CHAPTER - I

INTRODUCTION

1.1Background of the Study

A market is a sensitive place and is influenced by multiple factors. Therefore, forecast about future movement has become global phenomena and a basic concern of financial and economic condition of a nation. Stock market index is perceived as an indicator of investors' confidence to invest in stocks, which obviously, represents economic status of the nation. As capital market is the crucial element in the national economy, its role in reinvigorating and boosting the economic activities in the country holds significance. It helps to mobilize domestic resources. Its role to provide the best investment opportunity by transferring the funds from surplus sectors to deficit sectors through transaction of stocks cannot be ignored. Hence, for the attainment of self-reliant growth of national economy and smooth running of the economic activities of the nation, stock market's role has become major importance in financial management.

A number of studies have been conducted on the Stock Market in developed and big capital markets but their relevance is yet to be seen in the context of smaller and under developed capital markets. The Stock Market in smaller and under-developed capital markets is thus one of the most important areas of the study in finance (Pradhan, 1993).

The Nepalese stock market is characterized by a low trading volume, absence of professional brokers, early stage of growth, limited movement of share prices, and limited information available to the investors. Thus it is felt necessary to study stock market behavior in the context of smaller and under-developed capital markets, and this study prepared with reference to commercial banks listed in Nepal Stock Exchange Limited (NEPSE) is a small attempt.

The act of raising fund by issuing shares to the public in Nepal started in 1937.Though the development of securities markets could not be a national policy, Nepal led to institutional development of securities markets with the establishment of Security Exchange Centre (SEC) in 1976.The SEC used to manage and operate primary and secondary markets of long-term government securities and corporate securities. After some years of establishment, policies and programs were made to develop and promote Stock Exchange and market makers.

With the objectives of regulating securities transactions and protecting interest of the investors, a Security Exchange Act was enacted in 1993. The act provided some legal and institutional basis for the securities markets development. The SEC was converted into the Nepal Stock Exchange Ltd (NEPSE) in 1993 with the objectives of operating and managing secondary transaction of securities. After this conversion the open cry out system of trading among the stockbrokers started. It means transaction of the securities is conducted on open auction principle on the trading floor. The establishment of the specialized firm as NEPSE proved to be a strong step towards liberalization of the economy and a milestone in the path of the economic development in the nation.

The recent reforms have focused on enhancing institutional development. To ensure transparency and dynamism in stock transaction, the open voice bidding system has been replaced by computerized transactions. The NEPSE adopted the Automated Trading System (ATS) instead of open cry trading system from august 24, 2007, permitting a high degree of price transparency and real time price quotations. The ATS has started on-line trading through Wide Area Network (WAN). Now, the brokers have been able trade via computers either on the floor of the exchange or from their offices. As NEPSE become more systematic, it has implemented index-based circuit breakers with effect from 21 September 2007. In addition to the circuit breakers with effect, price range is also applicable on individual securities to stabilize the volatility of the stock market. The evolving capital market was started to attract small investors, which is a good sign for its further consolidation.(Surya Bdr G.C 2010)

Under the provision of securities exchange act 1983A.D, Securities Board Nepal (SEBO/N) was established in May 26, 1993 A.D. to regulate and manage the securities market. Since the establishment, SEBO/N has been concentrating its effort to improve the legal and statutory framework, which is one of the basis for the healthy development of capital market. The amendment of that same act was made in 1997. This amendment made provisions for registering securities businessperson and submitting semi and annual report to SEBO/N. It is the apex regulator of the securities markets in Nepal. It provides licenses to Stock Exchange and Securities business persons (stockbrokers, securities dealers, market makers, and issue managers) it approves public securities. NEPSE is the market operator and it provides membership to the securities businesspersons. Listed companies and the securities businesspersons report their performance to SEBON and NEPSE.

The securities market plays an important role in mobilizing savings and channeling them into productive investment for the development of commerce and industry in the country. It assists the capital formation and economic growth in the country. But, the Nepalese securities market still is in growing stage. Its further development is crucial.

History indicates that there are two basic theories of market price efficiency i..e. Stock price: the technical analysis theory and fundamental analysis theory. Briefly, the technical analysts believe that the forces of supply and demand are reflected in the patterns of price and volume of trading while fundamental analysts do that economic environment and earning power are reflected in the pattern of market prices (Fischer and Jordan 2000). Whereas the fundamentalists predict the efficiency of market price by analyzing earning power and the economic environment in the risk-return framework. The fundamentalists believe that at any point in time, every share has an intrinsic value which should be in principle be equal to the present value of the future stream of income from that share discounted at an appropriate risk related rate of interest (Bhalla 1999). Thus, the actual price of the security is considered a function of a set of anticipated capitalization rate.The present study represents an effort to improve on shortcommings of the past studies in the hope that the “Behavior of Stock price” can easily be understood.

Shareholders are the prime constituent of any company. Shareholders are the investors to tie their fortune with the fortune of the company in which they invest. So, there is no doubt regarding a company should maximize the wealth of its shareholders. This means a company should provide increment in shareholders' wealth or must create something of value to their shareholders that they can not do for themselves (Van Horne JC, 2004:3). The more accurate and simple way to measure whether shareholders' wealth is maximized or not is look for the return that the company is providing to their shareholders. This return comprises both of dividend yields and capital gain. Hence in this inflationary world investment is actually a blessing which can mitigate the effects of inflation. However, there are several investment instruments available from real to financial assets. Real investment includes investment in real estates, gold, silver, commodities etc. Financial instruments on the other hand range from money market instruments like treasury bills, commercial paper, certificates of deposit, banker's acceptance, repurchase agreements, short-term municipal securities etc. to capital market instruments like stocks, bonds, preference shares, mortgage loans, derivatives etc. Among these the prime concern is with stocks or equity shares. And the only capital market where this security is traded is NEPSE.

Nepal Stock Exchange (NEPSE) is the only stock exchange for trading securities in Nepal which was established in January 13, 1994. However, over–the–counter (OTC) market is started from June 4, 2008; it is yet to take full operational form. This means Nepalese shareholders have to trade securities on NEPSE through its brokers for maximizing their wealth and counter any other phenomenon like inflation that prevents from wealth maximization.

The history of commercial banking in Nepal started with the establishment of Nepal Bank Limited in 1994 B.S., with 51% government and 49% general public ownership. Later on, Rastriya Banijya Bank was established in 2022 B.S. with 100% government ownership. Nepalese commercial banking took yet another turn from 2041B.S. onwards with the establishment of series of joint venture commercial banks. Till day there are at least 28 commercial banks operating in Nepal. But only 21 of them have been listed in NEPSE for transaction, and the oldest bank Nepal Bank Limited has been delisted because of its internal problems. Till day there are 21

commercial banks listed in NEPSE for transaction (SEBON, 2008/09) as shown in the table 1.1

Table 1:1 *Commercial Banks in Nepal*

S.N.	Name	Operation Date (A.D.)	Listing Date (A.D)
1	Nepal Bank Limited	1937/11/15	
2	Rastriya Banijya Bank	1966/01/23	
3	NABIL Bank Limited	1984/07/16	1985/11/24
4	Nepal Investment Bank Limited	1986/02/27	1986/07/22
5	Standard Chartered Bank Nepal Limited	1987/01/30	1988/07/04
6	Himalayan Bank Limited	1993/01/18	1993/07/05
7	Nepal SBI Bank Limited	1993/07/07	1995/01/17
8	Nepal Bangladesh Bank Limited	1993/06/05	1995/12/24
9	Everest Bank Limited	1994/10/18	1996/04/07
10	Bank of Kathmandu Limited	1995/03/12	1997/07/17
11	Nepal Credit and Commerce Bank Limited	1996/10/14	2005/01/31
12	Lumbini Bank Limited	1998/07/17	2004/11/10
13	Nepal Industrial and Commercial Bank Limited	1998/07/21	2000/06/13
14	Machhapuchhre Bank Limited	2000/10/03	2003/05/28
15	Kumari Bank Limited	2001/04/03	2004/07/29
16	Laxmi Bank Limited	2002/04/03	2004/04/20
17	Siddhartha Bank Limited	2002/12/24	2006/02/24
18	Agriculture Development Bank Limited	2006/03/16	
19	Global Bank Limited	2007/01/02	2009/03/26
20	Citizens Bank International Limited	2007/06/21	2009/05/25
21	Prime Commercial Bank Limited	2007/09/24	
22	Sun Rise Bank Limited	2007/10/12	
23	Bank of Asia Nepal Limited	2007/10/12	2009/05/25
24	Development Credit Bank Ltd	2008/05/25	2002/13/06
25	NMB Bank Limited	2008/06/02	2001/06/20
26	Kist Bank Ltd	2009/05/07	2004/12/28
27	Janata Bank Nepal Ltd	2010/04/23	
28	Megha Bank Ltd		

Source: Banking and Financial Statistics, No.50, Mid-January 2008 (NRB); and Annual Report (Securities Board of Nepal), Fiscal year 2008/09.

Further commercial banks constitute the major chunk of NEPSE index. The visible dominance of commercial banks over NEPSE can be seen both volume-wise and transaction-wise which account for more than 70% each. Further, NEPSE sensitive index compose of commercial banks. Also, the highest rupees per unit of share traded are recorded for commercial banks. Investors were ready enough to pay more than Rs.9000 for a unit of share of SCB at October 2008. Not only in secondary market is

the investors' preference over commercial bank shares, this case is also same in primary market.

The IPOs of commercial bank shares are oversubscribed several times higher than that of other group shares. So, al these things provided impetus to the researcher to study whether the investors' behavior is logical to act in such a way or at least returns from commercial bank investment can compensate these shareholders against inflation.

1.2 Statement of the Problem

After the liberalization policy in 1980s, the financial made some progress and prudent regulatory measure have been introduced by central bank of the country. However actual performance of the financial institution couldn't improve. Financial institution in Nepal have been facing several problems like lack of smooth functioning of economy, different policies and guidelines on Nepal Rastra Bank , political instability, security problems, poor information system, caused by inefficient pricing shares Nepalese commercial banks are facing the problem in Nepalese stock market.

The technical analysis theory assumes that the historical behavior of a security is rich in information and that can be used to predict future behavior (Fama, 1965). Technical analysis uses most of the anomalies to extract information on future price movements from historical data. The theory of Random Walk Hypothesis (RWH) or Weak Efficient Market Hypothesis (EMH) attempts to analyze statistically underlying share price behavior. This study is concerned mainly with above mentioned theory, which is the most illustrious hypothesis in the field of share price behavior.

Thus, this study is carried out to analyze the market share prices of Nepalese Stock market in relation to banking sector and to recommend for the improvement. To sum up, the study deals with the following issues:

- What is the market price efficiency of commercial banks in Nepal?
- What is the behavior of commercial bank index with comparison to NEPSE index?
- Whether the Nepalese stock market efficient in pricing shares?
- Whether the price change are the random phenomenon or not?

1.3 Objectives of the Study

Within the periphery of the stated problem of the study, the broad objective of the study is to analyze and assess the behavior of stock prices of the sampled commercial banks operating in the present context of the country. It tests the hypothesis of the share price movements. However, the specific objectives of the study are as follows:

- To analyze the behavior of those commercial banks index and NEPSE index.
- To determine whether the present Nepalese stock market is efficient in pricing shares.
- To outline the possible implications and to analyze the stock price of the commercial banks operating in the present context of Nepal.
- To determine the price change are the random phenomenon or not.

1.4 Significance of the Study

The main reason behind this study is to analyze the market price efficiency of commercial banks in Nepal. This study will benefit the prospective investors to gain the information regarding the stocks of commercial banks and to make the better investment decisions. As well as the investors can gain the information about the position of Nepalese stock market during the study period. Besides, this study will contribute to the concerned authorities and the market makers. Further, it will add little worth to those who wants to conduct a research work in related topic.

Concerning the central library of Tribhuwan University, it was found that there are a few research regarding market price efficiency of commercial bank in Nepal. This research has been delivered some present issues. Latest information and data regarding the market price efficiency of commercial bank. Hence this study was significant to bankers, shareholders, Depositors, Investors and further researcher, students etc.

1.5 Limitation of the Study

For the MBS program this study represents the partial fulfillment and this research has been conducted and submitted within a time constraint, This study has been limited by the following factors:

- Since the data covers only a certain period and only stock price of only some banks are studied, the findings may not be a complete picture of the Nepalese stock market.
- The other limitations are time constraints, resource constraints, and lack of research experience.
- The regression equations are based on only five years data whereas the various tests are done on the basis of daily stock price from July 16 2008 to July 16 2009.
- The major portions of analysis and interpretation have been done on the basis of the available data and information. So the consistency of finding and conclusion is strictly dependent upon the reliability of secondary data and information.
- This study is done for the partial fulfillment for MBS degree in management. So, it is not a comprehensive study.
- The data has been collected from NEPSE for its official records and the data are not verified.

1.6 Organization of the Study

Entire thesis has been organized into five parts, each devoted to some aspects of the study of the market price efficiency. The titles of each part are as follows:

Chapter -I: Introduction
Chapter –II: Review of Literature
Chapter- III: Research Methodology
Chapter- IV: Data presentation and Empirical Analysis
Chapter-V: Summary, Conclusion and Recommendations.

The rationale behind this kind of organization is to follow a simple research methodology approach and to comply with the format prescribed by the faculty of management. The content of each part of this study are briefly mentioned here.

The first chapter introduction describes background of the study, statement of the problem, the major issues to be investigated along with the objectives and scope of the study, limitation of the study and ends with the organization of the study.

The second chapter is devoted to theoretical analysis and brief review of related literature. It tries to define the concept of security market, and conceptual theories of stock price. This chapter also reviews the literature from foreign context, as well as the Nepalese context, highlighting the major contributions of different studies like international journals, Masters Dissertations and Nepalese journals.

The third chapter, Research Methodology, is the most important part to the study which discusses the methodologies used in the study. It deals with research design, sources and nature of data, sampling and population, test model and method of analysis as test methodology and definition of key terms.

The fourth chapter, Data presentation and empirical analysis present the graphical and statistical analysis of stock behavior includes analysis of NEPSE and commercial Banks indices behavior and at the end of this chapter

The last chapter of the study states summary and conclusion, findings, suggestion and recommendation. It includes summary of the study, findings, conclusion drawn from the findings and the recommendation to the concerned authorities, companies, investors and forthcoming researches for improving the future performance of the sample banks. Finally, an extensive, bibliography and appendices are also presented at the end of the thesis work.

CHAPTER – II

REVIEW OF LITERATURE

In this chapter, reviews have been made on some of the basic literatures on share price behavior concerning theories including review of empirical evidence of previous studies done within and outside the country. This chapter is not however to develop any theories but will be in a effort to lay down certain decisional rules that can be of some value in assessing the market price efficiency of commercial banks in Nepal. This chapter is divided into two sub headings: conceptual review and research review. Conceptual review covers the concept of basic terms and various theories used in the study and research review includes the reviews of international journals, Masters Dissertation and Nepalese journals.

2.1 Conceptual Review

This part covers the theoretical concept of securities, securities market with its classification and security analysis or the theories of share price behavior. It concludes with the explanation of Nepalese securities market as well as the foreign context and its classification.

2.1.1 Concept of Securities

Securities are the financial assets that form the part of the investors' wealth. They are the marketable interests represented by the certificate as a financial value. They include shares of corporate stock or mutual funds, bond issued by the corporations or governmental agencies, stock options or other options, other derivative securities, limited partnership units and various other formal investment instruments.

A corporation may conveniently issue each class of securities in the market. There is a class of investors for each class of securities because of their varying preferences of risk, income and control. There are various class of buyers such as the stock holders, employers, customers and creditors of the corporation and traders in the capital market (Kulkarni, 1992). The largest number of security buyers is that of individual

investors who seek safety on their commitment and reasonable certainty of a moderate but regular income. The speculator seeks large profits, even though considerable risk may be involve in it.

