EFFICIENT STOCK MARKET HYPOTHESIS AND STOCK PRICE MOVEMENT: IN CONTEXT OF NEPAL

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This is to certify that the thesis:

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"Efficient Stock Market Hypothesis and Stock Price Movement: In Context of Nepal"

has been prepared as approved by this Department in the prescribed format of Faculty of Management. This thesis is forwarded for examination.

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and found the thesis to be the original work of the student written according to the prescribed format. We recommend this thesis to be accepted as partial fulfillment of the requirements for Master of Business Studies (M.B.S.)

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DECLARATION

I hereby declare that the work reported in this thesis entitled "**Efficient Stock Market Hypothesis and Stock Price Movement: In Context of Nepal**" Submitted to the office of the dean, faculty of management Tribhuvan University is my original work done in the form of partial fulfillment of the requirement for the Masters of Business Studies (MBS) under the supervision of **Mr Khagendra Adhikari**, Mahendra Multiple Campus.

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Needless to say, the error is of human kind and I am also not exception, so I alone am responsible for any deficiencies that may have remained in this work.

Nabin Shakya
Dharan

Date: August 2009

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%	Percentage
&	and
AGM	Annual General Meeting
AMEX	American Stock Exchange
BSE	Bombay Stock Exchange
CATS	Computer Assisted Trading System
ECM	Efficient Capital Market
EMH	Efficient Market Hypothesis
ESMH	Efficient Stock Market Hypothesis
et. al.	and others
etc	Etcetera
HMG	His Majesty's Government
ln	Natural logarithms
Log	Logarithms
NEPSE	Nepal Stock Exchange Ltd.
NIDC	Nepal Industrial Development Corporation
NRB	Nepal Rastra Bank
NYSE	New York Stock Exchange
OTC	Over The Counter
RWH	Random Walk Hypothesis
RWM	Random Walk Model
RWT	Random Walk Theory
SDC	Sanker Dev Campus
SEBO/N	Securities Board, Nepal
SEC	Securities Exchange Center
SEMH	Strong Form Efficient Market Hypothesis
SSEMH	Semi-Strong Form Efficient Market Hypothesis
WEMH	Weak Form Efficient Market Hypothesis

CHAPTER – ONE

INTRODUCTION

1.1 General Background

Capital Market plays vital role in the national economy. It renders very valuable services to the community by increasing the productive capacity of the country & thereby accelerating the pace of economy development. In the short, the growth of economy is tied with the growth of capital market in the country. The capital market is the market for corporate stocks and long-term debt instruments for more permanent financing purposes. The capital market plays a crucial role in mobilizing a constant flow of saving and channeling these financial resources for expanding productive capacity in the countries (Kui: 1989, 1). The capital market consists of security market and non-security market (Atje and Jovanovic: 1993, 634). Security market is a place where securities are bought and sold through intermediary networks. It acts as a mechanism for bringing together buyers and sellers of financial assets in order to facilitate trading (Sharpe et al: 2004, 47). Stock market is a major component of security market that plays mediator role through which corporate sectors mobilizes funds to finance productive projects by issuing shares in the market.

In this sense, Security market helps in proper mobilization of fund by facilitating the transfer between those who have and those who uses hence contributes immensely in economic growth (Bhalla: 2004, 21-22). But all these depend upon how efficient market is (shrestha: 2002,16). Securities that are priced efficiently guide the market in allocating funds

to their most productive use (Weston & Copeland: 1992, 93). In the same line, Sharpe opines “the more quickly and accurately price discovery is achieved, the more efficiently the security market will direct capital to its most productive opportunities” (Sharpe et al: 2004, 47). Thus it is only the efficient security market, which can provide enough liquidity, marketability and profitability to securities by enhancing the confidence of investors.

The market is said to be efficient if it rapidly and completely impounds all relevant information into assets prices. In broad, “an efficient market is defined as a market where there are large numbers of rational, profit-maximizers, actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants. In an efficient market competition among the many intelligent participants leads to a situation where at any point in time actual prices of individual securities already reflect the effects of information based both on events that have already occurs and on events which, as of now, the market expects to take place in the future. In other words, in an efficient market at any point in time the actual price of a security will be good estimate of its intrinsic value.”

If there are certain imperfections in the stock market, wise investor attempts to utilize them to get a better return. This perception has no rational significance in a world where shares are efficiently priced. In an efficient market, shares prices should adjust randomly upwards and downwards with respect to the new information. Stock market efficiency cannot be tested directly. However, by postulating some security price behaviour, one can have some idea about market efficiency. This study attempts to apply the widely accepted analytical approach in study of

stock market, namely efficient market hypothesis (EMH), to test weak-form market efficiency.

The importance of efficient security market for an economy is also apparent from the fact that emerging countries are assigning top priorities to the establishment and regulation of the security markets (Cheney & Moses: 1992, 64). In recent years, a number of developing countries in correct with the international finance corporation (IFC) and the World Bank have taken steps to establish and revitalize stock markets as an effective way of mobilizing finance (Murinde: 1996, 93). Realizing such, it's a high time for the Nepalese regulating authorities to emphasize on creating a business environment through efficiently operated stock market.

There are two approaches to explain share prices fluctuations. Market efficiency is the basis for both approaches. Conventional approach has considered that the market is inefficient, which includes technical analysis theory and fundamental analysis theory. Contrary approach has argued that the market is efficient under which there are three forms of efficient market hypothesis. Prior to the development of the efficient market theory, investors were generally divided into two groups, fundamentalists and technicians (Reilly: 1986, 347). Technical and fundamental analysts sell their services as security analysts to investors. A completely efficient market would be valueless. It is essential that a country is to enjoy highest capital market if that country is to enjoy highest possible level of wealth, welfare and education for population (Bhallla: 1983, 393). Such efficient market provides ready financing for worthwhile business ventures and drain capital a way from corporations, which are poorly, manages or producing obsolete products.

The random walk theory asserts that price movements will not follow any patterns or trends and that past price movements cannot be used to predict future price movements. Random walk hypothesis (RWH) emerged from empirical tests of changes in stock prices dates back to 1900 (Sprecher: 1975,453), In its simplest form, it state that price changes cannot be predicted from earlier changes in any meaningful manner. In the decade of 1960s (Roberts and Osborne: 1959), however, a “country theory”, first labeled “random walk” and later a “theory of efficient capital market” has been advanced to explain fluctuations in share prices.

Definition of market efficiency is linked up with the information that is available to investors and reflected in the price. Eugene Fama (1970) has suggested distinction between three forms of EMH. Under each form different types of information are assumed to be reflected in security prices. They are: -

-Weak form of EMH
-Semi-strong form of EMH
-Strong form of EMH.

As the above name imply, the three form of market efficiency represent increasing level of information available to the market.

The “weak” form asserts that all past market prices and data fully reflect insecurities prices. In other words, technical analysis is of no use. The “semi-strong” form asserts that all publicly available information is fully reflected in securities prices. In other words fundamental analysis is of no use. The “strong” form asserts that all information is fully reflected in securities prices. In other words, even insider information is of no use. In a review article, Fama expanded the definition of weak form and also changed the title of second and third form of efficient market hypothesis

(Fama: 1991, 1575). Instead of weak-form tests, which are only concerned with the forecast power of past return, the first category now covers the more general area of “test for return predictability”, which also includes the variable like dividend yield and interest rate. Instead of semi-strong form test of the adjustment of prices to public announcement, he used the common title, “event studies”. Instead of strong form test of whether specific investor has information not in market prices, he suggested the more descriptive title “test for private information”. However Nepalese stock market is relatively small and underdeveloped to compare with developed market. Yet the study is significant to test weak form efficiency whether past prices alone can predict current prices.

The history of Nepalese stock market begins with listing of shares by 16 companies that first took place in 1986 (Pradhan: 1993, 24). In the beginning of the organized open-out cry system, there was a brick in stock market activities. Share price increased tremendously. The turnover volume was also high. The increased share price could not last for long and soon the prices began to fall. That can be observed from the NEPSE index that was 97.78 in Mar 1993. It reached 254.29 in Aug. 1994 and slumped to 195.25 by the Jan 1995 (NEPSE: 2051-52). The high volatility of the prices can be observed from the changes of the ratio of market capitalization to paid-up value of listed securities. It was 6.36 times in F/Y 1993/94 and dropped to 2.88 times in F/Y 1997/98. Whether the stock price reflects its true value of the security or mot? Whether the prices are determined by the sole speculative behaviour of the participants regarding the expected prices or not? Answering these questions requires extensive study. However, development of an efficient market requires considerable efforts. This study attempts to find out whether the market is

efficient in pricing shares or not. The study, in this way, helps strengthen the reform in the performances of the stock market.

1.2 Statement of the Problem

Beginning with the work of Roberts and Osborne (1959), various studies have examined the behaviour of share prices. For many years the controversy centered around the question whether a serious of past share prices could be used in predicting future prices (Fama: 1965,34). Numerous theories were developed in the past to handle the problem. Among them, there are the various tools of technical analysis theory on the one hand, and on the other, the theory of random walk or efficient market theory.

The technical analysis theory holds that the historical behaviour of a security's prices is rich In information and hence can be used to predict future behaviour (Fama: 1965). The technical analyst (chartists) almost totally focused their attention on chart of share prices and assumed that one can discern certain patterns, which tend to repeat themselves. The another type of security analysis is fundamentalism, in essence which attempts to estimates the intrinsic value of a security by considering key economic and financial variables and then decide whether the actual price is above or below its intrinsic value. Both theories are included in the conventional security analysis theory. Their view about the stock market has been that prices generally fail to reflect the real worth of securities (Fama: 1965).

The second theory consisted of attempts of analyze statistically underlying share price behaviour this study is concerned with one of the most illustrious hypothesis namely the random walk hypothesis (RWH)

or weak form efficient market hypothesis (WEMH). In essence the RWH implies that the historical price change cannot be used to forecast future prices. The RWH is share price behaviour assets that the past behaviour of a security price is of no use in predicting its future price movements (Sharpe: 1969, 63-75). Thus an important debate has arises in the literature between convectional security analyst and those who believe in the concept of EMH. The EMH cannot be directly tested.

According to Fama (1970), three form is of the efficient market model, were investigated with respected to different subsets. “Week form has been designed as the RWH since the major tests of its validity were statistical tests for randomness in successive prices changes” (Lorine and Brealy: 1972,101-108). Like wise same semi strong and strong form of EMH can be tested indirectly. Whether prices “fully reflects” information cannot be directly observe (Dyckma and Dale: 1986,8). Thus, the semi strong form of EMH can be test by examine whether security price react appropriately to new items of publicity available information. Also, using inside information can test strong form EMH.

The WEMH or RWH is directly at odd with technical analysis theory while the RWH says that successive price changes are independent, the technical analysis supports that they are dependent. Similarly, the fundamental analysis theory holds that the value of the common stock is simply the present value of all the future income, which the owner of the share will receive (Francis: 1986,398). In an uncertain world, however, the intrinsic value of a security cannot be determined exactly. The fundamental ideas behind the RWH are that successive prices charges are uncorrelated over time and that it’s actual prices moves randomly about its intrinsic. Evidence in support of the RWH or WEMH varied across countries.

Although, some analyst view that the concept of market efficiency in developing countries is suspect for some reasons (Sharm and Kennlyu: 1977,391). a) Difficulty in detecting and discriminating among investment opportunities b) Investment performance is given to physical assets rather than financial assets; c) A dichotomy exists in the financial activities between organized and unorganized money markets etc. accordingly, in developing countries a lack of financial development, particularly in stock. Market, may result because of certain market imperfection such as lack of timely information (Hanson: 945,41-49), acquiring new information (Taylor: 1969,10-24) and possibly greater uncertainty about the future (Tunway and practice thought: 1973, 253-317). Though Nepalese stock market is in early development stage this study focused on the degree to which the stock market is efficient or inefficient pricing shares.

There are many empirical studies on share price behaviour market efficiently in developed stock markets. Roberts (1951) was the first to show the classical patterns of technical analysis. Moore (1964), Coother (1964) and King (1966) found the price of US stocks follow random walk. Runs of stock price changes give little evidence of dependence and the test for serials correlation provides evidence of independence on U.S. stock is documented by fama (1965) Alexander (1961), Mandelbrot (1963) and fama and blume (1966) test filter rules and also tends to supports the applicability of the random walk model. The existence of non-random prices movements on UK shares is investigated by Dryden (1970) and kemp and Reid (1971). Similarly Jennergren and Kiesvord (1975) found that the random walk hypothesis is probably not a very exact description of share price behaviour on Norvegain and Sewdish stock. Greater degree of dependency appears on germen stock prices as

revealed by Conrad and Juttner (1973). Thought there are these findings in the context of developed and big stock market but their applicability is yet to be seen in the context of smaller and underdeveloped stock market like that of Nepal.

A study on general behaviour of stock market prices (Aryal: 1995) and other study on test of RWH in the Nepalese context describing stock price behaviour (Shrestha: 1999,1-84) revealed that the Nepalese stock market is inefficient in pricing shares.

This conclusion was come through the secondary data. Like wise, a study on share prices behaviour in Nepal (Upadhaya: 2001) through analyzing both the secondary as well as primary data revealed that the Nepalese stock market, may not be termed as "weakly efficient" in pricing of share. However, the question exists as to what extent these findings are still relevant in present context?

Especially the main issues of the study are:

- Can historical trend predict speculators find trends in past prices that would enable them to earn abnormal profit?
- How quickly the market participants find out about the information and buy or sell securities on the basis of such information?
- Is there any evidence of discontinuity of trading in NEPSE?
- Can movement in stock be fully attributed to announcement of particular event? What could be some other factors affecting the price movement in NEPSE?
- What market efficiency means to the financial decision maker?
- What measures should be adopted by regulating to ensure consistent performance of market?

1.3 Objectives of the Study

This studies aims to discuss the main ideas behind the EMH and its relevance in the context of Nepal. It focuses on relevance of EMH to the pricing of share in NEPSE. Following are the specific objectives:

- To study the relevance and validity of efficient market hypothesis in the context of Nepalese security market.
- To examine whether successive price changes are independent or dependent of each other's.
- To analyze the market behaviour of NEPSE with reference to information availability.
- To conduct the opinions survey of securities businesspersons (brokers) and non-securities businesspersons on share prices behaviour in Nepal.
- To outline the possible implications and also suggests measures to develop an efficient stock market mechanism in NEPSE.

1.4 Limitation of the Study

As each and every study has its limitation, present study is not an exception. The data problem is acute in Nepal. Even the official directory of the quoted securities is not published by Nepal Stock Exchange Ltd. The up-to-date and complete data are very difficult to be obtained due to the inability of providing the required data by concerned authorities. The weekly price data relating to sample shares have been collected from the various issues of official file of NEPSE and other national dailies such as, The Rising Nepal and The Kathmandu Post.

In this study the term "efficiency" has been used only to denote informational efficiency of the market. It may also be noted that in this

study no attempt to analyze the price behaviour of preference share or other types of securities. In addition, tests based on filter rules have also not been performed here, as this investigation is not aimed at testing any specific mechanical trading technique, Further whenever actual week-end closing prices were not available, estimated closing prices have been used. The unavailability of various resources and references with the ready-made computer software to carry out comprehensive test of all methodological tools. The authenticity of this study depends on the authenticity of the data provided and collection. Respondent bias may also be a threat to the result of this study.

1.5 Hypothesis of Study

The following hypothesis has been posed for the study:

Hypothesis - I

Ho: Independence exists in successive price changes of the individual common stock.

