The optimal payout ratio for a growth firm (r>k) is nil.

b) The payout ratio for normal firm (r=k) is irrelevant.

c) The optimum payout ratio for a declining firm (r<k) is 100 percent.

**Criticism of Walter's study**: -Walter's model is quite useful to show the effect of dividend policy on an all equity firms under different assumptions about the rate of return. The simplified nature of the model can lead to conclusions, which are not true in general though true for the model. The following is a critical evaluation of some of the assumptions underlying the model.

**i) No external financing**: The model is based on assumption that the investment opportunities of the firm are financed by retained earnings. Only and no external financing is used for the firm's investment or dividend policy or both will be sub-optimum.

**ii) Constant rate of return (r) and opportunity cost of capital (k):** This model assumes that the rate of return (r) and opportunity cost of capital or discount rate (k) are constant. In fact rate of return (r) decreases as more investment occurs. In other words, rate of return (r) changes with increase and decrease of investment. Cost of capital (k) does not remain constant; it changes directly with the firm's risk. Thus, the present value of firm's income moves inversely with the cost of capital. By assuming that the discount rate (k) is constant this model abstracts from the effect of risk on the value of firm.

**Van Horne and Mc- Donald's Study** (1971)

Van Horne and Mc-Donald, conducted a comprehensive study on dividend policy and new equity financing. The purpose of this study was to investigate the combined effect of dividend policy and new equity financing decision on the market value of the firm's common stocks. Empirical tests were performed with year-end 1968 cross section for two industries using a well-known valuation model. For their investigation, they employed two samples of firm's viz. the 86 electric utilities in the

continental U.S. which were included on the COMPUSTAT utility data tape and 39 companies in the electronics and electric component industries as listed on the COMPUSTAT industrial data tape in 1968.

**The first Model was,**

$$P_o / E_o = a_{go} a_1 (g) + a_2 (D_o / E_o) + a_3 (Lev) + u$$

Where,

$P_o/E_o$ = Closing Market price in 1968 dividend by average EPS for 1967 & 1968.

$g$ = Expected growth rate, measured by the compound annual rate of growth in assets per share for 1960 through 1968.

$D_o / E_o$ = Dividend payout, measured by the cash dividend in 1968 dividend by earning in 1968.

$Lev$ = Financial risk, measured by interest charge dividend by the different of operating revenues and operating expenses.

$U$ = Error term

**The second model was,**

$$P_o / E_o = a_o + a_1 (g) + a_2 (D_o / E_o) + a_3 (Lev) + a_4 (fa) + a_5 (F_b) + a_6 (F_c) + a_7 (F_d) + u$$

Where,

$F_a$, $F_b$, $F_c$, and $F_d$ are dummy variables corresponding to "new issue ratio" (NIR) group A through D.

It is noted that they had grouped the firms in five categories A, B, C, D and E by NIR For each firm the value of dummy variables representing its NIR group is one and the values of remaining dummy variables are zero.

Again, they tested the following regression equation for electronics- electronic components industry.

$$P_o / E_o = a_o + a_1 (g) + a_2 (D_o / E_o) + a_3 (Lev) + a_4 (OR) + u$$

Where,

$Lev$ = Financial risk, measured by long- term debt plus preferred stock dividend by net worth as of the end of 1968.

OR = Operating risk, measured by the standard error for the regression of operating earnings per share on time for 1960 through 1968, and rest are as in first Model above.

By using these models, they compared the result obtained for the firms which both pay dividend and engage in new equity financing with other firms in an industry sample. They concluded that for electric utility firms in 1968, share value was not adversely affected by new equity financing in the presence of cash dividends, except for those firms in the highest new issue group and it made new equity a more costly form of financing than the retention of earnings. They also indicated that the payment of dividend through excessive equity financing reduces share prices. For forms in the electronics – electronic component industry, a significant relationship between new equity financing and value was not demonstrated.

**Joseph & Itzhok's Study**

These two people had focused on two devices, which are used widely in the firms. The manager poses inside information about their firm's future prospects and for that purpose various signaling devices are used and information conveyed to the public. As mentioned above, the two devices are:

1. Earning
2. Dividend

The information content of dividend hypothesis asserts that managers use each cash dividend announcement to the signal changes in their expectations about future prospects of the firm. The concentration about information broadly emphasized on the hypothesis that, since dividend decisions are almost solely at management's discretion, announcement of dividend changes should provide less ambiguous information signal than earnings numbers, if dividend convey useful information to the public, the same effect can be seen in stock prices which are changed after public announcement. The main focus of this study is to ascertain whether dividend changes provide information beyond that already provided by quarterly earning numbers. These two people believe dividend and earnings have signal effect in the practice and thinking of people with regards to the future prospects of the firm.

They have explained their arguments through data collection and analysis. For their purpose, they had grouped the sample data according to the dividend changes from one quarter to the next and by the number of trading days between earnings and dividend announcement date in any given quarter.

The sample includes 2612 dividend announcement that follow (Panel A) and 787 that precede (Panel B) quarterly earnings announcement by 11 trading days among these:

> 384-increased
> 47- Decreased
> 2968- Case of no change in dividend

## Panel A

- This includes those companies which announce dividend with no changes.
- Stockholders of such companies earned on average.
- The cumulative effect of the abnormal returns during this period is of small magnitudes.
- The average return do not defer significantly from zero.
- These results are similar whether earnings announcement precede or follow dividend announcement.

## Panel B

- Shareholder of the companies that announced increases realized on average.
- Positive abnormal returns over the 20 days surrounding announcement dates.
- Most of the statistically significant abnormal returns occurred during days A.D.-1 & A.D.1.

Moreover, they are of similar magnitude for both groups whether earnings announcement precede or follow dividend announcement. Therefore, one noticeable result is that abnormal returns for the decreases occurred during the day A.D.-1 and A.D.1 and they are of similar magnitude for both groups. The capital market reaction to dividend announcement like this support the information content of dividend hypothesis namely that changes in quarterly cash dividends do provide information about changes in managements' assessment of future prospects of the firm.

The study also focuses or emphasizes the quarterly dividend announcement contain useful information beyond that already provided by quarterly earning numbers. Both writers believe that ever earning announcement also affect the market price of the share. For this purpose, stock prices just before and after announcement were taken to analyze. In the same way, our practice is also none other than "Announcement of increase in earnings causes increase in market price of the share and vice-versa."

**Friend and Puckett's Study**

Friend and Puckett conducted a study on the relationship between dividend policy and price of stock by running regression analysis on the data taken from 110 firms from five industries taken as samples were chemicals, electric utilities, food, steels and electronics. These industries were selected to permit a distinction made between the results for growth and non growth industries and provide a basis for earlier years. They also considered cyclical and non cyclical industries in their study. The study period covered a boom year for the economy when stock prices leveled off after rise (1956) and a depressed year (1958) for the economy when stock prices, however, rose strongly. They used dividends, retained earning and earning price ratio as independent variables in their regression model of price function and dividend as supply function. Earnings, previous year's dividend and earning price ratio are independent variables in the dividend function. Symbolically, their price function and dividend supply functions are as follows.

Price function,
$$P_t = a + b D_t + c R_t + d (E/P)_{t-1}$$

Dividend supply function,
$$D_t = e + f E_t + g D_{t-1} + h (E/P)_{t-1}$$

Where, $P_t$ = share price at time t

$D_t$ = dividend at time t

$R_t$ = retained earning at time t

$(E/P)_{t-1}$ = lagged earning price ratio

$E_t$ = earning per share at time t

$D_{t-1}$ = last year's dividend

Their study was based on the following assumptions:

- Dividends react with year to year fluctuations in earnings
- Price doesn't contain speculative components.
- Earning fluctuations may not sum zero over the sample.

Their regression results based on the equation of $P_t = a + bD_t + cR_t$ showed the customary strong dividend and relatively weak retained earning effect in three of the five industries, i.e. chemicals, food and steels. They again tested other regression equation by addition of lagged earning price ratio to the above equation and results the following equation.

$$P_t = a + b D_t + c R_t + d (E/P)_{t-1}$$

They found that more than 80 percent of the variation in stock price could be explained by three independent variables. Dividend have a predominant influence of stock price in the same three out of five industries but they found the difference between dividend and retained earning coefficients are not quite so marked as in the first set of regression. They also found that the dividend and retained earning coefficients are closer to each other for all industries in both the years except for the steel in 1956 and the correlations are higher again except for steels.

They also calculated dividend supply equation [$D_t = e + f E_t + g D_{t-1} + h (E/P)_{t-1}$] and derived price equation for four industry group in 1958. The derived price equation showed that there were no significant changes from those obtained in single equation approval as explained above. They also argued that the stock price or more accurately the earning price ratio does not seem to have a significant effect on dividend payout. On the other hand, they noted that the retained earning effect increased relatively in the three of the four cases tested. Further, their results suggested price effects on dividend supply are probably not a serious source of bias on the customary deviation of dividend and retained earning effect on stock prices though such a bias might be marked if the disturbing effects of short term income movement are sufficiently great. Further, they used lagged price as a variable instead of earning price ratio and showed that more than 90 percent of variation in stock price can be explained by the three independent variables and retained earning received greater relative weights than dividend in most of the cases. The only exception was steels and food in 1958. They

considered chemicals, electronics and utilities as growth industries in these groups and the retained earning effect was larger than the dividend effect for both the year covered. For the other two industries namely food and steels there was no significant systemic different between the retained earning and dividend coefficients.

Similarly, they tested the regression equation $P_t = a + b D_t + c R_t$ by using normalized retained earning again which they obtained by subtracting dividend from normalized earning. This process of normalized earning was based on the period 1950 to 1961. They again added prior year's normalized earning price variable and compared the results and found that there was significant role of normalized earning and retained earning but the effect of normalized earning price ratio was constant. When they examined the later equation they found that the difference between dividend and retained earning coefficients disappeared. Finally, they concluded that management might be able to increase somewhat by raising dividend in food and steel industries.

They conducted more detailed examinations of chemical samples which disclosed that he result obtained largely reflected the undue regression weighting given the three firms with price deviating most from the average price in the sample of twenty firms and retained earning as a price determinant.

Finally, Friend and Puckett concluded that management might be able at least in some measure to increase stock prices in non growth industries by raising dividend payout and in growth industries by greater retention.

### 2.2.2 Review of Major National Studies

Nepalese capital market is in the early stage of development. There are only few studies done in this field. Due to the lack of information and expertise, no sufficient studies have been carried out in regards to the dividend policy. However, recent developments in the field of capital markets have shown some rays of hope for the future. Some of the studies done in the field of dividend policy and stock prices have been reviewed hereunder

**Manandhar,** (2000) conducted a study to test whether Nepalese corporate firms consider the lagged structure of dividend and different hypothesis on relationship of

payment and other financial factors were tested. He carried out his study based on the data taken from 17 Nepalese corporate firms and covered the period of 1987 to 1998. The conclusions of the study are as follows.

- There is significant relationship between change in dividend policy in terms of DPS and change in lagged earnings.

- In overall there is positive relationship between change in lagged consecutive earnings and dividend per share.

- There is relationship between distributed lag profits and dividend.

- When change in lagged consecutive earnings is greater than zero in 65% the cases change in dividend per share.

- There is relationship between distributed lag profits and dividend when change in lagged consecutive earnings is greater than zero in 65% the cases change in dividend per share.

- Overall increase in EPS (t) has resulted to the dividend pay out in 66.6% of the cases while in others decrease in EPS result decreases in dividend payments.

- Nepalese corporate firms have followed the practice of maintaining constant dividend payment per share.

- Corporate firm do not take into account that one-year and two year lagged earnings.

In overall Nepalese corporate firm are reluctant to decrease dividend either keeping dividend payment constant or higher to take the advantages of information continued progress and performance, sound financial strength, favorable investment environment, lower risk, ability to maintain dividend rate and finally to increase the market price of the stocks in the stock market

**Pradhan,** (2003) made an empirical study to explain share price, dividend and retained earnings relationship in the context of Nepal. Mr. Pradhan made the study using the pooled cross-section data of 29 companies with 93 observations for the period from 1994 to 1999. The attempt was to ascertain the effect of dividend

payment and retained earnings on market price of shares. The major findings and results were:

a) The relation between dividend, retained earnings and market price of shares can be explained by the following regression model.

$$MPS= 1709.62 – 4.57 \ DPS – 12.54 \ RE$$
$$(2.41) \quad (4.72^*) \quad (1.71)$$

R-bar square= 0.43, F= 7.6, SEE=225.9

b) The results show the customary strong dividend and very weak retained earnings effect. It implies the attractiveness of dividend among Nepalese investors.

c) Higher investor valuation is placed on dividends than on retained earnings. Thus, management might be able to increase share price by raising dividends. And it can be concluded that Nepalese stock market has not recognizing the impact of retained earnings.

### 2.2.3 Review of Thesis

**Timilsina** (1997) conducted his master's research on *"Dividends and Stock Prices: An Empirical Study"* conducted by using the data of 16 enterprises for the period of 1990 to 1994 has the following objectives:

    i. To test the relationship between DPS and Stock Prices.

    ii. To determine the impact of dividend policy on stock prices.

    iii. To identify whether it is possible to increase the market value of the stock changing dividend policy or payout ratio.

To explain the behavior, he used multiple regression models of three independent variables as developed by Friend and Puckett. Further he tired to highlight the relationship between stock price and other independent variables setting separate simple linear regression equations. The findings of the study are as follow:

i. The relationship between DPS and stock prices is positive in the sample companies.

ii. DPS affects the share prices variably in different sectors.

iii. Changing the dividend policy of dividend per share might help to increase the market price of share.

iv. The relationship between stock prices and retained earnings per share is not prominent.

v. The relationship between stock prices and lagged earnings price ratio is negative.

**Bhattarai** (2002) conducted his master's research on *"Dividend Policy an Its Impact On MarketPrice of Stock"* with the data taken from two commercial banks and two insurance companies, analyzed the data of five years from 1995 to 2000 using simple and multiple regression equations has the following objectives:

i. To study the prevailing practices and efforts made in dividend policy in the Nepalese firms with the help of sample firms.

ii. To find out the impact of dividend policy on market price of stock.

iii. To analyze if there is any uniformity among DPS, EPS, MPS and DPR in the sample firms.

Major findings of his study are as follows:

i. There is not any consistency in dividend policy in the sample firms. It has indicated the need of dividend strategy as well as the need of proper analysis of the respectively sector of the firms.

ii. Most of the Nepalese firm from the very past did not have profit planning and investment strategy, which has imbalanced the whole position of the firms. It means there is no consistency even in the earnings.

iii. The MPS is affected by the financial position and the dividend paid by the firms in this regards the MPS of the sample firms is seem to be fluctuated. It denotes that Nepalese investor is not treated fairly.

iv. The lack of financial knowledge and the market inefficiency has affected the market price of the share in all the firms.

**Katawal,** (2002), conducted a research entitles "*A Comparative Study of Dividend Policy in Commericial Bank*". The main objective of the study was to examine the impact of dividend on share price and finds out the relationship between DPS, EPS,DPR,P/E Ratio, liquidity ratio and profitability ratio on MVPS. In addition to this the study aimed to examine if there is any uniformity among DPS, EPS and DPR on sample joint venture bank. Main conclusion of the study are sample banks have got sufficient earning but some of the banks are paying high dividend and other are paying low dividend, DPS is not relatively more stable then DPR,MPS is attracted by dividend and also dividend is not clearly defined.

**Bhurtel** (2006) conducted his master's research on *"Dividend Policy & Its Impact on Stock Price"* The basic objective of the study was to identify the relationship between dividend and market price per share the major objective of this study can be stated as follows.

 i. To analyze the properties of portfolio formed on dividend.

 ii. To examine the relationship between dividend and stock price.

 iii. To survey the opinions of financial executive's on corporate dividend practices.

The thesis indicates following findings:

i. From the descriptive analysis, the researcher found there is not any consistency dividend policy in the sample banks, which has maintained stable dividend per share policy. It has indicated the need of dividend policy as well as the need of proper analysis of the banks.

ii. The MPS is affected by the financial position and the dividend paid by the firms, in this regards the MPS of the sample firms are seen to be fluctuated. It denotes Nepalese investors are not treated fairly.

Most of the Nepalese firm from the very past have not profit planning and investing strategy, which have imbalanced the whole position of the firms. It means there is not consistency even in the earning

**Yadav** (2007) made a study on *"Dividend Policy and Its Impact on Market Price of Stock"* based on the secondary data of two commercial banks and two insurance companies listed in NEPSE. To study the prevailing practice of dividend policy, to find the impact of dividend policy on market price of shares and to analyze the uniformity among DPS, EPS and MPS he used the statistical as well as financial tools for analysis.

The major findings of the study are:

    a) There is no consistency in dividend policy.

    b) Most of the Nepalese firms do not have profit planning and investment strategy.

    c) Dividend payout ratio is almost 40% each year.

    d) MPS is affected by the financial position and dividend payment.

    e) Further, informational effect and market inefficiency also make the effect on MPS.

**Adhikari** (2008) prepared a thesis entitled *"Impact of Dividend on Market Price of Shares"* based on the secondary data of past five commercial banks listed in NEPSE. Specifically, the main objects of the study were the examination of prevailing practices made in dividend policy, analyzing the uniformity of DPS, MPS, EPS, DPR, Net worth and examining the impact of dividend on market price of stock. Using the different financial and statistical tools he analyzed the data and presented the following results.

    a) There is no consistency in payment of dividend.

    b) DPR of the banks are not stable.

    c) The MPS is affected by the dividend related financial variables i-e DPS and DPR either positively or negatively.

d) MPS is largely depends upon the dividend.

e) EPS, DPR, Net profit, Net worth per share differently affect the DPS in different banks.

f) Besides dividend, other factors also affect the MPS i-e EPS, P/E Ratio, and net worth per share.

## Research Gap

As the real world and the book world may have some differences, the various studies therefore conducted on the relation between dividend and market price of stock (MPS) may based on some assumption. The study conducted on the international economy may not be compatible or suitable for our country since the capital market mechanism is different. Similarly, a research made on a period may not be true at all other points of time; hence, updating those results is must. Due to time and resources constraint, not a comprehensive study has been made. Only taking the sample as representative data almost studies have been conducted. Therefore, the results cannot be generalized to explain the whole behavior of market.

This study got life through the study of different journals and articles from national & international scholars related to the dividend policy Furthermore, the study has taken up five years latest data of three commercial Banks, ranked accordance to their performances in the market, they are Nabil Bank, Siddhartha Bank and NCC Bank with consideration of EPS, DPS, MPS and other relating ratios. Also correlation coefficient and regression analysis between DPS, EPS and MPS has been done At last; test of hypothesis has been done for DPS, EPS and MPS. So, it may be the supportive guidelines for the future research

# CHAPTER- III

# RESEARCH METHODOLOGY

Research methodology is a way to systematically solve the research problems. It refers to the various sequential steps to be adopted by a researcher is studying a problem with certain objects in views *(Kotha; 1978: 19)*. All the Describing the methods and process applied to complete the entire study is methodology. To attain the objectives of the study, sources of data and data collection procedure, sampling methods used, research design applied, tools used conduct the study.

## 3.1. Research Design

Research design is the plan, structure and strategy of investigation conceived so as to obtain answer to research questions and to control variances (*Kerlinger; 1978: 300*). This study does not strictly follow entire aspect of a single research design. Both qualitative and quantitative types of data and information have been processed. So, descriptive, comparative (co-relational) designs have been used to find the impact of dividend policy on market price of shares. In order to ascertain the extent to which dividend and market price are related; to describe whether these two or more other variables co-vary and if so, to establish the direction, magnitude and form of observed relationship, comparative design would be appropriate. Similarly, descriptive nature of associated problems and other objectives of the study, descriptive design would be additional benefit to make this study complete and meaningful.

In addition to this, casual comparative design has employed. This design has helped to investigate the possible causes affecting market price of shares by observing existing situation and to search the possible factors leading to these results. Hence, descriptive, co-relational and casual comparative designs have been used to complete this study.

## 3.2 Population and Sample

All the commercial banks whose securities are listed in NEPSE and whose shares are actively traded in the market are total population of this study. Due to time and resource constraints and due to limited scope of this study, study of behavior of those

all is not possible. Hence, using judgmental sampling method, on the basis of financial performance, three out of the listed banks, three has been selected for the study. The bank having high reputation with high performance, bank which is growing in the market and performance is moderate and poorly performed bank have been sampled for the study. The researcher has believed that these three samples would represent each categories of banks in general perception.

- Nabil Bank Limited ( high performance)
- Siddhartha Bank Limited ( moderate performance)
- Nepal Credit and Commerce Bank Limited ( poor performance)

**Rationale behind sampling these banks:** Quite formal and regular dividend policy can be seen in banks and other few large corporate houses. Therefore, researcher selected the banks to conduct this study. A comprehensive study collecting data from all banks is really impossible due to other constraints along with time and cost. Basically, the researcher wants to make this study representative study of dividend policy of banks in Nepal. Based on the performance in the latest years, a good performing bank, an average performing bank and a poor performing bank are selected to complete this study and to make this study representative.

## 3.3 Sources and Methods of Data Collection

"Secondary data is defined as data collected earlier for a purpose other than the one currently being pursued" *(*Pant*; 2005*). This research is mainly based on the secondary data. The data relating to dividend policy has been obtained from concerned banks. In this study, data has been collected from different sources either in published or unpublished forms. Annual reports of the concerned banks, publications of SEBON, NEPSE, NRB, Annual reports of SEBON, Annual trading Reports of NEPSE, Economic Survey published by Ministry of Finance, Research Reports, newspapers, journals, articles, books etc are the major sources of data for this study. In addition to this, data from websites of NEPSE, SEBON, NRB, MOF and concerned banks are other sources of data. The relevant data have been collected by official visit, website search and library visit.

## 3.4 Data Processing Tools and Techniques

The purpose of processing the data is to change it from an unprocessed form to an understandable presentation so as to obtain answers to the research questions. Presentation of available data in tables and different diagrams help in analyzing and interpreting to draw meaningful conclusions there from. All the collected data, relevant facts have been systematically figured, and tabulated under the different headings for the purpose of analysis. So far as computation is concerned, it has been done with the help of computer program SPSS-11.5 and scientific calculator. Basically, financial and statistical tools have been used to analyze the collected data. The contents of these tools are as follows.

