

# **CHAPTER I**

## **INTRODUCTION**

### **1.1 Background of study**

Hydropower is the only sector that yields multiple benefits and, in many cases, can be an effective agent for poverty alleviation. Apart from being a source of renewable and clean energy, to stabilize the supply of electricity, it helps provide year round irrigation resulting in the increase in the cropping intensity and changing cropping pattern, and it reduces both deforestation and greenhouse gas emissions. Nepal has adopted a policy of Integrated Water Resources Management (IWRM), by which hydropower projects are developed in conjunction with irrigation, flood control, water supply and navigation components whenever feasible. Electricity from hydropower projects currently contributes only 1% of energy need, whereas fuel wood contributes 68%, and fossil fuels 8%. Nepal could benefit substantially if consumption of petroleum products were replaced by hydropower, as it would also contribute positively to change of climate. However, Nepal has not been successful in exploiting much of it yet for many reasons. Continuous effort is necessary to achieve the sustainable development of the nation's potential in small and medium-sized hydroelectric projects. Environmental and social sensitivity will also be needed, to promote hydroelectric projects, using the best established, and where appropriate also innovative, technologies. This can be achieved by co-operation between local groups and international organizations in the planning, financing, construction, and operation of these projects as needed to bring success to the industry.

So considering the immense importance of hydropower in Nepal it is evident that Nepalese hydropower companies should make the most out of their business by proper planning and decision making. Now here comes the need of financial performance analysis. Through this analysis companies would be able to track the past performance and predict and plan future activities which will enable them to utilize their resources efficiently and effectively.

## **1.2 Brief Profile of Companies under Study**

### **(i) Butwal Power Company Limited**

It is a leading hydropower developer of Nepal became a public company since February 1993. After privatization of the company in 2003 the principal shareholders of BPC are the Private Shareholders Shangri-la Energy Limited and Interkraft, Norway and Ministry of Water resources, Nepal government. The company owns and operates 12 MW Jhimruk Hydropower Plant and the 5.1 MW Andhi Khola Hydropower Plant. Besides supplying power to the national electricity grid, it has electrified more than 27,000 households through these power plants under its rural electrification program. It owns 14.9% of the shares in Khimti I Hydropower Plant (60 MW), 51.3% in Nepal Hydro and Electric Pvt. Ltd, 20% in Hydro Lab Pvt. Ltd, 24% in JIDCO. It also owns 60% of the shares in Khudi Hydropower Company which has been in commercial operation since 30th December, 2006. Butwal Power Company has also established BPC Hydro consult in 1986 as the company's consulting wing operating in the hydropower, water and irrigation sector. Today BPC Hydroconsult is recognized as a leading consulting organization and is able to undertake multi-disciplinary projects.

### **(ii) Himal Power Limited:**

It was established in 1992 when Butwal Power Company Limited, a company registered under the Company Act 2021 of Nepal, together with Norwegian companies - Statkraft SF, Kværner Energy a.s. (now G.E. Hydro Norway) and ABB Energi a.s. (now ABB ALSTOM a.s.) registered a company under the Company Act 2021 of Nepal with an objective to build, own and operate the Khimti I Hydropower Project. In 1992, in order to make arrangements to expedite the construction of the Khimti I Hydropower Project, Nepal Government entered into an agreement with Butwal Power Company to commence preparatory works for the project. Nepal Government and Himal Power Limited worked together to establish a Project Agreement to enable HPL to make the necessary arrangements to build the Project. The original Project Agreement with Nepal Government and the Power Purchase

Agreement with Nepal Electricity Authority (NEA) were signed on 30th March 1994. Both of these agreements had to be amended in order for HPL to be in position to finance the Project. Amendments were signed on 24th November 1994 and 15th January 1996. It took a further 19 months for HPL and their sponsors to arrange the necessary financial for the project. The Date of Financial Closing was achieved on 26th June 1996. Himal Power company aims to provide the power forecasted without undue interruption, and to contribute to the development of the economy of Nepal by providing power in an environmentally friendly, efficient and profitable way.

### **1.3 Keen Eye to the Problem**

Hydropower companies in Nepal have not been able to efficiently achieve their objectives due to improper planning and agreement with NEA prior to operation. For example during dry season the hydroelectric projects are unable to generate the agreed power for with they are penalized by NEA. Although this is a result of natural obstruction due to low rainfall the hydropower project loses revenue. But this loss could have been forgone if they had done a proper planning by reaching an agreement that during winter they could supply considerably low electricity than what they have agreed to at present.

There is a big push for large hydro projects as the dominant national strategy not only for sectoral gains but also as an engine for country's overall economic development. The exploitation of rural natural resources for a larger public gain will ultimately lead to a win-win situation for all. Within this context, formal institutions such as laws, acts, policies, and guidelines provide the framework for direct technological intervention strategies. These interventions are usually acts as a barrier for successful implementation and operation of hydropower projects. In the present study , it is desired to analyses the financial status of hydropower companies . The financial statement of the hydropower companies disclose their financial position. Financial statements of the hydropower companies are multifunctional to meet the varied needs of various parties, Both internal and external which make use of these information for their own purposes. However , they do not speak any things more , but assess the financial health of the unit by

transforming their variable into financial ratios. This enables the real things of the company as well as to forecast the future.

The present study , there after attempts to diagnose and analysis the financials statements of BPC & HPL under this study. This study also points out the areas where necessary an adequate actions could be talking in to rove the situation .

#### **1.4 Objective of Study**

The study basically aims to analyze the financial performance of BPC and HPL and draw comparative conclusions through financial analysis taking relevant variables. It will also evaluate the financial position of BPC and HPL and suggest recommendation based upon it. In addition to this the study also aims to identify major strengths and weakness of BPC and HPL and find out the past and present challenges undergone by hydropower companies in Nepal.

The objective of this study are mentioned belows :-

- 1 ) To analysis Financial position of BPC and HPL
- 2) To Identify the contemporary steps are essential for performance improvement of Nepalese hydropower company.
- 3) To know the financial ratios best describe the performance of the companies under study.
- 4)To assess the satisfied are stakeholders with the performance of these companies
- 5) To give constructive suggestion for improving financial structure of these companies in future .

#### **1.5 Limitations of Study**

This study only focuses on five years data, which is based on published secondary data so it lacks the internal information, which might make the

analysis look different from what is real. This study is mainly based on the secondary data. The primary data are used for the study where it is required. The secondary data is basic input of the study and thus accuracy of conclusions derived from highly depends upon the reliability of these data. Since the study is mainly concerned with BPC and HPL among the various hydropower companies in operation, the conclusion drawn from the study, and the suggestions offered may not be applicable to any other private or public enterprise. The inherent limitations of the financial statements of the company are also the limitations of the study.

## **1.6 Significance of the Study**

This study attempts to provide information and grab attention of private and non-governmental agencies that are willing to invest on hydropower projects in Nepal. This study also expects to provide some appropriate measures to solve financial problems of Nepalese hydropower producers as much as possible.

## **1.7 Organization of the Study**

The purpose of this study is to explain the financial position of BPC and HPL. This study has been divided into five sections.

Section One Introduction

Section Two Review of Literature

Section Three Research Methodology

Section Four Presentation and Analysis of Data

Section Five Summary, Conclusion and Recommendation

The first section deals with the initial proposal of the thesis incorporated with a view to explain and detail the aspect of hydropower development and a brief overview. It is focused on the statement of the problem; importance, objectives, limitations and organization of the study.

Section Two reviews available literature from books and other sources.

Section three discusses Research methodology, which includes research design, types and sources of data, data collection procedure, methods of analysis and analytical tools used.

In the fourth section data collected through various sources have been presented. It mainly contains the analysis and presentations of collected data and information through definite course of research methodology. The generated results after the application of the research method are analyzed and interpreted in this section.

Ultimately, the fifth and the last section of the study covers summary, conclusions of the study and recommendations and suggestions for the further improvement. Besides these, bibliography and appendices are also included.

## CHAPTER II

### LITERATURE REVIEW

#### 2.1 Hydropower potential in Nepal

Nepal has a huge hydropower potential. It ranks second in the world after Brazil. The estimated potential is 83000 MW out of which 42000 MW is economically feasible. However the majority of this hydropower potential is still under developed and most of the energy depends on traditional energy sources like wood. Due to this situation, withering of forest has been increasing causing soil efflux to the downstream areas. Nepal Government has listed up the transition of traditional energy to commercial energy as one of the most important governmental strategies. Among the commercial energy sources, hydropower has been considered as the most economic and stable base energy compared with coal and thermal energies. It has been expected that hydropower development will become a motive power for economic development of the country. The total installed capacity is 584 MW comprising 527 MW of hydroelectric power facilities and 57 MW of diesel power facilities. Among the hydroelectric facilities, only Kulekhani No. 1 (60 MW) and NO.2 (32 MW) are of reservoir type power facilities restricted. In addition, it is anticipated that power demand will increase about 10% annually in the future. Against this background of power demand and supply, the development of new hydroelectric power sources is urgently required. (*Niraula , Hiramani 2065: 181 - 183*)

#### 2.2 Meaning of Financial Statement analysis

Financial statement analysis is the process of examining relationships among financial statement elements and making comparisons with relevant information. It is a valuable tool used by investors and creditors, financial analysts, and others in their decision-making processes related to stocks, bonds, and other financial instruments. The goal in analyzing financial statements is to assess past performance and current financial position and to make predictions about the future performance of a company. Investors who buy stock are primarily interested in a company's profitability and their prospects for earning a return on their investment by receiving dividends

and/or increasing the market value of their stock holdings. Creditors and investors who buy debt securities, such as bonds, are more interested in liquidity and solvency: the company's short-and long-run ability to pay its debts. Financial analysts, who frequently specialize in following certain industries, routinely assess the profitability, liquidity, and solvency of companies in order to make recommendations about the purchase or sale of securities, such as stocks and bonds. Analysts can obtain useful information by comparing a company's most recent financial statements with its results in previous years and with the results of other companies in the same industry. ( *Moer ,J. N. 1961: 375 - 379* )

## **2.3 Techniques of Financial Statement Analysis**

The techniques of financial statement analysis are commonly known as Trend analysis, Cash Flow analysis, and Ratio analysis. They are employed to ascertain or measure the relationship among the financial statement items of a single set of statement and changes that have taken place in these items as reflected in successive financial statements. Out of these techniques, selection of a technique or combination of the techniques depends on the purpose of analysis. Different techniques reveal different facts associated with the company, so some or all of the following major techniques can be used for financial statement analysis. ( Helfert, Erich A , 1997 : 603 - 305 )

### **2.3.1 Trend Analysis**

Trend analysis tries to predict the future trend based on past data. Trend analysis is based on the idea that what has happened in the past gives traders an idea of what will happen in the future. When an analyst compares financial information for two or more years for a single company, the process is referred to as trend analysis, since the analyst is reading across the page to compare any single line item, such as sales revenues. In addition to comparing dollar amounts, the analyst computes percentage changes from year to year for all financial statement balances, such as cash and inventory. Alternatively, in comparing financial statements for a number of years, the analyst may prefer to use a variation trend analysis. Trend



analysis involves calculating each year's financial statement balances as percentages of the first year, also known as the base year. When expressed as percentages, the base year figures are always 100 percent, and percentage changes from the base year can be determined ( *Panday I.M. 1999 :603 - 605*)

### **2.3.2 Cash Flow Analysis**

Cash flow analysis is the study of the cycle of a business' cash inflows and outflows, with the purpose of maintaining an adequate cash flow for a business, and to provide the basis for cash flow management. Cash flow analysis involves examining the components of a business that affect cash flow, such as accounts receivable, inventory, accounts payable, and credit terms. By performing a cash flow analysis on these separate components, a business will be able to more easily identify cash flow problems and find ways to improve its cash flow. A quick and easy way to perform a cash flow analysis is to compare the total unpaid purchases to the total sales due at the end of each month. If the total unpaid purchases are greater than the total sales due, then a business needs to spend more cash than it receives in the next month, indicating a potential cash flow problem. A revenue or expense stream that changes a cash account over a given period. Cash inflows usually arise from one of three activities - financing, operations or investing - although this also occurs as a result of donations or gifts in the case of personal finance. Cash outflows result from expenses or investments. This holds true for both business and finance.

An accounting statement called the "statement of cash flows", which shows the amount of cash generated and used by a company in a given period. It is calculated by adding non cash charges (such as depreciation) to net income after taxes. Cash flow can be attributed to a specific project, or to a business as a whole. Cash flow can be used as an indication of a company's financial strength. In business as in personal finance, cash flows are essential to solvency. They can be presented as a record of something that has happened in the past, such as the sale of a particular product, or forecasted into the future, representing what a business or a person expects to take in and to

spend. Cash flow is crucial to an entity's survival. Having ample cash on hand will ensure that creditors, employees and others can be paid on time. If a business or person does not have enough cash to support its operations, it is said to be insolvent, and a likely candidate for Bankruptcy should the insolvency continue. The statement of a business's cash flows is often used by analysts to gauge financial performance. Companies with ample cash on hand are able to invest the cash back into the business in order to generate more cash and profit. (*Snvastava, R.M.1993:785*)

### **2.3.3 Ratio Analysis**

Ratio analysis enables the analyst to compare items on a single financial statement or to examine the relationships between items on two financial statements. After calculating ratios for each year's financial data, the analyst can then examine trends for the company across years. Since ratios adjust for size, using this analytical tool facilitates intercompany as well as intra-company comparisons. Ratios are often classified using the following terms: profitability ratios (also known as operating ratios), liquidity ratios, and solvency ratios. Profitability ratios are gauges of the company's operating success for a given period of time. Liquidity ratios are measures of the short-term ability of the company to pay its debts when they come due and to meet unexpected needs for cash. Solvency ratios indicate the ability of the company to meet its long-term obligations on a continuing basis and thus to survive over a long period of time. In judging how well on a company is doing, analysts typically compare a company's ratios to industry statistics as well as to its own past performance. The following ratios can be used to examine the performance of a company. (*Western & Brigham, 1996: 609 - 613*)

#### **2.3.3.1. Liquidity Ratios**

The difference between current assets and current liabilities is known as working capital, which provides the liquidity position of a business. It is extremely essential for a business to meet its obligations, so

sufficient liquidity should be maintained neither excess nor less. A high degree of liquidity shows inability of proper utilization of funds whereas low degree of liquidity signals poor credit worthiness, loss of creditors confidence resulting in closure of a business. So appropriate liquidity should be maintained to meet short term liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio suggests that the company would be unable to pay off its obligations if they came due at that point. While this shows the company is not in good financial health, it does not necessarily mean that it will go bankrupt - as there are many ways to access financing.

The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. Companies that have trouble getting paid on their receivables or have long inventory turnover can run into liquidity problems because they are unable to alleviate their obligations. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaid as assets that can be liquidated. The components of current ratio (current assets and current liabilities) can be used to derive working capital (difference between current assets and current liabilities). Working capital is frequently used to derive the working capital ratio, which is working capital as a ratio of sales. (*Western & Brigham, 1996: 513 - 516*)

### **Current Ratio**

It measures short-term solvency, often known as liquidity solvency ratio and working capital ratio.

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

Currents assets represent the amount of liquid cash that is, cash and near cash assets available to the business, which can be converted into cash within a year. Current liabilities give an indication of the upcoming cash requirements are payable within a year from current assets.