H1: Independence does not exist in the successive prices changes of the individual common stock.

Hypothesis - II

Ho: There is no significant difference in opinions between securities businesspersons and non-security businesspersons.

H1: There is significant difference in opinion between securities businesspersons and non-security businesspersons.

1.6 Organization of the Study

This study is organized into organized into six chapters; each chapter deals with the specific aspect of the study, which will be as follows:

Chapter One	:	Introduction
Chapter Two	:	Review of Literature
Chapter Three	:	Research Methodology
Chapter Four	:	Presentation and Analysis of Secondary Data.
Chapter Five	:	Presentation and Analysis of Primary Data.
Chapter Six	:	Summary, Conclusions and Recommendations.

First chapter contains the introducing part of the study. As describe above the major issues to be investigates along with the general background and the objective has been mentioned. Second chapter presents the theoretical analysis and review of the related and pertinent literature available. It includes a discussion on the conceptual framework and review of related studies highlighting on its relevant finding. Third chapter describes the methodology employed in preparing this study. It deals with research design, population and sample, source of data for the study. It briefly mentioned the data collection and analyzes the technique and inherent limitation of such technique. Chapter four of study analyzes the empirical results of the secondary data. Results pertaining to analysis of secondary data using various analytical tools are presented in this section. Chapter five of this study deals with the presentation and analysis of primary data to find out different in opinions of the Securities businesspersons and non- Securities businesspersons. Last chapter presents summary of the study and its implication and also presented in brief for convenience of the reader. This section also incorporates suggestion and an outlet for future research. Annex and Bibliography are included at the end of the study.

CHAPTER – TWO

REVIEW OF LITERATURE

In this chapter, some of the basic literatures on the Efficient Stock Hypothesis are reviewed. It includes literatures regarding theories on the topic and review of the empirical evidences of previous studies done within and outside the country.

This chapter has been divided in four sections. The first section includes a brief description of theoretical review. It contains the technical analysis; fundamental or intrinsic value analysis and Random Walk-Efficient Market Theory. Second section briefly reviews the empirical evidence of the studies conducted in the context of the countries other than India and Nepal while third section includes a brief review of empirical results in the Indian context. The fourth section describes a brief review of empirical works in the context of Nepal.

2.1 Theoretical Review

Information on stock market behavior in such smaller and under-developed capital markets would help development of realistic theoretical models and formulation of relevant hypothesis for empirical testing in finance (Pradhan: 1994,42). Thus, it is significant to study stock market behavior in the context of smaller and under-developed capital markets. There are various reasons that cause the share price fluctuation which are classified as economic, non-economic and other factors. The price of securities is typically very sensitive, responsive to all events, both real and imagined, that cast light into the murkey future (Coontner: 1964,1). Though all factors give rise to the observed movement of share prices, it

would be very hard to find a completely accepted price formation theory. Before describing the random walk-efficient market theory, it would be appropriate to explain the first tow conventional theories.

Conventional Theory

Conventional approach has considered that market is inefficient, which includes technical analysis theory and fundamental analysis theory. “Prior to the development of the efficient market theory, investors were generally divided into two groups fundamentalists and technician (Frank K.: 1986,347).

Technical analysis theory

“Technical analysis can be defined as the use of published market data for the analyses of both the aggregate stock market and individual stocks. It is some times called market or internal analysis”(Jones: 1943,396). Technical analysis is based on published market data that include the price of a stock or the level of a market index, volume (No. Of shares traded), and technical indicators. Often technicians are referred to as chartists because much of their analysis takes the form of graphs or charts. Technicians believe that stock price follow recurring patterns. Once these patterns are discovered, they can be used to forecast the direction and perhaps the magnitude of future price changes.

Technical analyses theory includes study of past price and volume data of stocks to forecast future price movement. A highly specialized from of market analysis is practiced by technical analysts. They try to predict future stock prices just as we might predict that the pattern of wallpaper behind the mirror is the same as the pattern above the mirror (Malkiel: 1981, 129). The underlying philosophy of technical analysis is that the

price of a stock depends on supply and demand in the market and has little relation to intrinsic value, as fundamentalists believe it to be. Technical analysis tools are thus designed to measure supply and demand. The basic assumption of technicians is that history tends to repeat itself. In statistical terminology; the stock market technician relies upon the dependence of successive price changes (Robert: 1966, 83). That is, they assume that historical heavier of a security price is rich in information concerning its future behavior.

“The objective of technical analysis is timing – predicting short-term price movements in either individual stock or a market indicator. This is accomplished by studying the action of the market or stock through an analysis of price and volume data, or certain technical indicators. Technicians seek to forecast security price rather than security value. They attempt to forecast trends in price changes. “More specially, technical analysts seem to be trying to forecast short-run shifts in supply and demand that will affect the market price of one or more securities (Francis: 1986,581). In general, technical analysts record historical financial data on charts, study these charts in search of pattern that they find meaningful, and endeavor to use the patterns to predict the future prices. Some charts are used to predict the movements of a single security, others are used to predict the movements of a market index, and, still other are used to predict the movements of a market index, and, still other are used to predict the action of both individual assets and the market. Some is timing – predicting short-term price movements in either individual stock or a market indicator. This is accomplished by studding the action of the market or stock through analyses of price and volume data, or certain technical indicators. Technicians seek to forecast security price rather than security value. They attempt to forecast trends in price

changes. “More specially, technical analysis seems to be trying to forecast short-run shifts in supply and demand that will affect the market price of one or more securities (Francis: 1986,581). In general technical analyst's record historical financial data on charts, study these charts, study these charts in search of pattern that they find meaningful, and endeavor to use the pattern to predict the future prices. Some charts are used to predict the movements of a single security, others are used to predict the action of both individual asserts and the market. Some of these are used to predict the fluctuations in the price of a commodity, a foreign exchange or a rate of interest.

Fundamental analysis theory

Benjamin graham is recognized as the ether of fundamental analysis. Gramham advocate the use of the use of mathematics and quantitative procedures in the analysis of investments. This approach allowed him to estimate the intrinsic value of a stock, which is determined independency of the market price. An intrinsic value is the value that is justified by financial facts such as asserts value, earning, dividends and other fundamentals. Graham’s approach is known as fundamental analysis because it stresses the major (or fundamental) factors that determine a stock’s value.

Fundamental analysis theory claims that at any point of time an individual stock has an intrinsic value, which is equal to the present value of the future cash flows from the security discounted at appropriate risk adjusted discount rate. “The value of the common stock is simply the present value of all the future income which the owner of the share will receive”(Francis: 1986,398). And the actual price should reflect the intrinsic value of the stock i.e. good anticipation of cash flows and

capitalization rate corresponding to future time periods. But in practice, first it is not known in advance what a stock income will be in each future period, and second it is not clear what the appropriate discount rate should be for a particular stock. So, fundamental attempts to reach best estimate of the intrinsic value of share by studying company's sales, profit, dividends, managements competency, and numerous other economic and industrial factor which determines its future income and prospect of the business opportunities. "Fundamental analysis delves into companies' earning, their management, economic outlooks, firm's competition market conditions and many other factors" (Francis: 1986, 425).

Since in the world of uncertainty the anticipation of the values cannot be known exactly there will be disagreement on the opinion about the estimation among the market participants. Then the actual prices fluctuate closely around the "economic value" of share, because too far from the true value is profitable for the participants and they do not miss to exploit the situation. Over the time with continuous generation of new information related to company's earning prospect, the intrinsic value also changes. As a result prices of the stock adjust to new intrinsic value. The actual price of the security therefore is considered to be a function of a set of anticipation. Price change as anticipation change, which in turn changes as a result of new information (Bhalla: 1983,283). Whenever the stocks are priced over or under the true value of the stock, the recommendation of sales or purchases is called for after extensive analysis the investor derives and estimate of the "intrinsic" value of the security. Which is then compared to its market price? If the "value" exceeds the market price, the security should be acquired and vice versa" (Reilly: 1986, 347). Following this rule, they believe, above-average

return can be attained, given that market is inefficient in pricing the shares.

Fundamental security analysts estimate the intrinsic value of a security. In contrast, technical analysts (chartists) seek to predict security prices rather than values but in an efficient stock market, price always equal their values. Both the conventional theories to security valuation and price behaviour assumed that the pricing of shares in the market is not efficient, therefore, while making investment action, technical analysis theory suggests for proper time of buying and selling whereas fundamentalists or prospective investor in Nepal, however use some of the analytical tools either directly or indirectly but earning per share (EPS) and price earning ratio (PE ratio) seems to be popular.

Random Walk-efficient Market Theory

The third theory involves study of random walks or efficient market hypothesis. In 1900 a French mathematician, Louis Bachelier wrote a scientific paper suggesting that day-to-day price fluctuations were random walk theory (Cootner: 1962,24-25)

But interest in the model did not begin until the publication of two papers, one by Roberts and the other by Osborne in 1959. The random walk-efficient market theory is in completely at variance with the technical and fundamental analysis theory. A number of empirical researches have been done on varied set of data for different time periods to test the random walk-efficient market model for describing share price moment.

(i) The random walk hypothesis (RWH)

The random walk hypothesis (RWH) states that successive price changes are independent, and hence produces a random walk in price level (Alexander & Galvin: 1971,28). In its simplest form, it States that price changes in any "meaningful" manner. The past history of stock trading volume, do not contains any information that will allow the investor to do consistently better than a buy-and-hold strategy in managing a portfolio (Fisher: 1971,18). The fundamental believes at the back of the RWH are that successive price change of an industrial stock are independent over time and that its actual price fluctuate freely over time about its intrinsic value. Fama called this model an intrinsic value random walk-market (Fama: 1965, 36).

But in contrast to this market, random walk theorist denies the existence of any kind of "trends" or "pattern". Hence past price contains no useful information to predict future price behaviour. As fama advocates, 'the future of the price levels of a security is no more predictable than the path of a series of accumulated random numbers" (Ibid: 56). This means that at a given time the size and a direction, of the next price changes is random. The random walk model in share price actually involves two main hypothesis (Ibid: 35): - a) Successive price change are independent; and b) Price changes conform to some probability distribution statically independence means the probability distribution for the price change during the time period t is independence of the sequence of price change during previous periods (Ibid: 35). More preciously, independence means that

$$P_r\ (X_t = X \backslash X_{t-1}, X_{t-2}\text{……..})\ P_r\ (X_t = X)$$

The above expression implies that the conditional and marginal probability distribution of an independence random variable is identical (Ibid: 35).

Out of two hypothesis of the random walk theory (RWT), independence of successive price changes is strong and most important one to make theory valid. The second one is price change conforms to some probability distribution need not be specified i.e. any distribution is consistent with the theory as long as it correctly characterizes the process generating the price change (Ibid: 41). However, shape or form of price change knowledge is important to both investor and researcher for determining riskiness of investment in common stock (Ibid: 40-41). But the model when started in terms of predictability of price changes from either change need not be specific about this distribution (Clive and Morgenstern: 1970,72).

Independence is an important property of RWH. Proponents of random walk recognize that in general, strictly independence assumption does not exit in real world. So, they argue that small degree of dependence does not refuse the practical usefulness of RWH as long as it may not be useful to predict above normal market returns. The independence assumption of the random walk model is valid as long as knowledge of the past behaviour of the series of price changes cannot be use to increase expected gains (Fama: 1956,56). That is for practical purpose, the RWH may be considered to be suitable as long as the degree of dependence in the series of price changes is not adequate to forecast future the past price fluctuation so as to make profit higher than they would be under naïve buy-and-sell policy.

(ii) The efficient market hypothesis (EMH)

The efficient market hypothesis (EMH) is not properly understood by a large segment of financial community. The development of EMH could be traced into the random walk theory of stock market price moment. Later when empirical phenomenon showed that changes in stock price were largely random, endeavors were made to clothe the empirical result with economic contents, which lead to the advancement of efficient market theory.

Market efficiency may be defined in context of number of areas, for instance organization efficiency industrial efficiency, allocation efficiency, information efficiency and so on. The word "efficiency" as applied to securities market has unfortunately been used to represent a variety of logically distinct concept. In particular it may mean:……(a) Exchange efficiency (b) Production efficiency (c) Information efficiency (Rubinstein: 1979,812). However in this study it is concerned only with information efficiency in pricing the stocks. Efficient market theory contents that in free and perfect competitive market, stock price always reflects all the available information and adjust instantaneously every influx of new information. "In an efficient market "security price" fully reflect the available information." (Fama: 1977,133). The EMH says that the market rapidly in cooperates all information affecting the value a security test of market efficiency require a model showing the impact of information upon share prices. The EMH can be broken down into three sub-hypothesis, which differ according to the type information. Which are discussed below:

The weak form efficient market hypothesis (WEMH) assumes that all past information is reflect in security prices. This means that there is no

relationship between the past and future price fluctuations. Consequently, investors are unable to make profit from studying trend or pattern of past prices. The semi-strong efficient market hypothesis (SSEMH) holds that security price adjust rapidly to all publicity available information e.g. this implies that using publicity available information investor will not be able to earn above average return. The strong form efficient market hypothesis (SEMH) assumes that all information affecting stock prices, both public and private, is reflected in security prices. Thus in such a candidates even those who have access to private information cannot consistently earn excess returns.

The fundamental ideas behind the efficient market theory are that in a stock market, the prices of financial asserts should reflect all publicity available information and that these prices should adjust very rapidly to new information. In an uncertain world, however, the intrinsic value of a security cannot be exactly determined. Hence, one would expect differences of opinion among market participants as to the value of each (Fama: 1965A, 56). As a result, the intrinsic value. If enough buyers and seller have received and accurately, prices always will be in line with intrinsic value (David: 1997,37).

The main job of fundamentalist is to find out overvalued or undervalued securities. Furthermore, in a dynamic economy, intrinsic value can change themselves as a result of new of information (Brealely: 1969,4). The intrinsic value of a given security depends on the earning prospects of the company, which in turn are related to economic, political, and company specific factors. In case, the market participants do not rapidly know new information, security price changes will display dependence. However if the adjustment to new information is “instantaneous”, successive price changes will be independent.

The RWH is directly inconsistent with the technical analysis theory. While the technical analysis theory says that security price changes are dependent, the RWH states that they are independent. Actually, the WEMH is referred to as RWT of share price behaviour. Weak form of efficient market hypothesis is popularly known as the random walk theory (Donald and Jordan: 1995, 54). This form has been designated as the WEMH or RWH, since the major tests of its validity were statistical test for randomness in price changes (James and Richard: 1972, 101-102). In weekly efficient, the degree of variance between price and value of security is larger.

The SSEMH and SEMH cannot be tested directly; one can do so indirectly by accumulating evidence, which contradicts these hypotheses. Thus, the SSEMH is true, then accounting information has no value and only a few insiders trading on valuable information can earn a higher profit. In SSIMH the degree of variance between price and value of security is relatively low. Likewise, the SIMH can be tested by determining whether any investor appears to have gained and used superior information (Michael: 1977,107). It is difficult to test the SIMH because; private information cannot be examined directly. In SEMH, variance between price and value is zero.

2.2 EMH in Context of Developing Securities Market

“The empirical evidence in the random walk literature existed before the theory was established. That is to say, empirical results were discovered first, and then an attempt was made to develop a theory that could possibly explain the results” (Fisher & Jordan: 2000,539).

After these initial occurrences, more results and more theory were uncovered. This has led then to a Diversity of theories, which are generically called the random-walk theory.