**Financial Tools**

Financial tools are those which help to study the financial strength and weakness of the sample firms. The financial tools used in this study are briefly presented below.

### I. Earning per Share ( EPS)

EPS is a financial tool used to know the earning capacity of the firm. Directly or indirectly, the market price of share is affected by the earning capacity of the firm. Thus, it helps in determining the market price of equity shares and in estimating the company's capacity to pay dividend to its equity shareholders. The performance and prospects of the company are also affected by EPS. Higher EPS reveals there is possibility of paying more dividend or issue bonus shares and thus it is true that MPS will be affected by all these factors. Similarly, comparison of EPS will also help in deciding whether equity capital is being effectively used or not. In this research, study of EPS enables to make a comparison between the sampled banks and its effect on MPS. The ratio can be computed by dividing the earning available to equity shareholders by the total number of equity shares outstanding.

$$\text{EPS} = \frac{\text{Earning available to equity shareholders}}{\text{Number of equity shares outstanding}}$$

## II. Dividend per Share (DPS)

Dividend per share indicates the part of earning distributed to the equity shareholders on per share basis. DPS shows the portion of earning distributed to the stockholders. In order to flow the positive message in the market about the performance of the company, to meet the shareholders expectation a company makes the dividend distribution after retaining the required funds for internal financing and growth. It is true that higher DPS not only creates positive attitudes among shareholders but also helps to increase the market price of shares. Thus, MPS is also affected by DPS. In this research, study of DPS enable us to know the prevailing practice of dividend distribution in one hand and it works as an indicator of better performance in another. It is calculated by dividing the total dividend distributed to equity shareholders by the total number of equity shares outstanding.

$$DPS = \frac{\text{Total Amount of Dividend paid to Ordinary Shareholders}}{\text{Dividend Payout Ratio (DPR) and Retention Ratio}}$$

## III. Dividend Payout Ratio ( DPR) and Retention Ratio

DPR indicates as to what portion of EPS has been used for paying dividend and what has been retained for plaguing back. This ratio is very important from shareholders point of view as it tells him that if a company has used whole or substantially the whole of its earnings for paying dividend and retained nothing for future growth and expansion purposes, then there will be very dim chances of capital appreciation in the price of shares of such company. DPR is used to evaluate the financing practice and dividend distribution practice of the company. Dividend payment and retained earning both have certain impact on MPS. But the relation of dividend and retained earning is inverse each other. It means one factor has positive impact on MPS and another has negative impact and relation with MPS. In this research, it enables the researcher to make comparison of different banks. Moreover, it a variable affecting MPS, so, the relation of MPS and DPR will be another part of the study. It is calculated by using the following formula.

$$DPR = \frac{\text{Dividend per share}}{\text{Earning per share}}$$

And, Retention Ratio = (1-Dividend payout ratio)
= (1-DPR)

## IV. Dividend Yield (DY)

Dividend Yield is a percentage of dividends per share on market price per share It measure the dividend in relation to market value of share. So, dividend yield is the dividend received by the investors as a percentage of market prices per share in the stock market. This ratio highly influences the market price per share because a small change in dividend per share can bring effective change in the market value of the share. The share with higher dividend yields is worth buying. Thus the price of higher dividend yields increase sharply in the market. Dividend has important guidance to commit funds for the buying of shares in the secondary market. This ratio is important for those investors who are interested in the dividend income. This ratio is calculated by dividing dividend per share by market price of the stock. Thus,

$$\text{DY Ratio} = \frac{\text{Dividend per share}}{\text{Market Price per share}}$$

## V. Price Earning Ratio (P /E Ratio) / Earning Multiplier

Price-earning ratio is also called the earnings multiplier; Price- earning ratio is the ratio between market price per share and earning per share. In other words, this represents the amount which investors are willing to pay for each rupee of the firm's earnings. The P / E ratio measures investor's expectation and market appraisal of the performance of the firm. The higher P/E ratio implies the high market share price of a stock given the earning per share and the greater confidence of investor in the firm's future. This ratio is computed by dividing earning per share to market price per share. Thus,

$$\text{P/E Ratio} = \frac{\text{Market Price per share}}{\text{Earning per share}}$$

## VI.    Market Price per Share (MPS)

MPS is that value of stock, which can be obtained by a firm from the sale of a share in the market. MPS is one of the variables, which is affected by DPS of the firm. If the earning per share and dividend per share are high, the market value of the share will also be high. The capital market determines MPS. In this study the market price of share means the rupees value of one share indicated in NEPSE index.

### Statistical Tools

Besides the financial tools, various statistical tools have been used to conduct this study. The result of analysis has been properly tabulated, compared, analyzed and interpreted. In this study, the following statistical tools are used to analyze the relationship between dividend and other variables.

## I.    Arithmetic Mean or Average (*X*)

An average is the value, which represents a group of values. It depicts the characteristic of the whole group. It is an envoy of the entire mass of homogeneous data. Generally, the average value lies somewhere in between the two extremes, i.e. the largest and the smallest items. It is also known as simple average. In general, *n X* $X_1$ , $X_2$ ,..................*X*. 1, 2 3 are the given "n" observations. Then their arithmetic mean, usually denoted by *X* is given by

Arithmetic Mean ( $\overline{X}$ ) = $\dfrac{x_1 + x_2 + x_3......... + x_n}{N}$

Or, $\overline{X} = \dfrac{\sum X}{N}$

> Where, N = number of items
> $\sum x$ = Sum of size of the items.

## II.    Standard Deviation (σ)

The measurement of the scatter ness of the mass of figures in a series about an average is known as dispersion. The standard deviation measures the absolute dispersion of a distribution. The greater the amount of dispersion, the greater the

standard deviation will be, i.e. greater will be the magnitude of the deviations of the values from their mean. A small standard deviation means a high degree of uniformity of the observation as well as homogeneity of a series; a large standard deviation means just opposite. Standard deviation is denoted by a Greek letter 'σ' (Sigma) and is calculated as follows:

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2}$$

Where,
$\overline{X}$ = Mean

x = Variable

n = Number of items in the series

## III. Coefficient of Variation (CV)

The coefficient of variation reflects the relationship between standard deviation and mean. It is the relative measure of dispersion, comparable across, which is  defined as the ratios of the standard deviation to the mean expressed in percent   (*Levin, Richard I. and Rubin, David S.: 199:144*).The series with higher coefficient of variation is said to be more variable, less consistent, less stable and less homogenous. On the contrary, the series with less coefficient of variation is said to be less variable, more consistent, more uniform, and more stable and more homogenous. It is denoted by C.V. and is obtained by dividing the standard deviation by arithmetic mean.

$$\text{Thus, in symbol Coefficient of Variation (C.V)} = \frac{\sigma}{\overline{X}} \times 100$$

SD = Standard Deviation
$\overline{X}$ = Mean average

### IV. Coefficient of Correlation (r)

The correlation analysis is the technique used to measure the closeness of the relationship between the variables. Correlation is an analysis of the covariance between two or more variables and correlation analysis deals to determine the degree of relationship between variables (*Pant and Choudhary; 2053:299*). It is a tool that can be used to describe the degree to which one variable is linearly related to another. It describes not only the magnitude of correlation, but also its direction. The coefficient of correlation is a number, which indicated to what extent two variables are related with each other and to what extent variations in one leads to the variations in the other. The value of coefficient of correlation always lies between ± 1.

A value of -1 indicates a perfect negative relationship between the variables and a value of +1 indicates a perfect positive relationship. A value of zero indicates that there is no relation between the variables. The zero correlation coefficient means the variables are uncorrelated. The closer r is to +1 or -1, the closer the relationship between the variables and closer r is to zero(0), the less close relationship. The algebraic sign of the correlation coefficient indicates the direction of the relationship between two variables, whether direct or inverse, while the numerical value of the coefficient is concerned with the strength, or closeness of the relationship between two variables.

Thus, in this study, the degree of relationship between market price and other relevant financial indicators such as dividend per share, earning per share, dividend payout ratio etc. is measured by the correlation coefficient. The correlation coefficient can be calculated as:

$$r = \frac{n\sum XY - \sum X.\sum Y}{\sqrt{\sum X^2 - \left(\sum X\right)^2} - \sqrt{n\sum Y^2 - \left(\sum Y\right)^2}}$$

## V.   Coefficient of Determination (r $^2$)

The coefficient of determination is the primary way to measure the extent, or strength of the association that exists between two variables, X and Y. it refers to a measure of the total variance in a dependent variable that is explained by its linear relationship to an independent variable. The coefficient of determination is denoted by $r^2$ and the value lies between zero and unity. The closer the $r^2$ to unity; the greater will be the explanatory power. A value of one can occur only if the unexplained variation is zero, which simply means that all the data points in the scatter diagram fall exactly on the regression line. The $r^2$ is always a positive number. It can't tell whether the relationship between the two variables is positive or negative. The $r_2$ is defined as the ratio of explained variance to the total variance. Thus,

$$\text{Coefficient of Determination } (r^2) = \frac{\text{Explained Variation}}{\text{Total Variation}}$$

$$\text{Or, } r^2 = 1 - \frac{\text{Unexplaine d Variance}}{\text{Total Variance}}$$

## VI.   Regression Analysis

Francis Galeton was the first person to introduce the concept of regression. Regression refers to an analysis, which involves the fitting of an equation to a set of data points, generally by the method of least square. In other words, the regression is a statistical method for determining relationships between the variables by the establishment of an approximate functional relationship between them. It is used to determine that whether the dependent variable is influenced by the given independent variable or not. It is considered as a useful tool for determining the strength or relationship between two (Simple Regression) or more (Multiple Regression) variables. It is also used to predict value of one variable given the value of other variables. Simple Linear regression analysis is used to find the relationship between variables. In this study, the following simple regressions have been analyzed.

**a)    Market price per Share on Earning Per Share**

MPS = a + b EPS

Where,

a and b are regression coefficient

MPS = Dependent variable

EPS = Independent variable

This model has been constructed to examine the relationship between market Price per Share (dependent Variable) and Earning per Share (independent variable).

**b)    Market Price per (MPS) Share on Dividend per Share (DPS)**

$MPS = a + b$ DPS

Where,

a and b are regression coefficient

MPS = Dependent variable

DPS = Independent variable

This model has been constructed to examine the relationship between market Price per Share (dependent variable) and Dividend per Share (independent variable).

**c)    Market Price per Share on Dividend Payout Ratio**

$MPS = a + b$ DPR

Where,

$a$ and $b$ are regression coefficient

MPS = Dependent variable

DPR = Independent variable

This model has been constructed to examine the relationship between market Price per Share (dependent variable) and Dividend Payout Ratio (independent variable).

**d)    Market Price per Share on Dividend Yield**

$$MPS = a + b\ DY$$

Where,

a and *b* are regression coefficient

$MPS = Dependent\ variable$

$DY = Independent\ variable$

The relationship between dividend per share (dependent variable) and earning per share (independent variable) can be explained through this model.

**e)    Market Price per Share on Price Earning Ratio**

$$MPS = a + b\ P/E\ ratio$$

Where,

a and b are regression coefficient

MPS = Dependent variable

P/E = Independent variable

The relationship between MPS (dependent variable) and Price Earning Ratio (independent variable) can be explained through this model.

**f)    Market Price per share on Retention Ratio**

$$MPS = a + b\ R/R$$

Where,

a and b are regression coefficient

MPS = Dependent variable

R/R = Independent variable

This model helps in explaining the relation between MPS (dependent variable) and return ratio (independent variable).

**Test of Hypothesis**

The part of study is concerned with the relationship between EPS, DPS, MPS and other financial variables of sample bank. In other words, this part of study is concerned with the test of the relationship between mentioned factors from the banking sectors and their significance. Similarly, in order to examine the significance of regression analysis hypothesis testing has been made.

**T-test**

Mr. Sir William S. Gosset developed t-test, which is used to test the hypothesis when population variance is not known. It is basically used when the sample size is less than 30 and the population standard deviation is unknown. For applying t-test in context of small samples, the t-value is calculated and than compared with the tabulated value of t. If the calculated value of (t) exceeds the table value (say to.05) we infer that the difference is significant at 5% level. But if (t) is less than the concerning table value of the (t) the difference is not treated as significant.

**F-test**

F- test generally known as variance ratio test and is mostly used in context of analysis of variance. F-test is considered to be more appropriate for testing the hypothesis of quality to verify the hypothesis of significance of a variable to explain the variability in another variable. In fact F- test is a test of significance concerning two-sample variance. The fundamental assumption of F-test is.

    I.   The population is normal

    II.   The observation is independent and the samples drawn are random samples.

    III.   There is no measurement error. The objective of F- test is to test hypothesis, where the two samples are from same normal population with same variance.

# CHAPTER-IV

# PRESENTATION AND ANALYSIS OF DATA

In order to attain the goal mentioned in the chapter-I of this study, necessary & relevant data have been collected from various secondary sources. Dividend policy of commercial banks, their actual practice and its impact on share prize are the major concern of this study. Therefore, relevant data are collected and these are presented & interpreted in this chapter. Using the tools developed in chapter-III, the data are processed and analyzed in subjective way. The organization of this chapter basically covers the explanation of the financial variables related to dividend policy, finding the correlation between dividends related variables and interpretation of them, regression analysis so as to explain the relation of MPS with other dividend related financial variables and results and major findings of the study.

## 4.1 Interpretation of financial variables and indicators.

### 4.1.1 Analysis of EPS

The earning per share of the banks under study is tabulated as follows.

**Table no.4.1**

**Analysis of EPS**

| Fiscal Year | Nabil Bank | Siddhartha Bank | NCC Bank |
|---|---|---|---|
| 2005/06 | 129.21 | 13.05 | -84.77 |
| 2006/07 | 137.08 | 15.88 | -16.56 |
| 2007/08 | 108.31 | 17.29 | 35.63 |
| 2008/09 | 106.76 | 22.89 | 29.35 |
| 2009/10 | 78.61 | 21.99 | 30.25 |
| Mean | 111.994 | 18.22 | -1.214 |
| S.D | 20.40 | 3.72 | 45.83 |
| C.V.% | 18.22 | 20.40 | -3774.88 |

*(Source: Annual Report 2009/10 )*

From the above table, it is seen that Nabil Bank has higher EPS than others. EPS signify that the rate of utilization of capital funds. EPS of Rs. 78.61 in FY 2009/10 reveals the earning capacity of the fund is very high and strong too. Profitability position is also strong because such a huge amount of EPS is not possible without strong earning capacity. On an average EPS of Rs.111.994 is very high in comparison to other similar commercial banks. Standard deviation of 20.40 shows the small deviation of EPS from the average of review period which signify the consistency in EPS of the bank. Similarly relative dispersion of EPS shown by CV value is 18.22 percent which is a good symbol of consistent earning of the bank.

Earning per share of Siddhartha Bank for the review period is gradually increasing at about constant rate in the recent years except in year 2009/10. It indicates that earning capacity of the bank is gradually increasing. The use of capital is being efficient in the later years. Similarly, it signifies that the prospect of paying dividend is constant till the current F.Y 2008/09, there is slight decrease in dividend on 2009/10. With the increase in number of shares, increase in EPS further clarifies the effective utilization of fund and sound operation of business. On an average EPS of Rs.18.22 is also average of industrial norms. But it is heavily weak in comparison to Nabil Bank. Standard deviation of 3.72 percent shows negligible deviation of EPS from the average of review period. This is a good symbol of constantly growing earning. The coefficient of variation is 20.40 percent which also shows a small variation of EPS of the bank.

NCC Bank is remarkably poor performing bank in latest years that is indicated by negative EPS. Negative EPS in earlier two years shows that bank is really very poor in earning. The earning capacity is not only zero but also negative. Positive EPS in later three years shows gradual increase in earning capacity of the bank. Negative average of Rs. -1.214 also indicates that still the earning capacity is negative though EPS of the later years is positive. The standard deviation of EPS is 45.83 percent in the review period which shows a greater deviation in earning of the bank within a short period of time. Negative coefficient of variation of -3774.88 percent also explains the negative relative dispersion of EPS. However, EPS in later three years is far better than that of Siddhartha Bank which is Rs.35.63 in fiscal year 2007/08, Rs.29.35 in fiscal year 2008/09 and 30.28 in the F.Y 2009/10 against Rs.17.29,

Rs.22.89 and 21.99 of Siddhartha Bank in those years. The comparative study of these three banks reveals that average EPS of Nabil, Siddhartha and NCC are Rs. 111.994, Rs. 18.22 and Rs.-1.214 respectively. This result shows the earning capacity of these banks is significantly different. Nabil has highest EPS and NCC Bank has lowest and negative EPS. Therefore, there is higher possibility of paying more dividends in case of Nabil Bank least chance of paying dividend in case of NCC Bank. Siddhartha Bank has moderate performance since its EPS is average. Thus,we can see that, Nabil Bank has higher prospect to pay high dividend since it has highest EPS and NCC has still negative EPS; therefore, dividend distribution is merely impossible. As the calculation lower value of standard deviation of Siddhartha Bank explains that EPS is more consistent in comparison to Nabil and NCC Bank. Higher value of standard deviation of NCC Bank reveals earning capacity is highly fluctuating. As the Shareholders' expectation has been sufficiently met by Nabil Bank with higher EPS since it maximizes the value of shareholders wealth, Siddhartha Bank has also started dividend distribution in later years which is attempting to address the shareholders expectation but NCC bank has not respected the shareholders aspiration of dividend income.

## 4.1.2 Analysis of Dividend per Share (DPS)

The dividend per share of the banks under study is tabulated as follows.

**Table no. 4.2**
**Analysis of Dividend per Share (DPS**

| Fiscal Year | Nabil Bank | Siddhartha Bank | NCC Bank |
|:-----------:|:----------:|:---------------:|:--------:|
| **2005/06** | 85 | - | - |
| **2006/07** | 140 | 15.79 | - |
| **2007/08** | 100 | 15.79 | - |
| **2008/09** | 85 | 15.79 | - |
| **2009/10** | 70 | 8.42 | - |
| **Mean** | 96 | 11.158 | - |
| **S.D** | 23.96 | 6.27 | - |
| **C.V.%** | 24.96 | 56.16 | - |

*(Source: Annual Report 2009/10)*

Nabil Bank is regularly paying dividend in higher amount to its shareholders including stock dividend. The DPS is high for the review period. DPS of Rs.140 is really remarkable distribution of dividend in Nepal. The DPS is decreasing and based on earning also. On an average a share of Rs.100 is receiving Rs.96 as dividend annually. In other words, a dividend return of 96 percent is really a symbol of better performance. In one hand its profitability and earning is very high and in another the shareholders return from their investment is very high i-e 96 percent. Due this higher amount of DPS, positive impact is seen in the stock market. Thus, Nabil Bank is creating positive attitude in shareholders and prospective investors along with increment in market price in stock market. Standard deviation of 23.96 percent shows a small deviation in DPS during the review period ranging from Rs.70 to Rs.140.

Siddhartha bank is also attempting to address the shareholders expectation. In the review period, the DPS is zero in the earlier year and in later four years dividend is paying regularly. DPS including stock dividend was Rs.15.79 in fiscal year 2006/07, 2007/08 and 2008/09. But in fiscal year 2009/10 cash dividend of Rs.8.42 has been distributed. Average EPS is Rs.18.22 in review period. Part of that EPS i-e Rs.11.158 in average has been distributing as dividend per share. This result shows at about 61.24 percent of its earning is distributing as dividend. Being a recently opened bank, the dividend distribution has been started. In one hand it helps to flow positive information in the market but at the same time higher DPS in relation to EPS really hinders in expansion and diversification of banking services along with internal and overall growth of the bank. However, average return of 11.158 percent on shareholders hand is not as per their expectation. Standard deviation of 6.27 percent signifies that the DPS is almost consistent and there is no higher deviation in DPS. It ranges from 0 to Rs.15.79.

NCC Bank has negative EPS to the time on an average. Therefore, the possibility of paying dividend is merely zero. Neither the shareholders are satisfied nor is the positive information flowing in the market. Market price of share is also very small because of negative EPS. Therefore the DPS of the bank for the review period is zero. In other words, the bank has not made any dividend distribution. This act of bank is to some extent responsible for decreasing stock price. Comparatively, the DPS is Rs.96, 11.158 and zero respectively of Nabil, Siddhartha and NCC Bank. This result is

sufficient to explain that the significant difference in DPS of Nepalese commercial banks. Rs.96, average DPS of high performing bank and zero DPS of poor performing bank reveals the dividend distribution practice is not at same level. This result also reveals that shareholders and investors are highly satisfied with Nabil, satisfied only with Siddhartha and dissatisfied with NCC Bank. However, the conclusions can be drawn from the above analysis i.e Nabil has highest DPS of Rs.96 and NCC has not paid dividend. There is positive relation between MPS and DPS. Hence, the effect is shown positively in the stock market accordingly.

### 4.1.3 Analysis of Dividend Payout Ratio (DPR)

The dividend payout ratio of the banks under study is presented as follows.

**Table no.4.3**

**Dividend Payout Ratio (DPR)**

| Fiscal Year | Nabil Bank | Siddhartha Bank | NCC Bank |
|:---:|:---:|:---:|:---:|
| 2005/06 | 65.78 | - | - |
| 2006/07 | 102 | 99.43 | - |
| 2007/08 | 92.33 | 91.32 | - |
| 2008/09 | 79.62 | 68.98 | - |
| 2009/10 | 89.05 | 38.29 | - |
| Mean | 85.756 | 59.604 | - |
| S.D | 12.29 | 36.57 | - |
| C.V.% | 14.33 | 61.36 | - |

*(Source: Annual Report 2009/10)*

Dividend payout ratio indicates that percentage of actual earning that has been distributed to equity shareholders. Nabil bank is one of the commercial banks which distribute both cash and stock dividend at higher rate than others. During the review period, average DPR is 85.756 percent ranging from 65.78 percent to 102 percent.

DPR of 102 percent indicates that the bank has distributed more than the earning of that fiscal year as dividend. Out of the accumulated earning from previous year, bank has distributed the dividend. The standard deviation of DPR is 12.29 percent which shows that the DPR is almost consistent. It is not significantly deviate from the average DPR. The smaller value of coefficient of variation also indicates the less variability of DPR in review period.