When someone borrows money from a pawnbroker, the borrower must leave some item of value as a security. If the borrower fails to repay the loan (plus interest), the pawnbroker can sell the pawned item to recover the amount of the loan (plus interest) and perhaps make the profit. The terms of the agreements are recorded on pawn tickets. When a college student borrows money to buy a car, the lenders usually holds formal title of the car until the loan is repaid. In the event of default, the lender can repossess the car, and sell it to recover the costs. In this case, the official certificate of title, issued by the state, serves as the security for the loan. A person who borrows money for a vacation may sign a piece of paper promising repayment with interest.

The loan is unsecured in the sense that there is no collateral, meaning that no specific assets have been promised to the lender in the event of default. In such a situation, the lender would have to take the borrower to court to try to recover the amount of the loan borrowed. Only a piece of paper called a promissory note stands as a evidence of such loan. When a firm borrows money, it may or may not offer collateral. Some loans may be secured with specific pieces of property (building or equipment). Such loans are recorded by means of mortgage bonds, which indicate the terms of repayment and the particular assets pledged to the lender in the event of default. However, it is much more common for a corporation to simply pledge all of its assets, perhaps some of which is provisioned for the manner in which the division will take place in the event of default. Such a promise is known as a debenture bond.

Finally a firm may promise a right to share in its profits in return for an investor's fund. Nothing is pledged and no irrevocable promises are made. The firm simply pledge whatever its directors deem reasonable from time to time. However, the investors are given the right to participate in the determination of who will be the member of the board of directors. This right protects the investors against serious malfeasance. A share of common stock, which can be sold to someone else, who will then be able to exercise that right, represents the investors' property right. The holder

of common stock is said to be the owner of the corporation and can exercise the control over its operations through the board of directors.

In general, only a piece of paper represents the investors' right to certain prospects or property and the conditions under which she/he may exercise those rights. This piece of paper, saving on evidence of property rights is called the security. It may be transferred to other investors and with it will go all its rights and conditions. Thus, everything from pawn ticket to a share of common stock is the security. Hence, the term of security can be understood as a legal representation of the right to receive prospective future benefits under conditions. The primary tasks of security analysis is to identify misplaced securities by determining these prospective future benefits, the conditions under which they will be received and the likelihood of such conditions (Francis, 2002).

Briefly, securities are the intangible assets, represented by legal claims to some future benefits or future cash. They give the holder an ownership interest in the assets of the company as well these have value in exchange. Securities are the term used interchangeably as financial assets or financial instruments.

2.1.2 Security Market

In recent years, globalization, deregulation, and advances in technology have contributed to a dramatic reshaping of global capital markets. Central banks play a pivotal role in financial markets by setting monetary policy and regulating financial institutions. Central bank operations have major impact on money and capital markets.

Stock markets are essential to economic development. The stock market provides a place where corporations can go to raise long-term capital to finance a multitude of projects. Stocks also offer investors the opportunity to obtain capital gains from ownership of business enterprises, as well as to receive current dividend income. Stock ownership has expanded dramatically in the past decade as individuals have assumed more responsibility for providing for their retirements. In addition, low-cost online trading has opened the world of equities to millions of people who might not have otherwise considered investing in the stock market. Corporations issue stocks in the primary market. In the secondary market investors express their opinions, based

on certain valuation techniques, about the future profitability of a company through the trades that they make. The aggregate of these trades gives the market consensus about the price of the stock. Investors use several approaches to determine the value of a stock, including fundamental analysis, technical analysis, and the efficient market hypothesis.

Security market is embraces a number of markets in which securities are transact. The securities traded in the securities market are share, bonds, debentures, bills, notes etc. Therefore, security market is a mechanism for raising required funds by selling and buying these securities. The development of the securities market enables the efficient transformation of savings from the hand of surplus to those of deficit who can use them productively with lesser risk.

The growth of the US economy has been due in large part to the strength and efficiency of its security markets (Cheney and Moses, 64). The importance of an efficient broadly based security market for a country's economy is demonstrated by the fact that one of the top priorities of emerging eastern European countries is the establishment of security markets. In converting from centrally planned economy to a market based system, the eastern European countries are establishing an environment in which business can operate. This includes, creating a new framework of commercial law, setting up autonomous and decentralized system of wholesale and retail distribution, establishing a banking system and providing sources of debt and equity capital for business through efficiently operated security market.

Security market interchangeably known as the integral part of the capital market is in fact basis of the economy. The most effective use to idle and surplus resources can be brought into pro-active purpose only by means of market mechanism. This indicates the structural network of the savers and user group of funds presumably garnered for the long term financing but the formation of network originates via conversion process of saving into investment outlet. Thus the security market upholds the attempts particularly concerned with the collection and mobilization of savings. Saving meticulously diverted towards the regeneration activities, in essence of financialization and industrialization activities will result in the repercussion favorable to the economy as a whole (Khatiwada, 1998).

The security market can be defined as a mechanism for bringing together buyer and seller of financial assets to facilitate trading. Security market is classified into two: the market in which new securities are sold known as the primary market and the market in which the securities are resold known as secondary market. Brokers, dealers, and market makers create secondary market. Brokers bring buyer and seller together without themselves actually buying and selling does not take place; dealer sets price at which they themselves are ready to buy and sell (bid and ask price respectively). Broker and dealer come together in organized market of stock exchange (Gitman 1994).

New York, London, Tokyo contain the largest securities market in the world-all are about equal in size (Francis, 2002). Trading goes on 24 hours in a day. Each market conducts trading differently, So that the securities market should be viewed as components of a global market.

The findings of market price efficiency tests (mostly weak-form efficiency tests) on emerging markets are rather varied. Some researchers find evidence in favour of weak-form efficiency (cheung and coutts,2001 and abrosimova and linowski 2002) but some other researchers find evidence of predictability of stock price.

Securities market can be classified by the maturity of the securities that are traded in the market and by the new securities being sold or already issued securities that are being brought and sold. New issues are made in the primary market whereas securities owned by the investors are usually bought and sold through the secondary market.

丿 Primary Market

The primary market is that part of securities market that deals with the issuance of new securities. Companies, governments or public sector institutions can obtain funding through the sale of new stock or bond issue. The issue of new securities is commonly known as an Initial Public Offering (IPO). Issuers usually retain investment banks to assist them in finding buyers for these issues, and in many cases, to buy any remaining interests themselves. This arrangement is known as underwriting.

The issuance of securities in the primary market leads to direct transfer of money from the savers to the issuer of the securities. Thus, the primary market transfers the fund from savers to investors to make the capital available for the investment in building, equipment, and stock of necessary goods (Shrestha, 2004).

⁾ Secondary Market

After the securities have been purchased in the primary market, they can be traded in the secondary market. The secondary market is an organized market to enable buyers and sellers to effect their transaction more quickly and cheaply. It is therefore important that the secondary market do not go to the original issuer but to the owner (sellers) of the securities. Once the investors have purchased the securities in the primary markets, they need to sell those securities. Without the liquidity of the secondary market, firms would have difficulty in raising funds for productive purposes in the primary market (Cheney and Moses, 10^{th} edition).

As the stock exchange typically deals in existing securities rather than in new issues, it has greater economic significance may be misunderstood. Because an increase in volume of securities trading in the stock market does not represent an increase in the economy's aggregate saving, every purchase of an existing security being exactly offset by the sale of the security. The availability of an efficient secondary market for securities is one of the more important factors including investors to acquire new issues of securities. The basic economic function is to provide marketability for long-term investments, thereby reducing the personal risk incurred by investors, broadening the supply of equity and long-term debt capital for the financing of business enterprise. Thus, the secondary market is vital to an efficient and modern securities market (Bhalla, 1993).

Stock Exchanges vs. Over-the-Counter-Market

The transactions among investors in the secondary market take place at organized exchanges or in the OTC market. The organized exchanges have trading floors where traders execute buy and sell orders for their clients. The OTC market does not have a trading floor; instead, traders execute transactions through a computerized telecommunications networks. (Liaw, K.T., 2004)

Stockholders Wealth

Shareholders are the owners of the corporation, and they purchase the stocks because they want to earn a good return on their investment without undue risk exposure. Management's primary goal is stockholder wealth maximization, which translates into maximizing the price of the firm's common stocks. Stock price maximization is the most important goal for most corporations (Brigham et al., 1996:13).

What kinds of actions can managers take to maximize a firm's stock price? What determines stock prices? In a nutshell, it is a company's ability to generate cash flows now and in the future. Three important facts that must be considered for maximizing the shareholders wealth are:

- Any financial assets, including a stock is only valuable if it generates cash flows.
- Timing of cash flows matters.
- Investors generally are averse to risk.

So if managers, enhance their firm's stock prices by increasing the size of the expected cash flows by speeding up their receipts, and by reducing their riskiness, can maximize shareholders' wealth. And keeping in mind the above factors, managers need to make investing, financing and dividend decisions.

It should be however kept in mind that increasing cash flows (present or future) may be sometimes in contrary to maximizing current profits or EPS (especially with increasing future cash flows).

All boats rise with the tide, but the same does not hold for stock market-regardless of trend some individual stocks make huge gains while others experience losses. The value of stock is determined using the time value of money concept. Further there are two special features of common stock. First, it entitles its owner to dividends, but only if the company has earnings out of which dividends can be paid, and only if management chooses to pay dividends rather than retaining and reinvesting all the earnings. And the other, stocks can be sold at some future date. A stock's value is the present value of the expected future cash flow streams. This expected cash flow consists of the dividends expected in each year and the price investors expect when they sell the stock.

The present value model used to determine the price of a security, which is as follows:

Present $Value_0 = cashflow_1/(1+K)^1 + cashflow_2/(1+k)^2 + \ldots\ldots + cashflow_n/(1+k)^n$

Time Value of Money is the very base for the calculation of the stock value. And the essence of this is: "a dollar in hand today is worth more than a dollar to be received in the future because, if you had it now, you could invest it, earn interest and end up with more than one dollar in the future". Dollars that are paid and received at two different points in time are different and this difference is recognized and accounted for by time value of money (TVM) analysis.

Another most important factor in determining the stock price is obviously cost of capital, K. Two important things governing the cost of capital are:

- That investors provide managers with the necessary funds or capital to undertake projects, and
- Managers, if they are good stewards of the money entrusted to them, invest only in projects that produce rates of return at least as high as the return investors could get elsewhere. The return investors could get elsewhere is their opportunity cost of capital, also called their required rate of return.

Three basic ways can be applied to calculate the firm's cost of capital so that it can be further used to calculate the firm's stock value.

1. The CAPM Approach: $K_s = K_{RF} + (K_M - K_{RF})\, b_i$
2. Bond-yield-plus-risk-premium approach: Ks = Bond yield + risk premium
3. Dividend-yield-plus-growth rate, or discounted cash flow approach: $\overset{z}{K} X\frac{D_1}{P_0} \Gamma g$

Another most similar interpretation for the composition of the cost of capital is given by the determination of market interest rates, which is as follows:

Quoted interest rate = $K = K^* + IP + DRP + LP + MRP$

$= K_{RF} + DRP + LP + MRP$

Where,

K*= real risk free rate with zero inflation were expected.

K_{RF} = quoted risk-free rate of interest on a security which is very liquid and also free of market risks.
IP = average expected inflation rate over the life of the security.
DRP = the possibility that the issuer will not pay interest or principal at the stated time and in the stated amount.
LP = liquidity or marketability premium to reflect the fact that some securities can not be converted to cash on short notice at a reasonable price.
MRP = exposure to risk of price declines.

The expression on the above equation for calculating the cost of capital clearly shows the inclusion of risk element. And also discussion of return would not be complete if risk is not taken into consideration. No investment will be undertaken unless the expected rate of return is high enough to compensate the investor for the perceived risk of the investment. Investment risk then is related to the probability of actually earning less than the expected return. The greater the chance of low or negative return, the riskier the investment.

2.1.3 Growth of Nepalese Security Markets

Security means shares, bonds, stocks, debentures or government's debts securities, nation saving certificates, treasury bills etc, which are issued by industrial organizations or organized institutions. Hence, security market refers to that market where buyers and sellers meet at a stated place.

The history of capital market in Nepal is very new. The concept of capital market was developed in 1976 by the establishment of Security Exchange Center (SEC). The number of listed companies and their trading was very negligible until the His Majesty Government (HMG) of Nepal has made economic reforms along with broad financial policy in 1993. The SEC is only the organization that is responsible for selling and buying securities in Nepal. It was established with the objectives of facilitating and promoting the growth of capital markets in Nepal. It was the only capital market institutions undertaking the job of broker, underwriting, managing public issue, market making for government bonds and other financial services. So it was both primary and secondary market as well.

The remarkable changes came only after the initiation to reform the market in 1993, when SEC was converted into the Nepal Stock Exchange Ltd. (NEPSE) and new market mechanism was introduced providing membership to market intermediaries and allowed to participate in the transaction of securities. Then the government established Securities Board of Nepal (SEBO/N) as an apex regulatory body under the security exchange act, 1983 (second amendment) to regulate and monitor both the markets in 1997. The act has authorized to SEBO/N to supervise, regulate and monitor the activities of the NEPSE and other companies related to securities business.

The history of securities market began with the floatation of shares by Biratnagar Jute Mills Ltd. and Nepal Bank Ltd. in 1937. Introduction of the Company Act in 1964, the first issuance of Government Bond in 1964 and the establishment of Securities Exchange Center Ltd. in 1976 were other significant development relating to capital markets.

The basic objective of NEPSE is to impart free marketability and liquidity to the government and the corporate securities by facilitating transactions in its trading floor through members, market intermediaries, such as brokers, market makers etc. NEPSE opened its trading floor on 13th January 1994. NEPSE the only Stock Exchange in Nepal introduced fully automated screen based trading since 24th August, 2007. The NEPSE trading system is called 'NEPSE Automated Trading System (ATS) is a fully automated screen based trading system, which adopts the principle of an order driven market. The growth pattern of Nepalese Securities for the last five years is shown in table 2.1.

Table 2.1

Growth Pattern of Nepalese Securities Market from 2004/05 to 2008/09

(Rs in Million)

Year	Number. of listed Companies	Number of Public Issue	Amount Issued (Rs)	Paid up value (Rs)	Annual Turnover	Market Capitalization	NEPSE Index
2004/05	125	14	1626.8	16771.9	4507.7	61365.9	286.67
2005/06	135	29	2443.3	19958.0	3415.4	96763.7	386.83
2006/07	135	34	2295.5	21799.0	8360.1	186301.3	683.95
2007/08	143	64	10668.2	29465.0	22820.8	366247.5	963.36
2008/09	159	64	16828.5	61140.0	21681.1	512939.1	749.10

Sources: SEBO/N Annual report 2008/2009

Table 2.1 shows the growth pattern of Nepalese stock market. The total market scenario can be learned from the above table regarding the number of listed companies, number of public issue and so on.

2.1.4 Role of Stock Exchange

Stock exchange is the market where second hand securities are bought and sold for investment or speculative purposes. It provides facilities for trading in listed securities. In recent years the role of stock exchange is being increasingly recognized by the authorities (Mahat, 1981). Stock exchange as the market for securities gives everybody access to a number of different opportunities for as many buyers and sellers of securities as possible. From a general economic point of view, the stock exchange constitutes the core of capital market.

Investment is the lifeblood of economic development. It is evident that stock exchange will continue to fulfill their vital function in the national economy. So long as private enterprise exists, we know that the stock exchange is the place where stock and shares are bought and sold.

The substantial competition in innumerable buyers and sellers determines the prices with a measure of precision that cannot be obtained in other unorganized market to such as the property market to such as the property market where activity are of spasmodic nature. Investors want liquidity, the facility to convert their investment into cash at any given time. The answer was a market for investments and thus was how the stock exchange cares into being.

Thus institution plays a notable role in the economic life of the country acting a free market for securities, where price are determined by the forces of supply and demand. The function of stock exchange is not only to provide a market for securities but also in raising funds for government and industry. Thus, a free and active market in stock and share has become a prerequisite for the mobilization and distribution of the nations saving as to support modern business (Mahat, 1981).