The proportion of current ratio 2:1 or more is considered satisfactory, which is based on assumption that even if the current assets are decreased by half, a firm can still meet its current obligations. *Sthapit, A.B. 2006:467-469*)

### **Cash and Bank Balance to Current Asset Ratio**

Cash and bank balance to current asset ratio reflects the portion of cash and bank balance in total of current assets. Cash and bank balance are highly liquid assets than other in current assets portion so this ratio visualizes higher liquidity position than current ratio. (*Snvastava, R.M.1993:789*)

This ratio can be calculated by using the following formula.

$$\text{Cash and Bank Balance to Current Assets Ratio} = \frac{\text{Total of Cash and Bank Balance}}{\text{Total of Current assets}}$$

### **2.3.3.2 Capital Structure Ratios**

Capital Structure Ratio are calculated to judge the long term financial position of the firm. These ratios indicate a mix of funds provided by owners and lenders. As a general rule, there should be an appropriate mix of debt and owners equity in financing the firms assets. Administration of capital can smoothly be carried on with the help of such ratios. Various capital structure ratios have been examined in this section. (*Needles, B.E. 1989: 984 - 986*)

### **Total Debt to Equity Ratio**

It is determined to measure the firm's obligation to creditors in relation to funds

$$\text{Total Debt to Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

## **Total Debt to Total Asset Ratio**

It reflects the financial contribution of outsiders and owners on total assets of the firm. It also measures the financial security to the outsiders.

$$\text{Total Debt to Total Assets} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

### **2.3.3.3 Profitability ratio:**

A class of financial metrics that are used to assess a business's ability to generate earnings as compared to its expenses and other relevant costs incurred during a specific period of time. For most of these ratios, having a higher value relative to a competitor's ratio or the same ratio from a previous period is indicative that the company is doing well.

Some examples of profitability ratios are profit margin, return on assets and return on equity. It is important to note that a little bit of background knowledge is necessary in order to make relevant comparison while analyzing these ratios. For instances, some industries experience seasonality in their operations. The retail industry, for example, typically experiences higher revenues and earnings for the Christmas season. Therefore, it would not be too useful to compare a retailer's fourth-quarter profit margin with its first-quarter profit margin. On the other hand, comparing a retailer's fourth-quarter profit margin with the profit margin from the same period a year. We have used the following profitability ratios for the study.( *Panday, I.M. 1999*)

### **After-Tax Profit Margin**

A financial performance ratio, calculated by dividing net income after taxes by net sales. A company's after-tax profit margin is important because it tells investors the percentage of money a

company actually earns per dollar of sales. This ratio is interpreted in the same way as profit margin - the after-tax profit margin is simply more stringent because it takes taxes into account. Often, a company's earnings don't tell the entire story. The amount of profit can increase, but that doesn't mean the company's profit margin is improving. For example, a company's sales could increase, but if costs also rise, that leads to a lower profit margin than what the company had when it had lower profits. This is an indication that the company needs to better control its costs. *(Jones Allen N.Feb, 5, 1996)*

### **Gross Margin**

A company's total sales revenue minus its cost of goods sold, divided by the total sales revenue, expressed as a percentage. The gross margin represents the percent of total sales revenue that the company retains after incurring the direct costs associated with producing the goods and services sold by a company. The higher the percentage, the more the company retains on each dollar of sales to service its other costs and obligations. *(Jones Allen N.Feb, 5, 1996)*

### **Net Income - NI**

Net income is calculated by taking revenues and adjusting for the cost of doing business, depreciation, interest, taxes and other expenses. This number is found on a company's income statement and is an important measure of how profitable the company is over a period of time. The measure is also used to calculate earning per share. Net income is calculated by starting with a company's total revenue. From this, the cost of sales, along with any other expenses that the company incurred during the period, is removed to reach earnings before tax. Tax is deducted from this amount to reach the net income number. Net income, like other accounting measures, is susceptible to manipulation through such things as aggressive revenue recognition or by hiding expenses. When basing an investment decision on net income numbers, it is important to review the quality of the numbers that were used to arrive at this value. *(Jones Allen N.Feb, 5, 1996)*

## **Return on Equity - ROE**

The ROE is useful for comparing the profitability of a company to that of other firms in the same industry. There are several variations on the formula that investors may use. Investors wishing to see the return on common equity may modify the formula above by subtracting preferred dividends from net income and subtracting preferred equity from shareholders' equity. Return on equity may also be calculated by dividing net income by *average* shareholders' equity. Average shareholders' equity is calculated by adding the shareholders' equity at the beginning of a period to the shareholders' equity at periods' end. (*Higgins Robert , C. 2000*)

### **2.4 Objectives of Financial Statement Analysis**

The objective of financial statements analysis is to provide information about the financial strength, performance and changes in financial position of an enterprise that is useful to a wide range of users in making economic decisions. Financial statements should be understandable, relevant, reliable and comparable. Reported assets, liabilities and equity are directly related to an organization's financial position. Reported income and expenses are directly related to an organization's financial performance. Financial statement analysis, being an information processing system designed to provide data for decision making, thus involves a study of relationship among various financial factors in a company as disclosed by a single set of statement and a study of trends of these factors as shown in series of statements. It aims to provide a clear understanding of changing profitability and financial condition of the company. However, objectives of financial statement analysis differ as per the need of different parties involved in a company. (*Moer, J.N. 1961: 856*)

### **2.5 Significance of Financial Statement Analysis**

Financial statement reports both on a firm's position at a point in time and on its operations over some past period. However, their real value lies in the fact that they can be used to help predict the firm's future earnings and

dividends. From an investor's standpoint, predicting the future is what financial statement is all about, while from management's standpoint, financial statement analysis is useful both as a way to anticipate future conditions and, more important as a starting point for planning actions that will influence the future course of events. It is important to different group of a company such as top management, creditors, shareholders, economist and labour unions.

Top management, being responsible of ensuring that the resources are used most efficiently and effectively and that the company's financial position is sound, must analyse financial statements to measure whether stated objectives have been met or not and to formulate operating strategies and policies so as to enhance overall performance of the company.

While trade creditors are interested in a company to meet the claim over a short period of time, the lenders of long-term debt are interested with a company's long-term solvency and survival. The lenders can decide whether the borrower retains the capacity of refunding the principal and paying interest in time or not through an analysis of financial statements.

The investors, who have invested their funds in a company's shares, are most concerned about the company's earning. Normally, if the performance of the company is excellent, the shareholders wish to buy shares whereas, they simply intend to hold the shares in case of satisfactory profit. And they rush to sell their shares in case of poor performance of the company. So the analysis of financial statements helps the shareholders to decide whether to buy, sell or hold the shares.

Economist analyse the financial statements with a view to study the prevailing business and economic condition. The governmental agencies analyze them for the purpose of price regulation, rate setting, taxes and similar other purposes.

Labour unions are interested in rights and benefits of labour to raise the moral of labours. To motivate the labours they expect increase in wages, fringe benefits and so on. An analysis of financial statements assists labour unions to assess whether the company is in the situation or not to make facilities available. (*Khan , M.Y. and Jain P.K. 1999: 704 - 706*)



## **CHAPTER III**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

Research is a systematic method of finding out solution to a problem where as research methodology refers to “various sequential steps to adopt by a research in studying a problem with certain objective in view”. In other words, research methodology describes the methods, techniques and process applied in the entire aspect of the study.

#### **3.2 Research Design**

The formidable problem that follows in task of defining the research is the preparation of design of the research project, popularly known as research design. Research design is the main part of a thesis or any research work. This study tries to evaluate the performance of selected nature of operations. To accomplish the objectives it has adopted the descriptive and analytical type of research design. It tries to describe and analyze all these facts that have been collected for the purpose of the study.

Financial and accounting tools have also been applied to examine the facts and descriptive techniques have been adopted to evaluate the structure of selected nature of operations.

#### **3.3 Sources of Data**

This is the study of two Hydropower Company. Data's are collected from both primary source i.e., by indirect oral investigation and telephonic interview from the persons concerned of selected companies and secondary source i.e., from the Financial Statements of the selected companies. But my main source of data is secondary i.e. from financial statements of the companies under study.

#### **3.4 Populations and Sample**

Population is known universe sample as the part of population, which represent the total population attributes and characteristics. I have

hydropower industry as the population and the sample for study are Butwal Power Company, and Himal Hydropower Limited.

### **3.5 Methods of Data Analysis**

I have used some financial, accounting tools and statistical tools to achieve the objectives of the study. The analysis of data will be done according to the pattern of data available. Due to limited time and resources simple analytical approach has been used.

#### **3.5.1 Financial Tools**

Financial tools are used to examine the financial performance i.e., strength to weakness. In this study financial tool like ratio analysis have been used.

##### **(i) Ratio Analysis**

Ratio analysis is a major device of measuring the financial activities of an enterprise. A ratio analysis is a significant way by which financial stability and health of a business concern can be judged. It also helps to draw future plans and forecasting. The process of determining and interpreting numerical relationships are based on financial statements. The relationship between two accounting figures, expressed mathematically is known as financial ratio. This study consist of ratios such as Liquidity ratios, Profitability ratios Earning Per Share, Dividend Per Share, Dividend Payout Ratio, Activity/efficiency/assets management ratios.

#### **3.5.2 Statistical Tools**

To achieve the objectives of the study, some important statistical tools such as arithmetic mean, correlation regression and compound growth rate are used which are as given follows:-

##### **(i) Arithmetic Mean:**

Arithmetic mean of a list of numbers is the sum of all the members of the list divided by the number of items in the list. If the list is a

statistical population, then the mean of that population is called a population mean. If the list is a statistical sample, we call the resulting statistic a sample mean.

The mean is the most commonly used type of average and is often referred to simply as the average. The term "mean" or "arithmetic mean" is preferred in mathematics and statistics to distinguish it from other averages such as the median and the mode.

In this study, AM of different ratios are calculated. In general, if  $X_1, X_2, \dots, X_n$  are the given  $n$  observations, then their arithmetic mean, usually denoted by  $\bar{X}$  is given by:

$$\bar{X} = \frac{X_1 + X_2 + \dots + X_n}{n} = \frac{\sum x}{n}$$

Where,

$\sum x$  = the sum of the observations and

$n$  = no. of years

**(ii) Correlation Coefficient: -**

A correlation coefficient is a number between -1 and 1, which measures the degree to which two variables are linearly related. If there is perfect linear relationship with positive slope between the two variables, we have a correlation coefficient of 1; if there is positive correlation, whenever one variable has a high (low) value, so does the other. If there is a perfect linear relationship with negative slope between the two variables, we have a correlation coefficient of -1; if there is negative correlation, whenever one variable has a high (low) value, the other has a low (high) value. A correlation coefficient of 0 means that there is no linear relationship between the variables.. In this study, it is used to calculate coefficient of correlation between net profit and different ratios calculated. It is calculated by the formula:

$$r = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum(x - \bar{x})^2 \sum(y - \bar{y})^2}}$$

**(iii) Regression Analysis**

Regression is the statistical tool expresses the relationship between two (or more) variables algebraically. It indicates the nature of the relationship between two (or more) variables. In particular, it indicates the extent to which you can predict some variables by knowing others, or the extent to which some are associated with others. The regression equation of Y on X is expressed as,

$$Y_e = a + bx \dots \dots \dots (1)$$

The regression equation of X on Y is expressed as,

$$X = a + by \dots \dots \dots (2)$$

The following two normal equations are solved simultaneously to find out the value of a and b.

$$\sum x = Na + b \sum y \dots \dots \dots (a)$$

$$\sum xy = a \sum y + b \sum y^2 \dots \dots \dots (b)$$

Solving two normal equations (a) and (b), we get,

$$a = (\bar{x} - b\bar{y}) \text{ and,}$$

$$b = \frac{N \sum XY - (\sum X)(\sum Y)}{N \sum Y^2 - (\sum Y)^2} \dots \dots \dots (d)$$

**(iv) Probable Error of Coefficient of Correlation**

Probable Error of Correlation coefficient is an old measure of testing the reality of an observed value of correlation coefficient. It is calculated to find the extent to which correlation coefficient depends upon the condition of random sample. Probable error of correlation coefficient denoted by PE(r) is obtained by:

$$PE = 0.6745 \times \frac{1-r^2}{\sqrt{N}}$$

where,  $\frac{1-r^2}{\sqrt{N}}$  = Standard Error

Reason for taking 0.6745 is that in a normal distribution, 50% of observations lie in the range  $p = \pm 0.6745$

PE is used to test if an observed value of sample correlation coefficient is significant of any correlation in the population. If  $r > 6$  PE, correlation is significant otherwise not.

### (v) Least Square Linear Trend

Trend analysis is a very useful and commonly applied tool to forecast the future event in quantitative term, on the basis of the tendencies in the dependent variable in the past period. The straight line trend implies that irrespective of the seasonal and cyclical as well as irregular fluctuation, the trend value increases by absolute amount per unit of time. The linear trend values from a series in arithmetic progression.

Mathematically  $Y = a + bX$

Where,  $Y$  = value of the dependent value

$A$  =  $Y$  –intercept

$B$  = slope of the trend line

$X$  = value of the independent value

Normal equations fitting above equation are:

$$\sum Y = Na + b\sum X$$

$$\sum XY = a\sum X + b\sum X^2$$

Since,  $\sum X=0$ ,  $a = \frac{\sum Y}{N}$ , and  $b = \frac{\sum XY}{\sum X^2}$

## The Chi-Square Test

The Chi-square test is designed to work with nominal data. It provides the researcher with a mathematical way of examining a classification table to see whether the arrangement of values within that table is unusual in some way. In performing this test, the mathematical process will be looking for a significant difference between the observed and expected frequencies. The chi-square test involves a comparison of two or more responding groups.

Since Chi-square test does not make any assumption about population parameters, it is called distribution free test. This test is good for normal or ordinal scale of measurement. Chi-square test is also used for analysis of quantitative variables, such as opinion of people, religious affiliation, smoking habits and so on. Chi-square test is a test that describes the magnitude of difference between observed and expected (theoretical) frequencies under certain assumptions. In other words, it describes the magnitude of the discrepancy between theory and observation.

It is defined as:

$$\text{Chi-square, } \chi^2 = \sum \frac{(O - E)^2}{E}$$

Where, O = Observed Frequency

E = Expected Frequency

$$\text{Expected Frequency (E)} = \frac{RT \times CT}{N}$$

Where, N = Number of observation

RT = Row Total

CT = Column Total

*Note: 5% level of significance have been used for all tests*

## **CHAPTER IV**

### **DATA PRESENTATION AND ANALYSIS**

In this chapter, the data have been analysed and interpreted using financial statement tools and statistical tools following the research methodology dealt in the third chapter. In the part of analysis, various tables have been prepared and data collected from different sources have been inserted in the required tables according to their homogeneous nature. The outcomes of the analysis of both the companies have been compared with each other. Furthermore many suitable graphs, lines and diagrams have also been used to clarify the actual position, and performance of the companies. So this chapter concentrates on the analysis and evolution of the financial performance on the basis of

- Ratio analysis
- Income/expenditure analysis
- Least square trend analysis
- Growth analysis

#### **4.1 Ratio Analysis**

##### **4.1.1 Liquidity Ratios**

A class of financial metrics that is used to determine a company's ability to pay off its short-terms debts obligations. Generally, the higher the value of the ratio, the larger the margin of safety that the company possesses to cover short-term debts.

##### **Current Ratio**

Current ratio measures the liquidity position of the company. The standard current ratio should be 2:1 and it is also defined by the nature of the company. The current ratio of different sampled years has been presented in the table no. 4.1 below.

**Table No. 4.1**

**Calculation of Current Ratio**

(In Thousand NRs.)

Year	Current assets		Current liabilities		Ratio	
	BPC	HPL	BPC	HPL	BPC	HPL
2005/06	520,987	2,417,624	261,299	1,086,310	1.99	2.23
2006/07	481,833	1,894,735	210,152	485,106	2.29	3.91
2007/08	335,582	2,182,302	155,657	809,554	2.16	2.70
2008/09	543,416	2,326,982	433,618	784,873	1.25	2.96
2009/10	670,674	2,199,619	562,584	881,517	1.19	2.50
<b>Mean</b>					<b>1.78</b>	<b>2.86</b>
<b>Standard Deviation</b>					<b>0.52</b>	<b>0.65</b>
<b>Coefficient of variance (C.V.) in %</b>					<b>29.14</b>	<b>22.59</b>

Looking over the trend of current ratio of BPC over 5 years, it can be observed that other than last two years, the company's current ratio has remained satisfactory. Increased creditors and payables of BPC is the reason for decreased current ratio in last two years.