The EMH had its genesis in random walk theory of the movement of security prices, which appeared in security price literature in the late 1950's.Actually the earliest known work on the distribution of security prices was done by Louis Bachelier (1900) who studied commodity prices in France and concluded that the current price of a commodity was also an unbiased estimate of its future price. This is the definition of a random walk as applied to the series commodity prices, although Bachelier did not use that term. It was another sixty years before further research on security prices again suggested the hypothesis that changes in stock prices were random, that is, that they followed a random walk. Two studies published in 1959 suggested that price changes were independent of each other. One by Roberts (1959) Simply showed that a series of stock prices; another by Obsborne (1959) found the movement of stock prices similar to that of the movement of small particles suspended in a chemical solution. These studies ushered in a boom of research interest on this topic.

In 1927 Slutsky proved that the randomly generated price changes look like stock price changes and that they appear to exhibit cycles and other patterns. Alfred cowls (1933) found little evidence that stock market analysis could predict future price. In 1934,Halbrook working extensively analyzed commodity prices, and noted that speculative price patterns might be shown to be random comparing with artificially generated series of price. Even the random artificial series of price changes from apparent trends and patterns. On the contrary, in 1937, Alfred Cowles and Herbert E. Jones reported that stock prices moved with predictable trends. They

gave a controversy to the random walk model as valid share price behavior model in U.S.A. This finding remained a challenge against the random walk hypothesis for more than two decades.

Kendall also tested the model and gave rises to the theory. In 1953, Kendall made significant contribution to advance in the study of the random walk model. He tested the model on the weakly price changes of the 19 indices of British industrial shares and in the spot price series of cotton (New York and wheat (Chicago). He analyzed the data by serial correlation co-efficient and concluded that the subsequent stock price movement follows random walk. He showed that the successive price changes are statistically independent to its past price changes.

More recent research into the random walk hypothesis began in 1959 with articles by Roberts (1959) and Osborne (1959). Roberts compared the levels of Dow Jones Industrial average with the levels of variable generated by a random walk mechanism and concluded that the random walk mechanism produced patterns very similar to the patterns of stock price movements. Roverts showed that a series of cumulative random numbers would closely resemble an actual stock price series. He further showed that changes in the random number series, as expected, do not exhibit a pattern as is true for stock price changes. Where as Osborne found that security prices behaved in a manner with a Brownian motion model in which the prices change in one period was independent of the price change in any preceding period.

After the appearance of Robberts and Osborne articles, a number of additional studies appeared which attempted to test whether security prices followed a random walk. Moore (1964) looked at the serial correlation of weekly security prices of 30 companies of U.S. stock.

“Serial correlation is a measure of the association of a series of numbers separated by some constant time period, such as association of the level of Gross National Product (GNP) in one year with level of GNP in the previous year.” In particular, Moore measured the correlation of one week’s price change with the next week’s price change .He found an average serial correlation of –0.056 which might indicate a very slight tendency for security price changes to reverse themselves, that is, for a price rise to follow a price full and vice versa. However, the evidence is so weak that it cannot be interpreted as being different from an average correlation for zero, which implies no association at all. Further, the existences of such a price reversal not allow sufficient returns to compensate for the transaction cost involved.

Fama’s study (1965) on the Random walk model was one of the best definitive and comprehensive studies. He observed the daily proportionate price of 30 individuals stocks of the DOW Jones Industrial Average. The study was based from the end of 1957 to 26 September 1962. The usual serial correlation model; the theory of runs; and Alexander’s Filter technique were employed to draw inference about dependence of the price series. He calculated auto-correlation coefficient for daily changes in log prices for lag from 1 to 30 and found that the coefficients were almost close to zero in overall. The correlation coefficient for daily changes in average was +0.03, which is near to zero. But on the daily price changes, 11 out of 30 stocks had correlation coefficients more than twice their computed standard errors. The coefficients ranged from smallest 0.06 to 0.123. However, Fama concluded, “dependence as such a small order of magnitude is, from a practical point of view, probably unimportant for both the statisticians and the investors.” Although the sample serial correlation coefficients for

the daily changes were all very small, it is possible that price changes across longer differencing intervals would show stronger evidence of dependence. To test this, serial correlation coefficients for lag from 1 to 10 were computed for each stock for non-over loping differencing intervals of four, nine, sixteen days. Again all the sample serial correlation coefficients were quite small. This lead Fama to conclude that the evidence produced by the autocorrelation model seems to indicate that dependence in successive price change is either extremely slight or non-existent.

Fama further investigated the data by run analyses by total number of runs, number of runs by sign and distribution for runs by length. This method also agreed with the independence hypothesis of successive price changes to each other. In fact, he found the total actual number of runs is less than the expected number, which is consistent with the positive correlation coefficients in the daily price changes. On 26 out of 30 stocks had the actual number of runs less than the expected number while the serial correlation coefficient was positive for 23 out of 30 stocks. Though, there exist slight dependencies in the series; the departure from randomness was not significant .So Fama (1965,80) asserts, “There is little evidence, either from the serial correlation or from the various runs tests, of any large degree of dependence in the daily, four day, nine –day and sixteen-day price changes.” He further says that “… as far as theses are concerned, there is no evidence of important dependence from either and investment or a statistical point of view” (Fama: 1965,80).

Fama and Blume (1966) tested filter technique extensively after commissions are deducted; they reported that none of the 30 DOW-Jones Industrial Average (DJIA) stocks that investigated outperformed the

naïve strategy. Again, this result also support the evidence for the conclusion previously mentioned from statistical method.

In the UK, papers by Dryden (1970) and Conningham (1973) reached similar conclusion. In general, these early studies supported market efficiency. Kemp and Reid (19710 also carried out the study on the Britain stock market. He investigated daily price series of 51 individual stocks and one FT index for a period from October 28,1968 to January 10, 1969. The statistical tools applied were especially non-parametric run test. The conclusion was drawn against the random walk theory of price behavior. They said, “our conclusion is that share price movements were obviously non-random over the period considered” (1971, 47). However, due to the very short study period and the application of only non-parametric tests, the findings should be used with care.

Some researchers have tested the model in the securities markets other than organized securities markets to examine whether they are weakly efficient or not. Hagerman and Richmond (1973) analyzed the monthly returns of the 253 randomly selected securities for the period from Jan.31, 1963 to Dec 31, 1967.

They applied the serial correlation and run tests. The results of runs supported the independence assumption of the random walk but the distribution of correlation coefficients displayed the existence of serial dependence of price changes. However, the conclusion was the monthly returns of the stocks traded over-the –counter are serially independency, as supported by the runs tests while the results of the serial correlation test must be discounted because of the possible bias involved in the estimation (Hagerman and Richmond: 1973, 908). Conard and Juttner (1973) analyzed the daily closing prices of 54 German stocks during

January 1968 to April 1971. They used both serial correlation and runs tests and found that the random walk theory is inappropriate to describe the recent share price movement in Germany.

Jennergren and Karsvold (in Elton and Gruber: 1975) examined daily price series of 15 stocks from Oslo Exchange (Norway) and 30 stocks from Stockholm stock Exchange (Sweden) during 1967 to 1971. They applied serial correlations and runs analysis in both the Norwegian and Swedish stock market prices. The average 1-day lag auto correlation coefficients reported were 0.83 and 0.109 for Norwegian and Swiss stock market prices respectively. The run analysis also proved consistent with these finding that the mean standardized variable for differencing interval one was –4.9 for Norway and –4.64 for Sweden. From the above analytical tools, considerable dependence in both the Norwegian and Swedish stock market prices were found and concluded "… price changes are not independent random variable in the case of the majority of the 45 investigated Norwegian and Swedish stocks." This implies that the random walk hypothesis is probably not a very accurate description of share price behaviour in both the Norwegian and Swedish stock markets.

Low (1982) tested the weak form efficient market hypothesis (WEMH) on Hong Kong stocks. He investigated daily price series of 56 stocks for a period from January 1978 to December 1979. The statistical tools applied were: serial correlation, runs test and regression analysis. He reported that 32 out of 56 stocks were non-random, within which 19 stocks were strictly random and additional 5 stocks were slightly random.

Butler and Malikah (1992) used serial correlation and run tests to evaluate the weak from efficiency of the stock market in Saudi Arabia and Kuwait. Their results indicate significant departure from random

walk for the Saudi stocks and less pronounced but significant autocorrelation for many Kuwaiti stocks similar to other thinly traded markets. Al- Loughani (1995), using more robust statistical techniques on the Kuwait market index, concludes that the series exhibit stationary but not random walk.

Urrautia (1995), using the variance ratio test, rejected the RWH fro the latin American emerging equity markets of Argentina, Brazil, Chile, and Mexico, where as the runs test indicated weak form efficiency. In contrast, Ojah and Kamera (1999) found that the Latin America equity returns follow a random walk and were generally weak form efficient. Grieb and Rayes (1999) re-examined the random walk properties of stock traded in Brazil and Mexico using the variance ration tests and concluded that index returns in Mexico exhibited mean reversion and a tendency toward random walk in Brazil. These conflicting inferences possibly could be attributed to the effect of cross sectional and temporal variations in the degree of infrequent trading in those emerging markets.

The behavior of stocks prices on the Colombo stock Exchange (CSE) was examined with a view to determine its consistency with the weak form of the Efficient Market Hypothesis (EMH). Runs, Autocorrelation and co-integration tests were applied to daily, weekly and monthly CSE index data for the period of January 1991- November 1996. Sensitive share Index reported by the Colombo stock Exchange and a 40- security value weighted index, adjusted for dividends, splits, rights and bonuses were used. Results of Runs, Correlation and Co-integration tests overwhelmingly rejected the serial independence hypothesis, leading to the conclusion that the behavior of stock prices in the Colombo stock Exchange was not consistent with the weak form of the Efficient Market Hypothesis. Tests of the day of –the –weak-effect, however, show that

there was no evidence of such a phenomenon on the Colombo Stock Exchange stock prices. Result of the tests of the month of the year effect lead to the conclusion that CES prices did not display any month-specific behavior (Abeysekera: 2001).

Lime and Tabak, (2004) carried out a study to test the random walk hypothesis for China, Hong-Kong and Singapore. Using variance ratio tests, robust to heteroskedasticity and employing a recently developed boots trap technique to customize percentiles for inference purpose it is found that class A shares for Chinese stock exchanges and the Hong Kong equity markets are weak from efficient. However, Singapore and class B shares for Chinese stock exchanges don't follow the random walk hypothesis, which suggests that liquidity and market capitalization may play a trade in explaining results of weak from efficiency tests.

The review of above motioned studies carried out in developed countries shows many interesting findings on efficiency market Hypothesis and price Movement. However, question arises as to what extent their findings are pertinent for Nepal. They all may not be applicable for Nepal Where stock market is small and underdeveloped. The more pertinent studies would be the studies conducted in India, Since Nepalese and Indian companies are operating under similar conditions. Hence, the following section attempts to analyze the studies conducted in the context of India.

2.3 A Review of Major Indian Studies

There are some studies conducted to test efficient market hypothesis (EMH) in India. In one of the earlier studies, Rao and Mukherjee (1971) first conducted the study to test random walk model of share price

behaviour of only one aluminum company's share. They examined weekly average share price for the sixteen years from 1955 to 1970 by employing spectral methods. The conclusion confirmed the RWH. In another study, Sharma and Kennedy (1977) investigated on the monthly indices of the Bombay (BVDISI or BSE), London and New York 11 years period, from 1963 to 1973. The data covering 11 year consists 132 observations as of last Friday of each month. They applied runs and spectral analysis and found that the BVDISI is statistically indistinguishable from that concluded that the Bombay stock Exchange obey a random walk.

Gupta (1978) carried out comprehensive test of the random walk, hypothesis by employing serial correlation and runs analysis in tow sets of time series data. First set time series data used were: The Economic time Index Number of daily share prices and Financial Express Index Numbers of Equity prices –one a daily and other weekly series. The second was weekend closing prices of 39euity shares. Statistical results from both the methods comply with the random walk hypothesis. On the basis of these tests, Gupta concluded that the random walk model appeared to be an appropriate model even for the less developed country like India to describe share price behavior, thus, suggesting that the Indian stock exchange were "efficient" in the weak sense in pricing shares (Ibid: 53-54)

Roa (1978) employed the autocorrelation analysis, runs test and filter rule to weekend closing prices of 10 blue chip stocks over the period 1983 to 1987. His study supported the RWH.

Pandey and Bhat (1988) conducted a survey to know the attitudes and perceptions of market participants in understanding and acceptance of

efficient market hypothesis. In order to obtain and analyze the primary data, questionnaires were sent to 600 persons who were into four groups:(i) the chief financial executives (ii) academicians (iii) chartered accounts and (IV) cross section of investors and brokers. Only 160 questionnaires were returned duly filled in by the respondents. Their analysis denied the existence of market efficiency in any of its three forms; viz, the weak forms the semi-strong and the strong forms.

Mahapatra (1995) tested the WEMH using rank correlation analysis based on relatives' strength. His sample consisted of month and closing price of 26 stocks from Bombay stock exchange during the periods January 1986 to December 1992. He argued that the short run but more efficient in the long run.

Bhatia and Shekhar (1996) a study on the impact of past shares price on its present market price in Indian stock market by manner a univeriate analysis. The data used for the study was the time series data from 1982-90 of the Bombay stock exchange (BSE). Applying random sampling techniques total of 42 companies were selected from four-industry classification. Serial correlation and run analysis were used to test the random walk model. The results of both tests do not generate any strong evidence that can refute the validity of RWM. Thus study concluded by commenting that the behaviour of BSE confirms to the weak forms of EMH.

Shukla and Chowhan (2000) have conducted similar study examine the issue of volatility in the stock market. The study tied to unearth the rationale for the weird moments that are evident in the Indian stock market. An empirical study of BSE sensex and a set of representative stocks (including Info-Tech stock, Demat and Rolling settlement stocks)

are carried out to find changes in their volatility during the period of 1998 to 2000. The variance calculation showed that market was highly volatile the period, with variance ranging from 0ti 453. The major finding of the study can be summarized as (a) volatility is high when market is in downturn, (b) during the study period BSE sensex has shown similarly pattern as shown by major IT stocks and sentiment was same across the market, (c) investment can earn return commensurate to risk if they time their entry and exit properly. Overall the study states that perceptual factors have led to the mad rush for stock and thus led to the mad rush for stock and thus led to the emergence of such high volatility in the market. The study further commented that market regulator are unable to curb such speculative uprising and recommended that such can be done by allowing free trade, strengthening analytical media that highlight on better risk management coupled with investor learning.

Nath (2000) made an attempt to confirm whether EMH is applicable to emerging market like India. The primarily objective pursued in this study was to investigate if long memory models can characterize the price behaviour in Indian stock market. The study used the daily closing values of the index for the period from 1990 to 2001. Returns have been calculated for various time lags like 1 day, 14,30,90,180,270,360,720 and 1800 day to understand to what extent, the long memory process exist, if it exist at all. Two important test variance ratio test and rescaled range analysis was used. The variance test clearly implies that there does not exist any short term or long memory. However the rescaled range analysis provided indication of long-term memory but with noise. In either case analysis showed that the movement of stock price does not follow a random movement.

2.4 Review of Nepalese Studies

Comparing few research efforts have been undertaken in Nepalese context. Majority of the researches primarily focused on analyzing the share price behaviour using random walk model and measuring influence of certain financial variable like dividend, bonus share, right issue etc on the share price. Beside that there are also pertinent literatures that address the issue relevant to stock market behaviour.