In this way, we can say that stock exchange have a vital role to play in helping industries to raise necessary finance. They have a supremacy function to perform in developing a stock capital and to enable government to raise loans. Their services are indispensable in the operation by the authority for the regulation of the country's credit play. It is generally thought that a stock exchange serves only those who have money to invest and securities to sell. In fact this is not true. A stock exchange benefits the whole community in many ways such as it enables producers to raise capacity thereby creating opportunity for employment to the millions of people and helps consumers in creating and accumulating wealth.

2.1.5 Theories of Market Price Efficiency of Share Price

There are numerous reasons that cause the share price movements. Mainly they are economic and non-economic factors. The price of securities is typically very sensitive, responsive to all events, both real and imagined, that cast light into the murky future (Cootner, 1962). Although all factors give rise to observed movement of share prices, it would be very hard to find a completely accepted price formation theory. Before describing the Efficient Market Theory, it would be proper to explain the first two conventional theories, viz; Technical Analysis Theory and Fundamental Analysis Theory.

⁾ Technical Analysis Theory

The word technical implies the study of the market itself excluding all those external factors, which are reflected in the market. In simple term, “Technical Analysis” is a general term for a number of investigating techniques that attempt to forecast securities prices by studying past prices and related statistics. Charles Dow is the greatest protagonist of this theory. The technicians usually attempt to predict the term price movements and thus make recommendation concerning the timing of purchase and sales of either specific stock or group of stocks in general. However a large part of the methodology of technical analysis lacks a strictly logical explanation. Technical analysis is useful for timing a buy or sells order. Investors put off the buy a share if technicians predict that stock prices are further dropping in future. Conversely, investors postpone the selling order if technicians predict that prices further are increasing in near future.

⁾ Fundamental Analysis Theory

Fundamental analysis approach involves working to analyze different factors such as economic influences, industry factors, governmental action, firms financial statement, its competitors and pertinent company information like product demand, earnings, dividends in order to calculate an intrinsic value for firms securities. The analysts who believe on fundamental facts to determine intrinsic value of the stock is popularly known as fundamentalist.

Fundamentalist forecast stock price on the basis of economic industry and company statistic. The principal decision variables ultimately take form of earning and value with a risk-returns framework based upon earning power and the economic environment. Fundamental analysts delve into company’s earnings, their management, economic outlook, firm’s competitors, market condition and many other factors (Francis, 1991).

The objective of fundamentalist is to appraise the intrinsic value of a security. The fundamentalist maintain that any point of time every stock has an intrinsic value (true economic work of financial assets) which should in principle be equal to the present

value of the future stream of income from the stock discounted at an appropriated risk related to the rate of interest.

The study of fundamentalist involves examining its sales earnings, profit margins, dividends, management proficiency, industrial and business outlook, labor competence any factor that would have a bearing on its performance in its future. On the basis of such study, fundamentalists project a company's future profits and earning capacity with reasonable accuracy what the price of company's share ought to be. The estimated price is termed as the intrinsic value, which is generally away from the present market value.

Thus, there is a gap between them. Fundamentalist reaches to an investment decision by comparing this value with current market value; it is believed that price will rise. In this situation, fundamentalist will acquire the share as the difference presents them with an opportunity to make a profit. Alternatively, in case of low intrinsic value the share is considered overpriced and fundamentalist sell the share believing that the market is inefficient in pricing shares.

- **Efficient Market Theory**

An efficient market is one where shares are correctly priced. An efficient financial market exists when a security price reflects all available public information about economic, financial markets and all about the specific company involved (Van Horne, 1998). An efficient capital market is one in which it is impossible to earn abnormal return by trading on the basis of publicly available information.

An initial and very important premise of an efficient market is that there are large numbers of knowledgeable and profit maximizing independent buyers and sellers, new information is generated randomly and the investors adjust the information rapidly (Reilly, 1986). The Efficient Market Hypothesis (EMH) states that three forms of stock market prevails in theory,

- **Weak**

The weak form of efficient market hypothesis states that the current share prices fully reflect the information contained in the past price movements. The stock price will fluctuate less and more randomly. Weak efficiency market are markets in which past

prices provide no information about future prices that would allow a short-term trader to buy and hold strategy.

- **Semi-strong**

The semi-strong form of efficient market hypothesis states that current market price also reflects all the publicly available information besides all price movements.

- **Strong**

The strong form of efficient market hypothesis states that current market prices reflect all the relevant information in security prices. The market price reflects the true or intrinsic value of the share based on underlying future cash flow and no one can beat such market.

So, the form of the markets are determined on the basis of how publicly available information is reflected in the market price of share.

Some analysts doubt the concept of stock market efficiency in developing countries due to some reasons. These are;(a)difficulty in detecting and discriminating among investment opportunities,(b) investment preference is given to physical assets rather than to financial assets, and (c) A dichotomy exists in the financial activities between organized and unorganized money markets etc (Sharma and Kennedy,1977).There is no unanimous finding as regards the effect of capital structure on stock price behavior. Different studies have come up with different findings. Some of the issues are pointed below:

- **Irrational or Inefficient Behavior of Investors**

Some economists, for example Eugene Fama, argue that most of these patterns occur accidentally, rather than as a result of irrational or inefficient behavior of investors: the huge amount of data available to researchers for analysis allegedly causes the fluctuations.

- **Lacks to Reflect the Real Worth of Securities**

The another theory, Fundamental analysis, in essence, which attempts to estimate the intrinsic value of the security by considering key economic and financial variables

and then decide whether the actual price of share is above or under the intrinsic value. Both the theories are included in conventional security analysis theory. Their view about the stock market has been that the prices generally fall to reflect the real worth of securities.

⁾ Provides More Challenges to the Investors

The theory of efficient market in stock-market prices presents important challenges to both the technical analysis and the proponent of the fundamental analysis. For the chartist (technical analysis) the challenge is straight forward. If the efficient market theory is valid description reality, the work of the chartists, like that of the astrologer, is of no real value in the stock market analysis. The empirical evidence to data provides strong support for the efficient market theory. The only way the chartists can indicate his position is to show that he can consistently use his techniques to make better-than-chance predictions of stock prices.

The challenges of the theory of efficient market to the proponent of fundamental analysis, however, are more involved. If the efficient market theory is valid and if the security exchanges are “efficient” markets then the stock prices at any point in time will represent good estimates of intrinsic or fundamental values. Thus, additional fundamental analysis is of value is only when the analyst has new information, which was not fully considered in forming current market prices, or has new insights concerning the effects of generally available information, he may as well forget about the fundamental analysis and choose securities by some random selection procedure.

In essence, the RWH implies that the past price changes cannot be used to predict future prices. The RWH in share price has no use in predicting its future price movements. Furthermore, the EMH theory cannot be tested directly.

⁾ Conflict in Dependency in the Theories

The weak form of EMH or RWH theory is just opposite with the technical analysis theory. While RWH says that successive price changes are independent, the technical analysis supports that they are dependent. Likewise, the fundamental analysis theory holds that the value of share is simply the present value of all the future income which

the owner of the share will receive (Francis,1991). In an uncertain world, however the intrinsic value of a security cannot be determined exactly. The basic ideas behind the RWH are the successive price changes are uncorrelated over the time and its actual price moves randomly about its intrinsic value.

- **Lack of Appropriate Policy for Development of Nepalese Stock Market**

Nepalese stock market is in early stage of development, and the problem of the Nepalese Stock Market have not been diagnosed and identified. The policy makers are unable to make the appropriate policy for the development of the stock market.

- **Harmful effect due to Stock Price Hike and More Liquidity in the Secondary Market**

The stock prices and the liquidity in the stock market increased sharply after the introduction of semi-modern (open-out-cry) system of trading and conversion of the SEC into the NEPSE. It attracts the general public to invest their savings in the stocks, which caused the stock prices to raise further. The stock price hike and the more liquidity in the secondary market have left positive and immediate impact on the capital mobilization in the economy and the equillibrium of the supply of and demand for funds from the general public is set at lower level than the previous level which is one of the most harmful signals to the stock market and the economy as a whole.

- **Immature Stage of Stock Market**

Since, the stock market in Nepal is the most sufferer problems and is operating in an immature stage. This market has inseperable part of the liberal economy; existing economic imbalances, political instability and ineffective implementation of the liberal economic policy and political crisis are the major problems that have severe impact in the economy. However, there has been continous increased in the number of listed companies. The stock of the financial institutions play crucial role to extend the growth rate of economic development of the nation.

- **Defeciency in the Profitability and Good Governance**

The major causes of the deficiencies in Nepalese stock market appeared to be the profitability and the good governance of the company, government policy regarding investment, market operation system, investors' knowledge information disclosures

and inefficiency of the market. Despite these facts, market makers involved in the securities market are unable to exhibit the well performance according to the expectations of the investors. It is very difficult to examine all these avenues of the stock market.

2.1.6 Commercial Banks

Commercial banks are organized on a joint stock company system, primarily for the purpose of earning a profit. They can be either of the branches banking type, as we see in most of the countries, with a large, network of branches, or of the unit banking type, as we see in the United States, where a bank's operations are confined to a single office or to a few branches within a strictly limited area. Although the commercial banks attract deposits of all kinds current, savings and fixed, their resources are chiefly drawn from current deposits, which are repayable on demand. So they attach much importance to the liquidity of their investments and as such they specialize in satisfying the short-term credit needs of business other than the long-term.

Commercial banks play a dynamic role in the economic development of a nation. It may not be an exaggeration to assert that without the evolution of commercial banks in the 18^{th} and 19^{th} centuries, industrial evolution would not have occurred in Europe. It is equally true that without the development of sound commercial banking, underdeveloped countries can not hope to join the group of advanced countries. Sayers has rightly remarked that the banking system as a whole has an important influence on the tempo of economic activity. (Gordon and Natarajan K, 2001:50).

2.2 Research Review

This section discusses about the review of international journals, Masters Dissertations and Nepalese Journals. The journals have been browsed through websites whereas the Masters dissertations have been reviewed through central library of TU, library of SEBON and college library.

2.2.1 Review of Foreign Context

All the empirical work on efficient market hypothesis can be considered within the context of the expected return on "fair game" model. Indeed in the early literature,

discussion of the efficient market hypothesis were phrased in terms of the even more special random walk model though most of the early authors were in the fact concerned with more general version of the "Fair Game" model. There are large numbers of studies but only few of them are briefly reviewed below.

Fama's (1965) study on random walk model was considered to be one of the most definitive studies. He analyzed the daily proportionate price changes of 30 blue chip stocks in the DJIA for the period of late 1957 to 26th September 1962. He followed standard statistical tools such as serial correlation and run tests to examine whether any dependency exists in any lag price change. He found that the serial correlation coefficient for daily price change were very small and average was 0.03,which is close to zero, but the correlation coefficient of 11 stocks out of 30 were more than twice of their computed standard errors. He used serial correlation coefficient for differentiating intervals stronger evidence of dependence. It leads Fama to conclude that the evidence produced by the serial correlation model seems to indicate that dependence in successive price changes is either extremely, slight or non-existence (Fama, 1965).

Fama further examined using run test analysis to testify whether price changes were likely to be followed by more price changes in the same time. In fact, he found that the actual and expected runs are not significantly different. The largest difference exists for daily changes, but the different was not significant. However, the difference for the 4-day,9-day and 16-day intervals was very small and the departure from Random Walk Hypothesis was negligible and Fama concludes that there was little evidence ,either from serial correlation or run test of any large degree of dependence in the daily 4-day,9-day and 16-day price changes (Fama, 1965).

Conard and Juttner (1973), applied runs and serial correlation test to examine the daily prices of 54 German stocks and observer dependence in the successive price changes. Thus, they concluded that the random walk theory is an inappropriate one to describe the behavior of share price in Germany (Conard and Junter, 1973).

Rao and Mukherjee (1979), applied spectral method to test random walk model of share price behavior by using spectral analysis. They examined weekly average share price of Aluminum Company's share for the sixteen years from 1954 to 1970 and

eventually their study supported the random walk hypothesis (Rao and Mukherji, 1979).

Mahapatra (1995) tested the EMH using rank correlation analysis based on relative strength. His sample consisted of month-end closing price of 26 stocks from Bombay stock Exchange between the periods of January 1989 to December 1992. He found that the Indian stock market is less efficient in the short run, but more efficient in the long run (Mahapatra, 1995).

Dorner (2005) conducted a research by using a computer-based content analysis of qualitative data. He took the data from a Swedish real estate firm during the period 1991-1996. The main objective was to examine the response of stock price to financial announcement. He found the positive correlation between the stock price and the following information categories: net assets value, occupancy rates, cash flow and overall capitalization rate. The main contribution of the study was to support the assumption that public financial information has an impact on stock market behavior (Dorner, 2005).

The review of the above mentioned studies carried out in foreign countries shows many interesting findings on share price behavior. However the question arises as to what extent these findings are pertinent for the context of Nepal? They all may not be applicable for Nepalese stock market where stock market is small and underdeveloped.

2.2.2 Review Related Studies in Nepal

There are many researches carried out by different researchers in this topic in Nepal. Here are some of the past related studies conducted which can help us to understand about their objectives, used statistical tools and major findings about the market price efficiency of commercial banks in Nepal.

Gurung (December 2004) had conducted the study on Growth and performance of securities market. The variables such as number of listed and traded companies, their securities, number of transactions, trading turnovers, paid up value, market capitalization and NEPSE index. They were analyzed to know the growth trend and the performance of Nepalese securities market. The study revealed the growth and

performance of Nepalese securities market even after the introduction of new mechanism in 1993/1994 are not satisfactory though it is improving gradually.

Pradhan and Upadhyay (January 2004) had tested the efficient market hypothesis in context of Nepal. The core objective of the study was to make the comprehensive investigation of weak and other form of EMH. In order to be conclusive about the efficiency of the stock market, primary sources of information about the share price was collected for the first time to find out more subjective facts on share price behavior, which could not be determined by using secondary data. Statistical tools like serial correlation, the run test, the weighted mean, median, chi-square test, and spearman's rank correlation are used. The twenty-three stocks actively traded are examined as a sample for the study from mid July 1997 to mid July 2000.

Shrestha (Summer 1992) has the studied on Capital Market in Nepal. He had attempted to highlight mainly on three aspects: conceptual rationale of the capital market, achievement of the Nepalese capital market and the possible scenarios to improve the performance of the capital market in Nepal. For this he had examine the 14 listed companies and his study concluded that the various inconsistencies and hindrance do exists in the smooth functioning of capital market. Likewise it is necessary to identify national talent and put committed-dedicated professionals with additional background of knowledge and experience in the decision-making capacity of SEC.

Pradhan (1993) conducted a study on Stock Market Behavior in a small capital market by collecting the data of 17 enterprises from 1986-1990. He had applied Market Equity, Market Value to Book Value, Price Earning and Dividend as the technical tools for analysis of data. His findings indicated that larger stocks had larger price earning ratios, larger ratios of market value to book value of equity, lower liquidity, lower profitability and smaller dividends. Price earning ratios and dividend ratios were more variable for smaller stocks where as market value to book value was mare variable to for larger stocks. Larger stocks also have higher leverage, lower assets turnover, and lower interest coverage but these are more variable for smaller stocks than for larger stocks. Stocks with larger market value to book value of equity have larger price-earning ratios, and lower dividends. These stocks also had lower liquidity, higher leverage, lower earnings, lower turnover and lower interest coverage. The

study can be concluded that there is positive relation between the ratio of dividend per share and interest coverage.

2.2.3 Review of Unpublished Masters Dissertations

Poudel (2001) studied on share price movement of joint venture commercial banks by using various financial and statistical tools like standard deviation, correlation, beta, t-test concluded that Nepal stock exchange operates in a weak form of efficient market hypothesis, indicating that the market price move randomly .The market value per share does not accommodate all the available historical information. The shares of joint venture commercial banks emerge as a blue chip in the Nepalese stock market. The beta coefficient, which measures the friskiness of individual security in relative term, suggests that none of the share of eight sampled banks were risky.