But HPL has been enjoying a higher current ratio than the BPC. Though both companies has fluctuating trend of current ratio, HPL's "mean" current ratio of 2.86 seems to be over than the conventional standard of 2:1 which suggests a sound liquidity position than BPC's mean current ratio. Likewise HPL has a higher CV than that of BPC that means that HPL has more fluctuations in ratios than BPC and the main reason behind this is because of higher current ratio of HPL on 2006/07.

**Quick Ratio**

The quick ratio is more accurate guide to measure the liquidity position of any company.

Generally a quick ratio of 1:1 (quick assets equal to current liabilities) is considered satisfactory as it means a company can easily meet all current claims.



**Table No.4.2**

**Calculation of Quick Ratio**

(In Thousand NRs.)

Year	Quick assets		Current liabilities		Ratio	
	BPC	HPL	BPC	HPL	BPC	HPL
2005/06	477,002	2,417,624	261,299	1,086,310	1.83	2.23
2006/07	440,067	1,894,735	210,152	485,106	2.09	3.91
2007/08	287,544	2,182,302	155,657	809,554	1.85	2.70
2008/09	485,793	2,326,982	433,619	784,873	1.12	2.96
2009/10	611,778	2,199,619	562,584	881,517	1.09	2.50
<b>Mean</b>					<b>1.59</b>	<b>2.86</b>
<b>Standard Deviation</b>					<b>0.46</b>	<b>0.65</b>
<b>Coefficient of variance (C.V.) in %</b>					<b>28.9</b>	<b>22.6</b>

Above table reveals a fluctuating trend of quick ratio of BPC with a mean current ratio of 1.59 whereas HPL has higher mean quick ratio of 2.86. Except in year 2006/07 where both companies has a higher ratio than the other years on study, HPL's ratios shows that it has a more adequate resources to meet current obligation than the BPC which too has a sound quick assets to meet current liabilities. It is to mention here that HPL has no or very small amount of closing inventory which was not possible to quantify from the available financial statements.

**4.1.2 Activity/Efficiency/Assets Management Ratios**

Activity ratios are called Efficiency or Assets management ratios indicate the speed with which assets are being converted or turned over into sales. A proper balance between sales and assets generally reflects that assets are managed well. The following activity ratios are used to judge the effectiveness of assets utilization in this study.

**Fixed Assets Turnover ratio (FATOR)**

This ratio is a rough measure of the productivity of a company's fixed assets (property, plant and equipment or PP&E) with respect to generating sales. For most companies, their investment in fixed assets represents the single largest component of their total assets. This annual turnover ratio is designed

to reflect a company's efficiency in managing these significant assets. Simply put, the higher the yearly turnover rate, the better.

**Table No. 4.3**

**Calculation of Fixed Assets Turnover ratio**

(In Thousand of NRs.)

Year	Sales		Fixed Assets		Ratio	
	BPC	HPL	BPC	HPL	BPC	HPL
2005/06	96,364	2,193,850	764,374	8,570,394	0.13	0.26
2006/07	283,167	2,092,032	732,617	8,213,644	0.39	0.25
2007/08	323,134	2,104,124	714,334	7,908,173	0.45	0.27
2008/09	358,419	2,121,897	762,181	7,551,062	0.47	0.28
2009/10	379,769	2,307,461	745,004	7,203,678	0.51	0.32
<b>Mean</b>					<b>0.39</b>	<b>0.28</b>
<b>Standard Deviation</b>					<b>0.15</b>	<b>0.03</b>
<b>Coefficient of variance (C.V.) in %</b>					<b>39.5</b>	<b>9.84</b>

From above table it is seen that the sales is in increasing trend for both the companies. Except in 2006/07, BPC has used its fixed assets quite adequately; generating an overall mean sale of Rs. 0.39 out of each rupee invested in fixed assets. HPL is also not far behind in generating not-so-modest sale at per rupee investment in fixed assets. It has a mean fixed assets turnover ratio of 0.28 and CV of 9.84% that is also less than the CV of BPC. Thus, the volatility of ratios is far lower in HPL than BPC, which is a good indicator.

**Total Assets Turnover ratio (TATOR)**

Asset turnover measures a firm's efficiency at using its assets in generating sales or revenue - the higher the number the better. It also indicates pricing strategy: companies with low profit margins tend to have high asset turnover, while those with high profit margins have low asset turnover.

**Table No. 4.4**

**Calculation of Total Assets Turnover Ratio**

(In Thousand of NRs.)

2005/06	96,364	2,193,850	1,825,464	22,495,000	0.05	0.10
2006/07	283,167	2,092,032	1,579,195	12,574,721	0.18	0.17
2007/08	323,134	2,104,124	1,439,238	10,098,600	0.22	0.21
2008/09	358,419	2,121,897	1,744,447	9,897,921	0.21	0.21
2009/10	379,769	2,307,461	1,882,271	9,423,896	0.20	0.24
Mean					0.17	0.19
Standard Deviation					0.07	0.06
Coefficient of variance (C.V.) in %					39.9	30.6

Above table reveals a fluctuating and unsatisfactory total assets turnover ratio of BPC in 2005/06 with compared to HPL. Although in later years the trend of total assets turnover ratio is about the same with mean of 0.17 for BPC and 0.19 for HPL and CV of 39.9% and 30.6% for BPC and HPL respectively which shows that coefficient of variance of BPC is more volatile than that of HPL's coefficient of variance. With compared to HPL, BPC is not utilizing its assets in efficient way to generate sales.

**Inventory Turnover Ratio**

Inventory turnover ratio represents how often a company's inventory is sold, and then replaced, over a particular period. In other words, it shows how long it takes for a company to sell its goods and then replace

Keep in mind that the inventory turnover ratio can be calculated with a simple equation: sales divided by inventory.

Understand Average inventory turnover ratios vary by industry, so a company's ratio should always be compared to others in its field for context. Generally, low turnover is a bad sign, since it signifies that the company is having a hard time selling its goods. The longer goods remain unsold, the longer the money the company paid to produce those goods is tied up in

them, with a return of zero until they are sold. Higher inventory turnover ratios, therefore, are desirable.

**Table No. 4.5**

**Calculation of Inventory Turnover Ratio**

(In Thousand of NRs.)

Year	Sales	Closing Stock	Ratio (Times)
	BPC	BPC	BPC
2005/06	96,364	43,985	2.19
2006/07	283,167	41,766	6.78
2007/08	323,134	48,038	6.73
2008/09	358,419	57,623	6.22
2009/10	379,769	58,896	6.45
<b>Mean</b>			<b>5.67</b>
<b>Standard Deviation</b>			<b>1.96</b>
<b>Coefficient of variance (C.V.) in %</b>			<b>34.54</b>

Except in the year 2006/07 when the inventory turnover ratio was 2.19, BPC has able to decrease its inventory level with compared to proportion of sales. Their sale has increased to 6 times of inventory level, which is a good sign of the company's efficient management. The mean inventory ratio of 5.67 is slightly lower than the average of last four years that is the result of lower turnover ratio of 2005/06. And its Standard deviation is 1.96 and coefficient of variance is 34.54%.

There is no or minimal closing inventory in HPL so that it is not possible to compare this ratio. But if we assume it to be very low than BPC has very high inventory ratio with compared to HPL.

**Receivables' Turnover Ratio**

Receivable turnover ratio measures the number of times, on average; receivables (e.g. Accounts Receivable) are collected during the period. A popular variant of the receivables turnover ratio is to convert it into an Average Collection Period in terms of days. Remember that the Receivable

turnover ratio is figured as "turnover times" and the Average collection period is in "days".

By maintaining accounts receivable, firms are indirectly extending interest-free loans to their clients. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

A low ratio implies the company should re-assess its credit policies in order to ensure the timely collection of imparted credit that is not earning interest for the firm.

**Table No. 4.6**

**Calculation of Receivables Turnover Ratio**

(In Thousand of NRs.)

Year	Sales		Accounts receivable		Ratio	
	BPC	HPL	BPC	HPL	BPC	HPL
2005/06	96,364	2,193,850	36,224	396,465	2.66	5.53
2006/07	283,167	2,092,032	31,309	416,028	9.04	5.03
2007/08	323,134	2,104,124	42,921	393,674	7.53	5.34
2008/09	358,419	2,121,897	35,512	428,146	10.09	4.96
2009/10	379,769	2,307,461	58,918	417,834	6.45	5.52
<b>Mean</b>					<b>7.15</b>	<b>5.28</b>
<b>Standard Deviation</b>					<b>2.87</b>	<b>0.27</b>
<b>Coefficient of variance (C.V.) in %</b>					<b>40.18</b>	<b>5.15</b>

Above table reveals a fluctuating trend of receivables turnover ratio with steady trend of receivables turnover ratio of HPL. Due to considerable amount of receivables, the receivables turnover ratio of BPC has dropped to 6.45 in 2009/10 with that of previous year. The mean of receivable turnover ratio is 7.15 for BPC and 5.28 for HPL.

Standard deviation of BPC and HPL is 2.87 and 0.27 and coefficient of variance is 40.18% and 5.15% respectively. The higher coefficient of variance of BPC shows that it has very volatile accounts receivable where as the HPL has no or very low volatility of sales to accounts receivable.

## Average Collection Period

The average collection period provides the average turnover days receivables and outstanding, the average time it takes to convert them into cash. Short average collection period shows the timely payment of debt and long average collection period indicates inefficiency of the company in collection of receivables.

**Table No.4.7**

### Calculation of Average collection period

(In Thousand of NRs.)

Year	days in Year	Debtors turnover ratio		ACP (days)	
		BPC	HPL	BPC	HPL
2005/06	365	2.66	5.53	137.22	66.00
2006/07	366	9.04	5.03	40.49	72.76
2007/08	365	7.53	5.34	48.47	68.35
2008/09	365	10.09	4.96	36.17	73.59
2009/10	365	6.45	5.52	56.59	66.12
<b>Mean</b>				<b>63.79</b>	<b>69.37</b>
<b>Standard Deviation</b>				<b>41.78</b>	<b>3.613</b>
<b>Coefficient of variance (C.V.) in %</b>				<b>65.51</b>	<b>5.21</b>

Above table reveals a very fluctuating trend of Average collection period of BPC with a mean of 64 days. Although the last four years shows that it has less collection period than the average period but the mean does not describe the true picture of BPC which has experiencing a high collection period even in 2009/10 with compared to 2008/09 when the collection period increased by 20 days. It has also a more volatile average collection period that we can see from the coefficient of variance, which is stood at 65.5%. It shows the inefficiency of accounts department of BPC.

The mean of average collection period of HPL is 69.37 days, which is higher than BPC, but the volatility of average collection period is lower for HPL than BPC at 5.21%.

### 4.1.3 Leverage / Capital Structure Ratios

Leverage ratio, also called as Capital Structure ratio, is calculated to judge the long-term financial position of the company. This ratio indicates the mix of funds provided by the owners and lenders.

#### Debt-Equity Ratio

Debt to shareholders equity is calculated dividing total debts by total shareholders' equity. This ratio shows the relationship between debt capital and equity capital.

#### Debt to Total Assets Ratio

Debt to total assets ratio is calculated dividing total debts by total assets. This ratio shows the relationship between debt capital and total assets.

**Table No. 4.8**

#### Calculation of Leverage Ratios

(In Thousand of NRs.)

Year	Total debt of HPL	Shareholders' Equity of HPL	Total assets of HPL	Leverage Ratio of HPL	
				Debt to Equity	Debt to Total assets
2005/06	6,429,352	3,483,863	10,999,524	1.85	0.58
2006/07	5,807,483	3,818,257	10,110,845	1.52	0.57
2007/08	4,987,040	4,302,006	10,098,599	1.16	0.49
2008/09	4,598,321	4,514,727	9,897,921	1.02	0.46
2009/10	3,432,851	5,109,527	9,423,895	0.67	0.36
<b>Mean</b>				<b>1.24</b>	<b>0.50</b>
<b>Standard Deviation</b>				<b>0.454</b>	<b>0.090</b>
<b>Coefficient of variance (C.V.) in %</b>				<b>36.50</b>	<b>18.11</b>

Above table shows that HPL has a decreasing trend of both debt to equity and debt to total assets ratios. The debt to shareholders equity ratio has fallen from 1.85 to 0.67 with a mean of 1.24 and coefficient of variance of 36.5% for last 5 years. Likewise debt to total assets has also fallen from 0.58 to

0.36 with mean of 0.5 and coefficient of variance of 18.11% in the same period. Although the coefficient of variance shows the volatility or risks for the investors, the company's profitability and reserves shows that they will get their return in form of dividend.

#### **4.1.4 Profitability Ratios**

Profitability ratios give users a good understanding of how well the company utilized its resources in generating profit and shareholder value

The long-term profitability of a company is vital for both the survivability of the company as well as the benefit received by shareholders. It is these ratios that can give insight into the all-important "profit".

##### **Net Profit Ratio**

Often referred to simply as a company's profit margin, the so-called bottom line is the most often mentioned when discussing a company's profitability. While undeniably an important number, investors can easily see from a complete profit margin analysis that there are several income and expense operating elements in an income statement that determine a net profit margin. It behooves investors to take a comprehensive look at a company's profit margins on a systematic basis.



**Table No.4.9**

**Calculation of Net Profit Ratio**

(In Thousand of NRs.)

Year	Net profit after tax		Sales		Ratio (%)	
	BPC	HPL	BPC	HPL	BPC	HPL
2005/06	(44,944)	773,597	96,364	2,193,850	-46.64	35.26
2006/07	235,418	893,285	283,167	2,092,032	83.14	42.70
2007/08	197,761	1,162,551	323,134	2,104,124	61.20	55.25
2008/09	288,419	878,985	358,419	2,121,897	80.47	41.42
2009/10	252,840	1,482,560	379,769	2,307,461	66.58	64.25
<b>Mean</b>					<b>48.95</b>	<b>47.78</b>
<b>Standard Deviation</b>					<b>54.223</b>	<b>11.73</b>
<b>Coefficient of variance (C.V.) in %</b>					<b>110.77</b>	<b>24.54</b>

Above table shows a fluctuating trend of net profit ratio for both the companies. In 2005/06 BPC has suffered a loss of 46.64% due to decreased sales. Although, the net profit after tax ratio remained admirable in later years with increasing in trend and overall mean ratio of 48.95%, the coefficient of variance at 110% is very high which shows the volatility of the net profit after tax on proportionate change in sales. On the other hand, net profit ratio of HPL is also increasing in trend with a mean ratio of 47.78% and lower coefficient of variance of 24.54% with compared to BPC.

**Operating and Administration Expenses Ratios (OER)**

The Operating Expense Ratio is usually viewed as a measurement of management efficiency. This is because management usually has greater control over operating expenses than they do over revenues.

The operating expense ratio is calculated: Operating Expenses / Net Sales

When viewed over time, the operating expense ratio can tell you if management can expand operations without dramatically increasing expenses. For example, if sales were to expand from year to year and the operating expense ratio goes down. This would mean that sales increased,

and operating expense went down at an even faster rate. This would be a very positive situation from a net income standpoint.

**Table No.4.10**

**Calculation of Operating Expenses ratio**

(In Thousand of NRs.)