Siddhartha bank is also distributing dividend out of its earning. The average rate of DPR is significantly smaller than that of Nabil but on an average 59.604 percent DPR is satisfactory. In the later four years bank has distributed 99.43 percent, 91.32 percent, 68.98 percent dividend including stock dividend except in F.Y 2009/10, i.e. only cash dividend of 38.29 percent. It has given positive message about bank in the market. The range of DPR in review period is significantly large. It is ranging from zero to 99.43 percent and deviation from mean is very high which is shown by higher value of standard deviation i-e 59.604 percent. Similarly, relative measure of dispersion, coefficient of variation is 61.36 percent which further clarifies the inconsistency and higher variability of dividend payout ratio.

In case of NCC Bank, the DPR is zero. All the earnings made on later years has retained by bank. In order to set off the accumulated loss and negative earning, the earning available has been utilized. Hence, the DPR is zero. DPR zero means inability of the bank to pay the dividend. Negative earning in earlier years, ineffective utilization of the fund etc are the reasons behind zero DPR. From the above analysis following conclusions can be drawn. i.e  Nabil has highest DPR than Siddhartha Bank, there is higher consistency in DPR of Nabil Bank than Siddhartha Bank since the value of standard deviation is smaller& higher DPR generally create positive attitude of investors and as a consequence the MPS increases.

### 4.1.4 Analysis of Price Earning Ratio (P/E Ratio)

Price earning ratio of the banks under study is presented in following table.

**Table no.4.4**

**Price Earning Ratio (P/E Ratio)**

| Fiscal Year | Nabil Bank | Siddhartha Bank | NCC Bank |
|:---:|:---:|:---:|:---:|
| 2005/06 | 17.34 | 27.59 | -1.11 |
| 2006/07 | 36.84 | 48.98 | -19.08 |
| 2007/08 | 48.70 | 63.04 | 12.83 |
| 2008/09 | 45.89 | 43.70 | 11.41 |
| 2009/10 | 30.33 | 20.19 | 9.08 |
| Mean | 35.82 | 40.7 | 2.626 |
| S.D | 11.31 | 15.29 | 11.91 |
| C.V.% | 31.58 | 37.57 | 453.16 |

*(Source: Annual Report 2009/10)*

Price earning ratio of Nabil Bank was gradually increasing up to fiscal year 2007/08 from 17.34 times to 48.70 times. This ratio helps to explain the relation of MPS and EPS. The increasing P/E ratio signifies that market price of share was increasing at a higher rate than the growth rate of earning. It means the shareholders and investors had more expectation towards banks performance and as a result MPS was such high. In fiscal years 2008/09, 2009/10 the P/E ratio has decreased to 45.89 and 30.33 respectively. This is due to decline in MPS and EPS both in that fiscal year. Average P/E ratio of 35.82 signifies that market price is 35.82 times of average EPS. There is not significant deviation in P/E ratio from the mean P/E ratio during review period since the standard deviation is only 11.31 percent. However, coefficient of variation is 31.58 percent which shows moderate type of deviation in P/E ratio. This ratio is neither consistent nor highly fluctuating.

Siddhartha Bank has also increasing P/E ratio up to fiscal year 2007/08 from 27.59 times to 63.04 times. The increasing P/E ratio indicates that the growth rate of MPS is much better than the growth rate of EPS. Further, it signifies that the investors had more expectation towards banks performance. But in fiscal year 2008/09 and 2009/10 P/E ratio has decreased from 63.04 to 43.70 and 20.19 times respectively. This is due to decrease in MPS though the EPS has increased. Average P/E ratio for the review period is 40.7 times which is much better than that of Nabil Bank. It means the MPS is 40.7 times of the EPS of the bank. But variation in P/E ratio is 15.29 percent which is higher than Nabil and hence, it can be said that P/E ratio is more volatile from an average ratio. Similarly higher value of coefficient of variation i-e 65.73 percent explains the more variable nature of P/E ratio.. Based on this result, it is concluded that performance of bank is much better than that of Nabil Bank in growth of MPS and EPS.

NCC Bank having negative EPS in the earlier two years has negative P/E ratio during that period. But with positive EPS in fiscal year 2007/08, 2008/09 and 2009/10, P/E ratio is also positive. Looking upon the trend, the performance and condition of bank is improving in the later years. Negative P/E ratio of -19.08 times was symptom of failure but due to significant improvement in earning capacity, bank is now generating positive earning with positive P/E ratio of 9.08 times in fiscal year 2009/10 seem to be satisfactory. It means the MPS is 9.08 times the EPS of bank. There is greater deviation from the mean P/E ratio which is signified by the value of standard deviation i-e 11.91 percent. Similarly, higher value of coefficient of variation shows the greater variability and less consistency in P/E ratio. Based on this analysis the conclusions can be drawn as NCC Bank is in progressing stage since the P/E ratio is turning from negative to positive in the review period and Siddhartha bank has better performance in growth of EPS and MPS both since the average P/E ratio is higher than others. Nabil has more consistent P/E ratio than others since value of standard deviation is minimum. The P/E ratio of all banks has fallen in fiscal year 2009/10.

### 4.1.5 Analysis of Dividend Yield (DY)

The dividend yield of the banks under study is presented in following table.

**Table no.4.5**

**Dividend Yield (DY)**

| Fiscal Year | Nabil Bank | Siddhartha Bank | NCC Bank |
|:---:|:---:|:---:|:---:|
| 2005/06 | 3.79 | - | - |
| 2006/07 | 1.02 | 2.03 | - |
| 2007/08 | 1.90 | 1.44 | - |
| 2008/09 | 1.74 | 1.58 | - |
| 2009/10 | 2.94 | 1.91 | - |
| Mean | 2.278 | 1.392 | - |
| S.D | 97.36 | 72.81 | - |
| C.V.% | 42.74 | 52.31 | - |

*(Source: Annual Report 2009/10)*

The dividend yield compares dividend payment with market price per share. Dividend return as a percentage of market prices is shown by dividend yield. Dividend yield of Nabil Bank ranges between 1.02 to 3.79 percent during the review period and average dividend yield is 2.278 percent. The trend of dividend yield in study period is decreasing. This is due to higher growth rate of MPS in relation to DPS. The annual increment in MPS reduces dividend yield if growth rate of both is not same. Higher value of standard deviation i-e 97.36 indicates a greater deviation of DY from the mean. Consistency and variability of DY is almost moderate since the value of coefficient of variation is only 42.74 percent.

Dividend yield of Siddhartha bank is also constantly increasing in the later two years. It means rate of increase in MPS is higher than the rate of dividend growth. Bank has not paid dividend in earlier one year, therefore, DY is zero. Average value of dividend yield 1.392 percent for the study period shows very small amount has been distributed

as dividend. The smaller value of dividend yield does not show a satisfactory result since the DPS is negligible in relation to MPS. 72.81, the value of standard deviation explains the deviation of DY from average is moderate and average. Coefficient of variation of 52.31 percent shows the relative fluctuation and insignificant variability of dividend yield.

During the period of study, NCC Bank has not paid any dividend to its shareholders; therefore, value of dividend yield is zero. From the above discussion, the following conclusions can be drawn. Nabil Bank has higher dividend yield than Siddhartha Bank. Higher value of dividend yield shows that dividend payment is higher in relation to MPS. The dividend yield is more consistent in case of Siddhartha Bank than that of Nabil Bank. NCC Bank has zero dividend yields since the DPS is zero for the review period.

### 4.1.6 Analysis of Retention Ratio (RR)

The retention ratio of the banks under study is presented in following table.

**Table no.4.6**

**Retention Ratio (RR)**

| Fiscal Year | Nabil Bank | Siddhartha Bank | NCC Bank |
|:-----------:|:----------:|:---------------:|:--------:|
| 2005/06 | 34.22 | 100 | 100 |
| 2006/07 | -2 | 0.57 | 100 |
| 2007/08 | 7.67 | 8.68 | 100 |
| 2008/09 | 20.38 | 31.02 | 100 |
| 2009/10 | 10.95 | 61.71 | 100 |
| Mean | 14.244 | 40.396 | 100 |
| S.D | 12.29 | 36.57 | 0 |
| C.V.% | 86.25 | 90.53 | 0 |

*(Source: Annual Report 2009/10)*

High yielding bank, Nabil Bank has distributed a large part of its earning to the shareholders as dividend either in cash or in the form of bonus shares. The table no 4.6 exhibits Nabil Bank has very low retention ratio. The range of retention is minus two to 34.22 percent. Negative retention is the result of dividend distribution higher than the EPS of the bank. The EPS was Rs.137.08 but the DPS was Rs.140. When bank distribute dividend higher than the earning, the negative retention ratio appears in the financial books. On an average only 14.244 percent of its earning has retained during the study period. This ratio signifies that bank is fully aware about shareholders expectation, bank has sufficient fund for internal financing, bank has no immediate expansion and diversification policy and the fund already created are sufficient to finance in them, if any and bank has good performance. Moreover this low retention ratio indicates the saturation stage of banks operation. Standard deviation of 12.29 percent indicates greater consistency of retention ratio during the study period.

Newly opened bank Siddhartha has the high retention rate than Nabil Bank. In the earlier two years of the study, retention rate is hundred percent which indicates the zero dividend distribution in fiscal year 2005/06. In fiscal year 2006/07, almost all the earning has distributed as dividend since retention rate is 0.57 percent only. In fiscal year 2007/08 and 2008/09 and 2009/10, this rate has increased to 8.68 percent, 31.02 percent and 61.71% respectively. This statistics shows that bank has followed the policy of high retention rate. For newly opened bank, generally this rate must be high for effective operation and for developing competency development. The average retention rate of 40.396 percent reveals the policy of retention of about fifty percent. Standard deviation of 36.57 shows the inconsistency in retention rate during the study period. The deviation from the mean retention rate is almost high. Further, the retention rate is more volatile and less consistent since the coefficient of variation is about 90.5 percent.

 NCC Bank has not made any dividend distribution during the study period. Previously, the earning was negative in fiscal year 2005/06 and 2006/07. But in the later three years earning is positive. However, the bank is not in a position to distribute dividend since the accumulated loss of the previous period is very high. Unless it fully set off the accumulated loss, it cannot distribute any dividend (Bank

and Financial Institution Act 2006). Therefore, entire amount of earning has been retained by the bank during the review period. Hundred percent retention rates signify, all earning has been utilized either in internal financing or in setting off the accumulated loss. Poor performance of the bank since retention rate is hundred percent during the study period.

Always the retention rate is 100 percent; therefore, the deviation is zero. From the above study, following conclusions can be drawn. Nabil Bank has very low retention ratio than other banks. Siddhartha Bank is using about 40.396 percent of its earning for internal financing and only about 36.57 percent has been distributed as dividend. NCC Bank has retained the entire earning. Comparative table shows that Nabil Bank is addressing the shareholders desire of dividend income. Retention ratio shows performance and position of the bank to some extent. The result of RR in the table helps to depict that Nabil Bank is in the saturation stage, Siddhartha Bank is in growing stage and NCC Bank is still struggling for existence.

### 4.1.7 Analysis of Market Price per Share (MPS)

The market price per share of the banks under study is presented in following table.

**Table no.4.7**
**Market Price per Share (MPS)**

| Fiscal Year | Nabil Bank | Siddhartha Bank | NCC Bank |
|:---:|:---:|:---:|:---:|
| 2005/06 | 2240 | 360 | 94 |
| 2006/07 | 5050 | 778 | 316 |
| 2007/08 | 5275 | 1090 | 457 |
| 2008/09 | 4899 | 1000 | 335 |
| 2009/10 | 2381 | 444 | 275 |
| Mean | 3969 | 734.4 | 395.4 |
| S.D | 1360 | 290.99 | 117.55 |
| C.V.% | 34.27 | 39.62 | 39.79 |

*(Source: Annual Report 2009/10)*

Table no.4.7 exhibits MPS of the sampled banks. Nabil Bank has the highest market price ranging from Rs.2240 to Rs.5275. the trend is increasing until fiscal year 2007/08 but slightly decreased to Rs.4899 in fiscal year 2008/09 and to 2381 in 2009/10. This trend indicates that Nabil has high reputation with high performance and thus, MPS is increasing. A number of variables of macro economics are also responsible for the increase or decrease of MPS along with the performance of the company. The average MPS of Rs.3969 is very high price in the Nepalese stock market. It shows the seniority of Nabil Bank in the stock market in comparison to other similar banks. Higher value of standard deviation shows that the deviation of MPS from average MPS is very high. But this is not an unusual symptom in case of the rising company in market. Similarly, coefficient of variation of 34.27 percent shows the average consistency in MPS of Nabil Bank.

After getting listed in NEPSE in fiscal year 2005/06, Siddhartha Bank had MPS of Rs.360. gradually the MPS was increased until fiscal year2007/08 and reached to Rs.1090, but in fiscal year 2008/09 market price slightly decreased to Rs.1000 and to Rs.444 in 2009/10. The average MPS for review period is Rs.734.4 and value of standard deviation is 290.99 which signify a greater deviation and high volatility in MPS. MPS is the reflection of company's internal affairs as well as the country's economic dynamics. Generally, increasing trend indicates the growth of bank in the review period and investors' expectation of better performance of the bank in future.

NCC Bank has the lowest MPS in fiscal year 2005/06 since the EPS was highly negative in the same year. In fiscal year 2006/07 and 2007/08 MPS also increased that is due to profitability of the bank. Due to poor performance of the bank during the earlier period has given negative message in the stock market. Therefore, MPS of the bank is remarkably very small in relation to other similar banks. Average MPS is Rs.395.4 which is relatively smaller than others; however, it is a good strength of the bank because the earning capacity and profitability is improving in the later years. Standard deviation of 117.55 and coefficient of variation of 39.79 percent signify the higher consistency, less volatility and fluctuation of MPS of NCC Bank.

From the above discussion, following conclusions can be drawn. In comparison to others, Nabil Bank has the highest MPS with higher deviation and fluctuation. The trend of increment and decrement in MPS is as same as with EPS. Thus this result further helps to prove the strong relation of MPS and EPS. Nabil Bank having higher EPS has high price, Siddhartha Bank has average EPS with average price and NCC Bank has low EPS along with low MPS.NCC Bank has more consistent MPS than other two banks. As said previously, MPS is the reflection of company's performance. Therefore, this MPS reflect the better performance of Nabil Bank, average performance of Siddhartha Bank and poor Performance of NCC Bank.

## 4.2 Correlation between Financial Variables and Their Interpretation

Correlation is generally used to describe the degree to which one variable is related to another. The coefficient of correlation shows the magnitude and direction of relationship between variables. It helps to determine both positive and negative relationship of the variables. The positive correlation indicates that increase in value of one variable leads to increase in value of another variable and negative correlation depicts the inverse relationship between variables. The dividend related variables EPS, DPS, DPR, P/E Ratio, DY, RR and MPS are the financial variables for this study. Correlation between these variables for the individual banks is shown separately in the following section of this report.

### 4.2.1 Correlation between Financial Variables of Nabil Bank

**Table no.4.8**

**Correlation between Financial Variables of Nabil Bank**

| Variables | EPS | DPS | DPR | P/E Ratio | DY | RR | MPS |
|---|---|---|---|---|---|---|---|
| EPS | 1 | | | | | | |
| DPS | 0.747 | 1 | | | | | |
| DPR | -0.031 | 0.641 | 1 | | | | |
| P/E Ratio | -0.181 | 0.245 | 0.562 | 1 | | | |
| DY | -0.236 | -0.727 | -0.797 | -0.783 | 1 | | |
| RR | 0.031 | -0.641 | -1 | -0.562 | 0.797 | 1 | |
| MPS | 0.2927 | 0.631 | 0.596 | 0.833 | -0.91 | -0.60 | 1 |

(*Source: Appendix-A*)

Table no 4.8 exhibits the direction and magnitude of correlation between various financial variables of the Nabil Bank. Basically, the degree of relationship of MPS with other variables is seen in the last row of the table. It is seen that MPS is positively correlated with EPS, DPS, DPR, and P/E Ratio and negatively correlated with dividend yield (DY) and retention rate (RR). Positive correlation shows the positive direction of movement end relation of the variables. It means both variables move on the same direction at the degree of correlation value. Correlation between MPS and EPS is 0.2927. This is very small value of correlation value which is insignificant in statistical term. It shows the negligible relationship between them. A number of other variables have significant impact on MPS along with EPS. Similarly, correlation of MPS and DPS is 0.631 which signifies the significant and high correlation between them in positive direction.

Similarly, the correlation between MPS and DPR is 0.596.This value shows the significant association between them in positive direction. This direct relationship indicates MPS increases or decreases as DPR increase or decrease. The correlation between MPS and P/E Ratio is 0.833. This relationship is positive and significant too. Increase in P/E Ratio generally shows the increment in MPS and vice versa.

MPS of the Nabil Bank is negatively correlated with DY and RR. Correlation between MPS and DY is -0.91 which shows that their relationship is negative and inverse. The linear association between them is negative. Similarly, negative correlation between MPS and RR -0.60 is significant the inverse relation between these variables shows MPS moves on opposite direction with RR. From the above discussion the conclusions drawn are, Market price per share of Nabil Bank is positively correlated with EPS, DPS, DPR and P/E Ratio and negatively correlated with DY and RR, EPS of the Nabil Bank explains negligible variation in MPS. However, DPS, DPR and P/E Ratio explain 63.1 percent, 59.6 percent and 83.3 percent respectively of the variation of MPS and market price of share has inverse relation with RR and DY which shows the opposite movement between them.

### 4.2.2 Correlation Between Financial Variables of Siddhartha Bank

**Table no.4.9**

**Correlation Between Financial Variables of Siddhartha Bank**

| Variables | EPS | DPS | DPR | P/E Ratio | DY | RR | MPS |
|---|---|---|---|---|---|---|---|
| EPS | 1 | | | | | | |
| DPS | 0.462 | 1 | | | | | |
| DPR | 0.219 | 0.958 | 1 | | | | |
| P/E Ratio | -0.126 | 0.748 | 0.817 | 1 | | | |
| DY | 0.627 | 0.796 | 0.756 | 0.261 | 1 | | |
| RR | -0.219 | -0.958 | -1 | -0.817 | -0.756 | 1 | |
| MPS | 0.30 | 0.88 | 0.83 | 0.90 | 0.44 | -0.83 | 1 |

(*Source: Appendix-B*)

Table no.4.9 exhibits the degree and direction of different financial variables of the Siddhartha Bank. The degree of relation between MPS and other variables is shown in the last row of the table and it is seen that MPS of Siddhartha Bank has positive correlation with EPS, DPS, DPR, P/E Ratio and DY and negative correlation with RR. Positive correlation indicates that the variables move on the same direction. Increment of dependent variable is along with the increment of independent variable and vice versa. This means the independent variables EPS, DPS, DPR, P/E Ratio dividend yield explain the positive movement of MPS. But correlation between market price and retention ratio (RR) ratio is negative which signifies the inverse relationship between them. The increase or decrease in MPS is due to opposite movement of RR along with other variables. From this explanation and results, MPS of Siddhartha Bank has positive correlation with EPS, DPS, DPR, P/E Ratio & DY and negative correlation with retention ratio (RR). To some extent all these variables have correlation with MPS. Hence, MPS is a function of these all variables.

### 4.2.3 Correlation between Financial Variables of NCC Bank

**Table no.4.10**

**Correlation between Financial Variables of NCC Bank**

| Variables | EPS | DPS | DPR | P/E Ratio | DY | RR | MPS |
|---|---|---|---|---|---|---|---|
| EPS | 1 | | | | | | |
| DPS | 0 | 1 | | | | | |
| DPR | 0 | 0 | 1 | | | | |
| P/E Ratio | 0.548 | 0 | 0 | 1 | | | |
| DY | 0 | 0 | 0 | 0 | 1 | | |
| RR | 0 | 0 | 0 | 0 | 0 | 1 | |
| MPS | 0.86 | 0 | 0 | 0.31 | 0 | 0 | 1 |

(*Source: Appendix-C*)

Table no.4.10 exhibits the degree and direction of different financial variables of the NCC Bank. The degree of relation between MPS and other variables is shown in the last row of the table. The correlation between MPS and EPS is 0.86 which is very significant and directed in positive direction. These two variables have direct relationship. Similarly, correlation between MPS & DPS, MPS & DPR, MPS & DY and MPS & RR is zero. Zero correlation means there is no association or relation between these variables in case of NCC Bank. They are not in any way associated to each other. They are totally independent to each other. The increase or decrease in MPS cannot be explained by these explanatory variables (DPS, DPR, DY and RR) since their correlation with MPS are zero. But correlation between MPS and P/E Ratio is 0.31. This result shows their relation to each other in positive direction. From the above explanation, this conclusion can be drawn. i.e MPS of NCC Bank significant positive correlation with EPS of the bank and highly positive correlation with P/E Ratio. But the MPS has zero correlation with DPS, DPR, DY and RR. The variation in MPS cannot be explained by DPS, DPR, DY and RR but EPS of the bank is not related with dividend related variables.

## 4.3 Simple Regression Equation and Their Interpretation

The regression analysis is used to estimate the likely value of one variable from the known value of other variable. It shows a kind of average irreversible functional relationship between two variables. The cause and effect relationship between the variables is clearly indicated through regression analysis. In this study, MPS is dependent variable and other variables EPS, DPS, DPR, P/E Ratio, DY and RR are the independent. The statistical relationship between these dependent and independent variables for the different banks in the form of regression equation is shown in the following section of this chapter.