Poudel (2002) carried study on Share Price Behavior of Joint Venture Banks in Nepal. He concluded that the growth rate analysis as a stand-alone may not be adequate for the analysis of share prices behavior and may not represent the banks performance in the secondary market. The ordinary least square equation of the book value per share on market value per share reveals that the independent variable does not fully explain the dependent variable. Nepal Stock Exchange operated in the weak form of EMH, including the market price move randomly. The market value per share does not accommodate all the available historical information. Having good record of accomplishment of the financial position, the market potential investors buy the shares of the joint venture commercial banks. Thus the shares of these banks emerge as a blue chip in the Nepalese Stock Market (NSM).

Poudel (2003) studied on the movement of stock price of Joint Venture commercial Banks and found that generally banking sectors NEPSE Index has dominated to all the other sectors. The movement of the stock prices is dependent to the historical prices. The stocks of all the sampled companies are under priced since their expected rate of return is higher than the respective required rate of return.

Gautam (2004) carried a study on stock market behavior. The study concluded that political instability and other laws related issues are the prominent factors for the underdevelopment of security market in Nepal. She further concluded that the

stockbrokers and the stock market are not being much active to create investment environment in the stock market. Information deficiency in the capital market is one of the reasons for determination of share price by excessive speculation. The available information is of low quality and people have very little knowledge of the trading procedure and price formation mechanism in the NEPSE. Lack of effective laws and implication of the existing laws are the contributing factors for the less development of capital market. She also highlighted some of the major problems experienced by stock market and the poor regulatory controls and supervisions by SEBON & NEPSE.

Poudel (2005) studied on Stock Price Behavior of Commercial Banks in NEPSE with the objectives to examine monthly closing price of 6 listed commercial banks during the period of three consecutives years from 2002-2004.The researcher used correlation coefficient, regression analysis, run test and auto correlation. He found that successive price changes were correlated with previous price series. He also found that most of the stocks do not follow Random Walk Hypothesis. The present stock prices were dependent to the historical prices. Most of the investors wanted to invest in the commercial banks and the fluctuation in the NEPSE index was due to the transaction of commercial banks. Data used in this study that is the monthly closing price was not enough to predict the stock prices.

Thapa (2006) has studied the behavior of Nepal Stock Exchange (NSE) index on Behavior of Nepal Stock Exchange Index. The study endeavors to examine the efficiency of the behavior of NEPSE index. It covers the period of five years from 2000-2005 by considering all the sectors. Conclusion says that the growth of the capital market is in slow pace. Banks and finance companies are in better position. NEPSE Index shows no sign of improvement and reflects the aggregate volatility of the share prices of the listed companies.

Bhattarai (2007) conducted the study on Stock Price Behavior of commercial Banks in Nepal with the objective to analyze the behavior of NEPSE index and the factors that impact on stock price. To meet the objectives the behavior of NEPSE index were identified by taking the closing point of sampled banks and NEPSE index and various financial tools like EPS, DPS, BVPS etc as well as correlation analysis were done. Survey shows that not only the position of the company, earning, dividend affects the

price of the share and the share price fluctuates with the publication of financial report increase in liquidity in market and so on but the environmental factors like uncertainty, strike, demand & supply of share also affect it.

Shrestha (2008) has completed the study on “An analysis on the factors of volatility of share price in Nepalese Stock Market” with the objective to analyze the share price volatility factors with different listed companies in NEPSE. Financial as well as the statistical tools were used by the researcher in analyzing and drawing the conclusion from the collected data. However this study concludes that there are various factors in the stock market, which is responsible in the fluctuation of the share price in Nepalese, share market.

2.3 Research Gap

Very few studies have been conducted in the field of share price behavior. The government policy to reform capital market under the extended structural program (ESAP) and modern system of open-cry-cut in F/Y 1993/94 had significantly positive impact on stock market development. After the restoration of democracy, the government has launched liberalization policy, which builds the expectation for the establishment of multinational companies. But unfortunately, because of lack of proper implementation stock market development seems useless. Various studies have been conducted related to share price considering it as a crucial phenomenon in the stock market. New laws are being established to control stock market price. But it is clearly realized that share price are fluctuating abnormally and there is lack of appropriate researches to find out the volatility of share price of commercial banks in the stock market.

Present study tries to analyze the stock price of commercial banks by applying various facts using secondary data. The present study will be fruitful to the interested person in academic as well as in policy prospective. Hope this study will help others in future in the related field.

CHAPTER – III

RESEARCH METHODOLOGY

This chapter contents the various sequential steps that are generally adopted. Arithmetic mean, Standard deviation and CV were used for descriptive statistics standard deviation measures the absolute dispersion and coefficient of variation (CV) is the measure of dispersion of a probability of the series. Different liner equations were used to find whether the series are liner with each other or not. In other words, regression analysis has been used to measure the average relationship between two or more variables in terms of original units of data.

This study is based on primary as well as secondary sources of information. Secondary sources of information were used to test the random walk hypothesis by means of (i) a parametric test for independence and (ii) a non parametric test for randomness. This chapter describes the following aspects of research methodology.

1. Research Design
2. Population and Sample
3. Nature and Sources of Data
4. Data Processing and Analysis
5. Limitation of the Methodology

3.1 Research Design

This study is carried out to get the empirical result of the stock price. To conduct the study, analytical and descriptive research design is adopted for the historical data and information. Descriptive design is adopted to analyze the behavior of daily stock price of the sampled banks, NEPSE index and commercial bank index. At the same time, analytical design is applied to identify the independence and the randomness of the successive stock prices further, it interprets the empirical results.

3.2 Population and Sample

There are altogether twenty eight commercial banks established in Nepal as per the data available on the website of Nepal Rastra Bank (NRB) and SEBO/N. The total number of listed companies for trading in the NEPSE is 159, which is categorized into 8 groups i.e. commercial banks, development banks, finance companies, insurance companies, hotels, manufacturing and processing companies, trading companies, and others. All these however do not provide the population for the study because the study is specifically concentrated in banking sector. So, the listed commercial banks provide the population of the study which stands 21 (SEBON Annual Report, 2008/09). Out of 21 commercial banks, 5 commercial banks i.e.24% of the total population was sampled using convenient sampling method.

Since the study of whole population is not feasible because of time, money and energy costs, the sampling technique have been applied for the study purpose. And hence determination of sample size is the most important part of sampling. For this 95% confidence interval has been set with the marginal standard error of estimate at 5% and the coefficient of variation of 7% has been used.

Accordingly the sample size is determined as:

$$N \text{ X } \frac{Z_{\sim/2} \mid C}{-}^{2} \text{ X } \frac{1.96 \mid 0.07}{0.05}^{2} \text{ X} 7.53 \beta 8$$

Where,

N= basic sampling unit

C= coefficient of variation set at 7%

$Z_{\alpha/2}$= 1.96, value at 5 % level of significance.

θ= standard error set at 5%.

The time undertaken for the study ranges from the year 2000/01 to 2008/09 i.e. 9 years. But all 21 commercial banks currently being listed in the NEPSE do not constitute 9 years data. So, the convenience sampling has been used for selecting the sample commercial banks. The list of sample commercial banks considered for the study is as follows:

Table 3.1: Sample Commercial Banks

Sample No.	Commercial Banks
1	BOK
2	HBL
3	NB
4	NBL
5	SCB

3.3 Nature and Sources of Data

This research is fully based on secondary data. However, primary data are also necessary for the support of the study. For the collection of the secondary data, various published and unpublished materials available in the aforementioned libraries have been referred. More specifically, Annual Reports of respective sample banks, SEBON Annual Reports, NEPSE Trading Reports, Economic Survey, Budget Speech, Monetary Policy, Statistical Year Book of Nepal, NRB Bulletins, Journals, and various magazines and newspaper have been extensively used. Further, persuasion, politeness and frequent visits to these sources were some of the methods employed for collecting secondary data. This study covers the observations of one fiscal year (July 16, 2008 to July 16, 2009).

3.4 Data Processing and Analysis

In this study, statistical as well as financial tools are used to analyze the data. For processing and analysis of data, they have been edited, coded, classified, tabulated, and presented in figures, graphs and charts. The mixes of financial and statistical tools have been applied. Help from several descriptive and inferential statistics have been used for analyzing data. Moreover, for analyzing secondary data parametric statistics have been mostly used and for primary data non parametric statistics have been used. Specifically the following data processing and analysis tools have been employed:

Statistical tools are to function as a tool in designing research, analyzing its data and drawing conclusion. Statistics is the science, which deals with classification and tabulation of numerical facts as the basis of explanation description and comparison of phenomenon. The various statistical as well as financial tools are presented below:

3.4.1 Statistical Tools

丿 Expected Return (Arithmetic Mean)

The most common method, generally referred to the average is the arithmetic mean. In descriptive statistics, the arithmetic mean is the average of set of values or distribution. Expected return is the arithmetic average of the historical returns forecasted for next period.

The most popular and widely used measure of representing the entire data by one value is what most laymen call an average and what the statisticians call the Arithmetic mean (Gupta, 2000) for a data set, the mean is just the sum of all the observations divided by the number of observations.

It is obtained by dividing the sum total of the return by the number of the observations. In probability distribution, the expected return is obtained as the weighted average of the probability and the forecasted return.

Symbolically,

$$\mu X \frac{X}{N}$$

Where,

μ = the population means variable 'X'

X = sum of all the observed value of 'X' variable

N = the total number of observations

) Standard Deviation

The standard deviation (SD) of a probability distribution, random variable or population or multiset of values is defined as the square root of the variance. The standard deviation measures the absolute dispersion, the greater the standard deviation the greater will be the magnitude of the deviation of the deviation means a high degree of uniformity of the observation as well as homogeneity of a series and a large standard deviation means just the opposite. Standard deviation is extremely useful in judging the representative ness of the means (Gupta, 2000).

Symbolically,

$$\pm = \sqrt{\frac{(X\ Z\mu)^2}{N}}$$

Where,

± = Standard deviation

X = Observation

« = population mean for observed value of 'X'

N = total number of observations

= sum of all values of $(X-«)^2$

) Coefficient of Variation

The coefficient of variation (CV) is the measure of dispersion of a probability distribution in probability theory and statistics. It is defined as the ratio of the SD to mean. It is dimensionless number that allows comparison of the variation of populations that have significantly different mean values. The CV of the exponential distribution is often more important than the normal distribution. The CV of an exponential distribution is equal to its mean, so its CV is equal to 1. Distribution with CV<1 are considered low-variance, while those with CV>1 are considered high-variance.

Symbolically,

$$CV = \frac{\sigma}{\mu} | 100\%$$

Where,

± =SD of population

« =Population Mean

⎩ Regression Analysis

The regression analysis is used estimate the likely value of one variable from the known value of the other variable i.e. in regression analysis we establish a kind of average irreversible functional relationship between the two variables. The cause and effect relationship is clearly indicated through regression analysis than by correlation. In other words, regression analysis is a mathematical measure of the average relationship two or more variables in terms of original units of data. The main objective of regression analysis is to predict or estimate the value of dependent variable corresponding to a given value of independent variable.

Regression equation of Y on X (Simple Regression Analysis)

It is the line that gives the best estimates for the values of Y for any specified values of X.

Regression equation of Y on X is given by

Y = a + bX

Where,

Y= Dependent variable

X= Independent variable

a= Intercept of the line

b= Slope of the line (it measures the average change in the value of Y as a result of one unit change in value of X). It is also called regression coefficient of Y on X. In other words, it measures the rate of relationship.

The values of the constants band a can be determined by solving following two normal equations (applying principle of method of least squares).

$$Y = na + b X \quad \text{.....(i)}$$

$$XY = a X + b X^2 \quad \text{.....(ii)}$$

Multiple Regression Analysis

Multiple regression analysis consists of the measurement of the relationship between the dependent variable and two or more independent variables. The procedure is similar to that for simple regression, with a difference that other independent variables are added to the regression equation.

Multiple Regression equation is the algebraic relationship between one dependent variable and two or more independent variables. This relationship is used to estimate the value of dependent variable for the given values of independent variables. In this chapter, we shall limit our discussion to one dependent variable X1 and two independent variables X_2 and X_3 so that the multiple regression equation for the observed data is given by,

$X_1 \text{ X} a \Gamma b_1 X_2 \Gamma b_2 X_3$.....(1)

Where,

a = Point of intercept on Y- axis = the value of X_1 when $X_2=X_3=0$

b_1 Xslope of X_1 with variable X_2 holding variable X_3 constant = Corresponding change in X_1 for each unit change in X_2 while X_3 is held constant = the partial regression coefficient of X_1 on X_2 keeping X_3 constant.

b_2 X slope of X_1 with variable X_3 holding variable X_2 constant = Corresponding change in X_1 for each unit change in X_3 while X_2 is held constant = the partial regression coefficient of X_1 on X_3 keeping X_2 constant.

The values of constants a, b_1 and b_2 are determined by solving simultaneously following three normal equations obtained by the method of least squares.

$X_1 \text{ X} na \Gamma b_1 \quad X_2 \Gamma b_2 \Gamma \quad X_2$.....(1)

$X_1 X_2 \text{ X} a \quad X_2 \Gamma b_2 \quad X_2^2 \Gamma b_2 \quad X_2 X_3$.....(2)

$X_1 X_3 \text{ X} a \quad X_3 \Gamma b_1 \quad X_2 X_3 \Gamma b_2 \quad X_3^2$.....(3)

Test of Regression Coefficient of Multiple Regression Model

Let us consider the multiple regression equation for two independent variables X_2 and X_3 as,

$X_{1e} \text{ X} a \Gamma b_1 X_2 \Gamma b_2 X_2$

Where, X_{1e} is the estimated value of 1st variable X_1, and $b_1$and b_2 is the partial regression coefficients. We can determine whether there is a significant relationship between the dependent variable and the set of independent (explanatory) variables by using F test or analysis of variance (ANOVA).

Step 1: Formulation of hypothesis

Because there is more than one explanatory variable, the null and alternative hypotheses are set up as follows:

$H_0 : b_1 \text{ X} b_2 \text{ X} 0$ (There is no relationship between the dependent variable and the explanatory y variable) OR (the regression equation X_1 on X_2 and X_3 is not significant)

$H_1 : b_1 \mid b_2 \mid 0$ or at least one $b_i \mid 0$ (There is linear relationship between the dependent variable and at least one of the explanatory variables) OR (the regression equation of X_1 on X_2 and X_3 is significant.)

Step 2: Calculation of test statistic

Under $H_{0,}$ F statistic is given by

$$F \text{ X} \frac{MSR}{MSE}$$

$$\text{X} \frac{Explained \text{ var} iation}{Un \exp lained \text{ var} iation}$$

Where, MSR= Mean sum of square due to regression

MSE = Mean sum of square due to error

$$\text{Explained variance } \text{X} \frac{(X_{1e} \text{ Z} \overset{\text{z}}{X})^2}{K \text{ Z} 1}$$

K is the number of constants in regression model. Also, K is the number of total variables involved in regression model so that (K-1) is the number of explanatory variables.

$$\text{Unexplained variance } \text{X} \frac{(X_1 \text{ Z} X_{1e})^2}{n \text{ Z} K}$$

n is the sample size or number of observations.

Step 3: Obtain the critical or table value of F at ~ level of significance for two tailed with degree of freedom (k-1, n-k)

Step 4: Decision

If calculated value of F is less then or equal to the tabulated value of F, the null hypothesis H0 is accepted.

If calculated value of F is greater than the tabulated value of F, the null hypothesis H0 is rejected.

Autocorrelation

On developing relationship between a dependent variable with some independent variables the regression model is used. In case of two variables, say, Y is dependent to independent variables X. the true linear regression is given by: $Y_i = a + bX_i + e_i$.....(1)

Where, a = constant value of Y_i when $X_i = e_i = 0$(Y_i = intercept)

b = regression coefficient (slope of regression)

e_i = error or disturbance term or residual value which is a random variable.