Year	Operating expenses		Sales		Ratio (%)	
	BPC	HPL	BPC	HPL	BPC	HPL
2005/06	110,922	280,076	96,364	2,193,850	115.11	12.77
2006/07	123,856	271,344	283,167	2,092,032	43.74	12.97
2007/08	146,000	280,773	323,134	2,104,124	45.18	13.34
2008/09	137,451	271,626	358,419	2,121,897	38.35	12.80
2009/10	154,287	353,751	379,769	2,307,461	40.63	15.33
<b>Mean</b>					<b>56.60</b>	<b>13.44</b>
<b>Standard Deviation</b>					<b>32.814</b>	<b>1.08</b>
<b>Coefficient of variance (C.V.) in %</b>					<b>57.975</b>	<b>8.035</b>

Above table depict the fluctuating trend of operating and administration expenses ratio of BPC. In 2005/06 the ratio was 115%, which shows that it had its expenses more than its sales. On later years the ratios were quite good with compared to the ratio of 2005/06, but it still has very high with compared to the operating and administration expenses ratio of HPL which was very steady with a mean ratio of 13.44% coefficient of variance of 8%, whereas the mean ratio of BPC was 56.6% and coefficient of variance of 57.9%. These ratios indicate that BPC has considerably high and fluctuating trend of operating and administration expenses than that of HPL.

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

This ratio indicates how profitable a company is by comparing its net income to its average shareholders' equity. The return on equity ratio (ROE) measures how much the shareholders earned for their investment in the company. The higher the ratio percentage, the more efficient management is in utilizing its equity base and the better return is to investors.

**Table No. 4.11****Return on Shareholders Equity**

(In Thousand of NRs.)

Year	Net profit after tax		Shareholders' equity		Ratio (%)	
	BPC	HPL	BPC	HPL	BPC	HPL
2005/06	(44,944)	773,597	1,537,645	3,483,863	-2.92	22.21
2006/07	235,418	893,285	1,345,784	3,818,257	17.49	23.40
2007/08	197,761	1,162,551	1,254,669	4,302,006	15.76	27.02
2008/09	288,419	878,985	1,300,568	4,514,727	22.18	19.47
2009/10	252,840	1,482,560	1,294,863	5,109,527	19.53	29.02
<b>Mean</b>					<b>14.41</b>	<b>24.22</b>
<b>Standard Deviation</b>					<b>9.9782</b>	<b>3.813</b>
<b>Coefficient of variance (C.V.) in %</b>					<b>69.259</b>	<b>15.74</b>

The above table shows a fluctuating trend of return on shareholders' equity of BPC with a mean ratio of 14.4%. In 2005/06 BPC suffered a loss which affected its return on shareholders' equity with a negative ratio of 2.92%, although in later years the ratios has been satisfactory revolving around 15%. On the other hand, HPL has maintained considerably higher and stable trend of return on shareholders' equity with an overall mean ratio of 24.2% and coefficient of variance of 15.74%. BPC with lower mean ratio higher coefficient of variance ratio proves to be less attractive than HPL for shareholders and investors.

**Return on Total Assets**

This ratio indicates how profitable a company is relative to its total assets. The return on total assets (ROTA) ratio illustrates how well management is employing the company's total assets to make a profit. The higher the return, the more efficient management is in utilizing its asset base. The ROTA ratio is calculated by comparing net income to average total assets, and is expressed as a percentage.

**Table No. 4.12**

**Calculation on Return on Total Assets**

(In Thousand of NRs.)

Year	Net profit after tax		Total Assets		Ratio (%)	
	BPC	HPL	BPC	HPL	BPC	HPL
2005/06	(44,944)	773,597	1,825,464	10,999,524	-2.46	7.03
2006/07	235,418	893,285	1,579,195	10,110,845	14.91	8.83
2007/08	197,761	1,162,551	1,439,238	10,098,599	13.74	11.51
2008/09	288,419	878,985	1,744,447	9,897,921	16.53	8.88
2009/10	252,840	1,482,560	1,882,271	9,423,895	13.43	15.73
Mean					11.23	10.40
Standard Deviation					7.75	3.382
Coefficient of variance (C.V.) in %					69.01	32.53

Above table reveals that in 2005/06 the return on total assets ratio of BPC was negative at 2.46%, whilst the ratios at later years were positive and steady. The overall mean ratio of 11.23% for BPC and 10.4% shows that both the companies have similar return on total assets ratios however, the coefficient of variance of HPL at 32.5% is better than that of BPC's coefficient of variance of 69%. It shows that that with compared to BPC, the management of HPL is utilizing its total assets more efficiently and effectively.

#### **4.1.5 Invisibility Ratio**

An analysis of invisibility ratio helps the investors to know the performance of the companies. If the companies' liquidity, profitability, leverage and utilization ratios are good, its market value ratios will be high and its stock price will probably be as high as can be expected.

## Earning per share (EPS)

Earnings per share are the portions of a company's profit allocated to each outstanding share of common stock. EPS serves as an indicator of a company's profitability.

Earnings per share are generally considered to be the single most important variable in determining a share's price. It is also a major component of the price-to-earnings valuation ratio.

**Table No. 4.13**

### Calculation of Earnings Per Share

(In Thousand of NRs.)

Year	Net profit after Tax		No of equity Shares		Rs.	
	In Thousands of Rs.		In Thousands of Shares		BPC	HPL
	BPC	HPL	BPC	HPL		
2005/06	(44,944)	773,597	8,391	22,500	-5.4	34.4
2006/07	235,418	893,285	8,391	22,500	28.1	39.7
2007/08	197,761	1,162,551	8,391	22,500	23.6	51.7
2008/09	288,419	878,985	8,391	22,500	34.4	39.1
2009/10	252,840	1,482,560	8,391	22,500	30.1	65.9
<b>Mean</b>					<b>22.2</b>	<b>46.1</b>
<b>Standard Deviation</b>					<b>15.9</b>	<b>12.8</b>
<b>Coefficient of variance (C.V.) in %</b>					<b>71.6</b>	<b>27.6</b>

The above table reveals huge differences in earning per share between BPC and HPL. While BPC has satisfactory mean earning per share at Rs. 22.2, HPL has excellent mean earning per share of Rs.46. In 2005/06, BPC has suffered a negative earning per share of Rs. 5.4 due to loss of Rs. 44944000. On later years BPC has improved a lot with positive earning per share. On the other hand, HPL has increasing and positive trend of earning per share with a mean of Rs. 46 which is double as compared to BPC. The coefficient of variance with respect to earning per share of BPC and HPL are 71.6% and 27.6% respectively.

## Dividend Per share

Dividend per share is the proportion of declared dividends for every ordinary share issued Dividends over the entire year (not including any special dividends) must be added together for a proper calculation of DPS, including interim dividends. Special dividends are dividends which are only expected to be issued once. The total number of ordinary shares outstanding is sometimes calculated using the weighted average over the reporting period.

Dividends are a form of profit distribution to the shareholder. Having a growing dividend per share can be a sign that the company's management believes that the growth can be sustained.

**Table No. 4.14**

### Calculation of Dividend Per Share

(In Thousand of NRs.)

Year	Total Distributed Dividend		No of equity Shares		Rs.	
	In Thousands of Rs.		shares In Thousands			
	BPC	HPL	BPC	HPL	BPC	HPL
2005/06	-	413,623	8,391	22,500	0	18
2006/07	335,623	558,891	8,391	22,500	40	25
2007/08	293,670	678,801	8,391	22,500	35	30
2008/09	251,718	666,265	8,391	22,500	30	30
2009/10	251,635	887,760	8,391	22,500	30	39
Mean					27.0	28.5
Standard Deviation					15.7	7.7
Coefficient of variance (C.V.) in %					58.0	27.2

Above table shows that a mean dividend per share of both the companies are about the same but the trend shows that BPC's dividend per share is decreasing with compared to HPL, which has an increasing trend of dividend per share. The coefficient of variance of HPL at 27% is better than that of BPC at 58%, who suffered a loss in the year 2005/06.

## Dividend payout Ratio

Dividend payout ratio is the fraction of net income a firm pays to its stockholders in dividends.

Dividend payout ratio

$$= \frac{\text{Yearly Dividend per Share}}{\text{Earnings per Share}}$$

or equivalently:

$$= \frac{\text{Dividends}}{\text{Net Income}}$$

The payout ratio provides an idea of how well earnings support the dividend payments. More mature companies tend to have a higher payout ratio.

**Table No. 4.15**

### Calculation of Dividend Payout Ratio

(In Thousand of NRs.)

Year	Dividend per share		Earning per share		Ratio (%)	
	BPC	HPL	BPC	HPL	BPC	HPL
2005/06	0	18	(5.4)	34.0	0.0	52.9
2006/07	40	25	28.0	40.0	142.9	62.5
2007/08	35	30	24.0	52.0	145.8	57.7
2008/09	30	30	34.0	39.0	88.2	76.9
2009/10	30	39	30.0	66.0	100.0	59.1
<b>Mean</b>					<b>95.4</b>	<b>61.8</b>
<b>Standard Deviation</b>					<b>59.1</b>	<b>9.1</b>
<b>Coefficient of variance (C.V.) in %</b>					<b>62.0</b>	<b>14.7</b>

Above table reveals a fluctuating trend of dividend payout ratio of BPC with compared to relatively stable dividend payout ratio of HPL. The mean dividend payout ratio of BPC is higher at 95% with that of 62.8% of HPL which indicates good dividend earnings per share. But the coefficient of variance of HPL is better at 14.7% than the coefficient of variance of BPC at 62%.

#### 4.1.6 Correlation Analysis

Karl Pearson's coefficient of correlation is most widely used in practice to measure the degree of relationship between two variables of the company. So, it is measured by using the following formula:

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

Where,

r = the coefficient of correlation

$\sum XY$  = Sum of Product of observation in two series

$\sum X$  = Sum of observation in X series

$\sum Y$  = Sum of observation in Y series

$\sum X^2$  = Sum of square observation in X series

$\sum Y^2$  = Sum of square observation in Y series

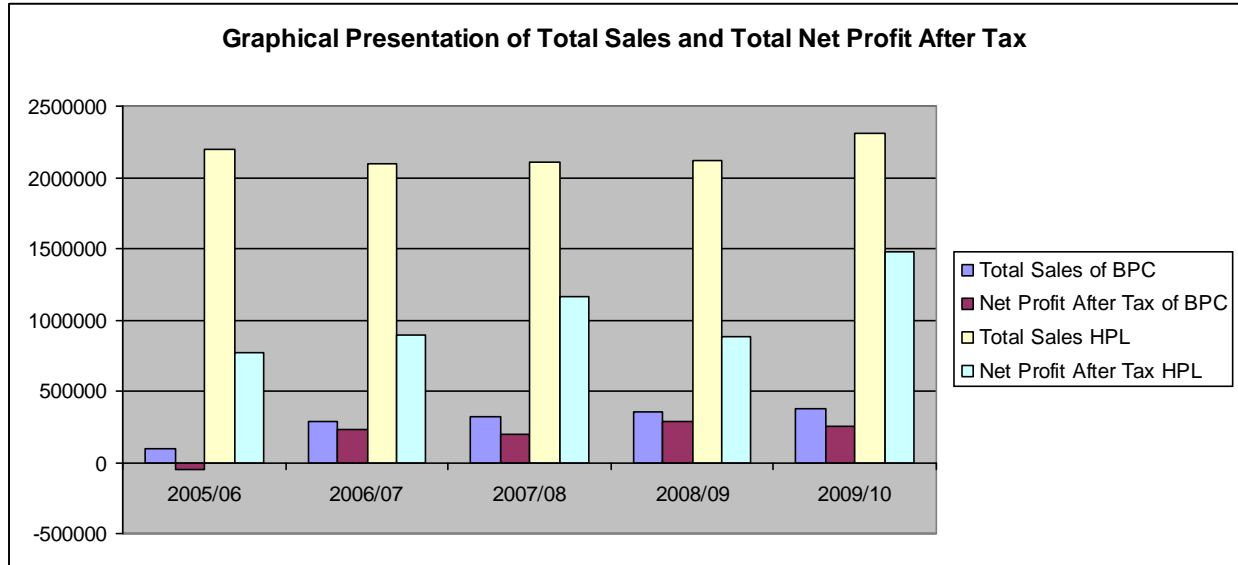
The relationships between the following categories of variables have been developed for the study purposes.

- Total sales and net profit after tax
- Total sales and total assets
- Total Assets and net profit after tax
- Total sales and net profit after tax

#### **Correlation Between Total Sales and Net Profit After Tax**

The Coefficient of correlation between total sales and net profit after tax of both the hydropower companies for the different sampled years has been calculated in appendix A.





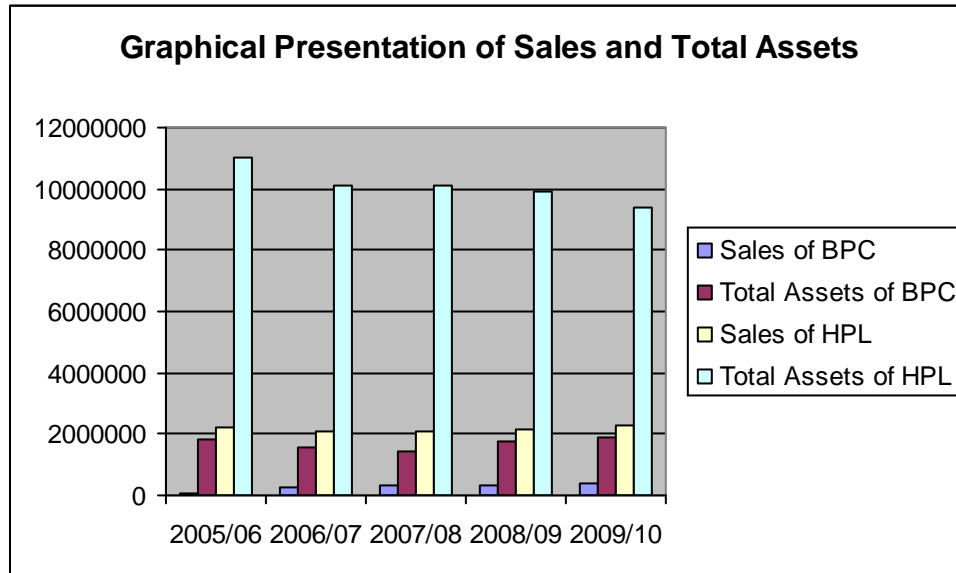
sources : Appendix A

The coefficient of correlation of between sales (X) and net profit after tax (Y) of BPC and HPL came to be 0.957 and 0.638 respectively. This suggests that the two variables have strong positive relation to each other and, HPL is slightly more successful than BPC to be able to yield more uniform profits out of its sales

Coefficient of correlation in BPC appeared greater than six times of PE, i.e.  $0.957 > 6 \times 0.024$ , which implies that the relation between sales and net profit after tax was positive at significant level. But the coefficient of correlation between sales and net profit after tax in HPL appeared less than six times of probable error, i.e.  $0.638 < 6 \times 0.178$ , which implies that the positive correlation between sales and net profit after tax is not at significant level.

### **Correlation between total sales and total assets**

The coefficient of correlation between total sales and total assets of both the hydropower companies for the different sampled years has been calculated in appendix A.