Shrestha (1992) has commented that best alternative for quick and efficient capital market development is through the free competition of the broker in the trading floor. The article has identified various challenges faced by Nepalese market; some of major are (a) the rise in market price less representative of the investor need and preference, since some of the market price are fixed without adherence to free play of market forces (b) deficiencies of market information (c) much deviation in the transaction volume and trading numbers of listed companies. Shrestha has emphasized that SEBO/N must implement its regulation efficiency and member broker must act in good faith in market to determine the final price for fair transaction.

Dhakal (1993) demonstrated empirically that inadequate corporate disclosure in annual reports is likely to widen fluctuation in the market price of security. The study commented that in absence of adequate information investment decision are based on less objective measures. Further it emphasized that quality of disclosure is one of the important variable affecting the price and fair disclosure reduces the excessive speculation and gambling in the market. Annual report of 52 listed companies and further questionnaire survey of 13 respondents were included in the analysis. The finding of the study showed (a) association

between size of companies which disclose adequate information are likely to be greater in size as measure by total assets and profitable as measured by earning margin.

Pardhan (1994) found a positive correlation between dividends per share. He indicates that stocks with large price. Earning ratio was with lower liquidity, profitability, assets turnover, and interest coverage. He also observed that liquidity and leverage ratio were more variable for stocks paying and interest coverage were more variable for the stocks paying higher dividend.

Bhattarai (1997) identified the decisive effect of EPS and ROE in pricing of common stock. Timilsina (1997) found positive relationship between stock price and dividend per share their own right; the question of "efficiency" of stock market in pricing shares is still unresolved. However, some empirical studies are market Hypothesis" to test the weak form efficient market hypothesis or random-walk hypothesis. Aryal (1995) studied the daily prices of 21 stocks out listed company's shares for about eight months period. He applied series correlation and runs analysis and concluded that Nepalese stock market is inefficient in terms of information efficient in pricing of shares in terms of information efficiency although there were some series limitation as the study periods was not long enough and the organized market was just started. Similarly, in the study of shrestha (1999). He used the model called serial correlation to test possible dependence in successive share price change and run test to examine the randomness in price change and run test to examine the randomness in price changes. By taking the daily closing prices of 30 stocks from 13 January 1994 to mid July 1998, he found that the successive price changes are dependent. It implies that the information of past price change was helpful in predicting future price

change. He also concluded that the Nepalese stock market is not efficient in pricing shares even in its weak form.

Shrestha (2002), Upadhya (2004), Bhattariai (2006) has tested the weak form market efficiency by using run analysis and serial correlation test. The result showed positive serial correlation and high number of expected runs for most of the stocks, which implies positive dependence in stocks price series. In addition to run and correlation test Kharel (2007) has used filter rule to test whether sophisticated mechanical trading rule can beat the average market return. The finding indicated that annual rates of rerun. The finding indicated that annual rates of return obtained from all filter trading strategy were greater than buy and hold strategy. Overall the result of these studies concluded that present stock price change are biased out come of past's price change, which demonstrated that the random walk model is not appropriate to define the security price moment of equity shares in Nepal. Thus the conclusion is drawn that Nepalese market is not even weakly efficient in pricing shares.

On concluding remarks, there are apparently a few research efforts undertaken to examine the validity of EMH in context of less developed security market like ours. As EMH is developed from the study based on market behaviour of developed capital market, its relevance is quite questionable in our context. Nevertheless such studies provide basis or foundations to develop a framework for examining the market behavior in our context and to take steps to curb such evident market inefficiencies.

In this study, some of the prominent research efforts on EMH conducted on developed capital market are briefly reviewed. The specified model of such studies could not be used primarily because of the need for specific data source and also because of the complex nature of the model itself.

The studies conducted in markets like India, Bangladesh, Taiwan, Malaysia are also reviewed in brief. Since their capital market are also in developing phase, result of such studies has significant implication and relevance in our context.

The pertinent Nepalese literatures are also reviewed to find the gap between the past and present scenario and to establish the relevance of this study. Reviewing the related literature in Nepalese context, it revealed that EMH is well documented in number of studies; there is yet controversy with regard to price behaviour in Nepalese market. Thus the question regarding the relevancy of RMH in our context can be best answered by analyzing largest possible sample size in conjunction with comprehensive and concurrent analysis of various standard tests. Further it is important to note, however, that in the previous studies the usual procedure has been to infer market inefficiency from the observed independence of successive price changes. There has been no attempt to measure the response of price to specific kind of information. Besides, that various changes have been taken place, which may have invalidated the relevancy of the previous studies. Viewed in this perspective, this study is expected to be useful.

CHAPTER – THREE

RESEARCH METHODOLOGY

This chapter describes the methodology employed to fulfill the objective of the study. First section gives the brief account of research design; second section has followed by description of population and selection of sample size. Third section describes the nature of data, while fourth section gives details of data collection technique and analysis tools. Section five deals with the adjustment for bonus and right issues. Finally, section six deals with the limitation that has bounded the scope of the study.

3.1 Research Design

The research design in a research study acts as a general framework for carrying out it. According to Kerlinger "Research design is the plan, structure and the strategy of investigation conceived so as to obtain answers to the research questions and to control variance". (1968, 275). Hence, research design is a road map by which the researcher reaches to his/her objective correctly on time.

Both descriptive and analytical research design are adopted to carry out this study more specially the descriptive approach has been adopted mainly for the conceptualization of problem. The analytical approach has been followed to analyze the related data and the relationship among variables.

3.2 Population and Sample Size

The listed companies of NEPSE are the population for the study. In 2007/2008, there are all-together 148 listed companies (NEPSE) are regarded as the population for the study. The study of each and every unit in the population is infeasible because of time data and budgetary constraints. And also it is not necessary to study the whole population because studying the sample if an appropriate sampling technique is applied can draw good conclusion. Twenty-five equality shares listed and actively traded in the Nepal stock exchange Ltd. during April 2005 to March 2008 constitute the sample for this study. While selecting the samples, adequate care has been taken to choose the highly traded shares to represents all the sectors as classified by NEPSE: banks, finance companies, insurance companies, hotels, manufacturing and processing companies, trading companies and other enterprises.

Table No. 3.1

Number of Enterprises Selected for the Study

S.N.	SECTORS	N	n	n/N*100
1	Banks	23	9	39.13%
2	Finance Companies	55	7	12.72%
3	Insurance companies	16	3	18.75%
4	Hotels	6	2	33%
5	Manufacturing and processing Co.	31	1	3.22%
6	Trading Company	10	1	10%
7	Other	7	2	28.57%
	Total	148	25	16.89%

Source: ***htpp://www.nepalstock.com***

Note: N indicates the total number of Nepalese enterprises that were listed in NEPSE and ‘n’ indicates for the number of enterprises selected for the survey investigation.

3.3 Nature of Data

Study is based on both primary and secondary data. Secondary data on the weekly share prices are used to test the evidence on market efficiency while the primary data is used to draw inferences on market efficiency by observing the trading behaviour of investors in the market. Beside that it is also used to survey the opinions of investors, brokers and regulating authorities regarding the various issues of market behaviour of NEPSE.

3.4 Data Collection Techniques and Analysis Tools

The price behaviour of efficient market may be easy to describe in theory, but in practice it can be very difficult to determine the degree to which actual market are efficient (Jrennrpohl and Gary: 1993, 201). In this regards various sophisticated statistical and financial model have been developed in recent years for empirical studies in developed market. However, in Nepalese context such advanced model and tools may not be appropriates due to data unavailability. so in this study, analysis tools that can be supported by available data are used. To analyze the price discovery process in Nepalese security market, secondary data and primary data are collected. The collection technique and methodology employed are discussed below:

Secondary Data

The secondary sources of information are used to test the random walk hypothesis by mean of (1) a parametric test for independence and (2) a non-parametric test for randomness. The secondary data are collected from the various published document such as journals, books and articles the reliability of secondary data depends on the source from where they are collected.

In the part, the random walk researches have used a variety of data: (1) share prices indices (2) their averages (3) daily closing prices (4) wee-end closing prices (5) months –end closing prices etc. for testing empirical validity of the random walk model to describes prices movements in speculative market, while there has been a growing tendency among the researchers to use time series of individual shares prices series (Osborne: 1959). Osborne was the first to use individuals' stock prices as against prices indexes later other researchers too, have employed prices of individuals stock.

Most of the studies have been conducted on indices at the same time the use of index numbers appears to be the most obvious weakness in many of the earlier studies of the random walk hypothesis (Kemp and Reid: 1971,31). In economic terms there seems little justification for using an index, as it is no more than a measure of general market trends and it is just interested to carry out the method of analysis than carrying out a detailed investigation. There are also more technical reasons for preferring individual share price series rather than to use an index series (Kemp and Reid: 1971,32). An index may give a completely false impression of the extent of price change in individual series. Hence to test the random walk hypothesis the use of individual share price series is appropriate. However, some methodological problems arise in the application of individual share price series. For example: (a) the choice of the time interval over which prices should be recoded, and (b) the selection of equality shares to be included in the sample.

Concerning the type of data used, the literatures offers a rich variety: indices, averages, daily, weekend and month end closing prices and others for some reasons even use of daily closing prices may be may be unsatisfactory: Alexander (1961), for example in this study, of filters

found that his initial result were affected materially by neglecting the within day fluctuation of share prices one of the consequences of the use of daily closing prices is that an institutional cycle might be introduced as there is no trading at weekend on the other hand daily closing prices are not available for some of the sample shares either because there may be 'no trading' in these shares . The uses of month's ends closing prices involve an unnecessary negligence of easily available data. Hence, in order to reduce the drawback in choosing the time intervals as mentioned above, the weekend closing prices of selected equality shares are taken into consideration, however in absence of weekend (Friday's) closing prices, the previous days closing prices have been used according to the necessity.

The actual tests of serial correlation are not performed in the weekly prices themselves but on the first differences of their natural logarithms.

$R_{i,\,t} = \ln P_{i,\,t}/P_{i,\,t-1} = \ln P_{i,\,t} - \text{In } P_{i,\,t-1}$ ---------- (3.1)

Where,

$R_{i,\,t}$ is the prices changes in natural logarithm of stock i.

P_i, t is the price of security i observed at the end of day t.

$P_{i,\,(t-1)}$ is the price of security i observed the end of day t-1.

i = 1,2,3…….n

t =1,2,3,…….n

There are three main reasons for using changes in log price rather than simple price changes. First, the changes in log price are the yield, with continuous compounding, from holding the security for that day. Second, more (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 change less than ±15 percent, the changes in log price are very close

to the percent price changes. Similarly, Roberts (1959) suggested that it is wiser to analyze changes of logarithms or square root of level. However, the other non-parametric tests i.e. run test have been performed on the arithmetic first differences.

A number of different types of test methodologies are available to examine prime hypothesis of the random walk theory. One approach is based on statistical inference of the independence of successive price changes. This approach adopts serial correction and run test while some other used spectral analysis this is concerned with testing various mechanical trading rules i.e. filtered rule. In this study, to test the independence hypothesis derived from the objective of the study, two statistical tools are used. Serial correlation analysis (a parametric test) and run test analysis (non-parametric test) have been applied as test methodologies to analyze the secondary data are discussed below:

1) Serial Correlation

"Serial Correlation (or Auto-correlation) measures the correlation coefficient among a series of number (stock price, in this case) with lagging number in the same time series. Either non-random trends or a pattern of reversals can be detected" (Francis: 1986, 611). It measures the correction between security price changes in one-time period and price change in the same security in the later periods. Correlation test are particularly appropriate in testing for independence between successive prices.

The most extensive study of common stock dependencies was a study of series correction coefficients undertaken by Fama (1965). The correlation coefficient is a ratio of the covariance to the product of the product of the

standard deviation of the two random variables. A serial correlation coefficient makes the same calculation of one variable with itself lagged one or more periods. Thus,

$$r_k = \frac{\text{Covariance } [Uj,_{t,}\ Uj_{(t-k)}]}{\sigma(Uj,_t)\ \sigma[Uj,_t]} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.2a)$$

$$r_k = \frac{\text{Covariance } [Uj,_t,\ Uj_{(t-k)}]}{\text{Variance } Uj,_t} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(3.2b)$$

Where,

r_k = serial correlation (auto-correlation) coefficient

$Uj,_t$ = the price changes in natural logarithm of stock j

K = logged variables (1,2,3…n)

t = time interval (1,2,3…n)

Correlation coefficient can take on a value ranging -1 to +1; a positive number indicates a direct correlation, a negative value implies an inverse relationships, and a value close to zero implies no relationships.

The standard error of U_t variable having serial correlation coefficient of r_k is given by:

$$\sigma(r_k) = \sqrt{\frac{1}{(N-K)}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.3)$$

Where, 0.187 and 0.186 respectively. Above table shows that the ratio has

N= sample size,

K= lag period

2) The Run Test Analysis

There is a potential problem, however, when one uses correlation coefficients to evaluate the possibility of independence in a particular series. This problem arises because correlation coefficients can be dominated by extreme values that ignores the magnitude of changes and observes only direction of change in a given time series to over come this possible shortcoming, the run test has been employed

The run test some time also known, as geary test, is a non-parametric test designed for the observations of a sample that are not normally distributed. A run can be defined as a sequence of consecutive price change of the same sign followed and preceded by changes of other sign. The theory of run ignores absolute values in a time series and observes only their signs. There are three types of runs in a series i.e. positive, negative and no change and thus implying three type of price change in a series. Therefore a plus run length may be defined as a sequence of positive price change preceded and succeeded by either negative or zero price change (Fama: 1965,74). Run tests are performed to examine whether the actual number of runs conformed to the expected numbers of runs under the Bernoulli process. If the observed and expected number of runs are not significantly differ from each other then it is concluded that the independence assumption of the successive price change up hold, on the contrary if the different significantly difference from the expected number of runs the price change would be dependent run analysis is non-pragmatics test the ignores the magnitude of change the observed only the direction of given time series. The difference between expected and actual numbers of runs has been analyzed by total numbers of runs.

Total Number of Runs

Under the hypothesis of independence and on the assumption that sample proportions of positive, negative and no-change are unbiased estimates of the population proportions, the expected number of runs of all types can be computed as follows (Walls and Roberts: 1956,569-572):

$$M = \frac{N(N+1) - \sum_{t=1}^{3} n_i^2}{N} \quad \text{.....(3.4)}$$

Where,

M is the expected number of runs,

N is the total number of observation and

n_i is the number of price changes of each sign.

Then, The standard error of M is:

$$\sigma_m = \left[\frac{\sum_{i=1}^{3} n_i^2 \left[\sum_{i=1}^{3} n_i^2 + N(N+1) \right] - 2N \sum_{i=1}^{3} n_i^2 - N^3}{N^2 (N-1)} \right]^{1/2} \quad \text{.....(3.5)}$$

For large samples the distribution of the total number of runs is approximately normal with mean (M) and standard error (σ_m) as defined by (3.4) and (3.5) respectively. Thus the difference between the actual number of runs (R) and the expected number can be expressed by means of the usual standardized variable,

$$Z = \frac{(R + 1/2) - M}{\sigma_m} \quad \text{.....(3.6)}$$

Where, R is the total actual number of runs of all signs, ½ in the numerator is a discontinuity adjustment and M & σ_m are respectively the mean and standard error of the sampling distribution of runs. For large sample, Z will be approximately normal with mean 0 and variance 1. The observed values of Z will be compared with the tabulated values of Z at 5 percent and 1 percent level of significance in order to know whether the null hypothesis (i.e. randomness hypothesis) will be rejected or accepted. In addition, the difference between the actual and expected number of runs as proportions of the expected numbers of runs will be employed to reduce the drawbacks of the usual standardized variable.