In business and economics, regressions that involves time series data it is true that effect of error of one period carries to its following period. Thus error for the i^{th} time period often correlated with the error for the preceding period e_{i-1}. The correlation of errors in successive periods is known as order autocorrelation. The presence of autocorrelation in the data makes some doubt in the reliability of fitting of regression model.

The presence and absence of autocorrelation of error terms can be ascertained by several statistical tests. However, for small sample, J Durbin and G.S. Watson (1951) had developed most popular test known as D-W d- statistic. The test statistic given by them is defined as

$$d = \frac{\sum_{t=2}^{n} (e_t - e_{t-1})^2}{\sum_{t=1}^{n} e_t^2}$$

It should be noted that for a positively autocorrelated error terms, the first order differences is likely to be small in absolute values in comparison to the absolute values of e_t i.e. $|e_t - e_{t-1}| < |e_t|$. But for negatively correlated error terms, the absolute value of finder order differences is likely to be large than absolute values of e_t i.e. $|e_t - e_{t-1}| > |e_t|$.

Thus, d- statistic would be small for positively autocorrelated series and would be large for negatively autocorrelated series and in between for a random series.

For positively correlated error terms the test is as follows:

i) If $d<d_L$, $e_t's$ are positively autocorrelated .

ii) If $d>d_u$, there is no positive auotcorrelation ijn error terms and $e_t's$ are independent.

iii) If $d_L <d<d_u$, nothing can be said about first order autocorrelation i.e. 'inconclusive'.

For negatively autocorrelated error terms the test is as follows:

i) If $d>4-d_L$ $e_t's$ are negatively correlated.

ii) If $d<4-d_u$ there is no negative autocorrelation and $e_t's$ are independent.

iii) If $4-d_u<d<4-d_L$ nothing can be said about the first order autocorrelation coefficient i.e. 'inconclusive'.

Test of Significance of Difference between Two Means

The steps that are taken in testing the significance of difference between two means in case of large samples can also be taken in testing the significance of difference between two means in case of small samples (n ™30), expect in respect of the application of the test statistic. In case of testing the significance of difference between two means of small samples, t-values are used to the t- distribution. The t-test for difference between two means is used to test whether two independent samples have been drawn from two normal populations having the same means and equal population variances or there is significant difference between population means from which the samples are drawn.

Null Hypothesis, H_0: «$_1$ X«$_2$: i.e. the samples have been drawn from normal populations with the same mean or the two population means do not differ significantly or there is no significant difference between two sample means $\overset{z}{X}_1$ and $\overset{z}{X}_2$.

Alternative Hypothesis, H_1: «$_1$ | «$_2$: i.e. the samples have not been drawn from normal populations with same means or the two population means differ significantly or there is significant difference between two sample means $\overset{z}{X}_1$ and $\overset{z}{X}_2$ (two tailed test).

Or, Alternative Hypothesis, H_1: «$_1$ Ψ«$_2$ i.e. mean of one population is higher than the mean of the other population (one tailed test).

Test Statistic $t_{(\overset{z}{X}_1 Z \overset{z}{X}_2)} = \dfrac{(\overset{z}{X}_1 Z \overset{z}{X}_2)}{\sqrt{S_P^2(\frac{1}{n_1} \Gamma \frac{1}{n_2})}}$

The test statistic t follows t-distribution with n_1+n_2-2 degrees of freedom.

Correlation may be defined as the degree of linear relationship existing between two or more variables. Two variables are said to be correlated when the change in the value of the variable is accompanied by the change of another variable.

Karl Pearson's Correlation Coefficient

Karl Pearson's correlation coefficient denoted by "r", measures the intensity or magnitude or degree of relationship between the two variables and is given by the formula.

$$r_{X,Y} \text{ X} \frac{\text{cov}\,ariance(X,Y)}{\pm_X \pm_Y}$$

Where, covariance measures the relative change in the variable X and Y. Mathematically it can be obtained by using the relation.

$$\text{Covariance (X, Y)} = \frac{1}{n} \quad (X \text{ Z} \overset{z}{X})(Y \text{ Z} \overset{z}{Y})$$

$$\pm_X \text{ X} \sqrt{\frac{1}{n} \quad (X \text{ Z} \overset{z}{X})^2}$$

$$\pm_Y \text{ X} \sqrt{\frac{1}{n} \quad (Y \text{ Z} \overset{z}{Y})^2}$$

n = number of pairs of observations

Multiple Correlation Coefficient

The study on degree of relationship between a single dependent variable and a number of independent variables in combination is called multiple correlation analysis, which is denoted by $R_{1.23}$ ……..n. the subscript left to the dot is the dependent variable and to right is the independent variables. Let us consider three variables say X_1, X_2 and X_3, then

$R_{1.23}$ = Correlation coefficient between dependent variable X_1 and joint effect of the independent variables X_2 and X_3 on X_1.In other words, it is the correlation coefficient between X_1 and its estimated value(X_{e1}) as given by the regression equation of X_1, X_2 and X_3.

The formulae for the calculation of multiple correlation coefficient can expressed in terms of r_{12}, r_{23} and r_{13} as follows,

$$R_{1.23} = \sqrt{\frac{r_{12}^2 + r_{13}^2 - 2r_{12}r_{23}r_{13}}{1 - r_{23}^2}}$$

Coefficient of Multiple Determination in Terns of Zero Order Correlation Coefficient:

The square of multiple correlation coefficient is known as the coefficient of multiple determination and is used to interpret the value of multiple correlation coefficient. It is the fraction that represents the proportion of total variation of dependent variable that is explained by regression plane. Coefficient of multiple determination measures how well the multiple regression plan fits the data.

Probable Error (PE)

The probable is used to measure the reliability and test of significance of correlation coefficient. It is calculated by the following formula.

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

Where, r = the value of correlation coefficient

n = number of pairs of observations

P.E. is used in interpretation whether the calculated value of r is significant or not.

i) If r<P.E., it is insignificant, i.e. there is no evidence of correlation.

ii) If r>6P.E. it is significant.

iii) IF PE < r < 6PE, nothing can be concluded.

t-Test for Significance of an Observed Sample Correlation Coefficient

Suppose a random sample of size n has been drawn from a bivariate normal population and let r be the observed sample correlation coefficient. In order to test if this sample correlation coefficient r is significant of any correlation between the

variables in the population or it is just due to fluctuation of sampling, we use t-Test for significance of an observed sample correlation as follows:

Null hypothesis: H_0: ° X0 i.e. the variables are not correlated in the population or the population correlation coefficient is zero.

Alternative hypothesis: H_1: ° ⏐0 i.e. the variables are correlated in the population or population correlation coefficient is not zero (two tailed test).

H_1: ° Ψ0 i.e. there is positive correlation in the population or the variables are positively correlated (right tailed test).

H_1: ° Φ0 i.e. there is negative correlation in the population or the variables are negatively correlated (left tailed test).

Test statistic Under H_0, the test statistic is

$$t \text{ X} \frac{r}{\sqrt{1 \text{Z} r^2}} \sqrt{n \text{Z} 2} \quad \rceil \; t_{n\text{Z}2}$$

Follows t- distribution with (n-2) degree of freedom

Where, r = sample correlation coefficient and is computed by

$$r \text{ X} \frac{n \quad XY \text{ Z} \quad X. \quad Y}{\sqrt{n \quad X^2} \text{ Z}(\quad X)^2 \sqrt{n \quad Y^2 \text{ Z}(\quad Y)^2}}$$

n = sample size (pairs)

Level of Significance: Fix the level of significance at ά =5% unless or otherwise stated and specify whether the alternative hypothesis is one tailed or two tailed.

Critical value: Tabulated or critical value of t at ά =5% level of significance for (n-2) degrees of freedom in one/two tailed test is obtained from t-tables.

Decision: if calculated $\left|t\right| \text{™} t_{\sim, n\text{Z}2,}$ accept null hypothesis otherwise reject null hypothesis on favor of alternative hypothesis.

3.4.2 Test Model

The daily closing price of each stock has been selected for analysis of share price behavior. The actual tests of autocorrelation were not performed on the daily prices

themselves but on the first differences of their natural logarithms. The variable of this study is: (Fama, 1965).

$$R_{j,t}\, t\ XLn\frac{P_{i,j}}{P_{j,(tZ1)}}$$

$$XLn(P_{j,t})\ ZLn[P_{j(tZ1)}]\text{……..3.1}$$

Where;

$R_{j.t}$ = Price Changes in natural logarithm of stock j

$P_{j,t}$ = Price of stock j. observed at the end of day t.

$P_{j(tZ1)}$ =Price of Stock j observed at the end of day t-1

j =1, 2, 3, 4, ……..n

t =1, 2, 3, 4, ……..n

L_n = natural log

It is preferable to analyze the data on the difference of lag prices rather than the raw prices. Because the changes in the log prices is the yield with continuous compounding from holding the security for that day (t) and the variability of the simple price changes for the given stock is probably the function of the price level (Fama, 1965).

There are three main reasons for using changes in log price rather than simple price changes (Fama, 1965). First, the changes in the log price are the yield, with continuous compounding, from holding the security for that day. Second, Moore (1962) has shown that the variability of simple price changes for a given stock is an increasing function of the price level of the stock. Third, for changes less stock (±) 15 percent the changes in log price is very close to the percentage price changes. Similarly, Roberts (Roberts, 1959) suggested that it is wiser to analyze changes of logarithms or square root of level. However, the other non-parametric test i.e. run tests have been performed on the arithmetic first differences.

3.4.3 Test Methodology

The method of analysis employed in this study includes the use of:

- Autocorrelation
- Run Tests

) Serial Correlation/ Autocorrelation

Serial correlation is one of the statistical tools used to measure dependence of successive number in series. It has been widely used to measure the possible dependence in successive share price change as well. In general, serial correlation coefficient measures the relationship between the values of a random variable in time (t) and its value of the (k) period earlier. It indicates whether the price change at time (t) is influenced by the price changes occurring (k) period earlier. (Pradhan, January 2004)

For the given time series, the auto correlation coefficient for lag k is;

$$r_k \; X \frac{\text{Covariance}(e_t . e_{tZ1})}{\text{Variance}(e_t)} \ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.2$$

$$= \frac{\sum_{t X1}^{n} e_t . e_{tZ1}}{\sum_{t X1}^{n} e_t^{\,2}}$$

[…variance($e_t . e_{tZ1}$)]

Where,

r_k =Auto correlation coefficient

e_t =Price changes in natural logarithm of given stock from the end of day $(t \; Z1)$ to the end of day (t)

k=lagged variables (1, 2, 3……..n)

t= time variable (1, 2, 3……n)

The result of autocorrelation always ranges between +1 and -1. If the computed coefficient of autocorrelation is near to zero, then it is an indication of independence, i.e. today's price is an unbiased outcome of yesterday's price. But if the computed value departs significantly from zero, in positive and negative direction causes dependence among the time series data accordingly either direction.

) The Run Test Analysis

Statistical tests based on the theory of runs ignore absolute values in the time series and observe only their signs. That is, they are essentially concerned with the direction of changes in a given time series. Thus for the present purpose, a run can be defined as a sequence of price changes of the same sign preceded and followed by price change of different sign. In a given share price change series, there are three types of price change in a series i.e. positive, negative, and no change, thus implying three types of runs. Therefore, a plus run of length I may be defined as the sequence of positive price changes preceded and succeeded by either negative or positive or zero price change (Fama, 1965). Likewise, a run of length I of minus and no-change sign can be defined as a sequence of I consecutive price changes of the same sign followed and preceded by negative and no-change sign of price changes. A run test is performed by comparing the actual number of runs with the expected number of runs on the assumptions that price changes are independent. If the actual (observed) runs are not significantly different from the expected number of runs then it is concluded that the successive price changes are independent. In contrast, if these differences were significant, the price changes would be dependent. Run test is the non-parametric test that ignores the magnitude of price changes and observes only direction of changes in a given time series. The difference between the expected and actual number of runs will be analyzed by the total number of runs.

) Total Number of Runs

Under the hypothesis of independence and on assumption that sample proportions of positive, negative and no-change are unbiased estimate of the population proportions, the population proportions, the expected number of runs of all types can be computed as follows: (Waills and Roberts,1956).

Symbolically,

$$M = \frac{N(N-1) - \sum_{i=1}^{3} n_i^2}{N} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.3$$

Where,

M : Expected number of runs.
N: Total number of runs.
n_i : Number of price changes of each sign.

The standard error of M is;

$$\sigma_m \; X \; \frac{\sum_{i=1}^{3} n_i^2 \sum_{i=1}^{3} n_i^2 - N(N-1) \; Z2N \sum_{i=1}^{3} n_i^3}{N^2(N-1)}^{\frac{1}{2}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.4$$

For large N, the sampling distribution of the expected number of runs of all types is approximately normal with mean M and standard error (σm) as given by (3.4) and (3.5) respectively. Thus, the difference between the actual number of runs and the expected number of runs can be expressed by means of the usual standardized variable.

Symbolically,

$$Z \; X \frac{R - \frac{1}{2} \; ZM}{\sigma_m} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.5$$

Where,

R=Total actual no of runs of all signs.

$\frac{1}{2}$ =Numerator of a discontinuity adjustment.

M =Mean (Expected number of runs).

$\pm_m$ =Standard error of sampling distribution of runs

For large sample, Z will be approximately normal with mean 0 and Variance 1. Therefore, for testing significance of the difference between actual and expected number of runs, the test statistic employed would be standardized to normal variate Z. the null hypothesis (i.e., randomness hypothesis) has been rejected or accepted at 5 percent and 1 percent level of significance in favor of (or against) the alternative hypothesis (non-random hypothesis) depending on observed values of Z. In addition, for comparison of actual and expected number of runs, the percentage of K will be employed as;

Symbolically,

$$K= \frac{(R - ZM)}{M} \ldots\ldots\ldots\ldots\ldots\ldots 3.6$$

Here, the term K, is defined as proportionate difference between actual and expected number of runs.

3.4.4 Hypothesis of the Study

The following hypothesis is set up in this study;

H_0 **:** The successive or lagged price changes are independent.

H_1 **:** The successive or lagged price changes are dependent.

Where,

H_0 =Null hypothesis

H_1 =Alternative hypothesis

Decision:

Decision can be made by comparing the calculated vale of Z with tabulated value of Z. if the calculated value of Z is less than equal to tabulated value of Z, it is not significant and H_0 is accepted. Otherwise, it is rejected.

3.5 Limitation of the Methodology

Like other studies, this study has no exception regarding the limitations. Convenience sampling method itself is not free from bias. Only equity shares of commercial banks are studied, though NEPSE has listed others company too. This study has covered the short period due to time constraints. In addition, NEPSE lacks the reliable system in keeping and disclosing data.

This has led difficulty in data collection process. Political instability has influenced the trading days of the stock market as well as to carry out the research work smoothly. Benefits of the study are limited to those who carry out the research work smoothly. Methods employed in this study may not be suitable to the other avenues of the Nepalese stock market.

CHAPTER – IV

DATA PRESENTATION AND ANALYSIS

This chapter presents the graphs of market return and volatility analysis of sampled stocks. Similarly it presents the comparative analysis of the commercial banks index and the NEPSE index. Whereas other aspect displays the graph of daily co-movement of commercial bank index and the Nepse index. Likewise, it imparts the detail of serial correlation analysis and run test analysis.