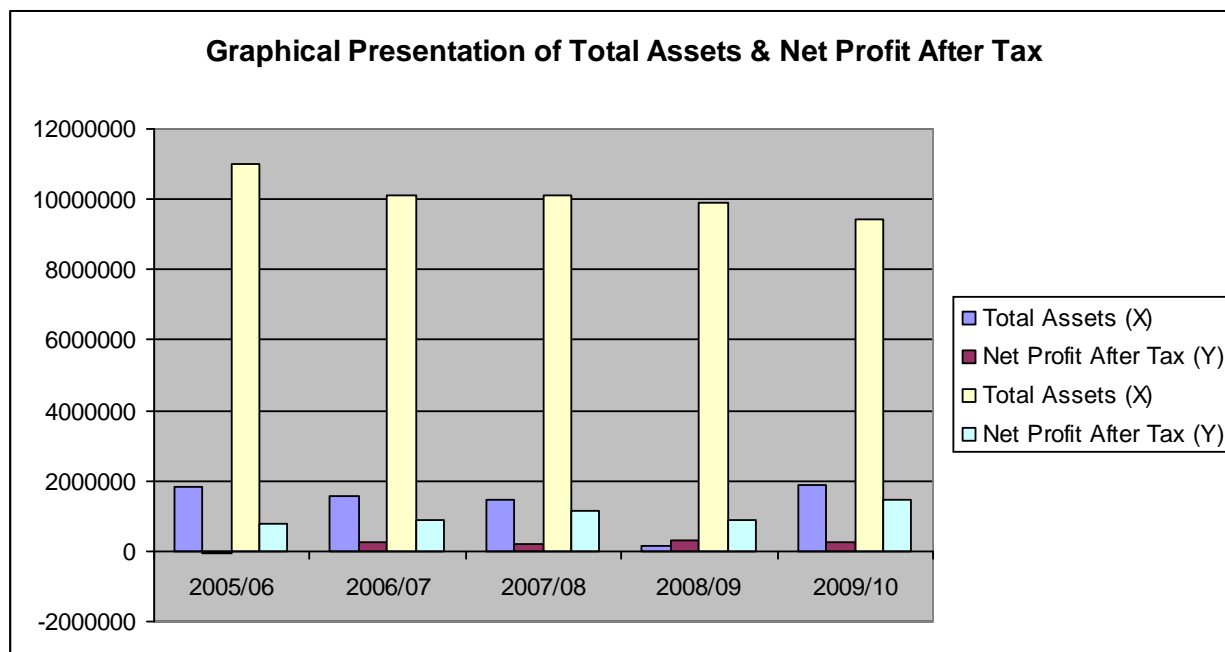
sources : Appendix A

The coefficient of correlation between sales (x) and total assets (y) of BPC and HPL came to be -0.154 and -0.305 respectively. This suggests that the two variables have negative relation to each other and, increase in sales have more adverse effect on total assets HPL than on total assets of BPC.

However, coefficient of correlation in BPC appeared less than six times of PE, i.e  $-0.154 < 6 \times 0.295$ , which implies that the relation between sales and total assets is not at significant level. Similarly, coefficient of correlation in CHPCL also appeared less than six times of PE, i.e.  $-0.305 < 6 \times 0.274$ , which impels that the relation between sales and total assets is not at significant level.

### **Correlation between Total Assets and Net Profit After Tax**

The Coefficient of Correlation between Total Assets and Net Profit After Tax of both the companies for the different sampled years has been calculated in Appendix A.



sources : Appendix A

The coefficient of correlation between Total Assets (X) and Net profit After Tax (Y) of BPC and HPL came to be -0.219 and -0.774 respectively. This suggests that the two variables have negative relation to each other and, it is likely that decrease in total assets is associated to increase in net profit after tax of HPL more than that of net profit after tax of BPC.

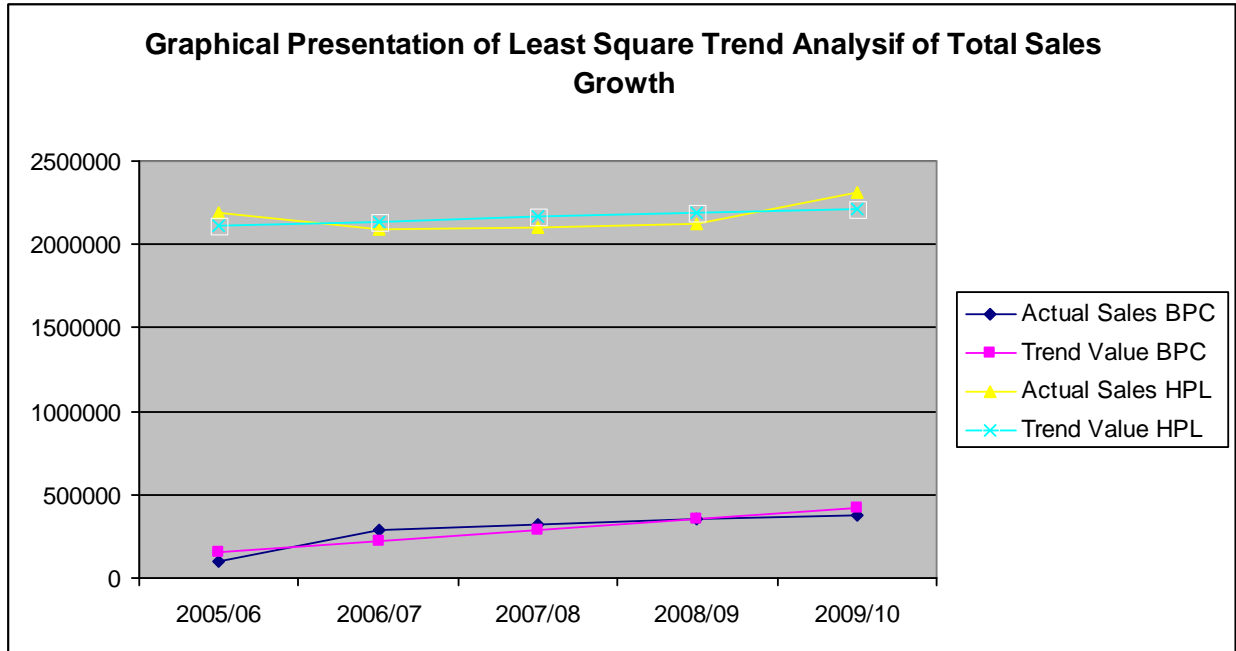
However, coefficient of correlation in BPC appeared less than six times of PE, i.e.  $-0.219 < 6 \times 0.287$ , which implies that the relation between total assets and net profit after tax is not at significant level. But the coefficient of correlation in HPL appeared more than six times of PE, i.e.  $-0.774 > 6 \times 0.121$ , which implies that the relation between sales and total assets is at significant level.

#### 4.1.7 Least Square Linear Growth Trend Analysis

Trend Analysis is a mathematical method which is widely used to find out future tendencies based on past findings and present assumption. Further more it is applied for finding out a trend line for those series which change periodically in absolute amount.

## Least Square Trend Analysis of Total Sales Growth

Least Square Trend Analysis of Total Sales Growth of both the Hydropower companies for the different sampled years has been calculated in Appendix B.



sources: Appendix B

The y-intercept (a) and slope of the trend line (b) of total sales of BPC remained to be Rs. 288,170.6 and Rs. 64,206.2 respectively. During the study period, total sales of BPC exposed an increasing trend. The trend equation of total sales is given by:

$$Y_c = 288,170.6 + 64,206.2x$$

According to the above trend equation, the forecasted values of total sales of BPC for coming five years would be Rs. 480,789, Rs. 544,995, Rs. 609,202, Rs. 673,408 and Rs. 737,614 thousand respectively.

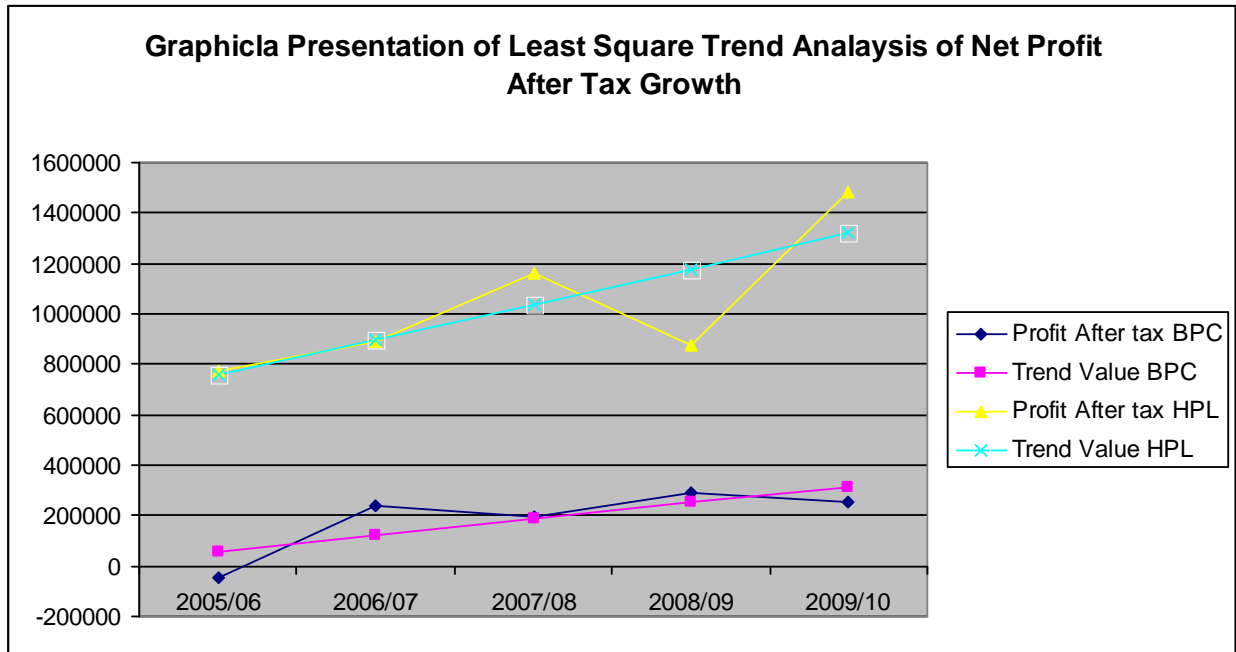
Similarly, the Y-intercept (a) and slope of the trend line (b) of total sales of HPL remained to be Rs. 2,163,873 and Rs. 25,708.7 respectively. During the study period, total sales of HPL exposed and increasing trend. The trend equation of total sales is given by.

$$Y_c = 2,163,873 + 25,708.7x$$

According to the above trend equation, the forecasted values of total sales of HPL for coming five years would be Rs. 2,240,999, Rs. 2,266,708, Rs. 2,292,416, Rs. 2,318,125 and Rs. 2,343,834 thousand respectively.

### Least Square Trend Analysis of Net Profit After Tax Growth

Least square trend analysis of net profit after tax growth of both companies for the different sampled years has been calculated in appendix B.



sources: Appendix B

The Y-intercept (a) and slope of the tend line (b) of net profit after tax of BPC remained to be Rs. 185,898.8 and Rs. 64,856.9 respectively. During the study period, total sales of BPC exposed an increasing trend. The trend equation of total sales is given by:

$$Y_2 = 185,898.8 + 64,856.9 X$$

According to the above trend equation, the forecasted values of net profit after tax of BPC for coming five years would be Rs. 380,470, Rs. 445,326, Rs. 510,183, Rs. 575,040 and Rs. 639,897 thousand respectively.

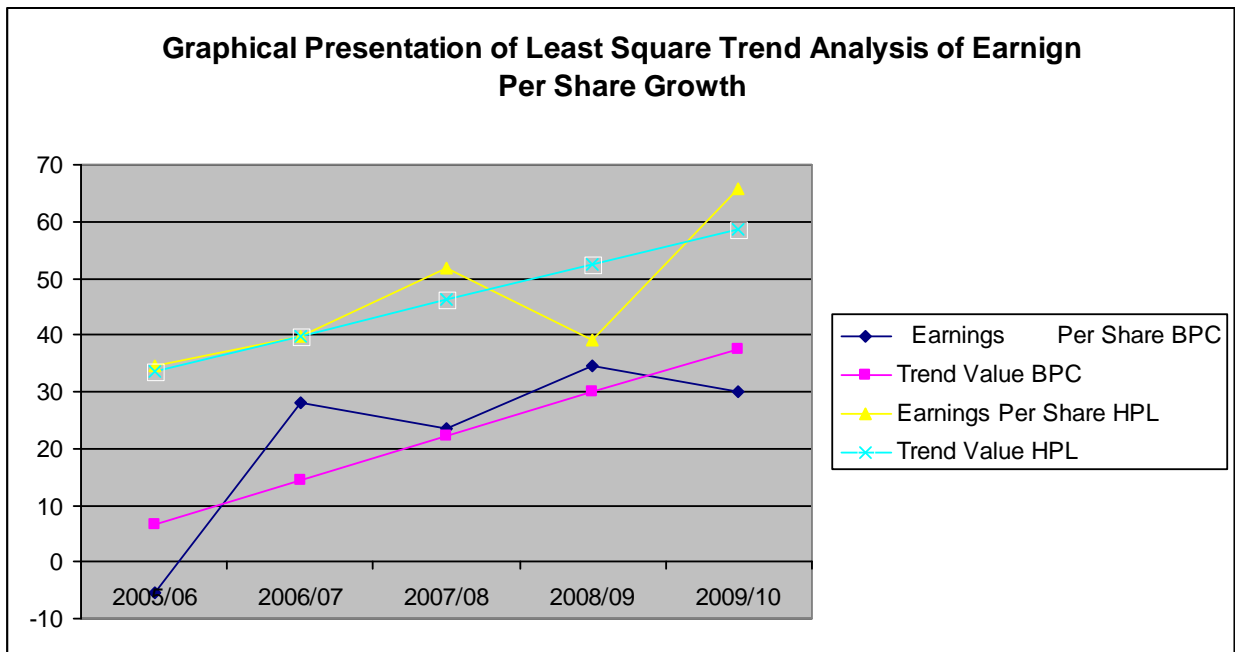
Similarly, the Y-intercept (a) and slope of the trend line (b) of net profit after tax of HPL remained to be Rs. 1,038,196 and Rs. 140,362.6 respectively. During the study period, of net profit after tax of HPL exposed an increasing trend. The trend equation of total sales is given by:

$$Y_2 = 1,038,196 + 140,362.6 X$$

According to the above trend equation, the forecasted values of of net profit after tax of HPL for coming five years would be Rs. 1,459,283, Rs. 1,599,646, Rs. 1,740,009, Rs. 1,880,371 and Rs. 2,020,734 thousand respectively.

### Least Square Trend Analysis of Earning per Share Growth

Least square trend analysis of earning per share growth of both the companies for the different sampled year has been calculated in appendix B.



sources: Appendix B

The Y-intercept (a) and slope of the trend line (b) of earning per share of BPC remained to be Rs. 22.15 and Rs. 7.73 respectively. During the study

period, EPS of BPC exposed an increasing trend. The trend equation of EPS is given by:

$$Y_2 = 22.15 + 7.73X$$

According to the above trend equation, the forecasted values of EPS of BPC for coming five years would be Rs. 45.34 Rs. 53.07, Rs.60.80, Rs. 68.53 and Rs. 76.26 respectively.

Similarly, the Y-intercept (a) and slope of the trend line (b) of earning per share of HPL remained to be Rs. 46.14 and Rs. 6.24 respectively. During the study period, EPS of HPL exposed an increasing trend. The trend equation of EPS is given by:

$$Y_2 = 46.14 + 6.24X$$

According to the above trend equation, the forecasted values of EPS of HPL for coming five years would be Rs. 64.86, Rs. 71.10, Rs. 77.33, Rs. 83.57 and Rs. 89.81 respectively.

## **4.2 Presentation of Data from Primary Sources**

This section includes the information related with the study from primary sources. Primary data were obtained through conversation and interview made with the engineers and managerial officials of both the companies. The presentation and analysis of these primary data are given below.

### **4.2.1 ROE as a Measure of Performance**

To know the respondents' view if ROE shows the performance of the selected companies a question was asked, "Does ROE show the performance of your company?" The responses provided by respondents are tabulated below:

**Table No. 16**

<b>Group</b>	<b>Yes</b>	<b>No</b>	<b>Total</b>
Executives	8	2	10
Non-executives	17	3	20
<b>Total</b>	25	5	30

Above question was asked and analyzed through chi-square method. In chi-square test two hypotheses should be taken and, accordingly these two hypotheses were set.