### 4.3.1 Regression Equation of MPS on EPS

**Table No.4.11**

**Regression Equation of MPS on EPS**

| Banks | Equation | Regression Coefficient (a) | Regression Coefficient (b) | Std. Error of estimate ($S_e$) | Std Error of Regression coeff. ($S_b$) | t-value |
|-------|----------|------------|------------|------------|------------|---------|
| Nabil Bank | MPS= 1785.72+19.50 EPS | 1785.72 | 19.50 | 1678.22 | 37.79 | 0.53 |
| Siddhartha Bank | MPS=299.69+ 23.86EPS | 299.69 | 23.86 | 357.8 | 43.12 | 0.554 |
| NCC | MPS=298.06+ 2.19EPS | 298.06 | 2.19 | 78.7 | 0.77 | 2.858 |

(*Source: Appendix A, B, C*)

Table no.4.11 exhibits the regression equation of MPS on EPS of Nabil Bank, Siddhartha Bank and NCC Bank. The table shows the linear relationship between MPS and EPS of these banks. All the banks have positive relationship of MPS with EPS. The result of regression equation in case of Nabil Bank shows the value of *a* and *b* are 1785.72 and 19.50 respectively. The y-intercept of regression line *a* is 1785.72 which shows that the average MPS would be Rs.1785.72 if the EPS would be zero. Even in case of EPS equal to zero, the MPS of Rs.1785.72 shows the nominal impact of EPS on MPS of Nabil Bank. The slope of regression line *b* is 19.50 which indicate

that if the EPS of Nabil Bank is increased by Re.1 per share, its impact on an average by Rs.19.50 per share is seen in the market price. Positive slope of the line indicates the direction of MPS and EPS movement is direct and positive. When the EPS increases, the MPS also increases and vice versa. Similarly, standard error of estimate $S_e$ is 1678.22 which show the higher variability of the observed value from the value that is predicted by regression line. The standard error of regression coefficient $S_b$ is 69.64 shows the probable error of the $b$ value in the equation. In the table, calculated t-value is 0.139 which is smaller than the tabulated value of t-distribution for 3 df at 5 percent significance level i-e 3.182. It infers that there is no statistically significant relation between MPS and EPS of the Nabil Bank.

The regression equation of MPS on EPS of Siddhartha Bank shows the value of regression coefficient $a$ and $b$ are 299.69 and 23.86 respectively. Y-intercept of regression line $a$ is 299.69 which indicates that the average MPS of Siddhartha Bank would be 299.69 if the EPS would be zero. This result shows the strong relationship of EPS with MPS. The slope of regression line $b$ is 23.86 which indicate a rupee change in EPS brings the change of Rs.23.86 in MPS. The positive slope of line indicates the positive relation of MPS and EPS. The standard error of estimate $S_e$ is 357.8 which show the variability in MPS that is predicted by regression line. Similarly, standard error of regression coefficient $S_b$ is 43.12. A deviation of 43.12 may come in the observed value of coefficient from the standardized value. The calculated value of t-distribution 0.554 which is smaller than the tabulated t-value for 2 d.f at 5 percent significance level i-e 4.303. This result helps to depict that the association between MPS and EPS is not statistically significant though these two are positively correlated to each other.

The regression equation of MPS on EPS for NCC Bank shows the value of regression coefficient $a$ and $b$ are 298.06 and 2.19 respectively. The y- intercept of regression line $a$ is 298.06 which indicates that the MPS of NCC Bank would be Rs.298.06 if the EPS would be zero when all other factors remain constant. It means even when the EPS is zero the MPs is Rs.298.06. It infers that there is not close association of MPS and EPS. The slope of regression line $b$ is 2.19 which indicate a rupee change in EPS causes a change of Rs.2.19 in value of MPS. Positive slope indicates the direction of movement between them is positive and direct. Increase in EPS also increases the MPS of the bank. The standard error of estimate $S_e$ is 78.7. This means probable error

in the value that is predicted by regression line might be of Rs.78.7. The standard error of regression coefficient is 2.858 which show the greater accuracy of the calculated value since it is very negligible error. Further, calculated t-value is 2.858 and tabulated t-value for 3 d.f at 5 percent significance level is 3.182. On comparison, calculated t- value is smaller than the tabulated t-value. This result illustrates the insignificant relation of MPS and EPS though they are positively correlated. This result further depicts that MPS of NCC Bank is not solely the positive function of EPS.

From the above explanation and result, following conclusions can be drawn. All the banks' MPS has positive correlation with EPS but the degree of their relation is different. Above analysis showed that MPS of the Nabil Bank and NCC Bank is less influenced by EPS but the impact of EPS on MPS of Siddhartha Bank is remarkable. The regression equation of MPS on EPS shows the positive linear relationship between them which proves that MPS is influenced by EPS.

### 4.3.2 Regression Equation of MPS on DPS

**Table no.4.12**

**Regression Equation of MPS on DPS**

| Banks | Equation | Regression Coefficient (a) | Regression Coefficient (b) | Std. Error of estimate ($S_e$) | Std Error of Regression coeff. ($S_b$) | t-value |
|---|---|---|---|---|---|---|
| Nabil Bank | MPS= 531.43+35.81 DPS | 531.43 | 35.81 | 1361.3 | 25.41 | 1.41 |
| Siddhartha Bank | MPS=276.86+41.01DPS | 276.86 | 41.01 | 176.3 | 12.58 | 3.26 |
| NCC | - | - | - | - | - | - |

(*Source: Appendix A, B, C*)

Table no.4.12 exhibits the regression equation of MPS on DPS of three banks namely Nabil Bank, Siddhartha Bank and NCC Bank. As the table shows that regression coefficients *a* and *b* of Nabil Bank are 531.43 and 35.81 respectively. Y- Intercept of the regression line *a* is 531.43 which signify that the value of MPS would be 531.43

when the DPS would be zero if all other factors remain constant. The slope of estimated regression line $b$ is 35.81. It indicates that a rupee change in DPS of the bank would bring the change of Rs. 35.81 in MPS. Standard error of estimate $S_e$ is 1361.3 which shows a higher deviation of Rs.1361.3 may come in MPS value that is predicted by the above mentioned regression line. The standard error of regression coefficient $S_b$ is 25.41 which show that the calculated $b$ value may vary by 25.41 points in observation. Similarly, calculated t-value for slope of regression line is 1.41 and tabulated t- value for 3 d.f at 5 percent significance level is 3.182. On comparison, tabulated t- value is greater than the calculated t- value. This result infers that there is no significant relation between MPS and EPS in case of Nabil Bank though the correlation between them is significant form correlation matrix. It further depicts that there are other variables along with DPS which could affect the overall MPS of the bank.

Regression equation of MPS on DPS for Siddhartha Bank shows the regression coefficient $a$ and $b$ are 276.86 and 41.01 respectively. The y-intercept of regression line $a$ is 276.86 which indicates that even when the DPS is zero, the MPS would be Rs.276.86. Average MPS of the bank is Rs.734.4 and the predicted value is Rs. 276.86 when DPS is zero and all other factors hold constant. This comparison shows that MPS of the bank is moderately correlated with the bank's DPS. The slope of regression line $b$ is 41.01 which mean a rupee change in DPS causes a change of Rs.41.01 in MPS. The positive association between these variables suggests us that the movements would be in positive direction. Standard error of estimate $S_e$ shows the variability or deviation in the observed value from the value predicted by the regression equation which is Rs.176.3 in case of Siddhartha Bank. Similarly, standard error of regression coefficient $b$ (slope of regression line) is 12.58. Here, the calculated t-value for the slope is 3.26 but the tabulated value at t-distribution table for 2 df at 5 percent significance level is 4.303. The greater value of tabulated t-value indicates there is no statistically significant relation between MPS and DPS though they are positively correlated each other. MPS of NCC Bank has no relationship with DPS since coefficient of correlation between them is zero which is seen from the correlation matrix of NCC Bank. Therefore, linear functional relationship between MPS and DPS is absent in the above table.

### 4.3.3 Regression Equation of MPS on DPR

**Table no.4.13**

**Regression Equation of MPS on DPR**

| Banks | Equation | Regression Coefficient (a) | Regression Coefficient (b) | Std. Error of estimate $(S_e)$ | Std Error of Regression coeff. $(S_b)$ | t-value |
|---|---|---|---|---|---|---|
| Nabil Bank | MPS=1684.74 +65.94 DPR | 1684.7 | 65.94 | 1409.5 | 51.31 | 1.29 |
| Siddhartha Bank | MPS=342.11+ 6.58DPR | 342.11 | 6.58 | 211.1 | 2.58 | 2.549 |
| NCC | - | - | - | - | - | - |

(*Source: Appendix A, B, C*)

Table no.4.13 exhibits the regression equation of MPS on DPS of three banks namely Nabil Bank, Siddhartha Bank and NCC Bank. As the table shows that regression coefficients *a* and *b* of Nabil Bank are 1684.7 and 65.94 respectively. Y- Intercept of the regression line *a* is 1684.7. Negative value of y-intercept shows that when the value of DPR would be equal to zero, the MPS of the Nabil tends to be 1684.7 if other factors hold constant. This result further shows the strong relationship of DPR and MPS. The slope of regression line *b* is 65.94. This signifies that when DPR of the bank changes by one percent, a change of Rs.65.94 can be seen in the MPS of the bank and positive slope indicates the positive direction of their movement. Increase in DPR brings the increment in MPS and vice versa. The standard error of estimate $S_e$ is 1409.5 which signify that variation in predicted MPS may be resulted by this amount. Similarly, value of standard error of regression coefficient $S_b$ is 51.31 which show that the slope of line *b* may be different by this amount. As we know that smaller the value of $S_b$ greater the accuracy of estimation by regression line. Therefore, the estimation would be more accurate too. The t-value of slope is 1.29 but the tabulated t-value for 3 df at 5 percent significance level is 3.182. On comparison, tabulated t-value is greater than the calculated t-value which signifies that the relation between MPS and DPR is not statistically significant but closer the calculated value of t with

tabulated value shows the significant relation between them. Further, the correlation between MPS and DPR is also high and significant which proves that their relationship is significant too in case of Nabil Bank.

MPS of Siddhartha Bank is positively correlated with DPR. The regression equation of MPS on DPR also shows their positive correlation. The regression coefficient $a$ and $b$ are 342.11 and 6.58 respectively. Y-intercept of the regression line $a$ is 342.11 which indicates that MPS of the bank would be Rs.6.58 when all other factors remain constant and DPR is zero. Average MPS is Rs.734.4 and in the absence of DPR the MPS would be Rs. 342.11. Comparison of these two MPS has no significant difference. Therefore, it can be concluded that MPS of Siddhartha Bank has no significant relation with DPR of the bank though there is certain positive correlation between them. The slope of predicted regression line $b$ is 6.58. This value indicates that when DPR of the bank is increased by one percent, a change of Rs.6.58 is seen in the MPS. This further depicts the weak relation of MPS with DPR of Siddhartha Bank. Positive slope of regression line signifies that increase in DPR causes the increase in MPS and vice versa. Standard error of estimate $S_e$ is 211.1. This value shows that the predicted value by regression line may be differentiated by Rs.211.1. The standard error of regression coefficient $S_b$ is 2.58 which explain the quantum of error on calculated value of $b$. The calculated t-value for their relation and slope is 2.549 which is smaller than the tabulated value of t-distribution at 5 percent significance level for 2 df i-e 4.303. This result reveals that there is not statistically significant relation between MPS and DPR of Siddhartha Bank.

The correlation analysis of DPR and MPS of NCC Bank in the correlation matrix showed that there is no association between MPS and DPR since coefficient of correlation between them is zero. Linearly, these two variables are unrelated therefore, it can be said that effect of DPR on MPS is zero.

### 4.3.4 Regression Equation of MPS on P/E Ratio

**Table no.4.14**

**Regression Equation of MPS on P/E Ratio**

| Banks | Equation | Regression Coefficient (a) | Regression Coefficient (b) | Std. Error of estimate ($S_e$) | Std Error of Regression coeff. ($S_b$) | t-value |
|-------|----------|-----|-----|-----|-----|-----|
| Nabil Bank | MPS=166.88+ 106.16P/E | 166.88 | 106.16 | 822.2 | 32.50 | 3.267 |
| Siddhartha Bank | MPS=39.35+17.08P/E | 39.35 | 17.08 | 165.8 | 4.85 | 3.523 |
| NCC | MPS=287.35+ 3.07P/E | 287.35 | 3.07 | 144.3 | 5.42 | 0.565 |

(*Source: Appendix A, B, C*)

Table no 4.14 exhibits the regression equation of MPS on P/E Ratio of three banks namely Nabil Bank, Siddhartha Bank and NCC Bank. As the table shows that regression coefficients *a* and *b* of Nabil Bank are 166.88 and 106.16 respectively. Y- Intercept of the regression line *a* is 166.88 which indicates that the MPS would be 166.88 when the P/E Ratio equals to zero. Average MPS of the bank is Rs.3969.6 and when P/E ratio is zero and all other factors remain constant; the MPS would be Rs.166.88. Comparison of these two prices easily helps us to say that the relation between MPS and P/E ratio is highly significant. The slope of regression line *b* is 106.16 which indicate the positive movement of P/E ratio for one time brings the change of Rs.106.16 in MPS of the bank. This result also shows that their relationship is strong. Standard error of estimate S $_e$ of 822.2 shows the variation that may occur in the predicted value by regression equation from the observed value of MPS which is Rs.822.2. Similarly, standard error of regression coefficient is 32.50 which show the error associated with calculated regression coefficient. Here, the calculated t-value is 3.267 but at 5 percent significance level for 3 df the value of t- distribution is 3.182. The calculated t-value is greater than the tabulated value which signifies that there is statistically significant relation between MPS and P/ E ratio.

Similarly regression equation of Siddhartha Bank shows the value of regression coefficient $a$ and $b$ are 39.35 and 17.08respectively. The slope of regression line $b$ is 17.08. It means a change of one time in the P/E ratio brings the change of Rs.17.08 in MPS of the bank.

The standard error of estimate $S_e$ is 165.8 which reveal that the deviation in the predicted value by regression line of Rs.165.8 may appear when it is compared with observed value. Standard error of regression coefficient is 4.85. This connotes that the predicted value by regression line would be close to the observed value with high accuracy. The t-value calculated above is 3.523 which is smaller than the tabulated t-value for 2 df at 5 percent significance level i-e 4.303. This result reveals that there is not statistically significant relationship between MPS and P/E ratio of the bank. Other variables are also associated as determinants of MPS.

The regression equation of NCC Bank for MPS on P/E ratio shows the regression coefficients $a$ and $b$ are 287.35 and 3.07 respectively. The y-intercept of regression line $a$ is 287.35 which reveals that when P/E ratio is equal to zero, value of MPS would be Rs.290. This result further signifies that the weak relationship between MPS and P/E ratio. The slope of regression line $b$ is 3.07.This positive slope indicates that increase in P/E ratio for one time brings the increment of Rs3.07 in MPS. This result also shows the insignificant relation between MPS and P/E ratio. Further, the tabulated value of t-distribution at 5 percent significance level for 3 df is 3.182 but the calculated t-value is 0.565. The smaller calculated value further clarifies that there is no significant relation between MPS and P/E ratio. The standard error of estimate $S_e$ is 144.3 which show the variability of MPS from the estimated MPS by regression line. Similarly, standard error of regression coefficient $S_b$ is 5.42 which is very small and signifies that the prediction would be more accurate and close to observed MPS by using regression equation since it is very small.

### 4.3.5 Regression Equation of MPS on DY

**Table no.4.15**

**Regression Equation of MPS on DY**

| Banks | Equation | Regression Coefficient (a) | Regression Coefficient (b) | Std. Error of estimate ($S_e$) | Std Error of Regression coeff. ($S_b$) | t-value |
|---|---|---|---|---|---|---|
| Nabil Bank | MPS=6861.96 -1269.69DY | 6861.96 | -1269.69 | 730.4 | 335.51 | -3.784 |
| Siddhartha Bank | MPS=489.91+ 175.64DY | 489.91 | 175.64 | 337.5 | 207.27 | 0.847 |
| NCC | - | - | - | - | - | - |

(*Source: Appendix A,B,C*)

Table no.4.15 exhibits the regression equation of MPS on DY of three banks namely Nabil Bank, Siddhartha Bank and NCC Bank. The intercept coefficient of Nabil Bank *a* is 6861.96 which signifies the MPS would be Rs.6861.69 when the dividend yield is equal to zero. The slope of regression line *b* is negative and value is -1269.69. It indicates that when one percent increase in dividend yield is made, the MPS would decrease by Rs.1269.69 and vice versa. It shows the inverse relation of MPS with DY. The standard error of estimate S $_e$ is 730.4 and standard error of regression coefficient S $_b$ is 355.51 which show the higher deviation in the value that is predicted by the regression line and least accuracy of estimation. Similarly, the calculated value of t-distribution is -3.784 smaller than the tabulated value at 5 percent significance level for 3 d.f i-e 3.182. This result indicates that there is not statistically significant relationship between MPS and DY. It further reveals the importance and association of other variables in determining MPS.

Similarly, the regression equation of MPS on DY for Siddhartha Bank shows the value of regression coefficient *a* and *b* are 489.91 and 175.64 respectively. The intercept value of 489.91 shows that the MPS would be Rs.489.91 when DY is equal to zero. Average MPS of the bank is Rs.734.4 and when DY is zero, the MPS is Rs.489.91. On comparison, there is no higher deviation between these two values. So, it can be said that there is no significant relation of MPS with DY. The slope of

regression equation $b$ is 175.64. This result explains that one percent increase in DY brings the change of Rs.175.64 in MPS when all other variables remain constant. The standard error of estimate $S_e$ is 337.5 and standard error of regression coefficient $S_b$ is 207.27. The higher value of $S_e$ and $S_b$ indicates the higher variability in the estimated value derived from regression line and least accuracy of the estimation. The possibility of reporting wrong estimation is equally high when these values are significantly high. Further, the calculated t- value is 0.847 but the tabulated t-value for 2 df at 5 percent significance level is 4.303. The smaller calculated value infers that there is no significant relationship between DY and MPS of Siddhartha Bank. It does not reject the higher correlation of MPS with other variables.

In case of NCC Bank, neither there is simple correlation between DY and MPS nor can the regression equation be formed to explain their linear functional relationship. Therefore, regression equation is absent in the table.

## 4.3.6 Regression Equation of MPS on RR

### Table no.4.16

### Regression Equation of MPS on RR

| Banks | Equation | Regression Coefficient (a) | Regression Coefficient (b) | Std. Error of estimate ($S_e$) | Std Error of Regression coeff. ($S_b$) | t-value |
|---|---|---|---|---|---|---|
| Nabil Bank | MPS=4908.78 -65.94RR | 4908.78 | -65.94 | 1409.5 | 51.31 | -1.285 |
| Siddhartha Bank | MPS=1000.27 -6.58RR | 1000.27 | -6.58 | 211.1 | 2.58 | -2.549 |
| NCC | - | - | - | - | - | - |

(*Source: Appendix A,B,C*)

Table no.4.16 exhibits the regression equation of MPS on RR of three banks namely Nabil Bank, Siddhartha Bank and NCC Bank. The intercept coefficient of Nabil Bank $a$ is 4908.78 which signifies the MPS would be Rs.4908.78 when the retention rate is equal to zero. The slope of regression line $b$ is negative and value is -65.94. It

indicates that when one percent increases in RR causes Rs.65.94 decrease in MPS. It also indicates that MPS is negatively related with RR. Increment in RR causes decrement in MPS and vice versa. Even when RR is zero, MPS is Rs.4908.78. An average MPS of the bank is Rs.3969.6 which is not significantly different from the intercept value. Therefore, RR and MPS have no significant relation though they are negatively correlated with each other. The standard error of estimate $S_e$ and standard error of regression coefficient $S_b$ are 1409.5 and 51.31 respectively. The higher value of $S_e$ and $S_b$ indicates the greater variability in the value that is predicted by regression equation and less possibility of predicting the value close to the observed value. The calculated t- value is also smaller than that the tabulated t-value at 5 percent significance level for 3 df. This result further proves that there is no significant relation between RR and MPS though they are inversely correlated each other.

The regression result of MPS on RR for Siddhartha Bank also shows the negative association of MPS with RR. The regression coefficients $a$ and $b$ are 1000.27 and -6.58 respectively. The intercept coefficient $a$ shows the value of MPS would be Rs.1000.27 when RR is equal to zero. The comparison of this value with average MPS of Rs.734.4 reveals that there is not significant impact of RR on MPS. The slope coefficient $b$ shows the negative relation of MPS with RR. It means one percent increase in RR causes a decrease of Rs.6.58 and vice versa in MPS of the bank. At the same time it is seen that recognizing the retained earning for growth of market price is really absent for this bank too. The standard error of estimate $S_e$ and standard error of regression coefficient $S_b$ are 211.1 and 2.58 respectively. A deviation of Rs.211.1 may be seen in the estimated value by this regression line and possibility of reporting error of 2.58 in the slope of regression line is depicted by $S_b$ value. The calculated t-value is -2.549 and tabulated t-value is 4.303 at 5 percent significance level for 2 df. The comparison of these values shows the smaller calculated t-value and that reveals insignificant relation between MPS and RR.

From the study, following conclusions can be drawn from the simple regression analysis of MPS on other financial variables. MPS has no statistically significant relation with EPS, DPS, DPR, P/E Ratio, DY and RR though all these variables are either positively or negatively associated with MPS. There is positive impact of EPS,

DPS, DPR and P/E ratio on MPS of Nabil Bank and negative impact of DY and RR on MPS. There is positive impact of EPS, DPS, DPR, P/E Ratio and DY on MPS and negative impact of RR on MPS of Siddhartha Bank. There is positive impact of EPS and P/E Ratio on MPS and no impact of DPS, DPR, DY and RR on MPS of the NCC Bank. A single variable is not fully responsible for increase or decrease in MPS. To some extent impact of all variables can be seen in MPS. Therefore, MPS is a function of numeral factors.

## 4.4  Test of Hypothesis

### 4.4.1 Test of DPS among the sample Banks

Null Hypothesis (H$_0$)**:** $\mu_1 = \mu_2 = \mu_3$ i.e. there is no significant difference in DPS of the sample banks.

Alternative Hypothesis (H$_1$)**:** $\mu_1 \neq \mu_2 \neq \mu_3$ i.e there is significant difference in DPS pf the sample banks.