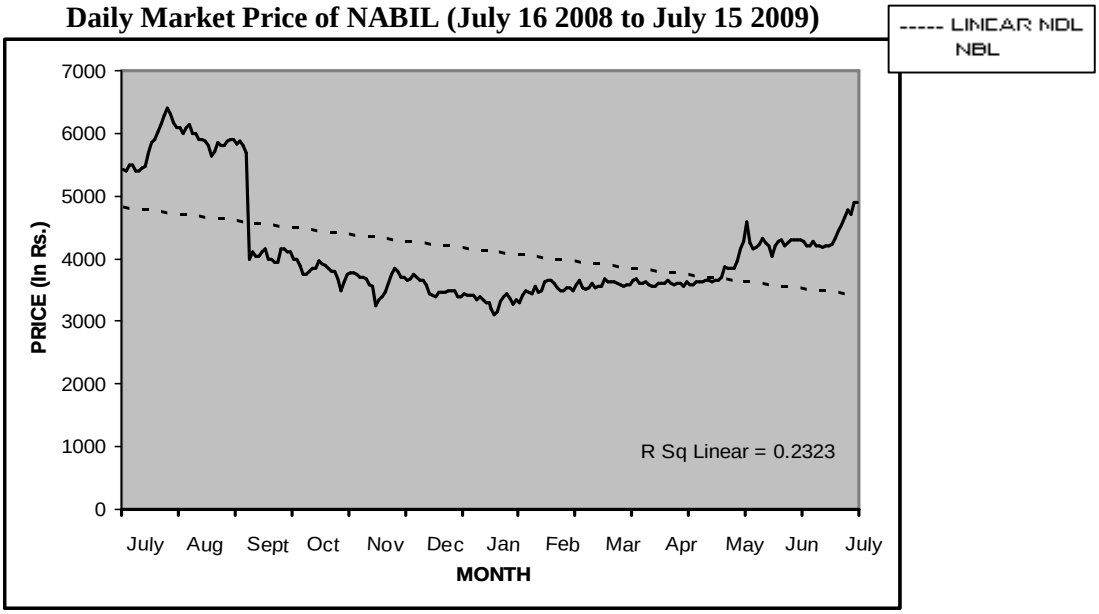
4.1 Descriptive Analysis

4.1.1 Trend Stock Price of Sampled Commercial Banks

This part presents the individual graphs of sampled commercial banks. Graphs clearly exhibit the series of market price efficiency of studied banks in Nepal. The series represents the daily data covering from July 16 2008 to July 15 2009. In the figures below dotted line represents the linear trend line where as the other line represents the true price of share.

Figure 4.1

Daily Market Price of NABIL (July 16 2008 to July 15 2009)

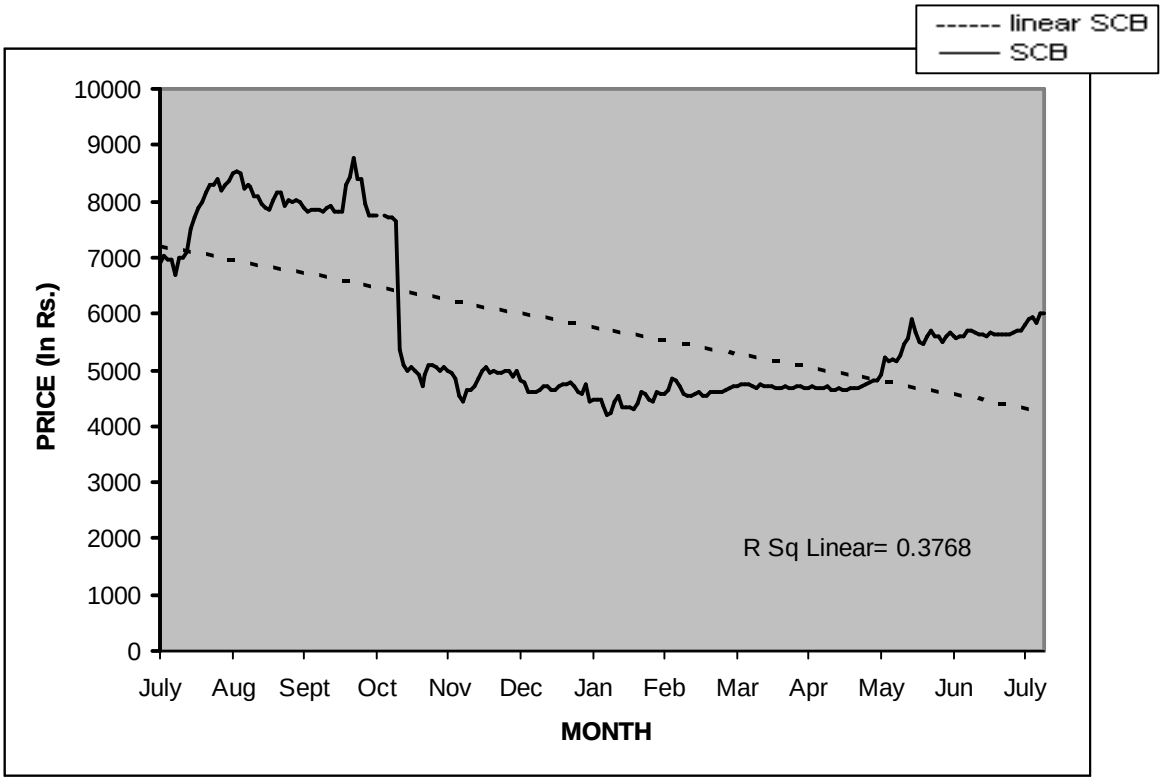


Source: Appendix-1

Figure 4.1 exhibits the daily stock price of Nabil. The maximum price of Nabil is Rs 6398.00 in August 06, 2008 and the minimum is Rs 3100.00 in January 22, 2009 and the average price is Rs 4234.87.it shows the high variation in the stock price. The positive linear equation shows the decreasing pattern in the stock price of Nabil bank.

Figure 4.2

Daily Market Price of SCB (July 16 2008 to July 15 2009)

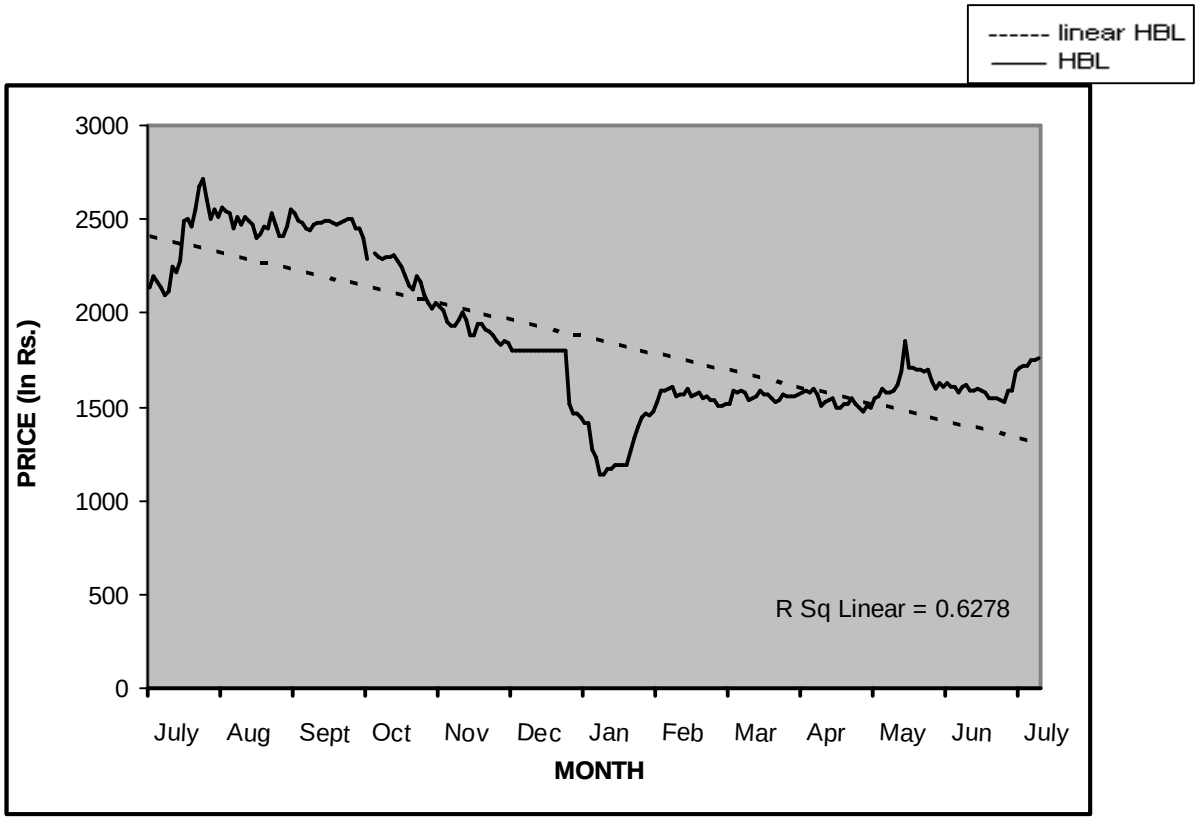


Source: Appendix-1

Fig 4.2 exhibits the daily stock price of SCB. The maximum price of SCB is Rs 8769.00 in October 01, 2008 and the minimum is Rs 4212.00 in January 22, 2009 and the average price is Rs 5722.52. Figure 4.2 shows the downward trend of the share price of SCB.

Figure 4.3

Daily Market Price of HBL (July 16 2008 to July 15 2009)

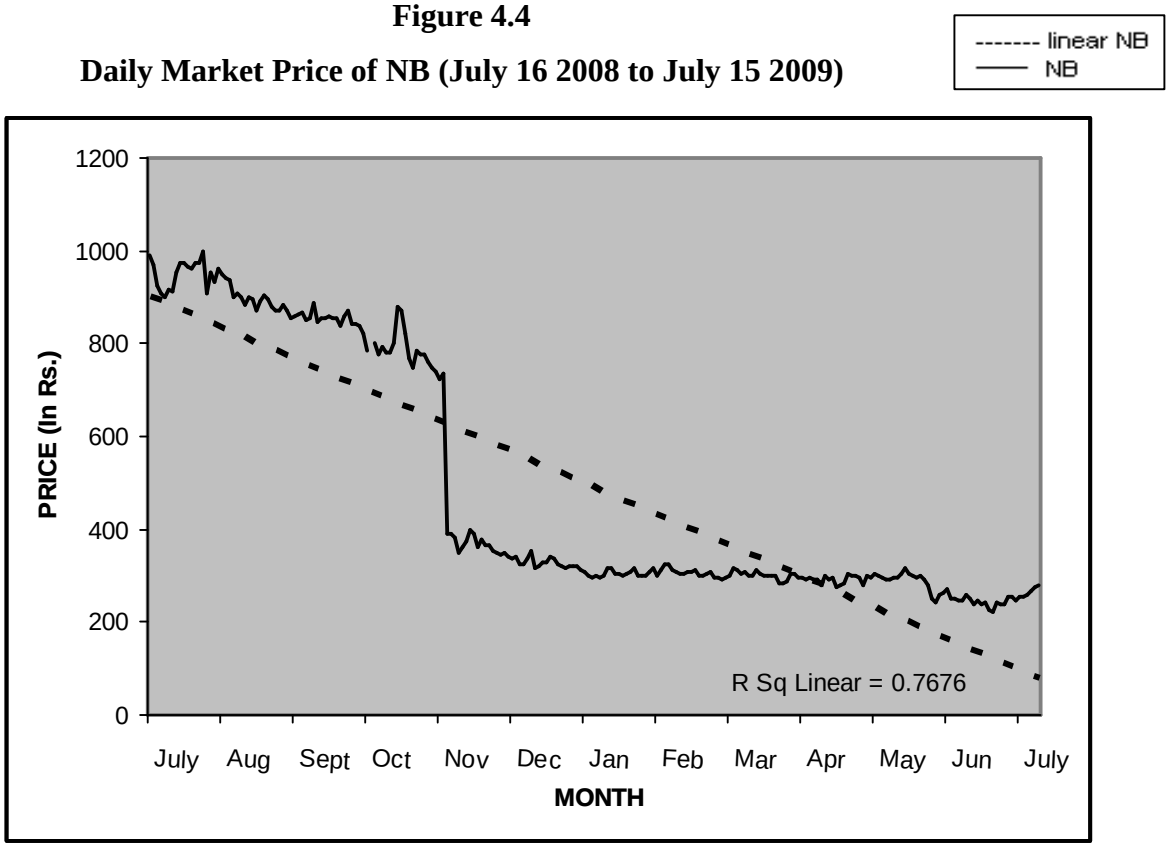


Source: Appendix-1

Figure 4.3 exhibits the daily stock price of HBL. The maximum price of HBL is Rs 2720.00 in August 06, 2008 and the minimum is Rs1137.00 in January 25, 2009 and the average price is Rs 1885.22.02. There is no such kind of variation in the price of stock of HBL during the study period. However, the coefficient of linear equation signifies the negative changes in the future.

Figure 4.4

Daily Market Price of NB (July 16 2008 to July 15 2009)

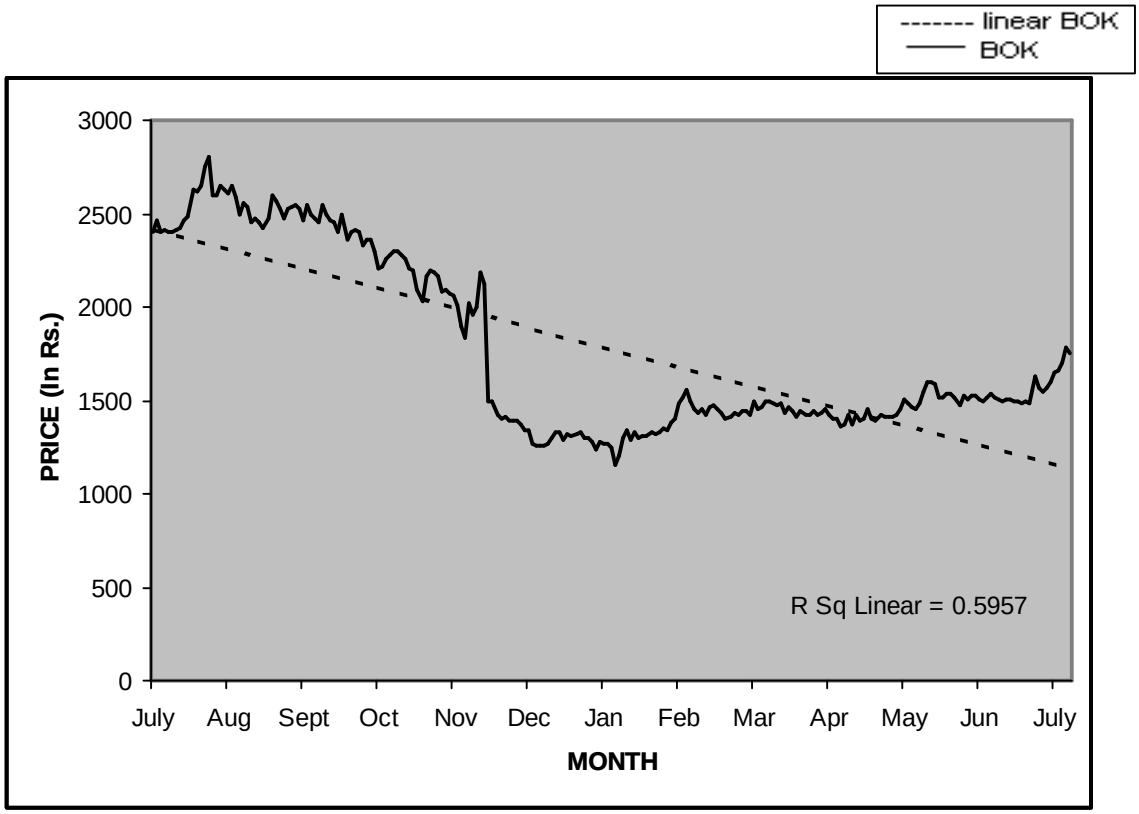


Source: Appendix-1

Figure 4.4 exhibits the daily stock price of NB. The maximum price of NB is Rs 1000.00in August 06, 2008 and the minimum is Rs 220.00 in January 29, 2009 and the average price is Rs 495.06.The stock price seems to be more fluctuation state and even in the decreasing trend.

Figure 4.5

Daily Market Price of BOK (July 16 2008 to July 15 2009)



Source: Appendix-1

Figure 4.5 exhibits the daily stock price of BOK. The maximum price of BOK is Rs 2809.00in August 06, 2008 and the minimum is Rs1155.00 in January 22, 2009 and the average price is Rs 1776.91.there is no great change and variation in the price of the stock of BOK. The positive linear equation shows the decreasing pattern in the stock price of BOK.