Primary Data

The required primary data have been collected through a questionnaire (Annex 1), unstructured interview and the observation of researcher. A variety of questions were asked to the respondents in order to examine the efficient market hypothesis and behaviour of share prices. Unstructured interview and conversation during questionnaire survey is also used to draw conclusions. The respondents are classified into two groups: securities businesspersons and non-securities businesspersons. Securities businesspersons include Issue Managers, Stockbrokers, and Securities Dealers whereas non-securities businesspersons include investors, academicians, and chartered accountants. The following tools are used to analyze the primary data:

1) Weighted Mean

Weighted mean is an average that takes into account how important each value is to the overall total. In this study, weighted mean is calculated to analyze rank wise number of responses to field survey.

2) Median

Median is especially applicable to cases to the qualitative phenomena which cannot be measured quantitatively. In this study, median values of responses for each statement of observation on efficient stock market hypothesis and share price movement have been calculated.

3) Chi-Square Test (χ^2)

The chi- square test is non-parametric test because it depends only on the set of observed and expected frequencies and degrees of freedom (Sharma & chaudhary: 2058,364). Chi – Square is a statistical measure used in the context of sampling analysis for computing a variance to a theoretical variance. In this study chi-square values are computed to assess the difference in the opinions of the securities businessperson and non-securities businessperson as to major aspect of stock market efficiency & share price movement in Nepal.

4) Spearman's Rank Correlation

Rank correlation coefficient measure the association between the two variables on the basis of their rank not numerical value of data (Murinde: 1996,101-102). This is computed in this study to find the degree of relationship between the responding groups, it is tested for significance.

3.5 Adjustment for Bonus and Right Issues

The share price changes suddenly when a company increases its paid up capital either by (i) calling up the balance, or (ii) issue of bonus share, or (iii) issue of right shares. Therefore, in such situations, immediately after the change, the prices are required to be adjusted.

Since, all the shares included in the sample were fully paid – up, situation mentioned in (i) above did not arise. However, during the study period covered, some companied had issued bonus and right shares. Therefore, in those cases, the ex-bonus or the ex-right prices were required to be adjusted to make them comparable with the cum-bonus or cum right quotations.

The ex-bonus prices were adjusted by multiplying them by the factor 1+1/r. Where, r was the number of shares issued against every odd share, since secondary data analysis has been carried out on the arithmetic first differences/logarithmic first differences of closing prices in this study, the ex-bonus prices were adjusted only for the first ex-bonus week (Annex 2)

In the case of right issues, the same procedure was followed with necessary adjustment for cash payment involved. However, no adjustment was made for cash dividend, since there is uncertainty as to the correct adjustment due to the different tax payment by investors belonging to different tax classed. Besides Fama (1965) has shown that adjustment for cash dividends does not have a considerable effect in the results of the serial correlation. He found that when adjustment for cash dividends, no important distortions were produced in his results.

CHARTER – FOUR

PRESENTATION & ANALYSIS OF SECONDARY DATA

This chapter reports all the test result of the secondary data that has been conducted in this study. The scheme of the chapter is as follows: section 1 examines the serial correlation technique used for measuring possible independence in price chapter section 2 attempts to test the randomness of changes in share price by means of run test analysis.

4.1 Serial Correlation Analysis

This section purports to test the hypothesis that successive share price changes are linearly independent. This is done with the help of the well-known serial correlation. The serial correlation coefficients synonymously called as auto correlation coefficient has been used to measure the degree of relationship between the series of log price changes with the same series of k periods earlier. Trends or reversal tendencies in securities price changes can be detected with serial correlation. Should the observed serial correlation among price changes be zero, it would amount to accept above hypothesis. This would imply that past price contains no predictive value regarding the future price change and that above normal returns cannot be earned simply by exploiting a sequence of historical prices. In such situation, the stock market is generally describes as ‘efficient’ in the weak sense. In other words, if the coefficients, in overall are found to be zero or close to zero, it can be inferred that the market is efficient in pricing shares. If the coefficients were significantly departed from zero, it would imply that the successive price changes are dependent. Hence it can be inferred that the

market is inefficient in pricing shares. The serial correlation coefficient and their standard error for 25 sample shares have been computed according to equation 3.2 & 3.3 Methodology chapter and presents in the annex 3 & 4 respectively.

Empirical Results

Generally, if there is to be any correlation in log price change, the most likely is between the successive terms $P_{i,t}$ and $P_{i,t-1}$. The results of serial coefficient for weekly share price series have been computed for lags 1-10. The first order coefficient shows serial independence.

Annex 4 shows the sign pattern of serial correlation coefficients. In annex 4, nineteen out of twenty five of the first and sixth order coefficients are negative, while sixteen of third; fourth, fifth and seventh-order co-efficient are negative. In eight and ninth order coefficient, out of twenty-five, thirteen coefficient is negative. For second and tenth-order coefficients, the signs are about evently split. The preponderance of negative in the coefficients for the weekly changes is consistent with Cootner's (1962) and Moore's (1964) results for weekly changes in log price of stock on the New York stock exchange.

However, agreement in the sign among the coefficients for the difference securities is not necessarily evidence for consistent patterns of dependence. King (1966) has shown that the price changes for different securities are related (although not all to the same extent) to the behaviour of a ' market' component common to all securities. The serial correlation coefficient of given securities for any given sampling period will be partly determined by the serial behaviour of the market component and partly by the serial behaviour of factors pertaining to that security and

perhaps also its industry. Since the market component is common to all securities. However its behaviour during the sampling period may tend to produce a common sign for the serial correlation coefficient of all the different securities. Thus although both the market component and the factors peculiar to individual firm and industry may be characterized by serial independence, the sample behaviour of the market component during any given period may be accepted to produce agreement among the signs of the sample serial correlation coefficient for the different securities. It is, therefore, desirable to perform the judgment of coefficient magnitude and statistical significance test of serial correlation coefficient. A perusal summery result for the different companies derived from annex 3 & 4 are given in table 4.1 which shows the statistically significance series for lag 1 to10.

Table 4.1

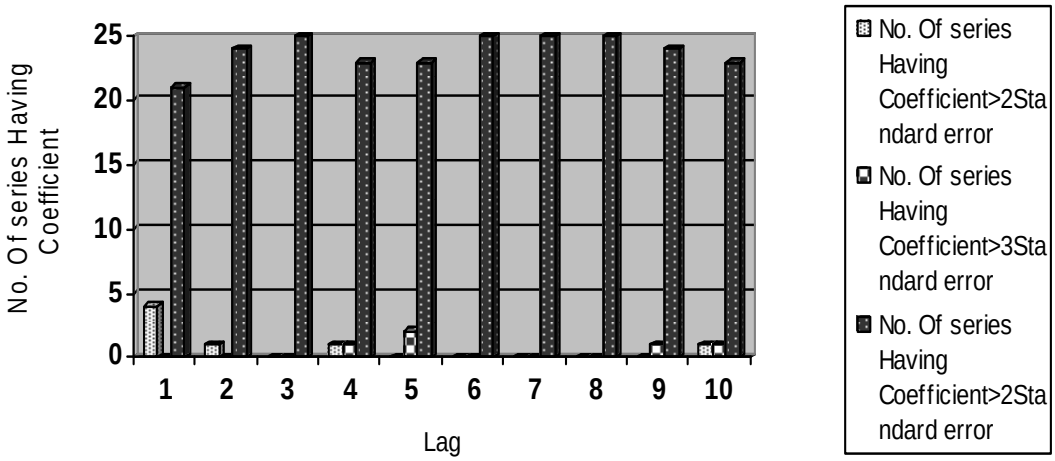
Series Having Significance and Insignificance values of first to Tenth order serial Correlation Coefficient

Lag	No. Of series Having Coefficient>2Standard error	No. Of series Having Coefficient>3 Standard error	No. Of series Having Coefficient<2 Standard error	Total sample
1	4	0	21	25
2	1	0	24	25
3	0	0	25	25
4	1	1	23	25
5	0	2	23	25
6	0	0	25	25
7	0	0	25	25
8	0	0	25	25
9	0	1	24	25
10	1	1	23	25

Sources: Annex – 4

Figure 4.1

Series Having Significance and Insignificance values of first to Tenth order serial Correlation Coefficient



The result based on table 4.1 and annex 4, however, present clear picture of the Nepalese stock market, 21 out of 25 coefficients are statistically insignificant, thus indicating that the week to week fluctuation are serially independent. For, these series the mean absolute serial coefficient for lag 1 is –0.0387. In this period, the largest of this serial correlation coefficient is –0.3806 for National Life and General Insurance Company Ltd. The smallest being -0.0055 for Sagarmatha Insurance Company Ltd. Out of the twenty-five serial coefficient for first order, four (Standard Chartered Bank Ltd., Nepal Industrial and Commercial Bank Ltd., Citizen Investment Trust, Siddhartha Finance Ltd) are greater than two times of their computed standard error in absolute terms. It should be noted that the second order coefficients are statistically insignificant for twenty four samples and the third, sixth, seventh and eight-order coefficient are statically insignificant for all samples. However, for longer lags coefficient is relatively small and statistically insignificant thereby implying some little linear dependence in share prices among the weekly changes.

To sum up, the evidence produced by serial correlation model seems to indicate that dependence in successive price change in either extremely slight or completely non-existent. This conclusion should be regarded as tentative, however until further results to be provided by the runs tests of the next section, are examined.

4.2 The Runs Test Analysis

There may be other patterns of price dependence that could not be detected by parametric tests, for example, ‘ too many’ price changes of the same sign might group together. Hence, the simple type of non-parametric test, i.e. the run test can be used to this analysis. A run is defined as sequence of price change of the same sign. Runs analysis has been performed in the same data used to derive correlation coefficient to test the independence hypothesis of the successive price change. To test the hypothesis, the deviation between the total actual and expected numbers of runs for each stock is analyzed. For share prices, there are three different possible types of price changes and three types of runs.

The run test is performed by comparing the actual number of runs with the expected number of runs on the assumption that price changes are independent.

Empirical Results

If it is assumed that the sample properties of positive, negative and zero price changes are good estimate of the population proportions, then the hypothesis of randomness can be tested by using the equations (3.4), (3.5) (3.6) of Research Methodology chapter. The total number of actual and expected runs of 25 equity shares along with standard errors of expected runs and values of standard normal variety z and k are shown in annex 5. The results of runs tests are also given in the same annex.

Table 4.2

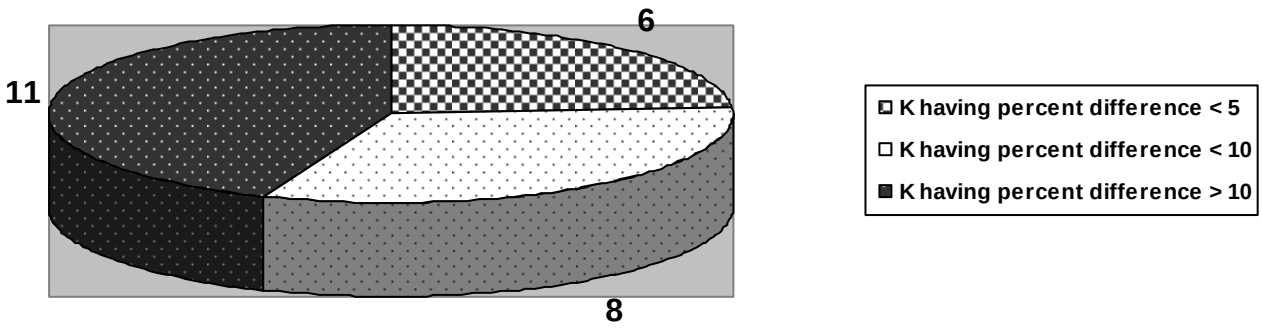
Name of Companies Having Insignificant Values of Standard Normal Variate Z

S.No.	Name of the Company	At 5%	At 1%
1	Nabil Bank Ltd	NA	NA
2	Nepal Investment bank Ltd	NA	NA
3	Himalayan Bank Ltd	NA	NA
4	Nepal SBI Bank Ltd	NR	NA
5	Everest Bank Ltd	NA	NA
6	Bank of Kathmandu Ltd	NA	NA
7	Nepal Bangladesh Bank Ltd	NA	NA
8	NIDC Capital Market Ltd	NA	NA
9	Citizen Investment Trust	NA	NA
10	Nepal Abas Bikash Bitta Co. Ltd	NA	NA
11	Narayani Finance Ltd	NA	NA
12	National Life and General Insurance Co. Ltd	NA	NA
13	Everest Insurance Co. Ltd	NA	NA
14	Sagarmatha Insurance Co. Ltd	NR	NA
15	Soaltee Hotel Ltd Taragaon Regency Hotel	NA	NA
16	Taragaon Regency Hotel Ltd	NR	NA
17	Bishal Bazar Co. Ltd	NA	NA
18	Nepal Lever Ltd	NA	NA
19	Necon Air Ltd	NA	NA
20	Nepal Film Development Co. Ltd	NA	NA

NA = Indicates that the null hypothesis randomness is accepted.
NR = indicates that the null hypothesis of randomness is rejected.

Figure 4.2

Results of percentage difference between actual and expected numbers of runs as proportions of expected numbers of runs



Inspecting table 4.2, which gives information regarding the composition of standardized variable it can be seen that the standard normal variable is insignificant (at 5%) in respect of seventeen companies. such companies are Nabil bank, Nepal investment Bank, Himalayan Bank, Everest Bank Ltd, Bank of Kathmandu, Nepal Bangladesh Bank, NIDC Capital Market, Citizen Investment Trust, Nepal Awas Bikas Bitta, Sidhartha Finance, National life and General Insurance Co., Everest Insurance Co., Soltee Hotel, Bisal Bazzar, Nepal Lever, Necon Air, Nepal Film Development Co. Ltd., while Nepal SBI Bank, Siddhartha Insurance Company and Taragaon Regency hotel are significant at 5% level. While all the z value for all twenty companies are insignificant at 1% Level. Note that this would imply serial independence among the price changes. The serial correlation analysis carried out earlier section has, however, revealed serial independence in first order correlation coefficient for most of the company except for companies: Nepal SBI Bank Ltd., Sagarmatha Insurance Companies Ltd. And Taragaon Regency Hotel.

The mean absolute value of |z| is 1.4108. However, fama 1965 has pointed out that the values of z (as defined in equation 3.6) can be slightly misleading and that the second method of comparison, i.e. by using k=(R-M) /M, may be supervisor. In comparisons the difference between the actual and expected number of runs, for most of companies are less than 10% while only 11 companies' values of K is greater than 10% out of twenty five share price series (Annex 5).

The table 4.3 presents the compares of the difference between actual and excepted numbers of runs as proportions of excepted numbers of runs (K).