### Table 4.17

### Dividend Per Share

| Fiscal Year | Nabil Bank | Siddhartha Bank | NCC Bank |
|:---:|:---:|:---:|:---:|
| 2005/06 | 85 | 0 | 0 |
| 2006/07 | 140 | 15.79 | 0 |
| 2007/08 | 100 | 15.79 | 0 |
| 2008/09 | 85 | 15.79 | 0 |
| 2009/10 | 70 | 8.42 | 0 |

*(Source: Annual report of Nabil, Siddhartha, NCC bank)*

F-Test Statistic

Correction Factor (C.F) =19138.0616

Total Sum of Squares (TSS) =30630.8071

Sum of Squares due to row of between banks (SSR) =27564.4432

Sum of Squares due to error or within banks (SEE) =3066.364

**Table 4.18**

**One- Way ANOVA table for DPS**

| Sources of variation | Sum of Squares | Degree of freedom (d.f. = n-1) | Mean Sum of Squares | F-Ratio |
|---|---|---|---|---|
| **Between Banks** | 27564.4432 | 3-1=2 | 13782.22 | 53.94 |
| **Within Banks** | 3066.364 | 14-2=12 | 255.5 | |
| **Total** | 30630.81 | 15-1=14 | | |

**Critical value**: The tabulate value of F at 5% level of significance for 2 and 12 d.f is 3.89.

**Decision:** Since the calculated F (53.94) is higher than the tabulated value of F (3.89), the Null Hypothesis ($H_o$) is rejected. Therefore, we can conclude that there is significant difference in DPS of sample banks.

**4.4.2 Test of EPS among the sample Banks**

Null Hypothesis ($H_0$)**:** $\mu_1 = \mu_2 = \mu_3$ i.e. there is no significant difference in EPS of the sample banks.

Alternative Hypothesis ($H_1$)**:** $\mu_1 \neq \mu_2 \neq \mu_3$ i.e there is significant difference in EPS of the sample banks.

**Table 4.19**
**Earning Per Share**

| Fiscal Year | Nabil Bank | Siddhartha Bank | NCC Bank |
|---|---|---|---|
| **2005/06** | 129.21 | 13.05 | -84.77 |
| **2006/07** | 137.08 | 15.88 | -16.56 |
| **2007/08** | 108.31 | 17.29 | 35.63 |
| **2008/09** | 106.76 | 22.89 | 29.35 |
| **2009/10** | 78.61 | 21.99 | 30.28 |

*(Source: Annual report of Nabil, Siddhartha, NCC bank)*

F-Test Statistic

Correction Factor (C.F) =27735

Total Sum of Squares (TSS) =49296.35

Sum of Squares due to row of between banks (SSR) =36645.49

Sum of Squares due to error or within banks (SEE) =12650.86

**Table 4.20**

**One- Way ANOVA table for EPS**

| Sources of variation | Sum of Squares | Degree of freedom (d.f. = n-1) | Mean Sum of Squares | F-Ratio |
|---|---|---|---|---|
| **Between Banks** | 36645.49 | 3-1=2 | 18322.745 | 17.38 |
| **Within Banks** | 12650.86 | 14-2=12 | 1054.2383 | |
| **Total** | 49296.35 | 15-1=14 | | |

**Critical value**: The tabulate value of F at 5% level of significance for 2 and 12 d.f is 3.89.

**Decision:** Since the calculated F (17.38) is lower than the tabulated value of F (3.89), the Null Hypothesis ($H_o$) is rejected. Therefore, we can conclude that there is significant difference in EPS of sample banks.

**4.4.3 Test of DPR among the sample Banks**

Null Hypothesis ($H_0$)**:** $\mu_1 = \mu_2 = \mu_3$ i.e. there is no significant difference in DPR of the sample banks.

Alternative Hypothesis ($H_1$)**:** $\mu_1 \neq \mu_2 \neq \mu_3$ i.e there is significant difference in DPR of the sample banks.

Table 4.21

**Dividend Payout Ratio**

| Fiscal Year | Nabil Bank | Siddhartha Bank | NCC Bank |
|:---:|:---:|:---:|:---:|
| **2005/06** | 65.78 | 0 | - |
| **2006/07** | 102 | 99.43 | - |
| **2007/08** | 92.33 | 91.32 | - |
| **2008/09** | 79.62 | 68.98 | - |
| **2009/10** | 89.05 | 38.29 | - |

*(Source: Annual report of Nabil, Siddhartha, NCC bank)*

F-Test Statistic

Correction Factor (C.F) =35215.88

Total Sum of Squares (TSS) =26759.23

Sum of Squares due to row of between banks (SSR) =19317.76

Sum of Squares due to error or within banks (SEE) =7441.47

**Table 4.22**

**One- Way ANOVA table for DPS**

| Sources of variation | Sum of Squares | Degree of freedom (d.f. = n-1) | Mean Sum of Squares | F-Ratio |
|:---:|:---:|:---:|:---:|:---:|
| **Between Banks** | 19317.76 | 3-1=2 | 9658.88 | 15.58 |
| **Within Banks** | 7441.47 | 14-2=12 | 620.1225 | |
| **Total** | 26759.23 | 15-1=14 | | |

**Critical value**: The tabulate value of F at 5% level of significance for 2 and 12 d.f is 3.89.

**Decision:** Since the calculated F (15.58) is higher than the tabulated value of F (3.89), the Null Hypothesis ($H_o$) is rejected. Therefore, we can conclude that there is significant difference in DPR of sample banks.

## 4.5 Results and Major Findings

### 4.5.1 Findings from analysis of financial indicators

- From the analysis of EPS, it is found that Nabil Bank has highest EPS of Rs.111.994 and NCC Bank has lowest and negative EPS of Rs.-1.214 on an average. The difference in EPS and earning capacity of these three banks are significantly different though all are A class financial institutions. The standard deviation of EPS from the average EPS is 20.40, 3.72 and 45.83 for Nabil Bank, Siddhartha Bank and NCC Bank respectively. Among these banks, Siddhartha Bank has more consistent EPS than others since standard deviation of the Siddhartha bank has minimum value.

- The range of DPS among the banks is zero per share to Rs.140 per share. This result showed the significant difference in DPS among the banks. It is also found that dividend payment is neither constant nor regular in these banks. Further it is found that there is no stable and consistent dividend policy of the banks; however, Nabil Bank has given regular dividend either in cash or in the form of stock.

- The researcher found that DPR of Nabil Bank is significantly high. On an average, DPR of Nabil Bank is 85.756 percent and Siddhartha Bank has 59.604 percent DPR. But the NCC Bank has zero DPR. Another important thing is that the DPR of Nabil Bank in fiscal year 2006/07 was 102 percent which indicates that the Bank has distributed dividend more than the earning of that fiscal year. It is possible due to accumulated earning from the previous years.

- The analysis of P/E Ratio for three banks showed that Siddhartha Bank has higher P/E ratio of 40.7 times on an average. Nabil Bank has more consistent P/E ratio of 35.82 with small value of standard deviation 11.31 percent. P/E ratio of NCC Bank is 20626 with Standard deviation of 11.91 percent

- Average DY shows that the percentage of dividend yield is decreasing. Average DY of Nabil Bank is 2.278 percent and DY of Siddhartha Bank is 1.392 percent. Small value of DY reveals the smaller amount of dividend payment in relation to MPS. Further, it is found that Siddhartha Bank has less

consistent DY than Nabil Bank since coefficient of variation is 52.31 percent in comparison to 42.74 percent of Nabil Bank. NCC Bank has not paid dividend during the study period so, DY is absent.

- The retention rate of NCC Bank is 100 percent higher than other two banks since it has not distributed any dividend during the review period. Nabil Bank has retained only 14.244 percent of its earning on an average and Siddhartha Bank has retained 40.396 percent of its earning on average. The standard deviation of RR is zero for NCC Bank since there is no deviation in retention rate and Siddhartha Bank has less consistent RR since standard deviation is 36.57 percent. Further, the retention rate of Nabil Bank in fiscal year 2006/07 is -2 percent signifies the dividend distribution higher than the earning.

### 4.5.2 Findings from correlation analysis of financial indicators

- The correlation analysis of financial indicators of Nabil Bank showed MPS of the bank is positively correlated with EPS, DPS, DPR and P/E ratio and negatively correlated with DY and RR. i.e, 29.27 percent, 63.1 percent, 59.6 percent, 83.3 percent, -91 percent and -60 percent respectively. The EPS and MPS of Nabil Bank have negligible correlation of 0.2927. However, the DPS and DPR have higher and significant relation with MPS which are 0.631 and.596 respectively. Correlation between EPS and DPS is 0.747 shows the strong positive relation between them.

- From the correlation analysis of financial indicators of Siddhartha Bank, the following results have been obtained.

  o The magnitude and direction of relation of MPS with EPS, DPS, DPR, P/E ratio, DY and RR are 0.30, 0.88, 083, 0.90, 0.44 and -0.83 respectively.

  o There is positive correlation of MPS with other variables except RR.

  o The relation of MPS with DPS is more significant than others.

- The negative relation of MPS with RR signifies the direction of their fluctuation is opposite. Increase in RR reduces the MPS and vice versa.

- The analysis of correlation between financial variables of NCC Bank reveals the following results.

  - The correlation of MPS with EPS is 0.86 and with P/E ratio is 0.31. The correlation of MPS with DPS, DPR, DY and RR is zero.

  - The researcher found that the MPS of NCC Bank is not associated with DPS, DPR, DY and RR. Changes in these variables do not influence the MPS. But changes in EPS and P/E ratio cause an influence in MPS.

### 4.5.3 Findings from regression analysis

- The regression equation of MPS on EPS shows that the regression coefficient b is 19.50, 23.86 and 2.19 respectively for Nabil, Siddhartha and NCC Bank. The degree of their movement is different but positive direction shows the direct impact of EPS on MPS. The relation between them is not statistically significant though they are correlated each other in positive direction.

- The regression analysis of MPS on DPS indicates the slope coefficient b is 35.81, 41.01 for Nabil Bank and Siddhartha Bank respectively. The relationship is positive but this relation is not statistically significant. But to a greater extent, MPS of the bank are determined by DPS since their correlation is very high and significant. This result does not deny that other variables are also the determinants of MPS. It further clarifies that impact of DPS on MPS is more than that of RR and other variables.

- The regression analysis of MPS on DPR also shows that slope coefficient b is 65.94 and 6.58 for Nabil Bank and Siddhartha Bank respectively. The positive slope of the line with higher influence in dependent variable is clearly seen in case of Nabil Bank. Therefore, the relation between them is quite significant. But this relation is not significant in case of Siddhartha Bank. NCC Bank has no DPR and therefore, the association between MPS and DPR in the form of regression equation is absent.

- The regression analysis of MPS on P/E ratio has less significance to draw meaningful conclusions, however, the results above shows higher positive slope of regression line to show the significant association between MPS and P/E ratio. In case of Nabil Bank relation between them is significant but in case of Siddhartha Bank and NCC Bank relation is insignificant.

- The positive slope of regression line of MPS on DY for Siddhartha Bank shows their close relationship; however, the relation is not statistically significant. In case of Nabil Bank, their relationship is negative

- The regression analysis of MPS on RR shows that the regression coefficient b is negative for both Nabil and Siddhartha Bank. The relationship between MPS and RR is not statistically significant.

### 4.5.1 Finding from Test of Hypothesis

- The calculated F (53.94) is more than the tabulated value for F (3.89), the Null Hypothesis ($H_0$) is rejected. Therefore, there is significant difference in DPS of sample Banks.

- The calculated F (17.38) is more than the tabulated value for F (3.89), the Null Hypothesis ($H_0$) is rejected. Therefore, there is significant difference in EPS of sample Banks.

- As the calculated F (15.58) is more than the tabulated value for F (3.89), the Null Hypothesis ($H_0$) is rejected. Therefore, there is significant difference in DPS of sample Banks.

# CHAPTER-V

# SUMMARY, CONCLUSION AND RECOMMENDATION

Being the final chapter of the study, this chapter basically focuses on summary of the study held with the conclusion of the research. The next part in this chapter will be made for the recommendations on the basis of findings. For this whole purpose the chapter is sub divided into summary, conclusion and recommendation as following:

## 5.1 Summary

This research is just a theoretical statement study to determine the effect of dividend policy on market price of share. Dividend is the portion of firm's net earning that is paid to their shareholders. Company's total net income can be divided into two parts: earning to be distributed to the equity shareholders and earning to be kept in the organization. Earnings that are distributed to the shareholders are known as retained earnings. Dividend policy determines the division of earnings between payments to stockholders and reinvestment in the firm. Therefore, the decision regarding how much profit to distribute to the shareholders and how much to keep in the organization is the dividend policy. The dividend decision is guided by number factors and company always should consider these factors at the time of dividend decisions.

Dividend policy is major financial policy of organization which determines not only the sustainability and growth but also reflect the image of organization in the market. Every investor expects handsome earnings on their share investment. Company paying higher dividend with high earning has good public image and market price is also high in Nepalese stock market but the company with poor earning and poor dividend payment has less interest and expectation of shareholders. Therefore, market price seems also very small in the market.

In Nepal, only few listed companies pay regular dividends however, they do not have stable dividend policy. Numbers of companies is just in growing stage and therefore, pay a small dividend and some companies do not any dividend to their shareholders. In the amidst of these firms, researcher picked up Nabil Bank ( regular dividend

paying company ), Siddhartha Bank ( growing and just dividend paying company) and NCC Bank ( struggling for existence with no dividend payment ) for the study and conducted this study. The objective was to examine the impact of dividend policy on market price of share for three banks. For this purpose, various financial and statistical tools were developed to analyze the data from banks.

## 5.2 Conclusion

This paper examines the valuation of shares in the market for three different banks. It attempts to determine relative importance of dividend policy, earnings and retained earning in determining market price of shares.

On the basis of the secondary data, we can conclude that Nabil Bank has the highest earning capacity that definitely benefits their shareholders by gaining more dividend than other sampled bank's shareholders. In consideration of Studying Dividend payout ratio (DPR), Nabil Bank is paying higher portion of its earning as dividend than other sampled banks The researcher concludes that major determinant of dividend policy is earning of the banks. Dividend distribution is directly depends upon the earning capacity of the banks. Another conclusion of this study is that Nepalese investors give more priority and importance to the dividend distribution rather than retained earning. Higher importance of dividend among Nepalese investors signifies that management can increase the market price of stock by raising dividend to some extent. From the analysis of retention ratio, it is concluded that a bank which is in saturation stage ( fully developed ) has lower retention rate, banks in growing stage has quite higher retention rate and the banks with poor performance has hundred percent retention rate. Generally increase in EPS and DPS of the banks shows the increasing performance of banks.

Thus in the context of Nepal, most of the banks provides share dividend instead of the cash dividend. Only the banks with the best performance provides the cash & share dividend to their shareholders. As Nabil Bank provided 70% i.e 40% share dividend and 30% cash dividend. on the other hand Siddhartha bank gave only 8.42% cash dividend but NCC could not provide any dividend to their shareholders due to its poor performances.

## 5.3 Recommendation

On the basis of the finding of the research, following recommendations are made

➢ From the above analysis, it has been known that no bank seems to have the consistent dividend policy. The result of it can be obtained by the degree of fluctuation in DPS. It may lack the Shareholders' expectation. That's why the firm should have the definite dividend policy that helps to create the good impression and good will in the market. So, the firm should acquire the certain policy to provide reasonable DPS each year as it helps to create positive impact towards the shareholders which certainly helps to increase the market value of share.

➢ The firm should follow the proper dividend policy. Dividend payment as a financial decisions need the formation of a comprehensive long term financial policy and optimal dividend policy to fulfill the investors' expectation and interest.

➢ Although the payout ratio of the sample banks is fluctuating from year to year, there is no rational approach in deciding the pay out. All the firms should analyze the internal rate of return and cost of capital in deciding DPR, which helps to maximize the shareholders wealth.

➢ All the firms must accept one major fact that EPS is to be considered for determining dividend amount. The analysis shows the condition of not being able to say either significant or insignificant relationship between EPS and DPS in average. It is important to consider earning rather than neglecting it while making dividend decision.

➢ Banks are paying dividend without adopting any appropriate policy. Companies should have their clearly defined dividend policy. Clearly defined dividend policy helps to determine specific policy i.e. stables dividend or constant pays out or low regular plus extras. What should be the long run dividend payout ratio either are pure residual policies, fixed dividend payout policies or smooth dividend policy. This helps to investor in deciding whether to buy or not the share of particular company and to build image in stock market.

- Each and every company should provide information regarding their activities and performance, so that investors can analyze the situation and invest their money in the best company

- It is necessary to enact legal rules that bind companies to pay dividend. The legal rule for the treatment of dividend is most for the smooth growth of the enterprises as well as growth of national economy. For this purpose, NEPSE, SEBON, NG and other concerned parties should work together.

- Banks should have long term vision regarding earning and dividend payment that helps to cope with challenging competitive situation of present world. Various factors, (internal and external factors) should be considered before taking decision regarding dividend policy.

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# Appendix-A

**Nabil Bank Limited**

**1. Simple correlation & regression analysis of MPS & EPS**

| Year | MPS (X) | EPS (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
| 2005/06 | 2240 | 129.21 | 5017600 | 16695.224 | 289430.4 |
| 2006/07 | 5050 | 137.08 | 25502500 | 18790.926 | 692254 |
| 2007/08 | 5275 | 108.31 | 27825625 | 11731.056 | 571335.3 |
| 2008/09 | 4899 | 106.76 | 24000201 | 11397.698 | 523017.2 |
| 2009/10 | 2384 | 78.61 | 5683456 | 6179.5321 | 187406.2 |
| **TOTAL** | **∑X=19848** | **∑Y=559.97** | **∑X²= 88029382** | **∑Y²=64794.4363** | **∑XY=2263443.1** |

(a) Mean ($\overline{X}$) = $\dfrac{19848}{5}$ =3969.6

Mean ($\overline{Y}$) = $\dfrac{559.97}{5}$ =111.994

(b) Coefficient of Correlation (r) = $\dfrac{n\sum XY - \sum X . \sum Y}{\sqrt{\sum X^2 - \left(\sum X\right)^2}\ \sqrt{n\sum Y^2 - \left(\sum Y\right)^2}}$

$$= \dfrac{5 \times 2263443.1 - 19848 \times 559.97}{\sqrt{5 \times 88029382 - \left(19848\right)^2}\ \sqrt{5 \times 64794.4363 - \left(559.97\right)^2}}$$

$$= \dfrac{202931.1}{6797.338 X 102} = 0.2927$$

(c) Coefficient of determination ($r^2$) = 0.0857

(d) Regression coefficient (b) $= \dfrac{\sum XY - n\overline{X}\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \dfrac{2263443.1 - 5X3969.6X111.994}{64794.4363 - 5X(111.994)^2}$

$$= \dfrac{40586.218}{2081.156} = 19.50$$

(a) $= \overline{X} - b\overline{Y} = 3969.6 - 19.50 \times 111.994$

$$= 1785.72$$

(e) Regression equation

$$\boxed{\text{MPS} = 1785.72 + 19.50 \text{ EPS}}$$

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n-2}}$

$$= \sqrt{\dfrac{88029382 - 1785.72\,X19848 - 19.50X\,2263443.1}{5-2}}$$

$$= 1678.22$$

(g) Standard error of regression coeff. (S$b$) $= \dfrac{Se}{\sqrt{\sum Y^2 - n\overline{Y}^2}}$

$$= \dfrac{1678.22}{\sqrt{64794.4363 - 5 \times 111.994^2}}$$

$$= \dfrac{1678.22}{45.62} = 36.79$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{19.50}{36.79} = 0.53$

## 2. Simple correlation & regression analysis of MPS & DPS

| Year | MPS (X) | DPS (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|---------|---------|--------|
| 2005/06 | 2240 | 85 | 5017600 | 7225 | 190400 |
| 2006/07 | 5050 | 140 | 25502500 | 19600 | 707000 |
| 2007/08 | 5275 | 100 | 27825625 | 10000 | 527500 |

| | | | | | |
|---|---|---|---|---|---|
| 2008/09 | 4899 | 85 | 24000201 | 7225 | 416415 |
| 2009/10 | 2384 | 70 | 5683456 | 4900 | 166880 |
| **TOTAL** | **∑X=19848** | **∑Y=480** | **∑X²= 88029382** | **∑Y²=48950** | **∑XY=2008195** |

a) Mean $(X) = \dfrac{SX}{N} = \dfrac{19848}{5} = 3969.6$

a) Mean $(Y) = \dfrac{SY}{N} \quad \dfrac{480}{5} = 96$

(b) Coefficient of Correlation $(r) = \dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \dfrac{5x2008195 - 19848x480}{\sqrt{5x88029382 - (19848)^2}\ \sqrt{5x48950 - (480)^2}}$$

$$= \dfrac{513935}{6797.34\,X\,119.79} = 0.631$$

(c) Coefficient of determination $(r^2) = (0.631)^2 = 0.398$

(d) Regression coefficient $(b) = \dfrac{\sum XY - n\overline{X}\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \dfrac{2008195 - 5\,X\,3969.6\,X\,96}{48950 - 5\,X\,(96)^2}$

$$= \dfrac{102787}{2870} = 35.81$$

$(a) = \overline{X} - b\overline{Y} = 3969.6 - 35.81 \times 96$

$= 531.43$

(e) Regression equation

MPS = 531.84+35.43 DPS

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n-2}}$

$$= \sqrt{\dfrac{88029382 - 531.84\,X\,19848 - 35.81\,X\,2008195}{5-2}}$$

$$= 1363.1$$

(g) Standard error of regression coeff. $(S_b)$ $= \dfrac{Se}{\sqrt{\sum Y^2 - n\bar{Y}^2}}$

$$= \dfrac{1360.31}{\sqrt{48950 - 5(96)^2}}$$

$$= \dfrac{1360.31}{53.57} = 25.41$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{35.81}{25.34} = 1.41$