4.1.2 Volatility of Daily Stock Prices

Only the graphical presentation is not sufficient. To gain the actual knowledge, some statistical tools are used to analyze the daily stock price. Therefore, this part presents the computation of average prices (mean), standard deviation (SD) and coefficient of variation (CV). Based on the analysis of absolute variation (SD) and relative Variation (CV), volatility of daily stock price is determined. The computation of stock volatility is shown in table 4.1.

Table 4.1

Computation of Stock Volatility

Banks	N*	Mean	Std. Deviation	C.V
NABIL	233	4125.81	853.92	0.2069
SCB	233	5722.52	1386.12	0.2422
HBL	233	1858.98	404.42	0.2145
NB	233	489.34	271.73	0.5553
BOK	233	1776.91	480.21	0.2583

Source: appendix-4 (Note: N means total no. of observation)

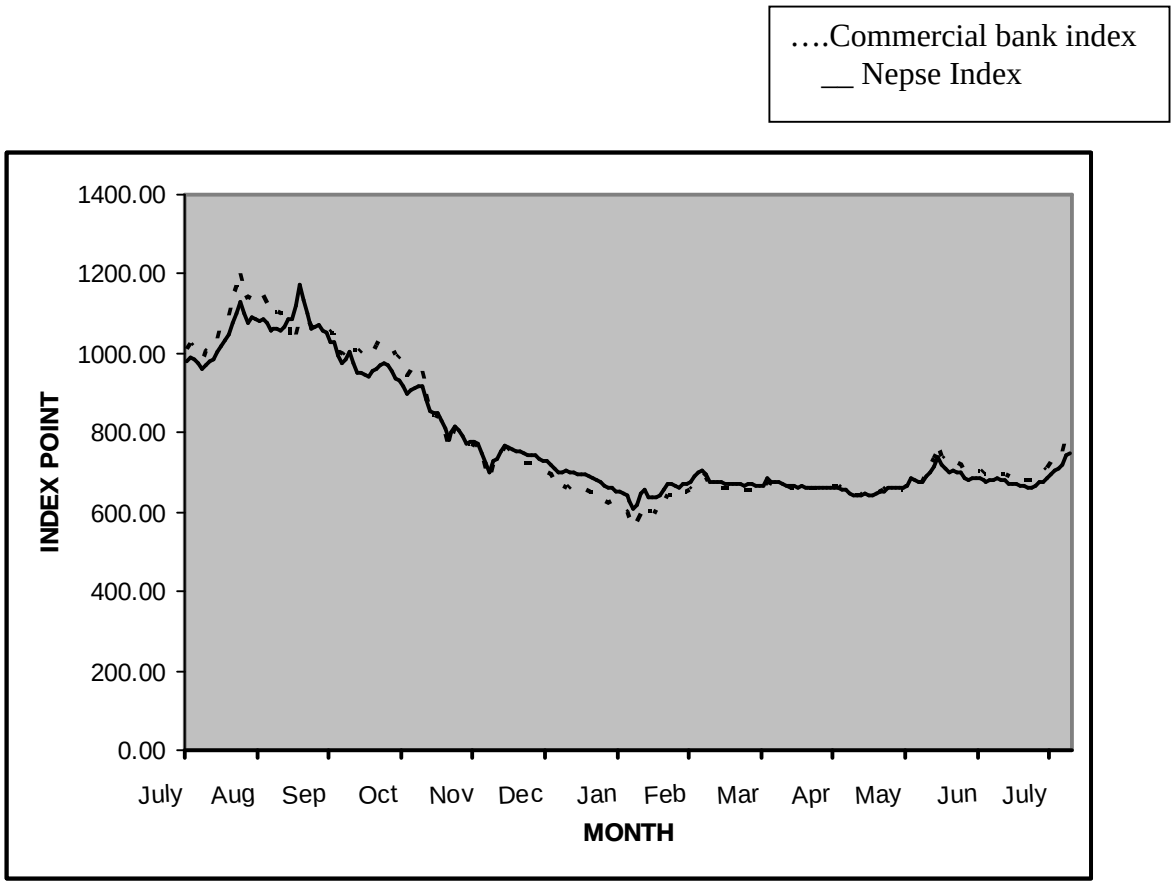
The mean shows the average value for each stock price of the sampled banks. The highest average value is of SCB where as the lowest average value is of NB. The standard deviation indicates the amount of variability in stock. Among the computed standard deviation of the sampled banks, the standard deviation of SCB is 1386.12, which indicates that the most volatile stock is of SCB. Similarly, the computed SD of NB is 271.73, which conveys that its stock is less volatile. The stocks of Nabil, HBL, BOK consecutively volatile. Only measuring the absolute variation is not sufficient to conclude the variation in the stock, the alternative of this is relative measure. The computed values of CV indicate the variance in the stock. CV, which is equal to 1, is considered as an exponential distribution whereas; CV with the distribution less than 1 is considered low variance. In the above computation all those stocks can be considered as low variance.

4.1.3 Analysis of Co-Movement of Commercial Bank Index and Nepse Index

This part presents the graph exhibiting the co-movement between commercial bank index and NEPSE index. Based on the index series, variation is compared between them. For this observation, daily closing index points are extracted from the annual NEPSE trading report 2008/09. Fig 4.6 clearly exhibits the graph of daily co-movement between commercial bank index and NEPSE index.

Figure 4.6

Co- movement between Indices of NEPSE and Commercial Bank



Source: Appendix-2

In the figure 4.6 index points describes the commercial index and NEPSE index. The index series of the commercial bank clearly exhibits that the fluctuation is higher than the NEPSE index. The maximum daily point of the commercial bank is 1204.79 on 06-Aug-08 where as the minimum point is Rs 561.03 on 22-Jan-09. In case of index series of Nepse the maximum daily point is Rs 1175.38 on 31-Aug-08 and the minimum daily point is Rs 609.46 on 22-Jan-09. From the above figure we can see that the index point of commercial bank as well as NEPSE is in decreasing trend.

4.2 Inferential Analysis

The explanation below provides the summary of descriptive statistics with respect o both dependent and explanatory variables. This shows the average indicators of variables computed from the financial statements. The regression equation is calculated using SPSS 14.0 software program as shown in appendix-5

4.2.1 Simple Regression Equation

The next aspect of the study is devoted to analyzing how NEPSE is related to Amount to public issue, Paid up value and total turnover. For the purpose, the average slopes were computed from linear regressions of return on NEPSE on various measures such as Amount to public issue (PI), Paid up value (PV) and Annual turnover (AT). NEPSE has been specified as the dependent variable and the independent variables are specified as PI, PV and AT. The results are presented in table 4.2.

The results are based on time series data of 5 banks with 1165 observations for the period of 2004/05to 2008/09 by using simple regression equation. The model is, NEPSE= a + B_1 (independent variable) + E. Results for various subsets of independent variables are presented as well.

Table 4.2

Estimated Relationship between NEPSE and Fundamental Variables

Independent Variable	Constant (a)	Regression Coefficient	R^2	SEE	F
Amt of Public Issue (PI)	424.71 (2.715)	0.028 (1.620)*	.467	232.478	2.624
Paid up Value (PV)	385.493 (1.496)	0.008 (1.009)	.253	275.016	1.019
Annual Turnover(AT)	296.583 (2.608)	0.026 (3.394)	.793	144.689	11.519

Notes: *Figures in parentheses are t- values*

*The sign * denotes that the results are significant at 5 percent level of Significance*

SEE=Sum of square due to error

F= F ratio

With respect to the computed regression equations shows that the few beta coefficients have priori expected signs. Above table shows the simple regression analysis between NEPSE and other independent variables. Here, only one beta coefficients is found to be significant. Among others, the above results indicate that only the Amount of public issue (PI) of all securities is significantly related to NEPSE

while Annual Turnover (AT) and Paid up value (PV) don't have significant relationship with dependent variable As NEPSE decreases, an increase can be noticed on Paid up value and amount of Public Issue while a decrease can be noticed in Annual Turnover. The result of t-statistic indicate that the variable PI and AT have higher explanatory power. Similarly, adjusted R square (R^2) is 0.467, 0.253 and 0.793 respectively. This indicate 46.7%, 25.3% and 79.3% variation in dependent variable NEPSE is explained by independent variables PI, PV and AT respectively.

4.2.2 Multiple Regression Equation

After examining the simple regression analysis among the selected variables, the multiple regression analysis has been undertaken for the purpose of investigating the causality between dependent and independent variables. The multiple regressions open up several additional options to enrich analysis and make modeling more realistic compared to the simple regression.

For the purpose, the average slopes were computed from linear regressions of NEPSE on various measures such as Amount to public issue (PI), Paid up value (PV) and Annual turnover (AT). NEPSE has been specified as the dependent variable and the independent variables are specified as (PI), (PV) and (AT). This model is developed to unravel the separate influence of the various variables on NEPSE and the results are presented in table 4.3. The model is:

$$NEPSE = a + B_1PI + B_2PV + B_3AT + E$$

With respect to the computed multiple regression equations shows that most of the beta coefficients have positive signs. However, only one beta coefficients was found to be significant. The positive regression coefficient indicates that there is an increase in the PV and AT. The regression constant in multiple regressions NEPSE on PI, PV and AI is 179.485 The results of t-statistics indicate that none of the selected variable is significant. However adjusted R square is 0.930. this indicate about 93.% variation is dependent variable NEPSE is explained by independent variable Amount on public issue (PI), Paid up (PV) and Annual Turnover (AT) The values of R squared range from 0 to 1. Here, R square being 0.930 indicates that the independent variables do explain the dependent variable NEPSE. The result of multiple regression analysis

presented that, the relationship between NEPSE (the dependent variable) have a negative relation with amount of Public Issue and positive relation with Paid up Value and Annual turnover.

The results are based data related to the securities market as a whole for the period of 2004/05 to 2008/09 by using multiple regression model stated above. Results for various subsets of independent variables are presented as well.

Table 4.3

Multiple Regression between NEPSE and Fundamental Variables

Model	Constant (a)	Regression Coefficients of			R^2	SEE	F
		AMT	Paid Up	Turn Over			
1	26.133 (0.73)	-.088 (-1.033)	.014 (0.690)	.064 (2.051)	.930	146.004	4.419

Notes: Figures in parentheses are t- values

*The sign * denotes that the results are significant at 5 percent level of Significance*

Table 4.3 displays the result of multiple regressions between NEPSE dependent variable with respect to other independent variable. Here, all the beta coefficient is found to be insignificant, Which explain the beta coefficient of paid up value and annual turnover are positive it means 1% increase by paid up values and annual turnover then the NEPSE increase by 0.014% and 0.064% respectively. And if 1% increases by amount of public issue then 0.088% decrease in NEPSE that means it has negative relation between amount of public issue and NEPSE. The result adjusted R square (R^2) is 93% This indicate 93%variation in dependent variable NEPSE is explained by independent variables PI, PV and AT respectively. However as the beta coefficients of all the independent variables are found to be insignificant the results are not valid.

Table 4.4

Relationships between NEPSE Index and Commercial Bank Index

Independent Variable	Constant (a)	Regression Coefficient	R^2	SEE	F
Constant (Commercial Bank)	80.722 (.892)	7.311* (.009)	.988	23.7126	9583.868

Table 4.4 displays the results of the regression model using NEPSE Index as the dependent and Commercial bank index as the independent variable. The beta coefficient has been found to be statistically significant at 1 percent significance level. The beta coefficient is positive which implies that when the commercial bank index increases by 1 point the NEPSE index also increases by 0.892 points. The R^2 value is 98.8 percent which implies that around 98.8 percent variation in NEPSE index is explained by the changes in commercial bank index.

4.3 Test of Random Walk Hypothesis

As stated in methodology, independency of successive price is tested using the serial correlation and run tests. In this section, first, results of serial correlation are analyzed and then of run tests.

4.3.1 Analysis of the Results of Serial Correlation (Autocorrelation)

Autocorrelation/serial correlation technique measures the correlation coefficient among the series of stock prices with the lagged numbers in the same time data series. Autocorrelation coefficients for each day in the sample were computed to test the hypothesis that successive share price changes are independent. It is computed under 1 natural log differences for lags 1 to 10.if the observed autocorrelation coefficient among price changes be zero, the null hypothesis would be accepted. It means past price contains no predictive values regarding the future price changes, which lead that, above normal return, cannot be earned by exploiting a sequence of historical prices. If the observed autocorrelation coefficients are significantly different from zero, in this situation the null hypothesis has been rejected. It means that the market is inefficient in pricing shares. Moreover, larger the values of coefficient (both positive and negative) i.e. departed from zero, greater the dependence in the service of price changes.

Table 4.5

Daily Autocorrelation coefficient for Lag 1 to 10, having natural log difference 1

Name of the company	Lag days									
	1	2	3	4	5	6	7	8	9	10
NABIL	0.304 (0.000)	0.070 (0.000)	-0.028 (0.000)	0.067 (0.000)	-0.020 (0.000)	-0.060 (0.000)	0.024 (0.000)	-0.074 (0.000)	-0.026 (0.000)	-0.014 (0.000)
SCB	-0.128 (0.000)	-0.027 (0.000)	0.040 (0.000)	-0.002 (0.000)	-0.070 (0.000)	-0.040 (0.000)	-0.023 (0.000)	-0.091 (0.000)	-0.027 (0.000)	-0.128 (0.000)
HBL	0.430 (0.000)	0.219 (0.000)	0.117 (0.000)	-0.057 (0.000)	0.178 (0.000)	-0.035 (0.000)	0.073 (0.000)	0.082 (0.000)	-0.090 (0.000)	-0.030 (0.000)
NB	-0.0430 (0.000)	-0.049 (0.000)	-0.036 (0.000)	-0.056 (0.000)	-0.038 (0.000)	-0.049 (0.000)	0.420 (0.000)	-0.009 (0.000)	-0.041 (0.000)	-0.017 (0.000)
BOK	-0.028 (0.000)	0.139 (0.000)	-0.051 (0.000)	0.019 (0.000)	0.099 (0.000)	-0.065 (0.000)	-0.036 (0.000)	-0.043 (0.000)	-0.068 (0.000)	-0.073 (0.000)
Average	0.0566	0.00704	0.0084	-0.0058	0.0298	-0.0498	0.0916	-0.027	-0.0504	-0.0524

*A. The values in the parentheses are p- values. *, **, *** indicate that the given test statistics is significant at 1%, 5%, and 10% level of significance respectively*

The results of autocorrelation coefficient for daily price series have been computed for lag 1 to 10. The first, second, forth, and seventh order coefficient of Nabil bank shows the positive serial dependence. While the other six third, fifth, sixth eighth and ninth and tenth order coefficient have negative values. It means if the order shifted in increasing order, the serial dependence also increases. According to above table only third order coefficient has positive value and nine out of ten have negative values s of

SCB. Likewise six out of ten order coefficients have positive and positive values in other remaining order of HBL. NB bank has only one (seventh) order coefficient has positive value and others have negative values .Likewise, seven out of ten in first, third, sixth, seventh, eighth, ninth and tenth order coefficient have negative values of BOK and second, fourth and fifth order coefficient shows the small serial dependence.

The result of daily autocorrelation can also be explained by taking an average among five banks coefficient in different lag period from lag 1 to 10.in an average lag period 1, 2, 3, 5 and 7 shows the positive correlation coefficient where as other shows the negative correlation coefficient. In lag period 1 the highest coefficient is 0.430 of HBL and the lowest or negative coefficient is of (.128) of SCB bank.

All autocorrelation from lag 1 to 10 of price series of all samples banks are statistically significant at 1% level of significance as shown by the p- values given in the parentheses. Hence the Null hypothesis of no autocorrelation is rejected. It can be concluded that as the price series of all the samples banks have significant autocorrelation with their lagged values, the price series are not random. It implies that the random walk hypothesis can be rejected for the Nepalese banks price series. And hence the market for banking stocks is not even weakly efficient.