Table 4.3

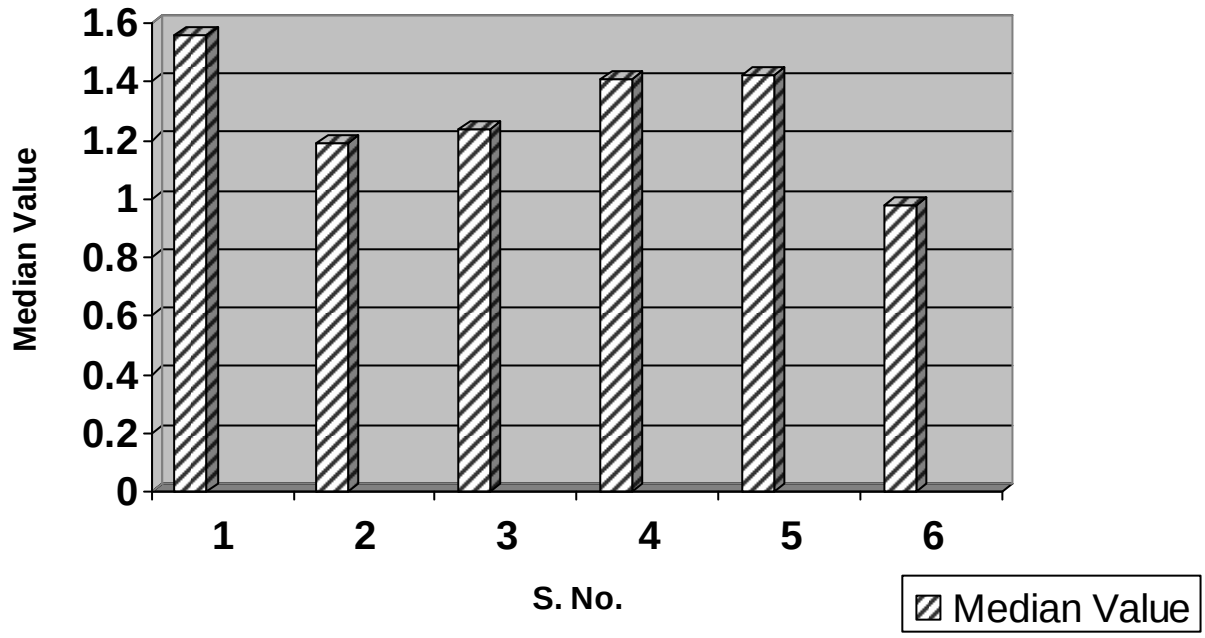
Results of percentage difference between actual and expected numbers of runs as proportions of expected numbers of runs

Percentage of inequalities of K	Number of K
K having percent difference < 5	6
K having percent difference < 10	8
K having percent difference > 10	11
Total	25

Sources: Annex 5

Figure 4.3

Median Value of the Statement as viewed by all Respondents



A perusal of this table would indicate that the percentage difference between actual and expected quite small. Out of twenty-five equity shares, nineteen are greater than five percent. However, the percentage difference for more than half of equity shares are less than 10%. Indeed is general, there is no significant difference between the actual and expected

number of runs in the series of price change (annex 5). Thus the available evidence suggested that the random walk hypothesis seems to fit in the weekly equity share of Nepalese stock market.

The overall result suggests that the hypothesis of randomness of share price is upheld for the series of weekly change. The finding that these companies follow the random walk model also support the results based on serial correlation analysis.

The serial correlation and run test have been applied to weekly share price date to test whether future share price movement is independent of trends in past price movement or not. It may be concluded that both tests, either from serial correlation or from runs test support the independence assumption of random walk model. One important implication of the random behaviour of share price is that the Nepalese stock market is termed as ‘weekly efficient’ in pricing shares. This means past prices provide no information about future prices that would allow a short-term trader to earn a return above what could be attained with a naive-buy and hold Strategy. This does not mean that short-term trader and speculators will not earn a positive rate of return. It means that, on average they will not beat naïve buy and hold strategy with information obtained from historical data.

CHAPTER – FIVE

PRESENTATION & ANALYSIS OF PRIMARY DATA

This chapter attempts to serve the purpose by analyzing primary data collected through questionnaires. This investigation deals with study of the opinions of respondents with respect to the major aspects of efficient stock market hypothesis and the stock price movement in Nepal. The study is based on questionnaire survey of the opinions of 109 respondents. Out of them, 48 respondents belong to securities businesspersons, which includes broker, issue manager and securities dealer and 61 respondents belongs to non-securities businesspersons, which includes investor academicians and chartered accounts. The classification of the respondents into securities businesspersons have been made for analyzing the different in their opinions with respect to major aspects that includes usefulness of current market price, factors playing major role in pricing of share, views on technical and fundamental analysis, reason of non-random market, policies to be adopted to improved stock market, phenomenon of right offering and their consequence involved there in, and other related information to efficient market hypothesis. The pro-forma of structural questionnaire and the details of response are presented in annex 7,9,10 and 11 respectively. Similarly, the list of responding organization belongs to securities businesspersons are given in Annex 8.

However, due to individual respondents belong to non-securities businesspersons, the name of each respondent are not given. Moreover, there is no identification in majority of the responses become name is not made mandatory for them.

The responses of each choice in the question, where the choices are to be ranked are weighted by the value of the rank assigned by the respondents, and the weighted arithmetic means were calculated to find out the over all rank for each choice for the securities business person, non-securities business person and all respondents. In order to find out the degree of relationship between the responses expressed by each responding group, the spearman's rank correlation coefficients were calculated and tested for their significance. The chi-square values were also calculated and rested in order to find out whether the difference in opinions expressed by responding groups is significant. The median value was calculated to find out the level of agreement of respondents with respect to stock market efficiency in terms of information and the behaviour of share prices.

5.1 Sensitiveness of Price in NEPSE to New Information

With respect to the sensitiveness of price in NEPSE to new information, majority (82%) of respondents stated that price of stock is sensitive to new information. Only 11% of them opined that price in NEPSE is not very sensitive and around 7% respondents, they have no idea about it. When group wise respondents were compared, it was found that the majority of respondents of the both groups stated that the movement in share price in NEPSE is sensitive to new information (appendix 9) .

The simple observation of response indicated that majority of respondents agreed to the view that market price in NEPSE is sensitive to new information. To test for the significance in their opinion, Chi-square test is used. The chi-square test is employed in order to examine whether it significance between the opinions expressed by two responding groups. The computed value (5.725) of chi-square is less than the tabulated value (5.991) at five percent level of significance (annex 12). It revealed that there is not significant difference in the opinions of two responding groups.

5.2 Role of Pertinent Information; Rumor and Whim in Pricing Share

With respect to whether rumor and whim play significant role in pricing share in absence of pertinent information, sixty seven of the respondents felt that rumor and whim do not play a significant role in pricing share in absence of pertinent information. Only twenty four percent of respondents opined that rumor and whim play significant role. When the group wise responses were compared, it was found that sixty-four and sixty-three percentage of the respondents from securities businessperson and non-securities businessperson respectively (i.e. majority of respondents) stated that rumor and whim do not play significant role in pricing shares although a lack of pertinent information (annex 9). To test whether there is a significant difference between the opinions expressed by two responding groups, the chi-square test is used. The computed value (1.3416) of chi-square is less than the tabulated value (5.991) at five percent level of significant (annex 12) it revealed that there is not significant difference in the opinions of two responding groups.

5.3 Factor Affecting the Nepalese Share Price

In their overall ranks for the factors affecting the share price in Nepal, The respondents assigned first rank to the statement ‘company earning.’ The second rank was assigned to the statement ‘Issue of bonus share and right share.’ The third was assigned to ‘announcement of dividend.’ Forth and fifth rank were assigned to ‘political instability’ and ‘information regarding changes in management’. When the rank given by each group was analyzed, the statement “Issue of bonus share and right share’ got first rank from securities businesspersons but got second rank from non securities businessperson. From the viewpoint of non-securities

businessperson, the statement ‘company earning’ is the first rank where as securities businessperson gave it second rank. The statements ‘announcement of dividend’, ‘political instability’ and ‘information regarding changes in management’ got third, fourth and fifth rank in overall as well as from both respondents individually (annex 10).

To test whether the different in opinions of the two groups is significant, the chi-square test is employed. The computed chi-square (3.1803) is less than the tabulated value (9.488) at 5% level of significant (annex 12). It reveals that there is not significant difference in viewers of both responding groups. Also, there are high positive relationships measured by rank correlation method between two responding groups.

5.4 Usefulness of Current Market Price

In their overall ranks for the usefulness of current market price of share, the respondents assigned first ranks 'to make buy and sell decision.’ The second rank was assigned to the statement ‘to predict future average return.’ The third, fourth and fifth rank was assigned respectively to ‘to differentiate good and bad share’, ‘to predict future price’, and ‘other’ like ‘to know the stock market situation.’ When the ranks given by each group were analyzed, the statement “ to predict future average return’ got first rank from securities businesspersons where as statement ‘ to make buy and sell decision’ got first rank from non securities businessperson (annex 10). The chi-square test is employed to test the difference in opinion expressed by two responding groups. The computed value (21.7992) is greater than tabulated value (9.49) at 5% level of significant, which indicates that there is significance different in viewers of both responding groups. The computed value (0.10) of rank correlation indicated that the weak relationship between the ranks assigned by two groups.

5.5 Awareness Regarding Security Analysis Technique

Performance of investors in the market is also influenced by their knowledge of securities analysis techniques. Since there is substantial evidences of market in efficiencies in an NEPSE, it is implicit that trade based on such analysis can lead to improve return in the market. The respondents were asked about their familiarity with the fundamental and technical analysis. Around seventy-six percent of securities businessperson and fifty four percent of non-securities businessperson commented that they are familiar with such techniques. Rest twenty four percent from securities businessperson and forty-six percent from non-securities businessperson responded that they are unaware of such technique (annex 9). To test whether the difference in the opinions of two groups is significant or not, the chi-square test is used. The computed chi-Square value is 4.6221, which is more than its tabulated value i.e. 3.841 at 5 percent level of significant for 1 degree of freedom. Thus null hypothesis is rejected which indicates that there is significant difference between in the opinion of two responding groups.

When inquired about use of such technique for investment in share, forty five percent of securities businesspersons answered that they use fundamental analysis and rest fifty-five percent use both technical and fundamental analysis. Around twenty-six percent from non-securities businessperson replied that they use fundamental analysis; ten percent chose technical analysis and rest sixty four percent stated that they use both technical and fundamental analysis. The response indicates that majority of securities businessperson are aware of security analysis technique and use both of them while investing in shares and this could

be one of the reason for better performance of securities businessperson in comparison to non-securities business person.

5.6 Usefulness of Technical Analysis

Some investors who analyze past pattern in the movement of share prices, are not able to 'beat the market' without using financial information. Sixty-five percent of the respondents felt that they are not able to 'beat the market' without using financial information. Twenty percent stated that the investor are able to "beat the market" by analyzing past pattern in the movement of share price without using financial information. The other 14 percent of the respondents stated that they have no idea about it. In this aspect, when the responses of securities businessperson are compared to the responses of non-securities businessperson respondents, sixty six percent of the respondents in the securities businesspersons sector stated that the investor are not able to 'beat the market' without using financial information. Similarly, sixty seven percent of the respondents in non-securities businessperson sector also gave the same opinion (Annex 9). To test whether the difference in the opinions of securities and non-securities businesspersons' respondents is significant, the chi-square test is employed. The computed chi-square value is 1.2045 and the tabular value is 5.991 at 5 percent level of significant (Annex 12). It can therefore, be stated that the difference in the opinions of the two responding group is not significant.

5.7 Disclose price sensitive Information on time by Nepalese Listed Companies

During survey, informal discussion with respondent revealed that except some commercial banks and finance companies, other listed companies are not providing timely and adequate information. Moreover investors

are losing faith on such companies and this is probably the main reason for low trading volume of such companies. When asked about the remedial action for non-compliance of disclosure norms, majority of respondents suggested that 'fine and penalty' or 'suspend trading for certain time period' is better option. Around twelve percent respondents suggested such companies should be de-listed (Annex 9). To determine whether the responses of securities businessperson and non-securities businessperson are significant, the chi-square test is employed. The computed value (0.1556) of chi-square is less than tabulated value (5.991) of chi-square at 5% level of significance (annex 12). It can therefore, be stated that there is no significant difference in opinions of the two responding groups regarding not providing price sensitive information behavior of listed companies.

5.8 Suggestion for Revival of Securities Market

The declining trend in the NEPSE index and unfavorable incidence of stock price downturn is indicating that evidence of the recession in the Nepalese stock market. In questionnaire survey respondents are asked to rank the five suggestions for revival from current recession in order of their impotence. In this regard both respondents group ranked the 'fair information dissemination from listed companies' as most important and 'established another stock exchange center outside of Katmandu' as second. Similarly third and fourth ranks were respectively assigned for Initiating Computer Assigned Trading System' and rational decision of investor. For fifth rank, no body had been specified of their opinions (Annex10).

To test whether the difference in the opinions of the responding groups is significance, the chi-square test is employed. The computed value

(11.3641) of chi-square is more than the tabulated value (9.488) at five percent of significance (Annex 12). It indicated that there is significant difference in the views of both responding groups. The value of spearman's rank correlation coefficient indicated (Annex 13) the highly positive relationship between the ranks assigned by two groups.

5.9 Investors' Awareness towards the Researches of Stock Price

With respect to awareness of the research of stock market prices, the majority (69 %) of the respondents stated that the Nepalese investors are not aware of the research of stock market prices. In this connection, only seven percent of the respondents opinioned that the investor are aware about it. Where as twenty four percent of the respondents stated that they have no idea about it. In this aspect, when the group wise responses were compare, it was found that the majority of the respondents of both groups supported that Nepalese investor are not aware of the research of stock market price (Annex 9). The computed value of chi-square is 2.3591 i.e. lower than tabulated value (5.991) at 5%level of significant (Annex12). From this it is concluded that the opinions expressed by two responding groups are similar and there is no significant difference in their opinions.

5.10 Reasons on Non-random Price Changes Phenomenon

In their overall ranks for the reasons of non-random phenomenon of share price changes the respondent's assigned first rank to the statement 'stock market is an early stage of development'. The second rank was assigned to 'excessive speculative behaviour of investors'. The third, fourth and fifth ranks were assigned respectively to 'lack of professionalism', 'poor performance of market intermediaries' and 'hidden information'. When the rank given by each group was analyzed, the securities the

businessperson gave first priority to 'stock market is in early state of development' where as non-securities businesspersons gave this statement as second rank. Similarly non-securities businesspersons gave first priority to 'excessive speculative behavior of the investor' but it got third rank from securities businessperson. Securities businessperson had given second rank to 'lack of professionalism where as this statement got third rank, from non-securities businesspersons. The statement 'poor performance of market intermediaries' and 'hidden information' got four and fifth rank from both responding group (Annex10).

To test whether the difference in the opinions of the two groups is significance, the chi-square test is employed. The computed chi-square is 5.7859, which is less than tabulated value of chi-square 9.488 at 5% level of significance (Annex 12). It can, therefore, be stated that the opinions of both responding groups are similar and there is no significance difference with respect to reasons for non-random phenomenon of share price changes in Nepal. The low value of rank or correlation coefficient (Annex 13) indicated the weak relation between the ranks assigned by two responding groups.