## 3. Simple correlation & regression analysis of MPS & DPR

| Year | MPS (X) | DPR (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2005/06 | 2240 | 65.78 | 5017600 | 4327.008 | 147347 |
| 2006/07 | 5050 | 102 | 25502500 | 10404 | 515100 |
| 2007/08 | 5275 | 92.33 | 27825625 | 8524.829 | 487041 |
| 2008/09 | 4899 | 79.62 | 24000201 | 6339.344 | 390058 |
| 2009/10 | 2384 | 89.05 | 5683456 | 7929.903 | 212295 |
| **TOTAL** | **∑X=19848** | **∑Y=428.78** | **∑X²= 88029382** | **∑Y²=37525.084** | **∑XY=1751842** |

a) Mean $(\bar{X}) = \dfrac{SX}{N} = \dfrac{19848}{5} = 3969.6$

Mean $(\bar{Y}) = \dfrac{SY}{N} \ \dfrac{428.78}{5} = 85.756$

(b) Coefficient of Correlation (r) $= \dfrac{nSXY - SX.SY}{\sqrt{nSX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 1751842 - 19848 \times 428.78}{\sqrt{5x88029382 - (19848)^2}\ \sqrt{5 \times 37525.084 - (428.78)^2}}$$

$$= \frac{248782.21}{6797.34\,X\,61.43} = 0.596$$

(c) Coefficient of determination $(r^2) = (0.596)^2 = 0.355$

(d) Regression coefficient (b) $= \dfrac{\sum XY - n\overline{X}\,\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \dfrac{1751842 - 5X3969.6X85.756}{37525.084 - 5X(85.756)^2}$

$$= \frac{49756.44}{754.6265} = 65.94$$

(a) $= \overline{X} - b\overline{Y} = 3969.6 - 65.94 \times 85.756$

$$= -1684.74$$

(e) Regression equation

$$\boxed{\text{MPS} = -1684.74 + 65.94 \text{ DPR}}$$

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n - 2}}$

$$= \sqrt{\frac{84610951 - (-4094.20)X18969 - 43.77X1639301.34}{5 - 2}}$$

$$= 1409.5$$

(g) Standard error of regression coeff. $(S_b) = \dfrac{Se}{\sqrt{\sum Y^2 - n\overline{Y}^2}}$

$$= \frac{1409.5}{\sqrt{37525.084 - 5*(85.756)^2}}$$

$$= \frac{1409.5}{27.47} = 51.31$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{65.94}{51.31} = 1.29$

## 4. Simple correlation & regression analysis of MPS & P/E

| Year | MPS (X) | P/E (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
|      |         |         |       |       |     |

| | | | $\sum X^2=$ | | |
|---|---|---|---|---|---|
| 2005/06 | 2240 | 17.34 | 5017600 | 300.6756 | 38841.6 |
| 2006/07 | 5050 | 36.84 | 25502500 | 1357.186 | 186042 |
| 2007/08 | 5275 | 48.70 | 27825625 | 2371.69 | 256893 |
| 2008/09 | 4899 | 45.89 | 24000201 | 2105.892 | 224815 |
| 2009/10 | 2384 | 30.33 | 5683456 | 919.9089 | 72306.7 |
| **TOTAL** | $\sum X=19848$ | $\sum Y=179.1$ | $\sum X^2=$ **88029382** | $\sum Y^2=7055.3522$ | $\sum XY=778897.9$ |

a) Mean $(\overline{X}) = \dfrac{SX}{N} = \dfrac{19848}{5} = 3969.6$

Mean $(\overline{Y}) = \dfrac{SY}{N} \quad \dfrac{179.1}{5} = 35.82$

(b) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$= \dfrac{5 \times 778897.9 - 19848 \times 179.1}{\sqrt{5 \times 88029382 - (19848)^2}\ \sqrt{5 \times 7055.3522 - (179.1)^2}}$

$= \dfrac{339712.9}{6797.34 X 56.57} = 0.833$

(c) Coefficient of determination $(r^2) = (0.833)^2 = 0.781$

(d) Regression coefficient (b) $= \dfrac{\sum XY - n\overline{X}\,\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \dfrac{778897.9 - 5 X 3969.6 X 35.82}{7055.3522 - 5 X (35.82)^2}$

$= \dfrac{67942.57}{639.99} = 106.16$

(a) $= \overline{X} - b\overline{Y} = 3969.6 - 106.16 \times 35.82$

$= 166.88$

(e) Regression equation $\boxed{\text{MPS } = 166.88 + 106.16 \text{ P/E}}$

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n-2}}$

$$= \sqrt{\frac{88029382 - (166.88)X19848 - 106.16X778897.9}{5-2}}$$

$$= 822.2$$

(g) Standard error of regression coeff. ($S_b$) $= \dfrac{Se}{\sqrt{\sum Y^2 - n\bar{Y}^2}}$

$$= \frac{822.2}{\sqrt{7055.3522 - 5(35.82)^2}}$$

$$= \frac{822.2}{25.3} = 32.50$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{106.16}{35.50} = 3.267$

## 5. Simple correlation & regression analysis of MPS & DY

| Year | MPS (X) | DY (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 2240 | 3.79 | 5017600 | 14.3641 | 8489.6 |
| 2006/07 | 5050 | 1.02 | 25502500 | 1.0404 | 5151 |
| 2007/08 | 5275 | 1.90 | 27825625 | 3.61 | 10022.5 |
| 2008/09 | 4899 | 1.74 | 24000201 | 3.0276 | 8524.26 |
| 2009/10 | 2384 | 2.94 | 5683456 | 8.6436 | 7008.96 |
| **TOTAL** | **∑X=19848** | **∑Y=11.39** | **∑X²= 88029382** | **∑Y²=306857** | **∑XY=39196.32** |

a) Mean ($\bar{X}$) $= \dfrac{SX}{N} = \dfrac{19848}{5} = 3969.6$

Mean ($\bar{Y}$) $= \dfrac{SY}{N} \dfrac{11.39}{5} = 2.278$

(b) Coefficient of Correlation (r) $= \dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 39196.32 - 19848 \times 11.39}{\sqrt{5 \times 88029382 - (19848)^2} \sqrt{5 \times 30.6857 - (11.39)^2}}$$

$$= \frac{-30087.1}{6797.34 \, X \, 4.87} = -0.91$$

(c) Coefficient of determination $(r^2) = (-0.91)^2 = 0.827$

(d) Regression coefficient (b) $= \dfrac{\sum XY - n\overline{X}\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \dfrac{39196.32 - 5 \, X \, 3969.6 \, X \, 2.278}{30.6857 - 5 \, X \, (2.278)^2}$

$$= \frac{-6017.42}{4.74} = -1269.69$$

(a) $= \overline{X} - b\overline{Y} = 3969.6 - (-1269.69) \times 2.278$

$$= 6861.96$$

(e) Regression equation

$$\boxed{\text{MPS} = 6861.96 \text{-} 1269.69 \text{ DY}}$$

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n - 2}}$

$$= \sqrt{\frac{88029382 - 6861.96 \, X \, 19848 - (-1269.69) \, X \, 39196.32}{5 - 2}}$$

$$= 730.4$$

(g) Standard error of regression coeff. $(S_b) = \dfrac{Se}{\sqrt{\sum Y^2 - n\overline{Y}^2}}$

$$= \frac{730.4}{\sqrt{30.6857 - 5(2.278)^2}}$$

$$= \frac{730.4}{2.2} = 335.51$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{-1269.69}{335.51} = -3.784$

## 6. Simple correlation & regression analysis of MPS & RR

| Year | MPS (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2004/05 | 2240 | 34.22 | 5017600 | 1171.008 | 76652.8 |
| 2005/06 | 5050 | -2 | 25502500 | 4 | -10100 |
| 2006/07 | 5275 | 7.67 | 27825625 | 58.8289 | 40459.3 |
| 2007/08 | 4899 | 20.38 | 24000201 | 415.3444 | 99841.6 |
| 2008/09 | 2384 | 10.95 | 5683456 | 119.9025 | 26104.8 |
| TOTAL | $\sum X$=19848 | $\sum Y$=71.22 | $\sum X^2$= 88029382 | $\sum Y^2$=1769.0842 | $\sum XY$=232958.5 |

a)  Mean $(\overline{X}) = \dfrac{SX}{N} = \dfrac{19848}{5} = 3969.6$

Mean $(\overline{Y}) = \dfrac{SY}{N} \quad \dfrac{71.22}{5} = 14.244$

(b) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\sqrt{nSY^2 - (SY)^2}}$

$= \dfrac{5 \times 232958.5 - 19848 \times 71.22}{\sqrt{5x88029382 - (19848)^2}\sqrt{5x1769.0842 - (71.22)^2}}$

$= \dfrac{-248782}{6797.34 X 61.43} = --0.60$

(c) Coefficient of determination ($r^2$) = $(-0.60)^2$ =0.355

(d) Regression coefficient (b) = $\dfrac{\sum XY - n\overline{X}\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \dfrac{232958.5 - 5X3969.6X14.244}{1769.0842 - 5X(14.244)^2}$

$= \dfrac{-49756.44}{754.63} = -65.94$

(a) = $\overline{X} - b\overline{Y}$ = 3969.6 – (-65.94)×14.244

= 4908.78

(e) Regression equation 

MPS = 4908.78-65.94 RR

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n-2}}$

$$= \sqrt{\frac{88029382 - 4908.78 X 19848 - (-65.94) X 232958.5}{5-2}}$$

$$= 1409.5$$

(g) Standard error of regression coeff. (S$_b$) $= \dfrac{Se}{\sqrt{\sum Y^2 - n\bar{Y}^2}}$

$$= \frac{1409.5}{\sqrt{1769.0842 - 5 X (14.244)^2}}$$

$$= 51.31$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{-65.94}{51.31} = -1.285$

## 7. Simple correlation & regression analysis of EPSS & DPS

| Year | EPS (X) | DPS (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
| 2004/05 | 129.21 | 85 | 16695.2241 | 7225 | 10982.85 |
| 2005/06 | 137.08 | 140 | 18790.9264 | 19600 | 19191.2 |
| 2006/07 | 108.31 | 100 | 11731.0561 | 10000 | 10831 |
| 2007/08 | 106.76 | 85 | 11397.6976 | 7225 | 9074.6 |
| 2008/09 | 78.61 | 70 | 6179.5321 | 4900 | 5502.7 |
| TOTAL | $\sum$X=559.97 | $\sum$Y=480 | 64794.4363 | 48950 | 55582.35 |

(a) Coefficient of Correlation (r) $= \dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 55582.35 - 559.97 \times 480}{\sqrt{5x64794.4363 - (559.97)^2}\ \sqrt{5x148950 - (480)^2}}$$

$$= \frac{19126.15}{102.01 X 119.79} = 0.747$$

## 8. Simple correlation & regression analysis of EPS & DPR

| Year | EPS (X) | DPR (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2004/05 | 129.21 | 65.78 | 16695.2241 | 4327.0084 | 8499.4338 |
| 2005/06 | 137.08 | 102 | 18790.9264 | 10404 | 13982.16 |
| 2006/07 | 108.31 | 92.33 | 11731.0561 | 8524.8289 | 10000.2623 |
| 2007/08 | 106.76 | 79.62 | 11397.6976 | 6339.3444 | 8500.2312 |
| 2008/09 | 78.61 | 89.05 | 6179.5321 | 7929.9025 | 7000.2205 |
| TOTAL | ∑X=559.97 | ∑Y=428.78 | 64794.4363 | 37525.0842 | 47982.3078 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 47982.3078 - 559.97 \times 428.78}{\sqrt{5x64794.4363 - (559.97)^2}\ \sqrt{5x37525.0842 - (428.78)^2}}$$

$$= \frac{-192.3976}{102.01 X 61.43} = \text{-0.031}$$

## 9. Simple correlation & regression analysis of EPS & P/E RATIO

| Year | EPS (X) | P/E (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2004/05 | 129.21 | 17.34 | 16695.2241 | 300.6756 | 2240.5014 |
| 2005/06 | 137.08 | 36.84 | 18790.9264 | 1357.1856 | 5050.0272 |
| 2006/07 | 108.31 | 48.70 | 11731.0561 | 2371.69 | 5274.697 |
| 2007/08 | 106.76 | 45.89 | 11397.6976 | 2105.8921 | 4899.2164 |
| 2008/09 | 78.61 | 30.33 | 6179.5321 | 919.9089 | 2384.2413 |
| TOTAL | ∑X=559.97 | ∑Y=179.1 | 64794.4363 | 7055.3522 | 19848.6833 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 19848.6833 - 559.97 \times 179.1}{\sqrt{5x64794.4363 - (559.97)^2}\ \sqrt{5x7055.3522 - (179.1)^2}}$$

$$= \frac{-1047.2105}{102.01 X 56.57} = -0.181$$

## 10. Simple correlation & regression analysis of EPS & DY

| Year | EPS (X) | DY (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2004/05 | 129.21 | 3.79 | 16695.2241 | 14.3641 | 489.7059 |
| 2005/06 | 137.08 | 1.02 | 18790.9264 | 1.0404 | 139.8216 |
| 2006/07 | 108.31 | 1.90 | 11731.0561 | 3.61 | 205.789 |
| 2007/08 | 106.76 | 1.74 | 11397.6976 | 3.0276 | 185.7624 |
| 2008/09 | 78.61 | 2.94 | 6179.5321 | 8.6436 | 231.1134 |
| TOTAL | ∑X=559.97 | ∑Y=11.39 | 64794.4363 | 30.6857 | 1252.1923 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 1252.1923 - 559.97 \times 11.39}{\sqrt{5 x 64794.4363 - (559.97)^2}\ \sqrt{5 x 30.6857 - (11.39)^2}}$$

$$= \frac{-117.0968}{102.01 X 4.87} = -0.236$$

## 11. Simple correlation & regression analysis of EPS & RR

| Year | EPS (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2004/05 | 129.21 | 34.22 | 16695.2241 | 1171.0084 | 4421.5662 |
| 2005/06 | 137.08 | -2 | 18790.9264 | 4 | -274.16 |
| 2006/07 | 108.31 | 7.67 | 11731.0561 | 58.8289 | 830.7377 |
| 2007/08 | 106.76 | 20.38 | 11397.6976 | 415.3444 | 2175.7688 |
| 2008/09 | 78.61 | 10.95 | 6179.5321 | 119.9025 | 860.7795 |
| TOTAL | ∑X=559.97 | ∑Y=71.22 | 64794.4363 | 1769.0842 | 8014.6922 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 8014.6922 - 559.97 \times 71.22}{\sqrt{5x64794.4363 - \left(559.97\right)^2} \sqrt{5x1769.0842 - (71.22)^2}}$$

$$= \frac{192.3976}{102.01 X 61.43} = 0.031$$

## 12. Simple correlation & regression analysis of DPS & DPR

| Year | DPS (X) | DPR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
| 2005/06 | 85 | 65.78 | 7225 | 4327.0084 | 5591.3 |
| 2006/07 | 140 | 102 | 19600 | 10404 | 14280 |
| 2007/08 | 100 | 92.33 | 10000 | 8524.8289 | 9233 |
| 2008/09 | 85 | 79.62 | 7225 | 6339.3444 | 6767.7 |
| 2009/10 | 70 | 89.05 | 4900 | 7929.9025 | 6233.5 |
| TOTAL | $\sum Y$=480 | $\sum Y$=428.78 | 48950 | 37525.0842 | 42105.5 |

(a) Coefficient of Correlation (r) $= \dfrac{nSXY - SX.SY}{\sqrt{SX^2 - \left(SX\right)^2} \sqrt{nSY^2 - \left(SY\right)^2}}$

$$= \frac{5 \times 42105.5 - 480 \times 428.78}{\sqrt{5x48950 - \left(480\right)^2} \sqrt{5x37525.0842 - (428.78)^2}}$$

$$= \frac{4713.1}{119.79 X 61.43} = 0.641$$

## 13. Simple correlation & regression analysis of DPS & P/E

| Year | DPS (X) | P/E (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
| 2005/06 | 85 | 17.34 | 7225 | 300.6756 | 1473.9 |
| 2006/07 | 140 | 36.84 | 19600 | 1357.1856 | 5157.6 |
| 2007/08 | 100 | 48.70 | 10000 | 2371.69 | 4870 |
| 2008/09 | 85 | 45.89 | 7225 | 2105.8921 | 3900.65 |
| 2009/10 | 70 | 30.33 | 4900 | 919.9089 | 2123.1 |
| TOTAL | $\sum Y$=480 | $\sum Y$=179.1 | 48950 | 7055.3522 | 17525.25 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \dfrac{5 \times 17525.25 - 480 \times 179.1}{\sqrt{5x48950 - (480)^2}\ \sqrt{5x7055.3522 - (179.1)^2}}$$

$$= \dfrac{1658.25}{119.79 X 56.57}$$

$$= 0.245$$

## 14. Simple correlation & regression analysis of DPS & DY

| Year | DPS (X) | DY (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 85 | 3.79 | 7225 | 14.3641 | 322.15 |
| 2006/07 | 140 | 1.02 | 19600 | 1.0404 | 142.8 |
| 2007/08 | 100 | 1.90 | 10000 | 3.61 | 190 |
| 2008/09 | 85 | 1.74 | 7225 | 3.0276 | 147.9 |
| 2009/10 | 70 | 2.94 | 4900 | 8.6436 | 205.8 |
| TOTAL | $\sum Y$=480 | $\sum Y$=11.39 | 48950 | 30.6857 | 1008.65 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \dfrac{5 \times 1008.65 - 480 \times 11.39}{\sqrt{5x48950 - (480)^2}\ \sqrt{5x30.6857 - (11.39)^2}}$$

$$= \dfrac{-423.95}{119.79 X 4.87}$$

$$= -0.727$$

**15. Simple correlation & regression analysis of DPS & RR**

| Year | DPS (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 85 | 34.22 | 7225 | 1171.0084 | 2908.7 |
| 2006/07 | 140 | -2 | 19600 | 4 | -280 |
| 2007/08 | 100 | 7.67 | 10000 | 58.8289 | 767 |
| 2008/09 | 85 | 20.38 | 7225 | 415.3444 | 1732.3 |
| 2009/10 | 70 | 10.95 | 4900 | 119.9025 | 766.5 |
| TOTAL | ∑Y=480 | ∑Y=71.22 | 48950 | 1769.0842 | 5894.5 |

(a) Coefficient of Correlation (r) =

$$\frac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$$

$$= \frac{5 \times 5894.5 - 480 \times 71.22}{\sqrt{5x48950 - (480)^2}\ \sqrt{5x1769.0842 - (71.22)^2}}$$

$$= \frac{-4713.1}{119.79X61.43} \quad = \text{-0.641}$$

**16. Simple correlation & regression analysis of DPR & P/E**

| Year | DPR (X) | P/E (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
| 2005/06 | 65.78 | 17.34 | 4327.0084 | 300.6756 | 1140.6252 |
| 2006/07 | 102 | 36.84 | 10404 | 1357.1856 | 3757.68 |
| 2007/08 | 92.33 | 48.70 | 8524.8289 | 2371.69 | 4496.471 |
| 2008/09 | 79.62 | 45.89 | 6339.3444 | 2105.8921 | 3653.7618 |
| 2009/10 | 89.05 | 30.33 | 7929.9025 | 919.9089 | 2700.8865 |
| TOTAL | ∑Y=428.78 | ∑Y=179.1 | 37525.0842 | 7055.3522 | 15749.4245 |

(a) Coefficient of Correlation (r) =

$$\frac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$$

$$= \frac{5 \times 15749.4245 - 428.78 - 179.1}{\sqrt{5x37525.0842 - (428.78)^2}\ \sqrt{5x7055.3522 - (179.1)^2}}$$

$$= \frac{1952.6245}{61.43 X 56.57} = 0.562$$

**17. Simple correlation & regression analysis of DPR & DY**

| Year | DPR (X) | DY (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 65.78 | 3.79 | 4327.0084 | 14.3641 | 249.3062 |
| 2006/07 | 102 | 1.02 | 10404 | 1.0404 | 104.04 |
| 2007/08 | 92.33 | 1.90 | 8524.8289 | 3.61 | 175.427 |
| 2008/09 | 79.62 | 1.74 | 6339.3444 | 3.0276 | 138.5388 |
| 2009/10 | 89.05 | 2.94 | 7929.9025 | 8.6436 | 261.807 |
| TOTAL | ∑Y=428.78 | ∑Y=11.39 | 37525.0842 | 30.6857 | 929.119 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 929.119 - 428.78 - 11.39}{\sqrt{5x37525.0842 - (428.78)^2}\ \sqrt{5x30.6857 - (11.39)^2}}$$

$$= \frac{-238.2092}{61.43 X 4.87} = -0.797$$

**18. Simple correlation & regression analysis of DPR & RR**

| Year | DPR (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 65.78 | 34.22 | 4327.0084 | 1171.0084 | 2250.9916 |
| 2006/07 | 102 | -2 | 10404 | 4 | -204 |
| 2007/08 | 92.33 | 7.67 | 8524.8289 | 58.8289 | 708.1711 |
| 2008/09 | 79.62 | 20.38 | 6339.3444 | 415.3444 | 1622.6556 |
| 2009/10 | 89.05 | 10.95 | 7929.9025 | 119.9025 | 975.0975 |
| TOTAL | ∑Y=428.78 | ∑Y=71.22 | 37525.0842 | 1769.0842 | 5352.9158 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 5352.9158 - 428.78 - 71.22}{\sqrt{5x37525.0842 - (428.78)^2} \sqrt{5x1769.0842 - (71.22)^2}}$$

$$= \frac{-3773.1326}{61.43 X 61.43} = -1$$

## 19. Simple correlation & regression analysis of P/E & DY

| Year | P/E (X) | DY (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 17.34 | 3.79 | 300.6756 | 14.3641 | 65.7186 |
| 2006/07 | 36.84 | 1.02 | 1357.1856 | 1.0404 | 37.5768 |
| 2007/08 | 48.70 | 1.90 | 2371.69 | 3.61 | 92.53 |
| 2008/09 | 45.89 | 1.74 | 2105.8921 | 3.0276 | 79.8486 |
| 2009/10 | 30.33 | 2.94 | 919.9089 | 8.6436 | 89.1702 |
| TOTAL | ∑X=179.1 | ∑Y=11.39 | 7055.3522 | 30.6857 | 364.8442 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 364.8442 - 179.1 - 11.39}{\sqrt{5x7055.3522 - (179.1)^2} \sqrt{5x30.6857 - (11.39)^2}}$$

$$= \frac{-215.728}{56.57 X 4.87} = -0.783$$

## 20. Simple correlation & regression analysis of P/E & RR

| Year | P/E (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 17.34 | 34.22 | 300.6756 | 1171.0084 | 593.3748 |
| 2006/07 | 36.84 | -2 | 1357.1856 | 4 | -73.68 |
| 2007/08 | 48.70 | 7.67 | 2371.69 | 58.8289 | 373.529 |
| 2008/09 | 45.89 | 20.38 | 2105.8921 | 415.3444 | 935.2382 |
| 2009/10 | 30.33 | 10.95 | 919.9089 | 119.9025 | 332.1135 |
| TOTAL | ∑X=179.1 | ∑Y=71.22 | 7055.3522 | 1769.0842 | 2160.5755 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 2160.5755 - 179.1 - 71.22}{\sqrt{5x7055.3522 - (179.1)^2} \sqrt{5x1769.0842 - (71.22)^2}}$$

$$= \frac{-1952.6245}{56.57 X 61.43} = -0.562$$

**21. Simple correlation & regression analysis of DY & RR**

| Year | DY (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|--------|--------|-------|-------|-----|
| 2005/06 | 3.79 | 34.22 | 14.3641 | 1171.0084 | 129.6938 |
| 2006/07 | 1.02 | -2 | 1.0404 | 4 | -2.04 |
| 2007/08 | 1.90 | 7.67 | 3.61 | 58.8289 | 14.573 |
| 2008/09 | 1.74 | 20.38 | 3.0276 | 415.3444 | 35.4612 |
| 2009/10 | 2.94 | 10.95 | 8.6436 | 119.9025 | 32.193 |
| **TOTAL** | **∑X=11.39** | **∑Y=71.22** | **30.6857** | **1769.0842** | **209.881** |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2} \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 209.881 - 11.39 - 71.22}{\sqrt{5x30.6857 - (11.39)^2} \sqrt{5x1769.0842 - (71.22)^2}}$$

$$= \frac{238.2092}{4.87 X 61.43} = 0.797$$

# Appendix-B

**Siddhartha Bank Limited**

1. **Simple correlation and regression between MPS & EPS**

| Year | MPS(X) | EPS (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2005/06 | 360 | 13.05 | 129600 | 170.3025 | 4698 |
| 2006/07 | 778 | 15.88 | 605284 | 252.1744 | 12354.6 |
| 2007/08 | 1090 | 17.29 | 1188100 | 298.9441 | 18846.1 |
| 2008/09 | 1000 | 22.89 | 1000000 | 523.9521 | 22890 |
| 2009/10 | 444 | 21.99 | 197136 | 483.5601 | 9763.56 |
| TOTAL | $\sum X=3672$ | $\sum Y=91.1$ | $\sum X^2=3120120$ | $\sum Y^2=1728.9332$ | $\sum XY=68552.3$ |

a) Mean $(\overline{X}) = \dfrac{SX}{N} = \dfrac{3672}{5} = 734.4$

Mean $(\overline{Y}) = \dfrac{SY}{N} \quad \dfrac{91.1}{5} = 18.22$

(b) Coefficient of Correlation (r) $= \dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$= \dfrac{5 x 68552.3 - 3672 x 91.1}{\sqrt{5 x 3120120 - (3672)^2}\ \sqrt{5 x 1728.9332 - (91.1)^2}}$