Null hypothesis ( $H_0$ ): ROE shows the performance of the selected companies.

Alternative hypothesis ( $H_1$ ): ROE does not show the performance of the selected companies.

Test statistic: Under  $H_0$ , the statistic is: 
$$= \sum \frac{(O - E)^2}{E}$$

<b>Row Column</b>	<b>O</b>	<b>E</b>	<b>O-E</b>	<b>(O-E)<sup>2</sup></b>	<b>(O-E)<sup>2</sup>/E</b>
<b>1,1</b>	8	8.333	-0.333	0.111	0.013
<b>1,2</b>	2	1.667	0.333	0.111	0.67
<b>2,1</b>	17	16.667	0.333	0.111	0.007
<b>2,2</b>	3	3.333	-0.003	0.111	0.033
<b>Total</b>					0.120

Here, calculated  $\chi^2 = 0.120$

Degree of freedom= (r-1) (c-1) = (2-1) (2-1) =1

$\alpha=5\%$



Tabulated value of  $\chi^2_{0.05}(1) = 3.841$

Conclusion: since calculated value of  $\chi^2$  is less than tabulated value of  $\chi^2$ ,  $H_0$  is accepted which means that ROE shows the performance of the selected company. From above test we can conclude that personnel think that ROE shows the performance of the selected companies.

#### 4.2.2 Performance Evaluation through Ratio Analysis

To know the respondents' view if ratio analysis used to measure performance in the selected companies, a question was asked, "Is ratio analysis used to measure performance in your company?"

The responses provided by respondents are tabulated below:

**Table No. 17**

Group	Yes	No	Total
Executives	10	0	10
Non-executives	16	4	20
Total	26	4	30

Above question was asked and analyzed through chi-square method. In chi-square test two hypotheses should be taken and, accordingly these two hypotheses were set.

Null hypothesis ( $H_0$ ): ratio analysis is used to measure performance in the selected companies.

Alternative hypothesis ( $H_1$ ): ratio analysis is not used to measure performance in the selected companies.

Test Statistics: Under  $H_0$ , the test statistic: 
$$= \sum \frac{(O - E)^2}{E}$$

Row Column	O	E	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
1,1	10	8.333	1.667	2.779	0.333
1,2	0	1.667	-1.667	2.779	1.667
2,1	16	16.667	-0.667	0.445	0.027
2,2	4	2.667	1.333	1.777	0.666
<b>Total</b>					2.693

Here, calculated  $\chi^2 = 2.693$

Degree of freedom = (r-1) (c-1) = (2-1) (2-1) = 1

$\alpha = 5\%$

Tabulated value of  $\chi^2_{0.05}(1) = 3.841$

Conclusion: since calculated value of  $\chi^2$  is less than tabulated value of  $\chi^2$ ,  $H_0$  is accepted which means that ROE shows the performance of the selected hydropower companies. From above test we can conclude that personnel think that ROE shows the performance of the selected companies.

#### 4.2.3 Adequacy of Government Assistance to the Hydropower Companies in Nepal

To know the respondents' view about the adequacy of government assistance to the hydropower companies in Nepal, a question was asked, "Has government provided adequate assistance to your company?"

The responses provided by respondents are tabulated below:

**Table No. 18**

Group	Yes	No	Total
Executives	6	4	10
Non-executives	12	8	20
<b>Total</b>	18	12	30

Above question was asked and analyzed through chi-square method. In chi-square test two hypotheses should be taken and, accordingly these two hypotheses were set.

Null Hypothesis ( $H_0$ ): there is adequate government assistance to the hydropower companies in Nepal.

Alternative Hypothesis ( $H_1$ ): there is not adequate government assistance to the hydropower companies in Nepal.

Test Statistics: Under  $H_0$ , the test statistic: 
$$= \sum \frac{(O - E)^2}{E}$$

Row Column	O	E	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
1,1	10	8.000	1667	2.779	0.333
1,2	0	1.667	-1.667	2.779	1.667
2,1	15	16.667	-1.667	2.779	0.167
2,2	5	3.333	1667	2.779	0.834
<b>Total</b>					3.001

Here, calculated  $\chi^2 = 3.001$

Degree of freedom= (r-1) (c-1) = (2-1) (2-1) =1

$\alpha=5\%$

Tabulated value of  $\chi^2_{0.05}(1) = 3.841$

Conclusion: Since calculated value of  $\chi^2$  is less than tabulated value of  $\chi^2$ ,  $H_0$  is accepted which means that there is adequate government assistance to hydropower companies in Nepal. From above test we can conclude that there is adequate government assistance to the hydropower companies in Nepal.

#### 4.2.4 Comparison of Present Return and Expectation of Investors

To compare the expected and actual earning status of the investors from the share investment, a question was asked, “Is the level of return you are presently getting is higher than your expectation from share investment?”

The responses provided by respondent are tabulated below:

**Table No. 19**

<b>Group</b>	<b>Yes</b>	<b>No</b>	<b>Total</b>
Executives	7	3	<b>10</b>
Non-executives	15	5	<b>20</b>
<b>Total</b>	<b>22</b>	<b>8</b>	<b>30</b>

Above question was asked and analyzed through chi-square method. In chi-square test two hypotheses should be taken and, accordingly these two hypotheses were set.

Null Hypothesis ( $H_0$ ): The level of return presently obtained from hydropower companies is higher than the expectation of investors.

Alternative Hypothesis ( $H_1$ ): The level of return presently obtained from hydropower companies is not higher than the expectation of investors.

Test Statistics: Under  $H_0$ , the test statistic: 
$$= \sum \frac{(O - E)^2}{E}$$

<b>Row Column</b>	<b>O</b>	<b>E</b>	<b>O-E</b>	<b>(O-E)<sup>2</sup></b>	<b>(O-E)<sup>2</sup>/E</b>
<b>1,1</b>	7	7.333	-0.333	0.111	0.015
<b>1,2</b>	3	2.667	0.333	0.111	0.042
<b>2,1</b>	15	14.667	0.333	0.111	0.008
<b>2,2</b>	5	5.333	-0.333	0.111	0.021
<b>Total</b>					0.086

Here, calculated  $\chi^2 = 0.086$

Degree of freedom= (r-1) (c-1) = (2-1) (2-1) =1

$\alpha=5\%$

Tabulated value of  $\chi^2_{0.05}(1) = 3.841$

Conclusion: Since calculated value of  $\chi^2$  is less than tabulated value of  $\chi^2$ ,  $H_0$  is accepted which means that the level of return presently obtained from Hydropower Company is higher than the expectation of investors. From above test we can conclude that personnel think that the level of return presently obtained from Hydropower Company is higher.

#### **4.2.5 Role of Whim and Rumors in Influencing Stock Prices of Hydropower Companies**

To know the viewpoint of respondents about the influence of whim and rumors in influencing stock prices, a question was asked, “Do you think that the stock prices of hydropower companies are influenced by whim and rumors rather than profitability reasons?”

The responses provided by respondent are tabulated below:

**Table No. 20**

<b>Group</b>	<b>Yes</b>	<b>No</b>	<b>Total</b>
Executives	6	4	<b>10</b>
Non-executives	10	10	<b>20</b>
<b>Total</b>	<b>16</b>	<b>14</b>	<b>30</b>

Above question was asked and analyzed through chi-square method. In chi-square test two hypotheses should be taken and, accordingly these two hypotheses were set.

Null Hypothesis ( $H_0$ ): The stock prices of hydropower companies are influenced by the whim and rumors rather than profitability reasons.

Alternative Hypothesis ( $H_1$ ): The stock prices of hydropower companies are not influenced by whim and rumors rather than profitability reason.

Test Statistics: Under  $H_0$ , the test statistic: 
$$= \sum \frac{(O - E)^2}{E}$$

Row Column	O	E	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
<b>1,1</b>	6	5.333	0.667	0.445	0.083
<b>1,2</b>	4	4.667	- 0.667	0.445	0.095
<b>2,1</b>	10	10.667	- 0.667	0.445	0.042
<b>2,2</b>	10	9.333	0.667	0.445	0.048
<b>Total</b>					<b>0.268</b>

Here, calculated  $\chi^2 = 0.268$

Degree of freedom= (r-1) (c-1) = (2-1) (2-1) =1

$\alpha=5\%$

Tabulated value of  $\chi^2_{0.05}(1) = 3.841$

Conclusion: Since calculated value of  $\chi^2$  is less than tabulated value of  $\chi^2$ ,  $H_0$  is accepted which means that the stock prices of hydropower companies are influenced by whim and rumors rather than profitability seasons. From above test we can conclude that personnel think that the stock prices of hydropower companies are influenced by whim and rumors rather than profitability reasons.

### **4.3 Major Findings**

From the above analysis and interpretation of data the following findings have been drawn:

#### **4.3.1 Major Finds from Secondary Sources**

The current ratios of BPC remained respectively 1.99, 2.99, 2.16, 1.25 and 1.19 throughout the five-year study period. The mean and CV of current ratios of BPC came to be 1.78 and 29.14%. Similarly, the current ratios of HPL remained 2.23, 3.91, 2.70, 2.96 and 2.50 respectively throughout the five-year study period. The mean and CV of current ratios of HPL came to be 2.86 and 22.59%.

The quick ratios of BPC remained 1.83, 2.09, 1.85, 1.12 and 1.09 respectively throughout the five-year study period. The mean and CV of quick ratios of BPC came to be 1.59 and 28.9%. Similarly, the quick ratios of HPL remained 2.23, 3.91, 2.70, 2.96 and 2.50 respectively throughout the five-year study period. The mean and CV of quick ratios of HPL came to be 2.86 and 22.6%.

The fixed assets turnover ratios of BPC remained 0.13, 0.39, 0.45, 0.47 and 0.51 respectively throughout the five-year study period. The mean and CV of assets turnover ratios of BPC came to be 0.39 and 39.5%. Similarly, the assets turnover ratios of HPL remained 0.26, 0.25, 0.27, 0.28 and 0.32 respectively throughout the five-year study period. The mean and CV of assets turnover ratios of HPL came to be 0.28 and 9.84%.

The total assets turnover ratios of BPC remained 0.05, 0.18, 0.22, 0.21 and 0.20 respectively throughout the five-year study period. The mean and CV of total assets turnover ratios of BPC came to be 0.17 and 39.9%. Similarly, the total assets turnover ratios of HPL remained 0.10, 0.17, 0.21, 0.21 and 0.24 respectively throughout the five year study period. The mean and CV of total assets turnover ratios of HPL came to be 0.19 and 30.6%.

The inventory turnover ratios of BPC remained 2.19, 6.78, 6.73, 6.2 and 6.45 respectively throughout the five-year study period. The mean and CV of inventory turnover ratios of BPC came to be 5.67 and 34.54%.

The receivables turnover ratios of BPC remained 2.66, 9.04, 7.53, 10.09 and 6.45 respectively throughout the five-year study period. The mean and CV of receivables turnover ratios of BPC came to be 7.15 and 40.18%. Similarly, the receivables turnover ratios of HPL remained 5.53, 5.03, 5.34, 4.96 and 5.52 respectively throughout the five year study period. The mean and CV of receivables turnover ratios of HPL came to be 5.28 and 5.15%.

The average collection period of BPC remained 137, 40, 48, 36 and 56 respectively throughout the five-year study period. The mean and CV of average collection period of BPC came to be 63 days and 65.51%. Similarly, the average collection period of HPL remained 66, 73, 68, 74 and 66 respectively throughout the five year study period. The mean and CV of average collection period of HPL came to be 69 days and 5.21%.

The debt to shareholders equity of HPL remained 1.85, 1.52, 1.16, 1.02, and 0.67 respectively throughout the five year study period. The mean and CV of debt to shareholders equity of HPL came to be 1.24 and 36.50%. Similarly, debt to shareholders equity of HPL remained 0.58, 0.57, 0.49, 0.46 and 0.36 respectively throughout the five year study period. The mean and CV of debt to total assets ratios of HPL came to be 0.50 and 18.11%.

The net profit ratios of BPC remained – 46.64%, 83.14%, 61.20% and 66.58% respectively throughout the five year study period. The mean and CV of net profit ratios of BPC came to be 48.95% and 110.77%. Similarly, the net profit ratios of HPL remained 35.26%, 42.70%, 55.25, 41.42% and 64.25% respectively throughout the five year study period. The mean and CV of net profit ratios of HPL came to be 47.78% and 24.54%.

The operating expenses ratios of BPC remained 115.11%, 43.74%, 45.18%, 38.35% and 40.63% respectively throughout the five year study period. The mean and CV of operating expenses ratios of BPC came to be 56.60% and 57.98%. Similarly, the operating expenses ratios of HPL remained 12.77%, 12.97%, 13.34%, 12.80% and 15.33% respectively throughout the five year study period. The mean and CV of operating expenses ratios of HPL came to be 13.44% and 8.035%.

The return on shareholders equity of BPC remained –2.92%, 17.49%, 15.76%, 22.18% and 19.53% respectively throughout the five year study



period. The mean and CV of return on shareholders equity of BPC came to be 14.41% and 69.26%. Similarly, the return on shareholders equity of HPL remained 22.21%, 23.40%, 27.02%, 19.47% and 29.02% respectively throughout the five year study period. The mean and CV of return on shareholders equity of HPL came to be 24.22% and 15.74%.

The return on total assets of BPC remained -2.46%, 13.74%, 16.53% and 13.43% respectively throughout the five year study period. The mean and CV of return on total assets of BPC came to be 11.23% and 69.01%. Similarly, the return on total assets of HPL remained 7.03%, 8.83%, 11.51%, 8.88% and 15.73% respectively throughout the five year study period. The mean and CV of return on total assets of HPL came to be 10.4% and 32.53%.

The earnings per share of BPC remained Rs. -5.36, Rs. 28.06, 23.57, Rs. 34.37 and Rs. 30.13 respectively throughout the five year study period. The mean and CV of earnings per share of BPC came to be Rs. 22.2 and 71.6%. Similarly, the earnings per share of HPL remained Rs. 34.4, Rs. 39.7, Rs. 51.7, Rs. 39.1 and Rs. 65.9 respectively throughout the five-year study period. The mean and CV of earnings per share of CHPCL came to be Rs. 46.1 and 27.6%.

The dividend per share of BPC remained Rs. 0, Rs. 40, Rs. 35, Rs. 30 and Rs. 30 respectively throughout the five year study period. The mean and CV of dividend per share of BPC came to be Rs. 27 and 58%. Similarly, the dividend per share of HPL remained Rs. 18, Rs. 25, Rs. 30, Rs. 30 and Rs. 39 respectively throughout the five year study period. The mean and CV of dividend per share of HPL came to be Rs. 28.50 and 27.2%.

The dividend payout ratios of BPC remained Rs. 0, Rs. 142.9, Rs. 145.8, Rs. 88.2 and Rs. 100 respectively throughout the five year study period. The mean and CV of dividend payout ratios of BPC came to be Rs. 95.4 and 62%. Similarly, the dividend payout ratios of HPL remained Rs. 0, Rs. 52.9, Rs. 62.5, Rs. 57.7, Rs. 76.9 and Rs. 59.1 respectively throughout the four year study period. The mean and CV of dividend payout ratios of HPL came to be Rs. 61.8 and 14.7%.

The coefficient of correlation between sales and net profit after tax of BPC and CHPCL came 0.957 and 0.675 respectively. This value of correlation indicates the positive relation between sales and net profit after tax.

Considering the probable errors of BPC and HPL, since the value of  $r$  is greater than  $6PE$ , the correlation between sales and net profit after tax of BPC is at significant level.