5.11 Other Issues on Nepalese Securities Market Regarding EMH and Stock Price Movement

All together lists of six statements dealing with various issues were provided to respondents to observe their opinions. Five point scale: strongly agree, agree, neutral, disagree and strongly disagree is assigned to each of the statement. Respondents were asked to specify their level of agreement for the statement. The details of respondents are presented in Annex 11. The lower value of median indicate that the statement is highly significant to majority of respondent, while higher value indicate

less significance the calculated median for statement are presented below (in table 5.1)

Table 5.1
Median Value of the Statement as viewed by all Respondents

S.No.	Statement	Median Value
1.	In Nepal majority of investors do not care whether company disclose information.	1.56
2.	Information on favorable future prospect would increase market price if share.	1.19
3.	Access to inside information can lead to greater returns	1.24
4.	Stock market is adversely affected by the present political instability and other unfavorable events existing in Nepal.	1.41
5.	Dividend has strong effect in market share price than retained earning.	1.42
6.	To develop efficient security market concerned authorities should control price manipulation and encourage the listed companies to disclose adequate information to investors.	.98

Sources: Annex 11

The median value for statement regarded from 0.98 to 1.56, indicating that majority of the respondent regarded the statement 'concerned authorities to develop efficient market' as significant and the statement that 'investor don't care of disclose or does not disclose information of company' as least significant. Further simple percentage analysis indicates that majority of respondents agreed to statement that 'Nepalese investor don't care about information disclose by company or not'. Similarly, majority of investor agreed for second, third, fourth and fifth but statement 'role of concerned authorities to develop efficient mask' has strongly agreed by the respondents.

The above analysis of level agreement in respect to different statements indicates the over all view of all respondents. It is also felt appropriate at

this point to assess the deference in opinions of securities businesspersons and non-securities businesspersons on the issue. For this the median value of both groups are presented in table 5.2

Table 5.2

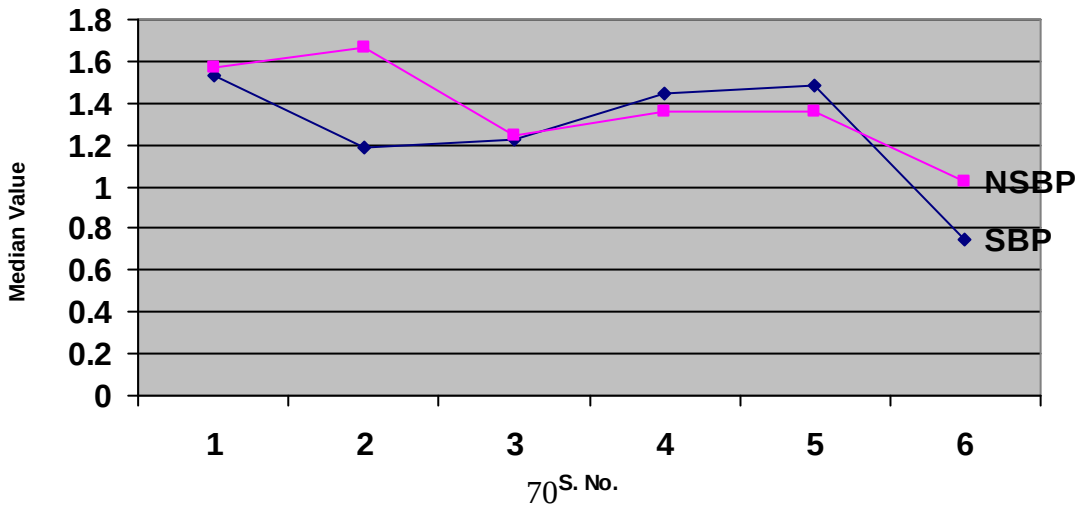
Median Value of the Statement as viewed by securities and non-securities businesspersons

S.No.	Statement	Median Value	
		SBP	NSBP
1.	In Nepal majority of investors do not care whether company disclose information.	1.53	1.57
2.	Information on favorable future prospect would increase market price if share.	1.19	1.67
3.	Access to inside information can lead to greater returns	1.23	1.24
4.	Stock market is adversely affected by the present political instability and other unfavorable events existing in Nepal.	1.45	1.36
5.	Dividend has strong effect in market share price than retained earning.	1.48	1.36
6.	To develop efficient security market concerned authorities should control price manipulation and encourage the listed companies to disclose adequate information to investors.	0.75	1.02

Sources : Annex9

Figure 5.1

Median Value of the Statement as viewed by securities and non-securities businesspersons



The median value of opinion expressed by the respondents from the securities businessperson varied from 0.75 to 1.53 while the median value ranged from 1.02 to 1.67 for the opinion of non-securities businessperson. Both of respondent groups regarded the ‘role of concern authorities’ as most significant statement. But from securities business person’ view point’, ‘investor does not care disclose the information by company or not’ statement had been list significant where as statement ‘information on favorable future prospect would increase market price of share’ as least significant for non-securities business person. From both groups agreed to statement that ‘access to inside information lead to greater return’ as shown by median on above table. For remaining of statements also degree of agreement is founds to be similar for both respondent groups

Both group of respondent have agree to the statement that “stock market affected by political instability and unfavorable events’ and dividend has strongly affected in MPS than retained earning. In overall, above analysis of the response of the two responding groups indicates that their views are almost similar.

To sum up, the survey attempted to analyze the various aspects of efficient stock market hypothesis and stock price movement in Nepal. The majority of respondents stated that the movement in share price in NEPSE is sensitive to new information. The respondents also view that rumor and whim does not play significance role in pricing share. Another view got from respondents is that the factors playing major role in pricing

of share as perceived by the respondents are ‘company earning’ and ‘issue of bonus share and right share’. The current market price of share is useful to make buy or sell decision, to predict future average return. About awareness the technique use to make the investment in share, majority respondents use such technique and among these techniques most of investor use fundamental analysis technique to make investment decision. Some investor who analyze past pattern in the movement of share price are not able to ‘beat the market’ without using any financial information. In Nepalese context most of the company do not disclosure price sensitive information on time regarding this statement most of respondents’ opinion was they should be punished either fine or penalty or suspend trading for certain time period. To improve or save security market from current recession listed companies should conduct timely AGM and provide fair financial report and establish another stock exchange center outside of Kathmandu. Also, it is found those Nepalese investors are not aware of the research of stock market prices. They also highlight that Nepalese stock exchange is in early stage of development, because of this the share price is not random phenomenon. Last but not the least both respondents group unanimously agreed to the statement that concerned authorities must play active role to control practices manipulation and on unfair practices of listed. However opinions of both respondent groups slightly differ for other statements.

5.12 Major Finding

The major findings of the study are discussed separately for secondary data analysis and primary data analysis.

Finding of Secondary Data Analysis

It is considered that equity share is random when any of the following criteria is met: (a) First order serial correlation coefficient is less than twice of its computed standard error; (b) first order serial correlation coefficient is less than three times of its computed standard error; (c) when actual and expected numbers of runs are not significantly difference at 5% and 1% level of significance (d) percentage differences between the actual and expected number of runs as proportion of expected number is less than 10% (see annex 5). Beside on above criteria, the major findings of secondary data analysis are stated as under:

- The first order serial correlation coefficients for most of the equality shares are statistically insignificant. Similarly, the second order coefficients are also insignificant for most of the equity shares, (except national life and general insurance co. Ltd). The empirical evidence pertaining to majority of equity shares indicates serial independence. Thus the available evidence suggests that the random walk hypothesis seem to fit the equity share of Nepalese stock market.
- The mean absolute value of the serial correlation coefficients is lower when the lags are increased. So, the information of past price change have low power to predict the future price changes.
- The total number of actual and expected number runs are statically insignificant for equity shares, which implies that their price change are substantially random.
- More than half of the equity shares have less than 10% difference between actual and expected number of runs as proportion of excepted number of runs. Thus, it indicates that there is no

significant difference between the actual and expected number of runs.

- The run test also verifies the fact that the price changes are random or the price changes in the future will be independent from the price changes of past.

In general, empirical results of both series correlation and runs test analysis suggest that the random walk model is justifiable to be used to describe equity share price behaviour in Nepal.

One important implication of the evidence reported here is that the Nepalese stock market is termed as 'weekly' efficient in pricing shares. This means average return cannot be earned simply from knowledge of past price or fundamental analysis does not become useful to earn average return.

Finding of Primary Data Analysis

Primary data is used to test hypothesis II and also to examine the various qualitative factors concerning the market behaviour of Nepalese securities market. The primary data were collected through questionnaire and unstructured interviews to examine the various aspect of efficient market hypothesis and share price movement in Nepal. The major results of the primary data analysis are:

- Majority (82%) of respondents agreed to the views that market price in NEPSE is sensitive to new information. The test statistics also indicated that views of both responding groups are not significantly different regarding the sensitiveness of price to new information.

- With respect to whether rumor and whim play a significant role in pricing shares in absence of pertinent information, the majority of

the respondents stated that rumor and whim does not play a significant role in pricing shares. The opinions expressed by the two responding groups are similar in this matter.

- In response to factor affecting share price in NEPSE, the majority of respondent assign first rank to 'company earning' second priority to 'issue bonus share and right share'; third to 'Announcement of Dividend'; fourth to 'political instability' and fifth to 'information regarding change in management'. The statistical test indicated that there is no significant difference in degree of agreement in ranking the factors between two groups.

- With respect to usefulness of current market price of share, the responding groups gave first priority to 'to make buy and sell decision'; the second priority to 'to predict future average return'; third to ' to differentiate good and bad shares' fourth to ' to predict future price' and fifth priority to ' to construct trend and pattern.' The opinions expressed by the two responding groups are not similar in this matter.
- Majority (76%) of securities businesspersons are aware of security analysis techniques and use such technique while investing in shares. While only fifty four percent of respondent from non-securities businessperson are aware of such information. Chi-square test results indicate that there is significance difference in view of both the responding groups. However Among the securities businesspersons as well as non-securities businessperson, who use the technique of determination of share price, majority of them, used fundamental analysis technique. In this aspect there is not significant difference between securities businessperson and non-securities businessperson in their opinion.

- With respect to usefulness of technical analysis the majority of the respondents states that the investor who analyze past pattern in the movement of share price are not able to 'beat the market' without using any financial information. In this view the responding groups have not different opinion means they have similar opinion about it.

- Regarding price sensitive information of listed companies, most of the companies' do not disclose that types of information on time. So, the majorities of respondents' view were that these companies should be punished through both fine and penalty or suspend trading for certain time period.

- With respect to the suggestion for revival of securities market, the respondents ranked the statement 'conduct timely AGM and provide fair financial reports' as first rank; second is establish another stock exchange center outside of Katmandu third priority to initiating computer assisted trading system fourth is rationality of investor'. But group wise rank was different. However test statistic result indicated that there is significant difference in rank assigned by both group.
- As regard the awareness of research of stock market price, the majority of the respondents felt that the Nepalese investor is not aware of research of the stock market prices. In this aspect there is not significant difference between opinions of both responding groups
- Regarding the non-random phenomenon majority of the respondent gave first priority to the statement 'Nepalese stock market is in early stage to development' and second priority to 'Excessive speculative behaviour of the investor. The statement 'lack of professionalism', 'poor performance of market intermediaries' and

‘hidden information’ got third fourth and fifth rank respectively. In this rank, both respondents have same view at all.

- Among the six observation statement ‘role of concerned authorities to develop efficient market’ has been regarded as most significant observation, while the statement that investors do not care whether company disclosure information or not’ as least significant one by all respondents.
- Regarding comment and suggestion for making Nepalese stock market efficient, introduction of Central Depositing System (CDS), establish another stock exchange, online trading, full information about the listed companies of their website, enhance professionalism, emphasis the research, restructure stock exchange, improve accounting practices, enhance market intermediary services are some of the highlighted points.

CHAPTER – SIX

SUMMARY, CONCLUSIONS & RECOMMENDATIONS

6.1 Summary

Efficient stock market hypothesis is an important school of thought in the development of Nepalese stock market. Efficient market helps in canalizations of saving and funds into the profitable investments for the maximum benefit to the society. It is also essential for optional allocation of scare resources in an economy. The EMH implies that all known information is immediately discounted by all the investors and reflected in the prices of share. It cannot be tested by directly. However, by postulating some security price behavior, one analyzes market efficiency. The literature on share price behavior developed during the part four decades in the developed countries such as USA, UK, Australia, etc. for testing the appropriateness for the random walk hypothesis (later known as weak form efficiently market hypothesis) can be used to describe common stock price behaviour. Studies on share price behaviour are important because information on how executives make decision would not only help development of realistic theoretical models but would also help to test empirically the difference hypothesis.

This study is mainly aimed to asses' equity share price behaviour in Nepal and tests the hypothesis that share price changes are independent. Its specific objective are: (1) to test the random walk or weak form efficient market hypothesis; (2) To examine whether successive price changes are independent to each other; (3) to conduct the opinion survey of securities businesspersons and non-securities businesspersons

regarding various aspect of share price behaviour in Nepal and (4) to provide feed back policy inputs towards institutional development of efficient market.

This study is based on secondary as well as primary data. The sample used for testing the weak form efficient market hypothesis consists total 1963 week-end closing prices of twenty-five actively traded equity shares. The period covered by the study is 2005 to2008 while survey of securities businessperson and non-securities businessperson was accomplished by using primary data from 109 respondents. Out of 109 respondents, 48 were from securities businesspersons and the rest were from non-securities businesspersons.

The statistical techniques used for testing the random walk hypothesis include both ‘parametric’ and ‘non-parametric’ tests. In the former, serial correlation (auto correlation) coefficients have been computed among the first difference of log price; the hypothesis being tested is that successive log price changes are serially independent. The random walk model is accepted for all the case.

Among non-parametric test, the well-known runs test has been used. In this case, examining the extent of divergence between the expected and actual runs has tested the hypothesis of randomness. The series is descried as random in all the cases. The random walk hypothesis is regarded as a valid description of share price behaviour in Nepal.

In order to study the opinion of securities businesspersons and non-securities businessperson on share price movement, questionnaire survey of 109 respondents was carried out. The results were analyzed to ascertain the difference in the responses of securities businesspersons and

non-securities businesspersons. For this purpose, a variety of statistical test were employed and results were tested for significance at 5% level of significance.

6.2 Conclusions

Overall evidence from both secondary and primary data analysis lead to the conclusion that NEPSE market is 'weekly efficient' in pricing share. The random walk hypothesis or weakly efficient market hypothesis of share price behaviour has been tested to determine whether stock market of Nepal is efficient in pricing share or not. To analyze the secondary data, serial correlation analysis and run test have been examined to test the random walk hypothesis. The result of both serial correlation and run test accept the null hypothesis of randomness means independent is accepted. Independent means market is efficient or not dependent upon past price of share to predict future price. For analysis of primary data, various statistical tools are used. Conclusion drawn from the views of securities business person and non-securities businessperson is that the share price movements are caused by flow of several kinds of information in the market; some affecting prices of a large number of stocks while the other only equities of some specific industry or a particular company. In general, securities businesspersons accept existence of weak form of efficient market hypothesis. Lastly, Nepalese stock market is termed as 'weekly efficient' in pricing shares.

6.3 Recommendations

Since the random share price changes are observed (secondary data), it is recommended that the investor should be aware of the fact that above average return is possible to some extent from the past 'term' and 'pattern'.

It is recommended that speculation on the basis of rumors regarding the current functioning of the companies should be avoided and the listed companies must, at least, publish their working results on time.

It is recommended that any price sensitive information should always be included in the agenda of the board meeting of the companies required to be circulated to the SEBO/N and NEPSE well in advance.

It is recommended that investor should be educated on the benefits of investment in corporate securities. Beside, adequate knowledge on investment analysis should be developed among investor to make competitive stock market.