$= \dfrac{8242.3}{1455 X 18.59} = 0.30$

(c) Coefficient of determination $(r^2) = (0.30)^2 = 0.093$

(d) Regression coefficient (b) $= \dfrac{\sum XY - n\overline{X}\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \dfrac{68552.3 - 5 X 734.4 X 18.22}{1728.9332 - 5 X (18.22)^2}$

$= \dfrac{1648.46}{69.09} = 23.86$

(a) $= \overline{X} - b\overline{Y} = 734.4 - 23.86 \times 18.22$

$= 299.69$

(e) Regression equation

$\boxed{\text{MPS} = 299.69 + 23.86 \text{ EPS}}$

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n-2}}$

$$= \sqrt{\dfrac{3120120 - 299.69 \times 3672 - 23.86 \times 68552.3}{5-2}}$$

$= 357.8$

(g) Standard error of regression coeff. (S$_b$) $= \dfrac{Se}{\sqrt{\sum Y^2 - n\bar{Y}^2}}$

$$= \dfrac{357.8}{\sqrt{1728.9332 - 5 \times (18.22)^2}}$$

$= 43.12$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{23.86}{43.12} = 0.554$

## 2. Simple correlation & regression analysis of MPS & DPS

| Year | MPS(X) | DPS (Y) | $X^2$ | $Y^2$ | XY |
|------|--------|---------|-------|-------|-----|
| 2005/06 | 360 | 0 | 129600 | 0 | 0 |
| 2006/07 | 778 | 15.79 | 605284 | 249.3241 | 12284.6 |
| 2007/08 | 1090 | 15.79 | 1188100 | 249.3241 | 17211.1 |
| 2008/09 | 1000 | 15.79 | 1000000 | 249.3241 | 15790 |
| 2009/10 | 444 | 8.42 | 197136 | 70.8964 | 3738.48 |
| TOTAL | $\sum X=3672$ | $\sum Y=55.79$ | $\sum X^2=3120120$ | $\sum Y^2=818.8687$ | $\sum XY=49024.2$ |

a)  Mean ($\bar{X}$) $= \dfrac{SX}{N} = \dfrac{3672}{5} = 734.4$

Mean ($\bar{Y}$) $= \dfrac{SY}{N} \dfrac{55.79}{5} = 11.158$

(b) Coefficient of Correlation (r) $= \dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5x49024.2 - 3672x55.79}{\sqrt{5x3120120 - (3672)^2}\sqrt{5x818.8687 - (55.79)^2}}$$

$$= \frac{40260.12}{1455 X 31.33} = 0.88$$

(c) Coefficient of determination $(r^2) = (0.88)^2 = 0.780$

(d) Regression coefficient (b) $= \frac{\sum XY - n\overline{X}\,\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \frac{49024.2 - 5X734.4X11.158}{818.8687 - 5X(11.158)^2}$

$$= \frac{8052.02}{196.36} = 41.01$$

(a) $= \overline{X} - b\overline{Y} = 734.3 - 41.01 \times 11.158$

$$= 276.86$$

(e) Regression equation

$$\boxed{\text{MPS} = 276.86 + 41.01 \text{ DPS}}$$

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n - 2}}$

$$= \sqrt{\frac{3120120 - 276.86X18969 - 41.01X49024.2}{5 - 2}}$$

$$= 176.3$$

(g) Standard error of regression coeff. $(S_b) = \dfrac{Se}{\sqrt{\sum Y^2 - n\overline{Y}^2}}$

$$= \frac{176.3}{\sqrt{818.8687 - 5X(11.158)^2}}$$

$$= 12.58$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{41.01}{12.58} = 3.26$

3. **Simple correlation & regression analysis of MPS & DPR**

| Year | MPS (X) | DPR (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2005/06 | 360 | 0 | 129600 | 0 | 0 |
| 2006/07 | 778 | 99.43 | 605284 | 9886.325 | 77356.5 |
| 2007/08 | 1090 | 91.32 | 1188100 | 8339.342 | 99538.8 |
| 2008/09 | 1000 | 68.98 | 1000000 | 4758.24 | 68980 |
| 2009/10 | 444 | 38.29 | 197136 | 1466.124 | 17000.8 |
| TOTAL | $\sum X=3672$ | $\sum Y=298.02$ | $\sum X^2=3120120$ | $\sum Y^2=24450.032$ | $\sum XY=262876.1$ |

b) Mean $(\bar{X}) = \dfrac{SX}{N} = \dfrac{3672}{5} = 734.4$

Mean $(\bar{Y}) = \dfrac{SY}{N} = \dfrac{298.02}{5} = 59.604$

(b) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$\dfrac{5x262876.1 - 3672x59.604}{\sqrt{5x3120120 - (3672)^2}\ \sqrt{5x24450.032 - (298.02)^2}}$$

$$= \dfrac{220051.1}{1455 X 182.85} = 0.83$$

(c) Coefficient of determination $(r^2) = (0.83)^2 = 0.684$

(d) Regression coefficient (b) $= \dfrac{\sum XY - n\bar{X}\bar{Y}}{\sum Y^2 - n\bar{Y}^2} = \dfrac{262876.1 - 5 X 734.4 X 59.604}{24450.032 - 5 X (59.604)^2}$

$$= \dfrac{44010.21}{6686.85} = 6.58$$

(a) $= \bar{X} - b\bar{Y} = 734.4 - 6.58 \times 59.604$

$= 342.11$

(e) Regression equation

MPS $= 342.11 + 6.58$ DPR

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n-2}}$

$$= \sqrt{\dfrac{3120120 - 342.11X\,3672 - 6.58X\,262876.1}{5-2}}$$

$$= 211.1$$

(g) Standard error of regression coeff. (S$_b$) $= \dfrac{Se}{\sqrt{\sum Y^2 - n\bar{Y}^2}}$

$$= \dfrac{211.1}{\sqrt{24450.032 - 5X\,(59.604)^2}}$$

$$= 2.58$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{6.58}{2.58} = 2.549$

4. **Simple correlation & regression analysis of MPS & P/E Ratio**

| Year | MPS (X) | P/E (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2005/06 | 360 | 27.59 | 129600 | 761.2081 | 9932.4 |
| 2006/07 | 778 | 48.98 | 605284 | 2399.04 | 38106.4 |
| 2007/08 | 1090 | 63.04 | 1188100 | 3974.042 | 68713.6 |
| 2008/09 | 1000 | 43.70 | 1000000 | 1909.69 | 43700 |
| 2009/10 | 444 | 20.19 | 197136 | 407.6361 | 8964.36 |
| **TOTAL** | **∑X=3672** | **∑Y=203.5** | **∑X²=3120120** | **∑Y²=9451.6162** | **∑XY=169416.8** |

c) Mean $(\bar{X}) = \dfrac{SX}{N} = \dfrac{3672}{5} = 734.4$

Mean $(\bar{Y}) = \dfrac{SY}{N} = \dfrac{203.5}{5} = 40.7$

(b) Coefficient of Correlation (r) $= \dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5x169416.8 - 3672x203.5}{\sqrt{5x3120120 - (3672)^2}\sqrt{5x9451.6162 - (203.5)^2}}$$

$$= \frac{99832}{1455X76.46} = 0.90$$

(c) Coefficient of determination $(r^2) = (0.90)^2 = 0.805$

(d) Regression coefficient (b) $= \frac{\sum XY - n\overline{X}\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \frac{169416.8 - 5X734.4X40.7}{9451.6162 - 5X(40.7)^2}$

$$= \frac{19966.40}{1169.17} = 17.08$$

(a) $= \overline{X} - b\overline{Y} = 734.4 - 17.08 \times 40.7$

$$= 39.35$$

(e) Regression equation 

$$\boxed{\text{MPS } = 39.35 + 17.08 \text{ P/E}}$$

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n-2}}$

$$= \sqrt{\frac{3120120 - 39.35X3672 - 17.08X169416.8}{5-2}}$$

$$= 165.8$$

(g) Standard error of regression coeff. (S$_b$) $= \dfrac{Se}{\sqrt{\sum Y^2 - n\overline{Y}^2}}$

$$= \frac{165.8}{\sqrt{9451.6162 - 5X(40.7)^2}}$$

$$= 4.85$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{17.08}{4.85} = 3.523$

**5. Simple correlation & regression analysis of MPS & DY**

| Year | MPS (X) | DY (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2005/06 | 360 | 0 | - | - | - |
| 2006/07 | 778 | 2.03 | 129600 | 0 | 0 |
| 2007/08 | 1090 | 1.44 | 605284 | 4.1209 | 1579.34 |
| 2008/09 | 1000 | 1.58 | 1188100 | 2.0736 | 1569.6 |
| 2009/10 | 444 | 1.91 | 1000000 | 1.1025 | 1050 |
| **TOTAL** | **$\sum X=3672$** | **$\sum Y=6.96$** | **$\sum X^2=3120120$** | **$\sum Y^2=12.339$** | **$\sum XY=5576.98$** |

d) Mean $(\overline{X}) = \dfrac{SX}{N} = \dfrac{3672}{5} = 734.4$

Mean $(\overline{Y}) = \dfrac{SY}{N} \quad \dfrac{6.96}{5} = 1.392$

(b) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$= \dfrac{5x5576.98 - 3672x6.96}{\sqrt{5x3120120 - (3672)^2}\ \sqrt{5x12.339 - (6.96)^2}}$

$= \dfrac{2327.78}{1455 X 13.2534} = 0.44$

(c) Coefficient of determination $(r^2) = (0.44)^2 = 0.193$

(d) Regression coefficient (b) $= \dfrac{\sum XY - n\overline{X}\,\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \dfrac{5576.98 - 5 X 734.4 X 1.392}{12.399 - 5 X (1.392)^2}$

$= \dfrac{465.56}{2.65} = 175.64$

(a) $= \overline{X} - b\overline{Y} = 734.4 - 175.64 \times 1.392$

(e) Regression equation

$\boxed{\text{MPS } = 489.91 + 175.64 \text{ DY}}$

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n-2}}$

$$= \sqrt{\frac{3120120 - 489.91X\,3672 - 175.64X\,5576.98}{5 - 2}}$$

$$= 337.5$$

(g) Standard error of regression coeff. ($S_b$) $= \dfrac{Se}{\sqrt{\sum Y^2 - n\overline{Y}^2}}$

$$= \dfrac{337.5}{\sqrt{12.339 - 5X(1.392)^2}}$$

$$= 207.27$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b} = \dfrac{175.64}{207.27} = 0.847$

## 6. Simple correlation & regression analysis of MPS & RR

| Year | MPS (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2004/05 | 360 | 100 | 129600 | 10000 | 36000 |
| 2005/06 | 778 | 0.57 | 605284 | 0.3249 | 443.46 |
| 2006/07 | 1090 | 8.68 | 1188100 | 75.3424 | 9461.2 |
| 2007/08 | 1000 | 31.02 | 1000000 | 962.2404 | 31020 |
| 2008/09 | 444 | 61.71 | 197136 | 3808.124 | 27399.2 |
| TOTAL | $\sum$X=3672 | $\sum$Y=201.98 | $\sum Y^2$=3120120 | $\sum Y^2$=14846.032 | $\sum$XY=104323.9 |

a)  Mean ($\overline{X}$) $= \dfrac{SX}{N} = \dfrac{3672}{5} = 734.4$

Mean ($\overline{Y}$) $= \dfrac{SY}{N}\ \dfrac{201.98}{5} = 40.396$

(b) Coefficient of Correlation (r) $= \dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \dfrac{5x104323.9 - 3672x201.98}{\sqrt{5x3120120 - (3672)^2}\ \sqrt{5x14846.032 - (201.98)^2}}$$

$$= \frac{-220051}{1455 X 182.85} = -0.83$$

(c) Coefficient of determination (r$^2$) = (-0.83)$^2$ =0.684

(d) Regression coefficient (b) $= \frac{\sum XY - n\overline{X}\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \frac{104323.9 - 5 X 734.4 X 40.396}{14846.032 - 5 X (40.396)^2}$

$$= \frac{-44010.21}{6686.85} = -6.58$$

(a) $= \overline{X} - b\overline{Y} = 734.4 - (-6.58) \times 40.396)$

$$= 1000.27$$

(e) Regression equation

MPS = 1000.27-6.58 RR

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n-2}}$

$$= \sqrt{\frac{3120120 - 1000.27 X 3672 - (-6.58) X 104323.9}{5-2}}$$

$$= 211.1$$

(g) Standard error of regression coeff. (S$_b$) $= \dfrac{Se}{\sqrt{\sum Y^2 - n\overline{Y}^2}}$

$$= \frac{211.1}{\sqrt{14846.032 - 5 X (40.396)^2}}$$

$$= 2.58$$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b}$

$$= \frac{-6.58}{2.58}$$

$$= -2.549$$

## 7. Simple correlation & regression analysis of EPS & DPS

| Year | EPS (X) | DPS (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2004/05 | 13.05 | 0 | 170.3025 | 0 | 0 |
| 2005/06 | 15.88 | 15.79 | 252.1744 | 249.3241 | 250.7452 |
| 2006/07 | 17.29 | 15.79 | 298.9441 | 249.3241 | 273.0091 |
| 2007/08 | 22.89 | 15.79 | 523.9521 | 249.3241 | 361.4331 |
| 2008/09 | 21.99 | 8.42 | 483.5601 | 70.8964 | 185.1558 |
| TOTAL | $\sum X=91.1$ | $\sum Y=55.79$ | 1728.9332 | 818.8687 | 1070.3432 |

a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 1070.3432 - 91.1 X 55.79}{\sqrt{5x1728.9332 - (91.1)^2}\ \sqrt{5x818.8687 - (55.79)^2}}$$

$$= \frac{269.247}{18.59 X 31.33} = 0.462$$

## 8. Simple correlation & regression analysis of EPS & DPR

| Year | EPS (X) | DPR (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2004/05 | 13.05 | 0 | 170.3025 | 0 | 0 |
| 2005/06 | 15.88 | 99.43 | 252.1744 | 9886.3249 | 1578.9484 |
| 2006/07 | 17.29 | 91.32 | 298.9441 | 8339.3424 | 1578.9228 |
| 2007/08 | 22.89 | 68.98 | 523.9521 | 4758.2404 | 1578.9522 |
| 2008/09 | 21.99 | 38.29 | 483.5601 | 1466.1241 | 841.9971 |
| TOTAL | $\sum X=91.1$ | $\sum Y=298.02$ | 1728.9332 | 24450.0318 | 5578.8205 |

a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 5578.8205 - 91.1 X 298.02}{\sqrt{5x1728.9332 - (91.1)^2} \sqrt{5x24450.0318 - (298.02)^2}}$$

$$= \frac{744.4805}{18.59 X 182.85} = 0.219$$

## 9. Simple correlation & regression analysis of EPS & P/E RATIO

| Year | EPS (X) | P/E (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
| 2004/05 | 13.05 | 27.59 | 170.3025 | 761.2081 | 360.0495 |
| 2005/06 | 15.88 | 48.98 | 252.1744 | 2399.0404 | 777.8024 |
| 2006/07 | 17.29 | 63.04 | 298.9441 | 3974.0416 | 1089.9616 |
| 2007/08 | 22.89 | 43.70 | 523.9521 | 1909.69 | 1000.293 |
| 2008/09 | 21.99 | 20.19 | 483.5601 | 407.6361 | 443.9781 |
| TOTAL | ∑X=91.1 | ∑Y=203.5 | 1728.9332 | 9451.6162 | 3672.0846 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2} \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 3672.0846 - 91.1 X 203.5}{\sqrt{5x1728.9332 - (91.1)^2} \sqrt{5x6451.6162 - (203.5)^2}}$$

$$= \frac{-178.427}{18.59 X 76.46} = -0.126$$

## 10. Simple correlation & regression analysis of EPS & DY

| Year | EPS (X) | DY (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2004/05 | 13.05 | 0 | 170.3025 | 0 | 0 |
| 2005/06 | 15.88 | 2.03 | 252.1744 | 4.1209 | 32.2364 |
| 2006/07 | 17.29 | 1.44 | 298.9441 | 2.0736 | 24.8976 |
| 2007/08 | 22.89 | 1.58 | 523.9521 | 2.4964 | 36.1662 |
| 2008/09 | 21.99 | 1.91 | 483.5601 | 3.6481 | 42.0009 |
| TOTAL | ∑X=91.1 | ∑Y=6.96 | 1728.9332 | 12.339 | 135.3011 |

(a) Coefficient of Correlation (r) = $$\frac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\sqrt{nSY^2 - (SY)^2}}$$

$$= \frac{5 \times 135.3011 - 91.1 X 6.96}{\sqrt{5x1728.9332 - (91.1)^2}\sqrt{5x12.339 - (6.96)^2}}$$

$$= \frac{42.4495}{18.59 X 3.64}$$

$$= 0.627$$

## 11. Simple correlation & regression analysis of EPS & RR

| Year | EPS (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2004/05 | 13.05 | 100 | 170.3025 | 10000 | 1305 |
| 2005/06 | 15.88 | 0.57 | 252.1744 | 0.3249 | 9.0516 |
| 2006/07 | 17.29 | 8.68 | 298.9441 | 75.3424 | 150.0772 |
| 2007/08 | 22.89 | 31.02 | 523.9521 | 962.2404 | 710.0478 |
| 2008/09 | 21.99 | 61.71 | 483.5601 | 3808.1241 | 1357.0029 |
| TOTAL | ∑X=91.1 | ∑Y=201.98 | 1728.9332 | 14846.0318 | 3531.1795 |

(a) Coefficient of Correlation (r) = $$\frac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\sqrt{nSY^2 - (SY)^2}}$$

$$= \frac{5 \times 3531.1795 - 91.1 X 201.98}{\sqrt{5x1728.9332 - (91.1)^2}\sqrt{5x14846.0318 - (201.98)^2}}$$

$$= \frac{-744.4805}{18.59 X 182.85}$$

$$= -0.219$$

## 12. Simple correlation & regression analysis of DPS & DPR

| Year | DPS (X) | DPR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
| 2005/06 | 0 | 0 | 0 | 0 | 0 |
| 2006/07 | 15.79 | 99.43 | 249.3241 | 9886.3249 | 1569.9997 |
| 2007/08 | 15.79 | 91.32 | 249.3241 | 8339.3424 | 1441.9428 |
| 2008/09 | 15.79 | 68.98 | 249.3241 | 4758.2404 | 1089.1942 |
| 2009/10 | 8.42 | 38.29 | 70.8964 | 1466.1241 | 322.4018 |
| **TOTAL** | **∑Y=55.79** | **∑Y=298.02** | **818.8687** | **24450.0318** | **4423.5385** |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\,\sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 4423.5385 - 55.79 * 298.02}{\sqrt{5x818.8687 - (55.79)^2}\,\sqrt{5x24450.0318 - (298.02)^2}}$$

$$= \frac{5491.1567}{31.33X182.85} = 0.958$$

## 13. Simple correlation & regression analysis of DPS & P/E

| Year | DPS (X) | P/E (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
| 2005/06 | 0 | 27.59 | 0 | 761.2081 | 0 |
| 2006/07 | 15.79 | 48.98 | 249.3241 | 2399.0404 | 773.3942 |
| 2007/08 | 15.79 | 63.04 | 249.3241 | 3974.0416 | 995.4016 |
| 2008/09 | 15.79 | 43.70 | 249.3241 | 1909.69 | 690.023 |
| 2009/10 | 8.42 | 20.19 | 70.8964 | 407.6361 | 169.9998 |
| **TOTAL** | **∑Y=55.79** | **∑Y=203.5** | **818.8687** | **9451.6162** | **2628.8186** |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\,\sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 2628.8186 - 55.79 * 203.5}{\sqrt{5x818.8687 - (55.79)^2} \sqrt{5x9451.6162 - (203.5)^2}}$$

$$= \frac{1790.828}{31.33X76.46} = 0.748$$

## 14. Simple correlation & regression analysis of DPS & DY

| Year | DPS (X) | DY (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 0 | 0 | 0 | 0 | 0 |
| 2006/07 | 15.79 | 2.03 | 249.3241 | 4.1209 | 32.0537 |
| 2007/08 | 15.79 | 1.44 | 249.3241 | 2.0736 | 22.7376 |
| 2008/09 | 15.79 | 1.58 | 249.3241 | 2.4964 | 24.9482 |
| 2009/10 | 8.42 | 1.91 | 70.8964 | 3.6481 | 16.0822 |
| TOTAL | ∑Y=55.79 | ∑Y=6.96 | 818.8687 | 12.339 | 95.8217 |