However, agreement in the sign among the coefficients for the different securities is not necessary evidence for consistent pattern for dependence. King (1996) has shown the price changes for different securities are related (although not all to the same extent) to the behavior of the market component common to all securities. The autocorrelation coefficient of a given security for any given sampling period has been partly determined by the serial behavior of the market component and partly by the serial behavior of factors pertaining to that security and perhaps also to its industry (Fama, 1965:73-75).since market components are common to all securities its behavior during the sampling period may tend to produce a common sign for the autocorrelation coefficient of all the different securities. Therefore it is desirable to measure the degree of dependence. Both the judgment of coefficient magnitude and statistical significance test of autocorrelation coefficient are required to be performed. Summary result of different taken from table 4.5 which shows the statistically significant and non-significant series for lag 1 to 10.

The result of autocorrelation showed that the observed first order coefficients are found to be relatively larger and statistically significant for most of the stocks, except Bank of Kathmandu. It also shows the pre dominance of negative sign. Third and eighth lags exhibit the predominance of negative sign where as lag 1, 2, 9 and10 shows the dominance of positive signs. Since the coefficient has more negative values it means that most of the observed coefficient are departed from zero. Thus we can say that few stocks had mild serial dependence. It can hardly used for predicting their future course in a meaningful manner. From the view of investors, such low order dependence may be enough to increase their expected profit to some extent. All above evidence related traded stocks indicate small auto dependence among day to day price changes. This evidence support that random walk hypothesis model to describe the price behavior.

4.3.2 Analysis of the Results of Run Test

A run is defined as the sequence of price changes in the same sign. For the changes in the stock price, there are three types of price change pattern namely positive, negative and zero which are known as three types of runs. This test is non parametric in nature and is used to examine independence assumption that the price changes are independent.

Testing the hypothesis of independence, the deviation between the total, actual and the total expected number of runs are analyzed. This hypothesis of independence can be tested by using the equation (3.4), (3.5), and (3.6). There should not be significant difference between the actual and the expected number of runs to support the hypothesis of the study. Value of normal variant Z and P are presented in table 4.6

Table 4.6
Computation of Run Test Daily Prices

S.NO	BANKS	Total Cases	Actual Runs(R)	Cases < Median	Cases >= Median	Z - Value	P - Value
1	NBL	233	96	128	105	-2.700*	0.007
2	SCB	233	104	110	123	-1.730***	0.084
3	HBL	233	101	100	133	-1.898***	0.058
4	NB	233	120	108	125	.412	0.680
5	BOK	233	122	116	117	.591	0.554
	Total	1165	543	562	603	-5.325	1.383
	Average	233	108.6	112.4	120.6	-1.065	0.2766

Source: Calculation of its recorded number based on official record of daily closing price of share transaction in NEPSE (Appendix-1)

As presented in the above table, the median is used as the test value. The test value is used as a cut point to dichotomize the sample. A run is defined as a sequence of cases on the same side of the cut point. The average number of runs is 109. The number of runs is a measure of randomness. Too many or too few runs. Suggest dependence between observations. A lower than expected number or runs indicates the market's over-reaction to information. While higher number of runs reflect a lagged response to information.. The value of Z of NABIL, SCB and HBL are negative. And. Remaining two companies are positive. The P values of all companies are positive which indicates the significant result of all companies. The P value is the probability of obtaining a Z statistic as or more extreme (in absolute value) then the obtained value. If the order of ratings above and below the median is purely random. The negative Z- values for all the indices indicate that the actual number of runs fall short of the expected number of runs. If expected number of runs do not equal to the actual number of runs we reject the null hypothesis of random walk when employing the nonparametric assumptions entailed in the runs test because the resulting P-values indicate insignificance of Z-values, there is sufficient evidence to conclude that the indices return series are in random order.

The Z- statistics for price series of Nabil is significant at 1% and 5% level of significance hence the null hypothesis of random price series is rejected. It means that the price series of the Nabil bank does not follow random walk whereas in case of SCB, HBL, NB and BOK hypothesis of random price series is accepted at 10% level of significant. It means that price series follow the random walk and null hypothesis is accepted.

Table 4.7

Names of Companies Having Significant Value of Standard Normal Variate Z at 10%, 5% & 1% Level of Significance

S.NO	Name of bank	Level of significance		
		10%	5%	1%
1	NBL	R	R	R
2	SCB	R	-	-
3	HBL	R	-	-
4	NB	-	-	-
5	BOK	-	-	-
Total		3	1	1

Note: R indicates that the hypothesis of independence is rejected

The above table is based on table 4.6. Inspecting the above table, which gives the information regarding the composition of standardized variable, it can be seen that the standard normal variate P is significant (at 10%, 5% and 1%) in respect of five sampled banks. At 10% level of significance, hypothesis of NABIL, SCB and HBL is not significant, that means the series reject the null hypothesis at 10% level of significance. At 5% level of significance, hypothesis of NABIL is rejected where as null hypothesis of SCB, HBL, NB and BOK is accepted. Looking at 1% level of significance hypothesis of NBL is rejected whereas of other 4 banks are accepted. It is notable that this would imply a small positive serial dependence among the price change of sample banks reference to NABIL (Dryden, 1970).

Table 4.8

Computation of Run Test of Bank and Nepse Index

S.NO	INDEX	Total Cases	Actual Runs(R)	Cases < Mean	Cases >= Mean	Z – Value	P - Value
1	COM. BANKS	234	91	117	117	-3.538*	0.000
2	NEPSE	234	93	123	111	-3.244*	0.001
	Total	468	184	234	234	-6.290	0.001
	Average	234	92	112.4	120.6	-3.145	0.0005

As presented in the above table, the mean is used as the test value The average number of runs is 92.The value of Z of both indices are negative and the P values are positive which indicates the significant result The P value is the probability of obtaining a Z statistic for Two index is significant at 1% level of significance We reject the null hypothesis of random walk when employing the nonparametric assumptions entailed in the runs test because the resulting P-values indicate significance of Z-values.

The serial correlation analysis carried out in earlier section and if the values of autocorrelation is near to zero it is the indication of independence. But if the value departs significantly from zero, in positive and negative direction it causes dependence among the time series data accordingly either direction.

In conclusion, the both tests, either the autocorrelation or the run test normally do not support the independence assumption of random walk model or weak efficient market hypothesis. It suggests that Nepalese stock market may not be defined as “efficient in weak sense” in pricing the stock where market efficiency is defined as all historical information is reflected in the security prices. This evidence supports the technical analysis theory and can be useful to some extent as an investment strategy for buying and selling shares in such market situation.

4.4 Major Findings of the Study

The major findings in this chapter are explained below

1. The graph of all the sampled commercial banks shows the downward slope of the trend line and this exhibits the decreasing trend in the price of the stock.

2. The computed mean shows the average value for each stock price of the sampled banks. The highest average value is of SCB where as the lowest average value is of NB. The standard deviation indicates the amount of variability in stock. Among the computed standard deviation of the sampled banks, the standard deviation of SCB is 1386.12, which indicates that the most volatile stock is of SCB. Similarly, the computed SD of NB is 271.73, which conveys that its stock is less volatile. The stocks of

Nabil, BOK and HBL are consecutively volatile. The computed value of SD and CV indicates the variability and volatility of the stock. The CV of the above share price indicates that all the stocks are low variance as the computed CV is less than 1.

3. The daily co-movement of the series of indices has exhibited the fluctuation of commercial bank index and NEPSE index. The CV of commercial bank index is higher then NEPSE index this indicates that the Commercial bank is more volatility and the positive beta coefficient between Bank index and NEPSE index shows the significant result of both index.

4. Simple regression as well as multiple regressions is shown between NEPSE, amount on public issue, paid up value and annual turnover. The regression coefficients are 0.028, 0.008 and 0.026 respectively and they all are positive. Which indicate that one rupee increase/decrease in the independent variable affects the dependent variable NEPSE.

5. The first order autocorrelation coefficient, for most of the equity shares is statistically significant from expected value zero. The evidence pertaining to most of the shares indicates serial dependence. Thus, this evidence suggests that the Nepalese market does not accept random walk hypothesis and some price changes can even predict some valuable information in predicting future price change. Therefore, opportunities for speculation exist for sophisticated investors in Nepalese stock market.

6. The Z statistics and p values are statistically significant for most of the shares, which implies that price changes are significantly different from random series. Results of run test also support the result of autocorrelation. Therefore, today's price change is dependent on the information of yesterday's price.

7. The mean absolute values of the autocorrelation are lower when lag days are increased. This means the information of past price changes have little role to predict changes for longer days.

8. The result of t-statistic under simple regression indicates that the variable PI and AT have higher explanatory power. Similarly, adjusted R square (R^2) is 0.467, 0.253 and 0.793 respectively. This indicate 46.7%, 25.3% and 79.3% variation in dependent variable NEPSE is explained by independent variables PI, PV and AT respectively. Whereas, the results of t-statistics on multiple regression indicate that none of the selected variable is significant. However adjusted R square is 0.930. this indicate about 93.0% variation is dependent variable NEPSE is explained by independent variable Amount on public issue (PI), Paid up (PV) and Annual Turnover (AT) respectively.

9. There include low order serial dependence, which helps in certain extent to increase investors expected profit.

10. Because the persistence hypothesis has been supported by the result of autocorrelation and the run test, professional investors either individual or institutional can beat the market. Therefore, to make greater profit than 'naïve buy and hold strategy', acute fundamental or other analysis are required which accurately predicts the appearance of the new information in the market that affects the price of shares.

To conclude, results of both test analysis generally suggests that the random walk model can not justifiably used to describe share price behavior in Nepal. Nepalese stock market may not be defined as the weakly efficient in pricing shares. This would mean that above average return may be earned simply from past price knowledge. This study suggests that the fundamental (intrinsic value) analysis becomes useful to make above average return in Nepalese stock market. The charts of past price movements may also have some values as an investment strategy in trading of shares in such market situations.

CHAPTER – V

SUMMARY, MAJOR FINDINGS CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The study is conducted to reveal the current status of stock price in Nepal Stock Exchange. This study mainly aims at examining the efficiency of market price of commercial banks in Nepal and to test whether successive price changes are dependent or not. Its specific objectives are (i) To analyze the behavior stock price of the commercial banks operating in the present context of Nepal. (ii) To determine whether the present Nepalese stock market is efficient in pricing shares. (iii)To outline the possible implications and also to recommend for the betterment of stock market. (iv) To determine the price change are the random phenomenon or not.

Only secondary data are used in this study. The required secondary data are collected mainly from the annual report of listed companies and the web page of NEPSE www.nepalstock.com. Other sources of secondary data are the various publications of Securities Board of Nepal and Nepal Stock Exchange Ltd. Review of national and international journals, books as well as masters degree dissertation are discussed in order to make the study more effective. The study period is from July 16 2008 to July 16 2009 consisting of 1165 observations.

Both the analytical and descriptive research designs are adopted to carry out this study. The stock market performance is examined by analyzing the number of listed companies in NEPSE. Statistical tools as well as the model are used to analyze the behavior of share price of the sampled banks. Run test is used to know whether the movement of market price of stock is random or not. Autocorrelation test is done to find the dependence of the price changes. In short, it analyzes whether the price changes are linearly correlated or not. To this end, the independent assumption examines the successive prices in natural logarithm of shares of five commercial

banks listed in NEPSE. The regression, autocorrelation and the run test were adopted as test methodology.

To test the independent assumption, the serial (auto) correlation coefficients were estimated among the first difference of log prices for different lags. The estimated autocorrelation were found significantly deviated from the expected value zero. It means that the log price series of shares were serially dependent. Therefore, the random walk model was not accepted for most of the cases. The run test was also conducted to test the hypothesis of randomness. The result of run test also supported the result of autocorrelation test. In most of the cases, significant difference between actual and expected number of runs were observed. So, the series was found to be non-random and the evidence did not support the assumption of independence.

The result of serial correlation test and run test did not support the hypothesis of independence. The result, however, demonstrated that the successive price changes are dependent with historical price series. Thus, the hypothesis of randomness was also rejected. It is important to note here that in come cases two tests have different conclusions. Such differences may arise from two ways. Firstly, the autocorrelation tests only claim to investigate whether or not the price changes are linearly correlated. Secondly, the run tests help to find out whether the price changes follow some trend, not necessary linear.

The research design has been the mixed i.e. descriptive, exploratory and analytical as per the demand of the situation. Both secondary and primary data have been collected. The major sources of secondary data are libraries, various annual reports, e.g. annual report of SEBO, Economic Surveys, Statistical year Book, Annual reports of respective banks, NRB Bulletins etc. And the sources of primary data are investors, brokers' offices, regulatory authorities, bankers etc.

All commercial banks listed in the NEPSE provide population for the study. However numbers of samples have been determined to be 5; and sample banks have been selected using non random sampling i.e. judgmental sampling so as to match the data with time period considered for the study which is from 2007/08 to 2008/09.

Data collection methods For secondary data various annual report have been collected from SEBO, respective commercial banks, Economic Survey, Statistical Year Book of Nepal, Monetary policy, NRB Bulletins, and various newspapers and magazines.

Further interview have also been conducted with the authorities of NRB, SEBO, Bankers, Security Businesspersons etc for primary data.

Data have been presented in charts and diagrams and analyzed with several descriptive and inferential statistics.

Finally the primarily analysis section ends with excerpts of interview with regulatory authorities, bankers, securities businesspersons, and investors.

5.2 Conclusions

1. The scenarios of NEPSE in most of the cases are dominated by the commercial banks. Even though the studied are concentrated upon some commercial banks, we can still project the Nepalese stock market. Observations of daily stock prices of sampled banks indicate that the change in NEPSE index is followed by change in commercial bank index

2. Nepalese stock market is efficient in pricing shares. Both the tests serial correlation and run test have accepted the null hypothesis. It means this research support the RWH.

3. The dependence in the series of the price changes implies that the price changes in the future will be dependent with the historical prices. Thus, the historical price is helpful to predict the future prices of shares. Therefore sufficient opportunities are available to individuals and institutional investors to make the higher expected profit.

4. The price change of the series are random phenomenon because the tests of both autocorrelation and run tests findings have shown that the successive price changes are dependent with the price of the historical change. So, it is

recommended that the investors should consult with the experts before the investment in any shares of NEPSE market

5. Runs test results also shows that the percentage deviation of actual number of runs in the series of price changes. It is obvious that the successive price changes are random. Thus, RWH hold true in the context of Nepalese stock market.

5.3 Recommendations

Findings of the study provide important information for those who are directly or indirectly concerned with the stock market activities. Thus, major recommendations are as follows:

1. Observation of volatility indicates that most of the sampled stocks exhibit large variation in their prices. They are not doing well. Therefore, the concerned authorities of sampled banks should monitor the causes of variation. Investors should be educated, self aware and informative regarding the daily stock price. They should be extremely careful before making the investment decision.
2. The computed SD and CV have implied that the index of commercial sectors fluctuates more than NEPSE index. The perfect positive correlation between them is observed. The series of commercial bank index indicates the dominance of its position in the co-movement graph. However, there should be clear pattern of index series. For this, the concerned authorities of the stock market should monitor the weaknesses of commercial sector as well as non-commercial sector.
3. This study collaborates with the previous studies. Therefore it is suggested that the smart investors should take benefits of the short-term speculation. It is also recommended that the stock market makers should carry out the research work to find out the causes of inefficiency.
4. The randomness of the price movement in the Nepalese market, (shows that) professional traders, either individual or institutional, can beat the market.

Thus, it is recommended that the investors should be aware of exploitation through short-term speculation where above average return is possible to some extent from past information.

5. Most of the price series of the shares indicates the serial dependence by the test of autocorrelation. This means the NEPSE market does not accept the Random walk hypothesis. It refers that the past price changes have great value for future price changes. So, it is recommended that the investors should study the past trend and pattern of price series of the stock for prediction of future price change to make safe investment.

6. This specific research studies only five commercial banks by covering the secondary data. Therefore, the forthcoming researchers should try to cover all the sectors listed in NEPSE. And it is better to study company wise.

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