The coefficient of correlation relation between sales and total assets of BPC and CHPCL came  $-0.154$  and  $-0.305$  respectively. This value of correlation indicates the negative relation between sales and total assets. Considering the probable errors of BPC and HPL, since the value of  $r$  is greater than  $6PE$ , the correlation is not at significant level.

The coefficient of correlation relation between total assets and net profit after tax of BPC and HPL came  $-0.219$  and  $-0.774$  respectively. This value of correlation indicates the negative relation between total assets and net profit after tax. Considering the probable errors of BPC, since the value of  $r$  is less than  $6PE$ , the correlation is not at significant level and for HPL,  $r$  is greater than  $6PE$ , so the correlation is at significant level.

According to the trend equation, the forecasted value of total sales of BPC for coming five years would be Rs. 480,789, Rs. 544,995, Rs. 609,202, Rs. 673,408 and Rs. 737,614 thousand respectively. Similarly, the forecasted value of total sales of HPL for coming five years would be Rs. 2,240,999, Rs. 2,266,708, Rs. 2,292,416, Rs. 2,318,125 and Rs. 2,343,834 thousand respectively.

According to the trend equation, the forecasted value of net profit after tax of BPC for coming five years would be Rs. 380,470, Rs. 445,326, Rs. 510,183, Rs. 575,040 and Rs. 639,897 thousand respectively. Similarly, the forecasted value of net profit after tax of HPL for coming five years would be Rs. 1,459,283, Rs. 1,599,646, Rs. 1,740,009, Rs. 1,880,371 and Rs. 2,020,734 thousand respectively.

According to the trend equation, the forecasted value of earnings per share of BPC for coming five years would be Rs. 45.34, Rs. 53.07, Rs. 60.80, Rs. 68.53 and Rs. 76.26 thousand respectively. Similarly, the forecasted value of earnings per share of HPL for coming five years would be Rs. 64.86, Rs. 71.10, Rs. 77.33, Rs. 83.57 and Rs. 89.81 thousand respectively.

### 4.3.2 Major Findings from primary Sources

Out of 30, 25 respondents agreed that ROE did show the performance of their company. And since calculated value of  $\chi^2$  is less than tabulated value of  $\chi^2$ ,  $H_0$  is accepted which means the ROE shows the performance of the selected hydropower companies.

Out of 30, 26 respondents agreed that ratio analysis was used to measure the performance of their company. And since calculated value of  $\chi^2$  is less than tabulated value of  $\chi^2$ ,  $H_0$  is accepted which means that ratio analysis is used to measure performance of the selected hydropower companies.

Out of 30, 18 respondents agreed that is adequate government assistance to the hydropower companies in Nepal. And since calculated value of  $\chi^2$  is less than tabulated value of  $\chi^2$ ,  $H_0$  is accepted which means that there is adequate government assistance to the hydropower companies in Nepal.

Out of 30, 22 respondents agreed that the level of return presently obtained for hydropower companies were higher than the expectation of investors. And since calculated value of  $\chi^2$  is less than tabulated value of  $\chi^2$ ,  $H_0$  is accepted which means that the level of return presently obtained from hydropower companies is higher than the expectation of investors.

Out of 30, 16 respondents agreed that the stock price of hydropower companies were influenced by whim and rumors rather than profitability reasons than the expectation in investors. And since calculated value of  $\chi^2$  is less than tabulated value of  $\chi^2$ ,  $H_0$  is accepted which means that the stock prices of hydropower companies are influenced by whim and rumors rather than profitability reasons.

## CHAPTER V

### SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.1 Summary:

Nepal has a huge hydropower potential and hydropower is the only sector that yields multiple benefits and, in many cases, can be an effective agent for poverty alleviation. Apart from being a source of renewable and clean energy, to stabilize the supply of electricity, it helps provide year round irrigation resulting in the increase in the cropping intensity and changing cropping pattern, and it reduces both deforestation and greenhouse gas emissions.

Currently in Nepal, there is a big push for large hydro projects as the dominant national strategy not only for sectoral gains but also as an engine for country's overall economic development. The exploitation of rural natural resources for a larger public gain will ultimately lead to a win-win situation for all. Within this context, formal institutions laws, acts, policies, and guidelines provide the framework for direct technological intervention strategies. In terms of outcomes of such intervention for the people affected, formal institutions concentrate on compensatory packages, financial as well as non-financial. There is limited research on how these institutions actually translate at the local rural level in regard to distributional outcomes particularly based on notions of equity or inequity. There is even less research on how the newly implanted technology impacts on people's access, dependence and exploitation of resources, both financial and natural land and water, whether they are displaced or not by the hydro projects.

Most companies operate for one reason and one reason only and that is to generate profit. In some cases, not enough profit is being made. There are many different reasons that a decline in profit may occur. Sometimes it is a result of increased operational costs, decreased revenue, or lack of proper planning and control activities. Especially in Nepalese companies we can see various examples where companies do not have a proper framework for

proper, planning and decision making resulting in slow growth of the organization.

Hydropower is the only sector that yields multiple benefits and, in many cases, can be an effective agent for poverty alleviation. Apart from being a source of renewable and clean energy, to stabilize the supply of electricity, it helps provide year round irrigation resulting in the increase in the cropping intensity and changing cropping pattern, and it reduces both deforestation and greenhouse gas emissions. So considering the immense importance of hydropower in Nepal it is evident that Nepalese hydropower companies should make the most out of their business by proper planning and decision making. Now here comes the need of financial performance analysis. Through this analysis companies would be able to track the past performance and predict and plan future activities which will enable them to utilize their resources efficiently and effectively.

As this study is related to the financial evaluation of BPC and HPL, a number of financial and statistical tools have been used to meet the prescribed objectives. Ratio analysis being the primary financial tool includes all five categories namely, liquidity ratio, activity ratio, leverage ratio, profitability ratio and invisibility ratio. To further analyze the financial data, a number of statistical tools have been used such as arithmetic mean, standard deviation, coefficient of variation, coefficient of correlation, probable error of correlation coefficient and least square trend line.

The liquidity ratios of the companies seem to be inconsistent. BPC and HPL both have maintained proper liquidity position. The mean and CV of current ratios of BPC came to be 1.78 and 29.14%. The mean and CV of current ratios of HPL came to be 2.86 and 22.59%. Similarly, the mean and CV of quick ratio of BPC came to be 1.59 and 28.9%. The mean and CV of quick ratios of HPL came to be 2.86 and 22.6%.

Except that of RTRs all other activity ratios of BPC percent fairly consistent trends for the last for years. Whereas, HPL holds less variation in all activity ratios as compared to BPC. The mean and CV of FATORs of BPC came to be 0.39 and 39.5%. The mean and CV of FATORs of HPL came to be 0.28 and 9.84%. Similarly, the mean and CV of TATORs BPC came to be 0.17 and 39.9%. The mean and CV of TATORs of HPL came to be 0.19 and 30.6%. Similarly, the mean and CV of ITRs of BPC came to be 5.67 and

34.54%. The mean and CV of RTRs of BPC came to be 7.15 and 40.18%. The mean and CV of RTRs of HPL came to be 5.28 and 5.15%. Similarly, the mean and CV of ACPs of BPC came to be 64 days and 65.51%. The mean and CV of ACPs of HPL came to be 69 days and 5.21%.

While BPC is all equity financed, the leverage ratios of HPL reveal decreasing risk of insolvency each year. While the mean and CV of debt to shareholders equity of HPL came to be 1.24 and 36.5%, the mean and CV of debt to total assets ratios of HPL came to be 0.50 and 18.11%.

Due to the loss incurred in F/Y 2005/06, BPC present fluctuating trends of profitability ratios. Unlike BPC, HPL has considerably low OERs and shows rather consistent trends of profitability ratios. The mean and CV of NPRs of BPC came to be 48.95% and 110.77%. The mean and CV of NPRs of HPL came to be 47.78% and 24.54%. Similarly, the mean and CV of OERs of BPC came to be 56.6% and 57.98%. The mean and CV of OERs of HPL came to be 13.44% and 8.03%. Similarly, the mean and CV of ROE ratios of BPC came to be 14.41% and 69.26%. The mean and CV of ROE ratios of HPL came to be 24.22% and 15.74%. Similarly, the mean and CV of ROTA ratios of BPC came to be 11.23% and 69.01%. The mean and CV of ROTA ratios of HPL came to be 10.40% and 32.53%.

The invisibility ratios of both companies present fluctuating trends. Though HPL has higher trends of EPS ratios, the DPS ratios and DPRs remain similar and in increasing in trend as compared to BPC. The mean and CV of EPS ratios of BPC came to be Rs. 22.2 and 71.6%. The mean and CV of EPS ratios of HPL came to be Rs. 46.1 and 27.6%. Similarly, the mean and CV of DPS ratios of BPC came to be Rs. 27.0 and 58.0%. The mean and CV of DPS ratios of HPL came to be Rs. 28.50 and 27.2%. Similarly, the mean and CV of DPRs of BPC came to be Rs. 95.4 and 62.0%. The mean and CV of DPRs of HPL came to be Rs. 61.8 and 14.7%.

The coefficient of correlation between sales and net profit after tax of BPC and HPL show positive and significant relation. The coefficient of correlation between these two variables of BPC and HPL came 0.957 and 0.675 respectively. Similarly, the probable errors of BPC and HPL came 0.03 and 0.18 respectively.

The coefficient of correlation between total sales and total assets of BPC and HPL show negative but insignificant relation. The coefficient of correlation

between these two variables of BPC and HPL came -0.154 and -0.305 respectively. Similarly, the probable errors of BPC and HPL came 0.259 and 0.274 respectively.

The coefficient of correlation between total assets and net profit after tax of BPC and HPL show negative but insignificant relation. The coefficient of correlation between these two variables of BPC and HPL came -0.219 and -0.774 respectively. Similarly, the probable errors of BPC and HPL came 0.287 and 0.121 respectively.

According to the trend equation, the forecasted value of total sales of BPC for coming five years would be Rs. 480,789, Rs. 544,995, Rs. 609,202, Rs. 673,408 and Rs. 737,614 thousand respectively. Similarly, the forecasted value of total sales of HPL for coming five years would be Rs.2,240,999, Rs. 2,266,708, Rs. 2,292,416, Rs. 2,318,125 and Rs. 2,343,834 thousand respectively.

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The thesis is divided into five sections that is (1) Introduction (2) Literature Review (3) Research Methodology (4) Data presentation and analysis and (5) Summary, Conclusion and Recommendation.

## 5.2 Conclusion

As per the analysis and interpretation of data the following conclusions have been derived:

- The current and quick ratios of the companies seem to be inconsistent. BPC and HPL both have maintained proper liquidity position. Where the Liquidity position of HPL is much satisfactory the BPC's position on liquidity is not satisfactory compared to HPL.
- The fixed assets turnover ratios of both the companies are satisfactory and somewhat consistent. However, BPC has not been able to utilize its current assets appropriately as the total assets turnover ratio remains vulnerable against that of HPL. BPC has a very humble rate of inventory turnover. Though the receivables turnover ratios are



almost equivalent, considering the average collection periods, it can be concluded that BPC suffers less from the problem of outstanding debt collection.

- BPC is all equity financed and thus the risk of insolvency is minimized for this company. The risk of insolvency of HPL has been decreasing each year with the decrease in its leverage ratios.
- Though BPC has considerably high operating expenses ratios and inconsistent trend in its net profit ratios the overall performance with respect to profitability is ahead to HPL. However, considering the return on shareholders equity and return on total assets, it is obvious that one would preferably invest in HPL rather in BPC.
- Though HPL has a two times higher EPS with compared to that of BPC, its tight custom of dividend payout ratio conceals the real charisma. On the other hand BPC, being much liberal in distributing the earnings in form of dividends, one might confuse to pick the preferable investment between BPC and HPL.
- The coefficient of correlation between sales and net profit after tax of BPC and HPL show positive and significant relation. It also reveals that BPC is slightly more successful than HPL to be able to yield more uniform profits out of its sales.
- The coefficient of correlation between sales and total assets of BPC and HPL show negative but insignificant relation. It also reveals that it is likely that decrease in total assets is associated to increase in net profit after tax of HPL more than in net profit after tax of BPC.
- The coefficient of correlation between total assets and net profit after tax of BPC and HPL show negative but insignificant relation. It also reveals that the net profit after tax of HPL is more reactive than that of BPC to fluctuations in total assets.
- The growth trend analysis of total sales and net profit after tax of HPL demonstrate a higher increasing trend than that of BPC. However, the

growth trend analysis of earning per share of HPL demonstrates lower increasing trend than that of BPC.

- From the primary data analysis it can be concluded that ROE does show the performance of the hydropower companies, ratio analysis is used to analyse the performance, government assistance to the hydropower companies, in Nepal is adequate, present return of the hydropower companies is higher than the expectation of investors and the stock prices are influenced by whims and rumors rather than profitability reasons.

**Table No. 5.1**

**SWOT Analysis**

Hydropower companies,	BPC	HPL
Strengths	<ul style="list-style-type: none"> <li>• Availability of Funds</li> <li>• No loans and borrowings</li> <li>• Diversified sources of income</li> </ul>	<ul style="list-style-type: none"> <li>• Use of domestic resources and financing</li> <li>• Low operating expenses</li> <li>• Tax subsidy and increasing profits</li> </ul>
Weaknesses	<ul style="list-style-type: none"> <li>• Inefficient use of resources</li> <li>• High operating expenses</li> <li>• Lack of strategies to realize financial plans</li> </ul>	<ul style="list-style-type: none"> <li>• High level of fixed cost</li> <li>• Lack of strategies of realize financial plans</li> <li>• Inconsistent dividend policy</li> </ul>
Opportunities	<ul style="list-style-type: none"> <li>• Plenty of market availability</li> <li>• No competition</li> </ul>	
Threats	<ul style="list-style-type: none"> <li>• High research cost</li> <li>• Tightening power purchase a agreements by NEA</li> </ul>	

**5.3 Recommendations**

Based on the conclusions, some recommendations are presented below:

- The liquidity position of HPL is very strong, and be must hold more liquid assets or otherwise cut off current liabilities to maintain a proper liquidity position. BPC needs to maintain the current liquidity position.

- HPL should maintain enough inventories so as to avoid threat of stock out. BPC needs to find better ways to control and improve its inventory and receivable management. Fixed assets turnover ratio of BPC is satisfactory but total assets needs to be managed more effectively.
- Including funds of fixed interest in the capital structure can maximize the value of company. Both the hydropower companies should enjoy the capital of less cost by borrowing funds as they are in strong credibility position. HPL should hold the current portion of leverage in its capital structure.
- The profitability position of both the hydropower companies is satisfactory. However, BPC can do much to increase the ROE and ROTA by better utilization of its assets. There is also a need for effective production management to control operating costs of BPC.
- Despite the availability of lucrative investment opportunities, shareholders need to be satisfied with dividends. HPL should adopt a more liberal dividend payout policy, as the earning per share is healthy to support such policy. The uniform distribution of dividends will also help to reduce fluctuations in stock prices.
- The projected sales values can be met by setting production and sales plans, and formulating proper policies and strategies. The hydropower companies should implement new techniques of management such as participative management, management by objective and total quality management.
- The hydropower companies should maintain research budgets to study new hydroelectric projects across the country. There should be proper cost control on maintenance activities.
- The hydropower companies should introduce SWOT analysis to improve their capability of dealing with external forces and managing internal issues of strengths and weaknesses.

- The hydropower companies should maintain a separate human resource department to make sure that there is an effective system of handling grievance of employees and conduction of management development and training programs.
- The hydropower companies should follow the practices of setting financial goals for future activities and should develop major programs to accomplish them.