(a) Coefficient of Correlation (r) = 

$$\frac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2} \sqrt{nSY^2 - (SY)^2}}$$

$$= \frac{5 \times 95.8217 - 55.79 * 6.96}{\sqrt{5x818.8687 - (55.79)^2} \sqrt{5x12.339 - (6.96)^2}}$$

$$= \frac{90.8101}{31.33X3.64} = 0.796$$

## 15. Simple correlation & regression analysis of DPS & RR

| Year | DPS (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 0 | 100 | 0 | 10000 | 0 |
| 2006/07 | 15.79 | 0.57 | 249.3241 | 0.3249 | 9.0003 |
| 2007/08 | 15.79 | 8.68 | 249.3241 | 75.3424 | 137.0572 |
| 2008/09 | 15.79 | 31.02 | 249.3241 | 962.2404 | 489.8058 |
| 2009/10 | 8.42 | 61.71 | 70.8964 | 3808.1241 | 519.5982 |
| TOTAL | ∑Y=55.79 | ∑Y=201.98 | 818.8687 | 14846.0318 | 1155.4615 |

(a) Coefficient of Correlation (r) = 

$$\frac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2} \sqrt{nSY^2 - (SY)^2}}$$

$$= \frac{5 \times 1155.4615 - 55.79 - 201.98}{\sqrt{5x818.8687 - (55.79)^2} \sqrt{5x14846.0318 - (201.98)^2}}$$

$$= \frac{-5491.1567}{31.33 X 182.85} = -0.958$$

## 16. Simple correlation & regression analysis of DPR & P/E

| Year | DPR (X) | P/E (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
| 2005/06 | 0 | 27.59 | 0 | 761.2081 | 0 |
| 2006/07 | 99.43 | 48.98 | 9886.3249 | 2399.0404 | 4870.0814 |
| 2007/08 | 91.32 | 63.04 | 8339.3424 | 3974.0416 | 5756.8128 |
| 2008/09 | 68.98 | 43.70 | 4758.2404 | 1909.69 | 3014.426 |
| 2009/10 | 38.29 | 20.19 | 1466.1241 | 407.6361 | 773.0751 |
| TOTAL | ∑Y=298.02 | ∑Y=203.5 | 24450.0318 | 9451.6162 | 14414.3953 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2} \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 14414.3953 - 298.02 - 203.5}{\sqrt{5x24450.0318 - (298.02)^2} \sqrt{5x9451.6162 - (203.5)^2}}$$

$$= \frac{11424.9065}{182.85 X 76.46} = 0.817$$

## 17. Simple correlation & regression analysis of DPR & DY

| Year | DPR (X) | DY (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 0 | 0 | 0 | 0 | 0 |
| 2006/07 | 99.43 | 2.03 | 9886.3249 | 4.1209 | 201.8429 |
| 2007/08 | 91.32 | 1.44 | 8339.3424 | 2.0736 | 131.5008 |
| 2008/09 | 68.98 | 1.58 | 4758.2404 | 2.4964 | 108.9884 |
| 2009/10 | 38.29 | 1.91 | 1466.1241 | 3.6481 | 73.1339 |
| TOTAL | ∑Y=298.02 | ∑Y=6.96 | 24450.0318 | 12.339 | 515.466 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 515.466 - 298.02 - 6.96}{\sqrt{5x24450.0318 - (298.02)^2}\ \sqrt{5x12.339 - (6.96)^2}}$$

$$= \frac{503.1108}{182.85\,X\,3.64} = 0.756$$

## 18. Simple correlation & regression analysis of DPR & RR

| Year | DPR (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 0 | 100 | 0 | 10000 | 0 |
| 2006/07 | 99.43 | 0.57 | 9886.3249 | 0.3249 | 56.6751 |
| 2007/08 | 91.32 | 8.68 | 8339.3424 | 75.3424 | 792.6576 |
| 2008/09 | 68.98 | 31.02 | 4758.2404 | 962.2404 | 2139.7596 |
| 2009/10 | 38.29 | 61.71 | 1466.1241 | 3808.1241 | 2362.8759 |
| TOTAL | ∑Y=298.02 | ∑Y=201.98 | 24450.0318 | 14846.0318 | 5351.9682 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 5351.9682 - 298.02 - 201.98}{\sqrt{5x24450.0318 - (298.02)^2}\ \sqrt{5x14846.0318 - (201.98)^2}}$$

$$= \frac{-33434.2386}{182.85\,X\,182.85} = -1$$

## 19. Simple correlation & regression analysis of P/E & DY

| Year | P/E (X) | DY (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 27.59 | 0 | 761.2081 | 0 | 0 |
| 2006/07 | 48.98 | 2.03 | 2399.0404 | 4.1209 | 99.4294 |
| 2007/08 | 63.04 | 1.44 | 3974.0416 | 2.0736 | 90.7776 |
| 2008/09 | 43.70 | 1.58 | 1909.69 | 2.4964 | 69.046 |
| 2009/10 | 20.19 | 1.91 | 407.6361 | 3.6481 | 38.5629 |
| TOTAL | ∑Y=203.5 | ∑Y=6.96 | 9451.6162 | 12.339 | 297.8159 |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 364297.8159 - 203.5 - 6.96}{\sqrt{5x9451.6162 - (203.5)^2}\ \sqrt{5x12.339 - (6.96)^2}}$$

$$= \frac{72.7195}{76.46 X 3.64} = 0.261$$

## 20. Simple correlation & regression analysis of P/E & RR

| Year | P/E (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|--------|-------|-------|-----|
| 2005/06 | 27.59 | 100 | 761.2081 | 10000 | 2759 |
| 2006/07 | 48.98 | 0.57 | 2399.0404 | 0.3249 | 27.9186 |
| 2007/08 | 63.04 | 8.68 | 3974.0416 | 75.3424 | 547.1872 |
| 2008/09 | 43.70 | 31.02 | 1909.69 | 962.2404 | 1355.574 |
| 2009/10 | 20.19 | 61.71 | 407.6361 | 3808.1241 | 1245.9249 |
| **TOTAL** | **∑Y=203.5** | **∑Y=201.98** | **9451.6162** | **14846.0318** | **5935.6047** |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 5935.6047 - 203.5 - 201.98}{\sqrt{5x9451.6162 - (203.5)^2}\ \sqrt{5x14846.0318 - (201.98)^2}}$$

$$= \frac{-11424.9065}{76.46 X 182.85}$$

$$= -0.817$$

**21. Simple correlation & regression analysis of  DY & RR**

| Year | DY (X) | RR (Y) | $X^2$ | $Y^2$ | XY |
|------|--------|--------|-------|-------|-----|
| 2005/06 | 0 | 100 | 0 | 10000 | 0 |
| 2006/07 | 2.03 | 0.57 | 4.1209 | 0.3249 | 1.1571 |
| 2007/08 | 1.44 | 8.68 | 2.0736 | 75.3424 | 12.4992 |
| 2008/09 | 1.58 | 31.02 | 2.4964 | 962.2404 | 49.0116 |
| 2009/10 | 1.91 | 61.71 | 3.6481 | 3808.1241 | 117.8661 |
| **TOTAL** | **∑Y=6.96** | **∑Y=201.98** | **12.339** | **14846.0318** | **180.534** |

(a) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$$= \frac{5 \times 180.534 - 6.96 - 201.98}{\sqrt{5x12.339 - (6.96)^2}\ \sqrt{5x14846.0318 - (201.98)^2}}$$

$$= \frac{-503.1108}{3.64X182.85} \quad = -0.756$$

# Appendix-C

## NCC Bank

### 1. Simple correlation & regression analysis of MPS & EPS

| Year | MPS (X) | EPS (Y) | $X^2$ | $Y^2$ | XY |
|------|---------|---------|-------|-------|-----|
| 2005/06 | 94 | -84.77 | 8836 | 7185.9529 | -7968.38 |
| 2006/07 | 316 | -16.56 | 99856 | 274.2336 | -5232.96 |
| 2007/08 | 457 | 35.63 | 208849 | 1269.4969 | 16282.91 |
| 2008/09 | 335 | 29.35 | 112225 | 861.4225 | 9832.25 |
| 2009/10 | 275 | 30.28 | 75625 | 916.8784 | 8327 |
| **TOTAL** | **∑X=1477** | **∑Y=93.94** | **505391** | **10507.9843** | **21240.82** |

a) Mean ($\overline{X}$) = $\dfrac{SX}{N}$ = $\dfrac{27.12}{5}$ = 295.4

Mean ($\overline{Y}$) = $\dfrac{SY}{N}$ $\dfrac{-6.07}{5}$ = -1.214

(b) Coefficient of Correlation (r) = $\dfrac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$

$= \dfrac{5x21240.82 - 1477x - 6.07}{\sqrt{5x505391 - (1477)^2}\ \sqrt{5x10507.984 - (-6.07)^2}}$

$= \dfrac{115169.5}{587.73 X 229.14}$ = 0.86

(c) Coefficient of determination ($r^2$) = $(0.86)^2$ = 0.731

(d) Regression coefficient (b) = $\dfrac{\sum XY - n\overline{X}\overline{Y}}{\sum Y^2 - n\overline{Y}^2}$ = $\dfrac{21240.82 - 5X295.4X - 1.214}{10507.984 - 5X(-1.214)^2}$

$= \dfrac{23033.90}{10500.62}$ = 2.19

(a) = $\overline{X} - b\overline{Y}$ = 295.4 – 2.19×-1.214

= 298.06

(e) Regression equation

$$\boxed{\text{MPS} = 298.06 + 2.19\,\text{EPS}}$$

(f) Standard error of estimate (Se)

$$= \sqrt{\frac{SX^2 - aSX - bSXY}{n-2}}$$

$$= \sqrt{\frac{505391 - 298.06 X 1447 - 2.19 X 21240.82}{5-2}}$$

$$= 78.7$$

(g) Standard error of regression coeff. (S$_b$)

$$= \frac{Se}{\sqrt{\sum Y^2 - n\overline{Y}^2}}$$

$$= \frac{78.7}{\sqrt{10507.984 - 5 X (-1.214)^2}}$$

$$= 0.77$$

(h) Standardized value of b (t-value)

$$= \frac{b}{S_b} = \frac{2.19}{0.77} = 2.858$$

## 2. Simple correlation & regression analysis of MPS & P/E Ratio

| Year | MPS (X) | P/E (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2005/06 | 94 | -1.11 | 8836 | 1.2321 | -104.34 |
| 2006/07 | 316 | -19.08 | 99856 | 364.0464 | -6029.28 |
| 2007/08 | 457 | 12.83 | 208849 | 164.6089 | 5863.31 |
| 2008/09 | 335 | 11.41 | 112225 | 130.1881 | 3822.35 |
| 2009/10 | 275 | 9.08 | 75625 | 82.4464 | 2497 |
| **TOTAL** | **∑X=1477** | **∑Y=13.13** | **∑X²=505391** | **∑Y²=742.5219** | **∑XY=6049.04** |

$$\text{b)  Mean } (\overline{X}) = \frac{SX}{N} = \frac{1477}{5} = 295.4$$

$$\text{Mean } (\overline{Y}) = \frac{SY}{N}\quad \frac{13.13}{5} = 2.626$$

(b) Coefficient of Correlation (r) =

$$\frac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$$

$$= \frac{5 x 6049.04 - 1477 x 13.13}{\sqrt{5 x 505391 - (1477)^2}\ \sqrt{5 x 742.5219 - (13.13)^2}}$$

$$= \frac{10852.19}{587.73 X 59.50} = 0.31$$

(c) Coefficient of determination $(r^2) = (0.31)^2 = 0.096$

(d) Regression coefficient (b) $= \dfrac{\sum XY - n\overline{X}\,\overline{Y}}{\sum Y^2 - n\overline{Y}^2} = \dfrac{6049.04 - 5 X 295.4 X 2.626}{742.5219 - 5 X (2.626)^2}$

$$= \frac{2170.44}{708.04} = 3.07$$

(a) $= \overline{X} - b\overline{Y} = 295.4 - 3.07 \times 2.626$

$\qquad = 287.35$

(e) Regression equation $\boxed{\text{MPS } = 287.35 + 3.07 \text{ P/E}}$

(f) Standard error of estimate (Se) $= \sqrt{\dfrac{SX^2 - aSX - bSXY}{n-2}}$

$$= \sqrt{\frac{505391 - 287.35 X 1477 - 3.07 X 6049.04}{5-2}}$$

$= 144.3$

(g) Standard error of regression coeff. (S$_b$) $= \dfrac{Se}{\sqrt{\sum Y^2 - n\overline{Y}^2}}$

$$= \frac{144.3}{\sqrt{742.5219 - 5 X (2.626)^2}}$$

$= 5.42$

(h) Standardized value of b (t-value) $= \dfrac{b}{S_b}$

$$= \frac{3.07}{5.42}$$

$= 0.565$

## 3. Simple correlation & regression analysis of EPS & P/E Ratio

| Year | EPS (X) | P/E (Y) | $X^2$ | $Y^2$ | XY |
|---|---|---|---|---|---|
| 2005/06 | -84.77 | -1.11 | 7185.9529 | 1.2321 | 94.0947 |
| 2006/07 | -16.56 | -19.08 | 274.2336 | 364.0464 | 315.9648 |
| 2007/08 | 35.63 | 12.83 | 1269.4969 | 164.6089 | 457.1329 |
| 2008/09 | 29.35 | 11.41 | 861.4225 | 130.1881 | 334.8835 |
| 2009/10 | 30.28 | 9.08 | 916.8784 | 82.4464 | 274.9424 |
| TOTAL | $\sum X = -6.07$ | $\sum Y = 13.13$ | 10507.9843 | 742.5219 | 1477.0183 |

(b) Coefficient of Correlation (r) =

$$\frac{nSXY - SX.SY}{\sqrt{SX^2 - (SX)^2}\ \sqrt{nSY^2 - (SY)^2}}$$

$$= \frac{5x1477.0183 - (-6.07)x13.13}{\sqrt{5x10507.9843 - (-6.07)^2}\ \sqrt{5x742.5219 - (13.13)^2}}$$

$$= \frac{7464.7906}{229.14\,X\,59.50} = 0.548$$

4. **Correlation between MPS & DPR ( Zero)**

5. **Correlation between MPS & DY ( Zero)**

6. **Correlation between MPS & RR ( Zero)**

7. **Correlation between EPS & DPR ( Zero)**

8. **Correlation between EPS & DPS ( Zero)**

9. **Correlation between EPS & DY ( Zero)**

10. **Correlation between EPS & RR( Zero)**

11. **Correlation between DPS & DY ( Zero)**

12. **Correlation between DPS & P/E ( Zero)**

13. **Correlation between MPS & RR ( Zero)**

14. **Correlation between DPS & RR ( Zero)**

15. **Correlation between DPR & P/E ( Zero)**

16. **Correlation between DPR & DY ( Zero)**

17. **Correlation between DPR & RR ( Zero)**

18. **Correlation between P/E & DY ( Zero)**

19. **Correlation between P/E & RR ( Zero)**

20. **Correlation between DY & RR ( Zero)**

## Test of hypothesis

## (A) One way analysis of variance (ANOVA) for dividend per share

| Fiscal Year | Nabil $(X_1)$ | Siddhartha$(X_2)$ | NCC$(X_3)$ | $X_1{}^2$ | $X_2{}^2$ | $X_3{}^2$ |
|---|---|---|---|---|---|---|
| 2005/06 | 85 | - | - | 7225 | 0 | 0 |
| 2006/07 | 140 | 15.79 | - | 19600 | 249.3241 | 0 |
| 2007/08 | 100 | 15.79 | - | 10000 | 249.3241 | 0 |
| 2008/09 | 85 | 15.79 | - | 7225 | 249.3241 | 0 |
| 2009/10 | 70 | 8.42 | - | 4900 | 70.8964 | 0 |
| | 480 | 55.79 | | 48950 | 818.8687 | 0 |

Here,

$$\sum X_1 = 480 \quad \sum X_2 = 55.79 \quad \sum X_1{}^2 = 48950 \quad \sum X_2{}^2 = 818.8687$$

Note:
Value of $X_1$, $X_2$ and $X_3$ represent the value of Dividend per share(DPS) of three banks Nabil, Siddhartha and NIC respectively.

Grand Total(T) = $\sum X_1 + \sum X_2 + \sum X_3$ =535.79

Correction Factor (CF) = $T^2/N$ = 19138.0616

Total sum of squares (TSS) = $\sum X_1{}^2 + \sum X_2{}^2 + \sum X_3{}^2 - CF$

$\qquad\qquad = 48950+818.8687+0-19138.0616$

$\qquad\qquad = 30630.8071$

Sum of square due to row or between banks (SSR)

$$= \frac{\left(\sum X_1\right)^2}{n_1} + \frac{\left(\sum X_2\right)^2}{n_2} + \frac{\left(\sum X_3\right)^2}{n_3} - CF$$

$= 480^2/5 + 55.79^2/5 + 0/5 - 19138.0616$

$= 46080 + 622.5 + 0 - 19138.0616$

$= 27564.4432$

Sum of Squares due to error or within banks (SSE) = TSS – SSR = 3066.364

## (B) One way analysis of variance (ANOVA) for Earning per share

| Fiscal Year | Nabil (X₁) | Siddhartha(X₂) | NCC(X₃) | X₁² | X₂² | X₃² |
|---|---|---|---|---|---|---|
| 2005/06 | 129.21 | 13.05 | -84.77 | 16695.2241 | 170.3025 | 7185.9529 |
| 2006/07 | 137.08 | 15.88 | -16.56 | 18790.9264 | 252.1744 | 274.2336 |
| 2007/08 | 108.31 | 17.29 | 35.63 | 11731.0561 | 298.9441 | 1269.4969 |
| 2008/09 | 106.76 | 22.89 | 29.35 | 11397.6976 | 523.9521 | 861.4225 |
| 2009/10 | 78.61 | 21.99 | 30.28 | 6179.5321 | 483.5601 | 916.8784 |
| **Total** | **559.97** | **91.1** | **-6.07** | **64794.4363** | **1728.9332** | **10507.9843** |

Here,

$$\sum X_1 = 559.97 , \quad \sum X_2 = 91.1,$$

$$\sum X_3 = -6.07, \sum X_1{}^2 = 64794.4363, \sum X_2{}^2 = 1728.9332, \sum X_3{}^2 = 10507.9843$$

Note:

Value of $X_1$, $X_2$ and $X_3$ represent the value of Dividend per share (DPS) of three banks Nabil, Siddhartha and NIC respectively.

Grand Total (T) = $\sum X_1 + \sum X_2 + \sum X_3$ =645

Correction Factor (CF) = $T^2/N$ = 416025/15 = 27735

Total sum of squares (TSS) = $\sum X_1{}^2 + \sum X_2{}^2 + \sum X_3{}^2 - CF$

$$= 64794.4363+1728.93+10507.9843-27735$$

$$= 49296.35$$

Sum of square due to row or between banks (SSR)

$$= \frac{\left(\sum X_1\right)^2}{n_1} + \frac{\left(\sum X_2\right)^2}{n_2} + \frac{\left(\sum X_3\right)^2}{n_3} - CF$$

$= 559^2/5 + 91.1^2/5 +(-6.07/5) -27735$

$= 62713.28+1659.84+7.37-27735$

$= 36645.49$

Sum of Squares due to error or within banks (SSE) = TSS – SSR =12650.86

## (C) One way analysis of variance (ANOVA) for DPR

| Fiscal Year | Nabil (X₁) | Siddhartha( X₂) | NCC(X₃) | X₁² | X₂² | X₃² |
|---|---|---|---|---|---|---|
| 2005/06 | 65.78 | 0 | - | 4327.0084 | 0 | 0 |
| 2006/07 | 102 | 99.43 | - | 10404 | 9886.325 | 0 |
| 2007/08 | 92.33 | 91.32 | - | 8524.8289 | 8339.342 | 0 |
| 2008/09 | 79.62 | 68.98 | - | 6339.3444 | 4758.24 | 0 |
| 2009/10 | 89.05 | 38.29 | - | 7929.9025 | 1466.124 | 0 |
| **Total** | **428.78** | **298.02** | **0** | **37525.0842** | **24450.0318** | 0 |

Here,

$$\sum X_1 = 428.78, \quad \sum X_2 = 298.02,$$

$$\sum X_3 = 0, \sum X_1^2 = 37525.0842, \sum X_2^2 = 24450.0318, \sum X_3^2 = 0$$

Note:
Value of $X_1$, $X_2$ and $X_3$ represent the value of Dividend per share (DPS) of three banks Nabil, Siddhartha and NIC respectively.

Grand Total (T) = $\sum X_1 + \sum X_2 + \sum X_3$ =726.80

Correction Factor (CF) = $T^2/N$ = 528238.24/15 = 35215.88

Total sum of squares (TSS) = $\sum X_1^2 + \sum X_2^2 + \sum X_3^2 - CF$

$$= 37525.0842+24450.03+0-35215.88$$

$$= 26759.23$$

Sum of square due to row or between banks (SSR)

$$= \frac{\left(\sum X_1\right)^2}{n_1} + \frac{\left(\sum X_2\right)^2}{n_2} + \frac{\left(\sum X_3\right)^2}{n_3} - CF$$

$$= 428.78^2/5 + 298.02^2/5 +0–35215.88$$

$$= 36770.46+17763.18+0-35215.88$$

$$= 19317.76$$

Sum of Squares due to error or within banks (SSE) = TSS – SSR =7441.47