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Websites:

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

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

# **APPENDICES**

- Appendix A  
Computation of Correlation of Coefficient and Probable Error
- Appendix B  
Computation of Trend Values



## Appendix-A

### Computation of Correlation of Coefficient and Probable Error Correlation between Total Sales and Net Profit after Tax of BPC

(In Thousand NRs.)

Year	Sales (X)	Net Profit After Tax (Y)	X <sup>2</sup>	Y <sup>2</sup>	X $\hat{=}$ Y
2005/06	96364	(44944)	9286020496	2019963136	(4330983616)
2006/07	283167	235418	80183549889	55421634724	66662608806
2007/08	323134	197761	104415571956	39109413121	63903302974
2008/09	358419	288419	128464179561	82185819561	103374849561
2009/10	379769	252840	144224493361	63928065600	96020793960
<b>Total</b>	$\Sigma X =$ <b>144085</b>	$\Sigma Y =$ <b>929494</b>	$\Sigma X^2 =$ <b>466573825263</b>	$\Sigma Y^2 =$ <b>243664596142</b>	$\Sigma XY =$ <b>325630571685</b>
<b>Correlation (r) = 0.957</b>			<b>Probable Error (PE) = 0.03</b>		

$$r = \frac{N \Sigma XY - \Sigma X \Sigma Y}{\sqrt{N \Sigma X^2 - (\Sigma X)^2} \sqrt{N \Sigma Y^2 - (\Sigma Y)^2}} = 0.957$$

$$PE = 0.6745 \times \frac{1 - r^2}{\sqrt{N}} = 0.03$$

**Computation of Correlation of Coefficient and Probable Error**  
**Correlation between Total Sales and Net Profit after Tax of HPL**

(In Thousand NRs.)

Year	Sales (X)	Net Profit After Tax (Y)	X <sup>2</sup>	Y <sup>2</sup>	X $\hat{=}$ Y
2005/06	2193850	773597	4812977822500	598452318409	1697155778450
2006/07	2092032	893285	4376597889024	797958091225	1868780805120
2007/08	2104124	1162551	4427337807376	1351524827601	2446151460324
2008/09	2121897	878985	4502446878609	772614630225	1865115634545
2009/10	2307461	1482560	5324376266521	2197984153600	3420949380160
<b>Total</b>	<b>ΣX= 10819364</b>	<b>ΣY= 51909078</b>	<b>ΣX<sup>2</sup>= 23443736664030</b>	<b>ΣY<sup>2</sup>= 5718534021060</b>	<b>ΣXY= 11298153058599</b>
<b>Correlation (r) = 0.638</b>			<b>Probable Error (PE) = 0.18</b>		

$$r = \frac{N \sum XY - \sum X \sum Y}{\sqrt{N \sum X^2 - (\sum X)^2} \sqrt{N \sum Y^2 - (\sum Y)^2}} = 0.638$$

$$PE = 0.6745 \times \frac{1 - r^2}{\sqrt{N}} = 0.18$$

### Correlation between Total Assets and Net Profit After Tax of BPC

(In Thousand NRs.)

Year	Total Assets (X)	Net Profit After Tax (Y)	X <sup>2</sup>	Y <sup>2</sup>	X $\hat{=}$ Y
2005/06	1825464	(44944)	3332318815296	2019963136	(82043654016)
2006/07	1579195	235418	2493856848025	55421634824	371770928510
2007/08	1439238	197761	2071406020644	39109413121	284625146118
2008/09	174447	288419	3043095335809	83185519561	503131659293
2009/10	1882271	252840	3542944117441	63928065600	475913399640
<b>Total</b>	<b><math>\Sigma X =</math> 8470615</b>	<b><math>\Sigma Y =</math> 929494</b>	<b><math>\Sigma X^2 =</math> 14483621137215</b>	<b><math>\Sigma Y^2 =</math> 243664596142</b>	<b><math>\Sigma XY =</math> 1553397479545</b>
<b>Correlation (r) = - 0.219</b>			<b>Probable Error (PE) = 0.287</b>		

$$r = \frac{N \Sigma XY - \Sigma X \Sigma Y}{\sqrt{N \Sigma X^2 - (\Sigma X)^2} \sqrt{N \Sigma Y^2 - (\Sigma Y)^2}} = -0.219$$

$$PE = 0.6745 \times \frac{1 - r^2}{\sqrt{N}} = 0.287$$

### Correlation between Total Assets and Net Profit After Tax of HPL

(In Thousand NRs.)

Year	Total Assets (X)	Net Profit After Tax (Y)	X <sup>2</sup>	Y <sup>2</sup>	X $\hat{=}$ Y
2005/06	10999524	773597	12098528226576	598452318409	8509198767828
2006/07	10110845	893285	102229186614025	797958091225	9031866175825
2007/08	10098599	1162551	101981701762801	1351524827601	11740136366049
2008/09	9897921	878985	97968840122241	772614630225	8700124090185
2009/10	9423895	1482560	88809796971025	2197984153600	13971489771200
<b>Total</b>	<b><math>\Sigma X =</math> 50530784</b>	<b><math>\Sigma Y =</math> 5190978</b>	<b><math>\Sigma X^2 =</math> 511979053696668</b>	<b><math>\Sigma Y^2 =</math> 5718534021060</b>	<b><math>\Sigma XY =</math> 51952815171087</b>
<b>Correlation (r) = - 0.774</b>			<b>Probable Error (PE) = 0.121</b>		

$$r = \frac{N \Sigma XY - \Sigma X \Sigma Y}{\sqrt{N \Sigma X^2 - (\Sigma X)^2} \sqrt{N \Sigma Y^2 - (\Sigma Y)^2}} = -0.774$$

$$PE = 0.6745 \times \frac{1 - r^2}{\sqrt{N}} = 0.121$$

### Correlation between Total Sales and Total Assets of BPC

(In Thousand NRs.)

Year	Sales (X)	Total Assets (Y)	$X^2$	$Y^2$	$X \hat{=} Y$
2005/06	96364	1825464	9286020496	3332318815296	175909012896
2006/07	283167	1579195	80183549889	2496856848025	447175910565
2007/08	323134	1439238	104415584956	071406020644	465066731892
2008/09	358419	1744447	128464179561	3043095335809	625242949293
2009/10	379769	1882271	14424493961	3542944117441	714828175399
<b>Total</b>	$\Sigma X =$ <b>1440853</b>	$\Sigma Y =$ <b>8470615</b>	$\Sigma X^2 =$ <b>466573825263</b>	$\Sigma Y^2 =$ <b>14483621137215</b>	$\Sigma XY =$ <b>2428222780045</b>
<b>Correlation (r) = - 0.154</b>			<b>Probable Error (PE) = 0.259</b>		

$$r = \frac{N \Sigma XY - \Sigma X \Sigma Y}{\sqrt{N \Sigma X^2 - (\Sigma X)^2} \sqrt{N \Sigma Y^2 - (\Sigma Y)^2}} = -0.154$$

$$PE = 0.6745 \times \frac{1 - r^2}{\sqrt{N}} = 0.259$$

### Correlation between Total Sales and Total Assets of HPL

(In Thousand NRs.)

Year	Sales (X)	Total Assets (Y)	X <sup>2</sup>	Y <sup>2</sup>	X $\hat{=}$ Y
2005/06	2193850	10999524	4812977822500	120989528226576	24131305727400
2006/07	2092032	10110845	4376597889024	102229186614025	21152211287040
2007/08	2104124	10098599	4427337807376	101981701762801	21248704522276
2008/09	2121897	9897921	4502446878609	97968840122241	21002368876137
2009/10	2307461	9423895	5324376266521	88809796971025	21745270180595
<b>Total</b>	<b>ΣX= 10819364</b>	<b>ΣY= 50530784</b>	<b>ΣX<sup>2</sup>= 23443736664030</b>	<b>ΣY<sup>2</sup>= 511979053696668</b>	<b>ΣXY= 109279860593448</b>
<b>Correlation (r) = - 0.305</b>			<b>Probable Error (PE) = 0.274</b>		

$$r = \frac{N \sum XY - \sum X \sum Y}{\sqrt{N \sum X^2 - (\sum X)^2} \sqrt{N \sum Y^2 - (\sum Y)^2}} = -0.305$$

$$PE = 0.6745 \times \frac{1 - r^2}{\sqrt{N}} = 0.274$$

## Appendix B

### Computation of Trend Values

#### Least Square Trend Analysis of Total Sales Growth of BPC

Fiscal Year	Time	X= Time-3	Sales (Y)	X <sup>2</sup>	X̂ Y	Trend Value
2005/06	1	-2	96364	4	-96364	159758.2
2006/07	2	-1	283167	1	-283167	223964.4
2007/08	3	0	323134	0	0	288170.6
2008/09	4	1	358419	1	358419	352376.8
2009/10	5	2	379769	2	759538	416583.0
		<b>∑X=0</b>	<b>∑Y= 1440853</b>	<b>∑X<sup>2</sup>=10</b>	<b>∑XY= 642062</b>	
<b>a=288170.6</b>			<b>b =64206.2</b>			
2010/11		3				480789.2
2011/12		4				544995.4
2012/13		5				609201.6
2013/14		6				673407.8
2014/15		7				737614.0

Mathematically  $Y = a + bX$

Where, Y = value of the dependent value

a = Y –intercept

b = slope of the trend line

X = value of the independent value

Normal equations fitting above equation are:

$$\sum Y = Na + b \sum X$$

$$\sum XY = a \sum X + b \sum X^2 \text{ Since, } \sum X = 0, a = \frac{\sum Y}{N} \text{ and } b = \frac{\sum XY}{\sum X^2}$$

### Least Square Trend Analysis of Total Sales Growth of HPL

Fiscal Year	Time	X= Time-3	Sales (Y)	X <sup>2</sup>	X <sup>2</sup> Y	Trend Value
2005/06	1	-2	2193850	4	-4387700	2112455.4
2006/07	2	-1	2092032	1	-2092032	2138164.1
2007/08	3	0	2104124	0	0	2163872.8
2008/09	4	1	2121897	1	2121897	2189581.5
2009/10	5	2	2307461	2	4614922	2215290.2
		$\sum X=0$	$\sum Y=$ <b>10819364</b>	$\sum X^2=10$	$\sum X^2Y=$ <b>257087</b>	
<b>a=2163873</b>			<b>b=25708.7</b>			
2010/11		3				2240998.9
2011/12		4				2266707.6
2012/13		5				2292416.3
2013/14		6				2318125.0
2014/15		7				2343833.7

Mathematically  $Y = a + bX$

Where, Y = value of the dependent value

a = Y –intercept

b = slope of the trend line

X = value of the independent value

Normal equations fitting above equation are:

$$\sum Y = Na + b \sum X$$



$$\sum XY = a \sum X + b \sum X^2 \quad \text{Since, } \sum X = 0, \quad a = \frac{\sum Y}{N} \quad \text{and} \quad b = \frac{\sum XY}{\sum X^2}$$

### Least Square Trend Analysis of Net Profit After Tax Growth of BPC

Fiscal Year	Time	X= Time-3	Profit After tax (Y)	X <sup>2</sup>	X̂ Y	Trend Value
2005/06	1	-2	-44944	4	89888	56185.0
2006/07	2	-1	235418	1	-235418	121041.9
2007/08	3	0	197761	0	0	185898.8
2008/09	4	1	288419	1	288419	250755.7
2009/10	5	2	252840	4	505680	315612.6
		<b>∑X=0</b>	<b>∑Y= 929494</b>	<b>∑X<sup>2</sup>=10</b>	<b>∑XY= 648569</b>	
<b>a=185898.8</b>			<b>b=64856.9</b>			
2010/11		3				380469.5
2011/12		4				445326.4
2012/13		5				510183.3
2013/14		6				575040.2
2014/15		7				639897.1

Mathematically  $Y = a + bX$

Where, Y = value of the dependent value

a = Y –intercept

b = slope of the trend line

X = value of the independent value

Normal equations fitting above equation are:

$$\sum Y = Na + b \sum X$$

$$\sum XY = a \sum X + b \sum X^2$$

Since,  $\sum X = 0$ ,  $a = \frac{\sum Y}{N}$  and  $b = \frac{\sum XY}{\sum X^2}$

## Least Square Trend Analysis of Net Profit after Tax Growth of HPL

Fiscal Year	Time	X= Time-3	Profit After tax (Y)	X <sup>2</sup>	X̂ Y	Trend Value
2005/06	1	-2	773597	4	-1547194	757470.4
2006/07	2	-1	893285	1	-893285	897833.0
2007/08	3	0	1162551	0	0	1038195.6
2008/09	4	1	878985	1	878985	1178558.2
2009/10	5	2	1482560	4	2965120	1318920.8
		$\sum X=0$	$\sum Y=$ <b>5190978</b>	$\sum X^2=10$	$\sum XY=$ <b>1403626</b>	
<b>a=1038196</b>		<b>b=140362.6</b>				
2010/11	6	3				1459283.4
2011/12	7	4				1599646.0
2012/13	8	5				1740008.6
2013/14	9	6				1880371.2
2014/15	10	7				2020733.8

Mathematically  $Y = a + bX$

Where, Y = value of the dependent value

a = Y –intercept

b = slope of the trend line

X = value of the independent value

Normal equations fitting above equation are:

$$\sum Y = Na + b \sum X$$

$$\sum XY = a \sum X + b \sum X^2$$

Since,  $\sum X = 0$ ,  $a = \frac{\sum Y}{N}$  and  $b = \frac{\sum XY}{\sum X^2}$

### Least Square Trend Analysis of Earnings per Share Growth of BPC

Fiscal Year	Time	X= Time-3	Earnings Per Share(Y)	X <sup>2</sup>	X̂ Y	Trend Value
2005/06	1	-2	-5.4	4	10.8	6.70
2006/07	2	-1	28.1	1	-28.1	14.43
2007/08	3	0	23.6	0	0	22.16
2008/09	4	1	34.4	1	34.4	29.89
2009/10	5	2	30.1	4	60.2	37.62
		$\sum X=0$	$\sum Y=111$	$\sum X^2=10$	$\sum XY=77.3$	
<b>a=22.16</b>			<b>b=7.73</b>			
2010/11		3				45.35
2011/12		4				53.08
2012/13		5				60.81
2013/14		6				68.54
2014/15		7				76.27

Mathematically  $Y = a + bX$

Where, Y = value of the independent value

a = Y –intercept

b = slope of the trend line

X = value of the independent value

Normal equations fitting above equation are:

$$\sum Y = Na + b \sum X$$

$$\sum XY = a \sum X + b \sum X^2$$

Since,  $\sum X = 0$ ,  $a = \frac{\sum Y}{N}$  and  $b = \frac{\sum XY}{\sum X^2}$

## Least Square Trend Analysis of Earnings Per Share Growth of HPL

Fiscal Year	Time	X=Time-3	Earnings Per Share (Y)	X <sup>2</sup>	X $\hat{Y}$	Trend Value
2005/06	1	-2	34.4	4	-69	33.67
2006/07	2	-1	39.7	1	-40	39.9
2007/08	3	0	51.7	0	0	46.14
2008/09	4	1	39.1	1	39	52.38
2009/10	5	2	65.9	4	132	58.62
		$\sum X=0$	$\sum Y=231$	$\sum X^2=10$	$\sum XY=62$	
<b>a=1038196</b>			<b>b=140362.6</b>			
2010/11	6	3				64.86
2011/12	7	4				71.1
2012/13	8	5				77.33
2013/14	9	6				83.57
2014/15	10	7				89.81

Mathematically  $Y = a + bX$

Where, Y = value of the independent value

a = Y –intercept

b = slope of the trend line

X = value of the independent value

Normal equations fitting above equation are:

$$\sum Y = Na + b \sum X$$

$$\sum XY = a \sum X + b \sum X^2$$

Since,  $\sum X = 0$ ,  $a = \frac{\sum Y}{N}$  and  $b = \frac{\sum XY}{\sum X^2}$