It is recommended that the concerned regulator body should encourage entering the mutual fund business in the market. That is one of the reason why, large investor such as mutual funds perform better in the market than the small investors do because they have access to better information.

It is recommended that stockbrokers and other connected with other securities business should develop necessary expertise. Beside, market intermediaries (secondary) should have adequate infrastructure facilities to offer appropriate services to investor.

Also it is recommended that for stock researcher should be provided adequate information from NEPSE. For that management of NEPSE should manage their employee and information about stock market. This also needs to say that security market is dominated by risky investment, i.e. equity share that may not be attractive to risk averter investors. So there must be initiation towards investment instruments diversification.

The confidence of investors in securities market is low. It must be restored through strengthening of investor protection and improvement in transparency, corporate governance and effective monitoring mechanism.
To competitive trading of share price, another stock exchange center should be lunched
It is also recommended that further incentives research and in depth study should be undertaken in regard of stock market efficiency by the concerned regulatory body.

Avenues for further research

It is likely that the notion of Nepalese security market may continue to be of great interest for academic researchers. In this perspective there are several avenues for future studies in this area. Using sophisticated tools to test for independence like variance ratio and other test that are robust to return distribution can be one possible avenue for study. Second it may be worthwhile to examine whether mechanical trading rule e.g. Alexander's filter techniques and relative strength, etc lead to superior profits in comparison to a simple buy-and-hold policy after taking into account transaction and other cost. It should be noted that the sample shares included in this study are "actively traded" shares of current market. So, in order to provide a complete picture of share price movement in Nepal, it may be imperative to conduct a study on "infrequently traded" shares. In this study random behaviour of equity shares are highlighted. It is doubtful whether these independence relationships are constant over time. Therefore, the same study could be investigated several times with larger sample at different time interval that will be useful in verifying the result of present study and this will help to comment on the improvements and changes taking place in Nepalese security market.

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ANNEX - 1

Number of Observation of Sample Companies
(Period covered from April 2002 to March 2005)

S.No.	Name of the Companies	Number of observation (Week-end Closing Price)
1	Nabil Bank Ltd (NABIL)	140
2	Nepal Investment bank Ltd (NIBL)	120
3	Standard Chartered Bank Ltd (SCBL)	138
4	Himalayan Bank Ltd (HBL)	132
5	Nepal SBI Bank Ltd (NSBIBL)	133
6	Everest Bank Ltd (EBL)	143
7	Bank of Kathmandu Ltd (BOK)	146
8	Nepal Industrial and Commercial Bank Ltd (NICBL)	140
9	Nepal Bangladesh Bank Ltd (NBL)	145
10	NIDC Capital Market Ltd (NIDC)	61
11	Kathmandu Finance Ltd (KFL)	40
12	Citizen Investment Trust (CIT)	39
13	Nepal Abas Bikash Bitta Co. Ltd (NABBCL)	65
14	Narayani Finance Ltd (NFL)	31
15	Ace Finance Co. Ltd (AFCL)	63
16	Siddhartha Finance Ltd (SFL)	84
17	National Life and General Insurance Co. Ltd (NLGICL)	22
18	Everest Insurance Co. Ltd (EICL)	50
19	Sagarmatha Insurance Co. Ltd (SICL)	85
20	Soaltee Hotel Ltd (SHL)	25
21	Taragaon Regency Hotel Ltd (TRHL)	67
22	Bishal Bazar Co. Ltd (BBCL)	28
23	Nepal Lever Ltd (NLL)	22
24	Necon Air Ltd (NAL)	53
25	Nepal Film Development Co. Ltd (NFDCL)	18
Total		1963

ANNEX - 2

Standard error of the sample listed Companies in NEPSE

S.No.	Name of the Companies	Lags									
		1	2	3	4	5	6	7	8	9	10
1	NBIL	0.0848	0.0851	0.0854	0.0857	0.0861	0.0864	0.867	0.0871	0.0874	0.0877
2	NIBL	0.0917	0.0921	0.0925	0.0928	0.0933	0.0937	0.0941	0.0945	0.0949	0.0953
3	SCBL	0.0854	0.0857	0.0861	0.0864	0.0867	0.0870	0.0874	0.0877	0.0881	0.0884
4	HBL	0.0874	0.0878	0.0880	0.0884	0.0887	0.0891	0.0894	0.0898	0.0902	0.0905
5	NSBIBL	0.0871	0.0874	0.0877	0.0881	0.0884	0.0887	0.0891	0.0894	0.0898	0.0901
6	EBL	0.0839	0.0842	0.0845	0.0848	0.0851	0.0854	0.0858	0.0861	0.0864	0.0867
7	BOK	0.0831	0.0833	0.0837	0.0839	0.0842	0.0845	0.0848	0.0851	0.0855	0.0857
8	NICBL	0.0848	0.0851	0.0854	0.0857	0.0861	0.0864	0.0867	0.0871	0.0874	0.0877
9	NBL	0.0833	0.0836	0.0839	0.0842	0.0845	0.0848	0.0851	0.0854	0.0857	0.0861
10	NIDC	0.1291	0.1302	0.1313	0.1325	0.1337	0.1348	0.1361	0.1374	0.1387	0.1401
11	KFL	0.1601	0.1622	0.1644	0.1667	0.1691	0.1715	0.1741	0.1768	0.1796	0.1825
12	CIT	0.1622	0.1644	0.1667	0.1691	0.1715	0.1741	0.1768	0.1796	0.1825	0.1857
13	NABBCL	0.125	0.1260	0.127	0.128	0.1291	0.1302	0.1313	0.1325	0.1337	0.1348
14	NFL	0.1825	0.1857	0.189	0.1925	0.1961	0.2000	0.2041	0.2085	0.2132	0.2182
15	AFCL	0.1691	0.1715	0.1741	0.1768	0.1796	0.1825	0.1857	0.189	0.1925	0.1961
16	SFL	0.1098	0.1104	0.1111	0.1118	0.1125	0.1132	0.1140	0.1147	0.1155	0.1162
17	NLGICL	0.2182	0.2236	0.2294	0.2357	0.2425	0.2500	0.2582	0.2673	0.2774	0.2887
18	EICL	0.1429	0.1443	0.1459	0.1474	0.1407	0.1508	0.1525	0.1543	0.1562	0.1581
19	SICL	0.1091	0.1098	0.1104	0.1111	0.1118	0.1125	0.1132	0.1140	0.1147	0.1155
20	SHL	0.2041	0.2085	0.2132	0.2182	0.2236	0.2294	0.2357	0.2725	0.2500	0.2582
21	TRHL	0.1231	0.1241	0.125	0.126	0.127	0.128	0.1291	0.1302	0.1313	0.1325
22	BBCL	0.1925	0.1961	0.2000	0.2041	0.2085	0.2132	0.2182	0.2236	0.2294	0.2357
23	NLL	0.2182	0.2236	0.2294	0.2357	0.2425	0.2500	0.2582	0.2673	0.2774	0.2887
24	NAL	0.1386	0.1400	0.1414	0.1429	0.1443	0.1459	0.1474	0.1407	0.1508	0.1525
25	NFDCL	0.2425	0.25	0.2582	0.2673	0.2774	0.2887	0.3015	0.3162	0.3333	0.3536

Note: ***To Know the Full Name of the companies, see annex-1***

ANNEX -3

Weekly Autocorrelation (Serial correlation) coefficient for lag K=1,2,3…10.

S.No.	Name of the Companies	Lags									
		1	2	3	4	5	6	7	8	9	10
1	NBIL	-0.1512	0.0238	-0.0778	-0.0155	0.1380	-0.0298	-0.1399	-0.0223	-0.0228	0.0438
2	NIBL	-0.0876	-0.0433	-0.0919	0.0609	-0.0616	-0.0108	-0.0266	-0.0828	0.0489	0.0119
3	SCBL	-0.2249*	0.0007	-0.0544	-0.0281	0.0298	-0.0306	-0.1302	-0.0613	0.038	0.2196*
4	HBL	-0.0885	0.0701	-0.0262	0.1792*	-0.0103	-0.0149	-0.0496	0.0519	-0.0189	-0.0299
5	NSBIBL	0.0648	0.1628	-0.0657	-0.325**	-0.1111	-0.1118	0.0186	0.0115	0.0643	0.0214
6	EBL	-0.1235	0.1038	-0.0708	-0.1332	-0.0289	-0.1344	-0.0319	-0.1083	-0.0076	0.08197
7	BOK	0.0414	0.0276	0.0595	-0.0719	-0.1611	-0.1201	-0.0566	-0.1379	-0.0237	0.0595
8	NICBL	-0.2453*	0.1262	0.0341	-0.0611	0.0507	-0.0759	-0.1576	-0.0112	-0.0152	0.0297
9	NBL	-0.0892	0.0544	-0.0630	-0.1089	0.0246	-0.0947	0.0491	-0.0382	-0.0306	0.0438
10	NIDC	-0.1720	-0.0026	-0.2157	0.0840	-0.0431	0.1550	-0.1407	0.0241	-0.0716	0.0926
11	KFL	0.1517	-0.1583	0.0194	0.0510	-0.1413	-0.1061	0.0640	0.0018	0.0276	0.1059
12	CIT	-0.2989*	0.0266	0.1716	-0.0235	-0.3326	-0.1758	-0.0333	-0.0541	-0.1519	0.3057
13	NABBCL	-0.0064	0.0789	-0.0175	-0.1815	-0.0718	-0.0713	0.0094	0.0063	0.0477	0.0226
14	NFL	-0.0774	-0.2051	-0.1138	0.0262	0.3134**	-0.2204	-0.0941	-0.0177	-0.1158	-0.0411
15	AFCL	-0.1367	-0.0462	-0.0809	-0.1048	-0.0523	0.0958	-0.2303	-0.1629	-0.0368	-0.1258
16	SFL	-0.2289*	-0.0523	-0.0125	-0.0425	0.0319	-0.0121	0.0274	0.0354	-0.0539	-0.0133
17	NLGICL	-0.3806	0.6639*	0.0777	0.0742	0.1749	0.06030	0.1176	0.3395	-0.0339	0.0960
18	EICL	0.0817	0.1368	0.0154	0.0360	-0.0848	-0.0288	-0.0012	0.0078	0.4642**	0.0961
19	SICL	-0.0055	0.0482	-0.0214	-0.0514	-0.416**	0.0662	0.0847	0.0628	0.051	-0.1599
20	SHL	0.2793	-0.3073	0.0367	0.0936	-0.0241	0.0502	-0.1137	-0.4735	0.1844	0.0209
21	TRHL	-0.0281	0.0322	0.0243	-0.0239	-0.0535	-0.0939	0.1217	0.0192	-0.0301	-0.0206
22	BBCL	-0.0806	0.0255	-0.2455	-0.0189	0.0071	-0.0216	-0.2614	-0.0563	0.0017	-0.0661
23	NLL	0.1516	-0.0336	-0.2256	-0.1674	-0.0701	0.1439	-0.1082	0.0949	0.0091	-0.3540
24	NAL	-0.1219	-0.1173	-0.1415	0.0359	0.0574	-0.0524	0.0885	0.1303	0.0648	-0.2593
25	NFDCL	-0.0346	0.0994	0.0339	-0.4715	-0.1599	-0.2495	-0.1188	-0.1605	0.3961	-0.709*
Total		-0.0387	0.0021	-0.0421	-0.0453	-0.0388	-0.0433	-0.0445	-0.0241	0.0134	-0.0017

* Coefficient is more than twice its computed standard error (in absolute value).

** Coefficient is more than three times its computed standard error (in absolute value).

ANNEX - 4

Total Actual & Expected Number of Runs (weekly changes)

S.No.	Name of the companies	Actual Run	Expected Runs	σ_m	Standard Z	K=(R-M)/M
1	NBIL	82	89.76	5.61	-1.2941	-0.0865
2	NIBL	77	85.39	5.42	-1.5480	-0.0982
3	SCBL	69	91.25	5.69	-3.8496	-0.244
4	HBL	82	85.30	6.01	-0.4659	-0.0387
5	NSBIBL	76	86.91	4.08	-2.551	-0.1255
6	EBL	84	87.43	6.22	-0.4711	-0.0392
7	BOK	82	90.46	5.09	-0.1662	-0.0935
8	NICBL	72	93.21	5.99	-3.4574	-0.2275
9	NBL	90	92.84	5.92	-0.3954	-0.0306
10	NIDC	51	52.43	4.02	-0.2313	-0.0373
11	KFL	22	31.22	3.07	-2.8404	-0.2953
12	CIT	26	27.05	4.2	-0.1309	-0.0388
13	NABBCL	53	58.80	4.54	-1.2775	-0.0986
14	NFL	25	35.80	3.56	-2.893	-0.3017
15	AFCL	20	33.27	3.46	-3.6908	-0.3989
16	SFL	75	76.20	3.85	-0.3116	-0.0357
17	NLGICL	18	18	2.84	-0.1761	-0.053
18	EICL	40	43.2	2.99	-0.903	-0.074
19	SICL	60	68.98	4.05	-2.093	-0.1302
20	SHL	20	22.08	2.56	-0.6172	-0.0942
21	TRHL	51	60.10	3.98	-2.161	-0.1514
22	BBCL	20	21.44	2.99	-0.3144	-0.4816
23	NLL	17	18.14	2.76	-0.2319	-0.0628
24	NAL	41	48.20	4.12	-1.626	-0.1493
25	NFDCL	13	15.17	1.377	-1.575	-0.1430
Total		50.64	57.31	4.18	-1.41	-0.1412

ANNEX - 5

A Summary of Statistical Findings for the testing of the weak form Efficient Market Hypothesis of stock Market of Nepal

S.No.	Name of the Companies	Serial correlation		Run Test		Conclusion
		(A)	(B)	(C)	(D)	(E)
1	NBIL	YES	YES	YES	YES	R (4)
2	NIBL	YES	YES	YES	-	R (3)
3	SCBL	-	YES	-	-	R (1)
4	HBL	YES	YES	YES	YES	R (4)
5	NSBIBL	YES	YES	-	-	R (2)
6	EBL	YES	YES	YES	YES	R (4)
7	BOK	YES	YES	YES	-	R (3)
8	NICBL	-	YES	-	-	R (1)
9	NBL	YES	YES	YES	YES	R (4)
10	NIDC	YES	YES	YES	YES	R (4)
11	KFL	YES	YES	-	-	R (2)
12	CIT	-	YES	YES	YES	R (3)
13	NABBCL	YES	YES	YES	-	R (3)
14	NFL	YES	YES	-	-	R (3)
15	AFCL	YES	YES	-	-	R (2)
16	SFL	-	YES	YES	YES	R (3)
17	NLGICL	YES	YES	YES	YES	R (4)
18	EICL	YES	YES	YES	YES	R (4)
19	SICL	YES	YES	-	-	R (2)
20	SHL	YES	YES	YES	YES	R (4)
21	TRHL	YES	YES	-	-	R (2)
22	BBCL	YES	YES	YES	-	R (3)
23	NLL	YES	YES	YES	YES	R (4)
24	NAL	YES	YES	YES	-	R (3)
25	NFDCL	YES	YES	YES	-	R (3)

Source: Annex 4 and 5.

Note:

(A) = First order serial correlation coefficients have less than two standard error (in absolute value)

(B) = First order serial correlation coefficients have less than three times its computed standard error (in absolute value).

(C) = The actual number of runs is insignificant from the expected number of runs at 1 percent or 5 percent level of significance.

(D) = The percentage differences, which are less than 10 percent between the actual and expected number of runs as proportion of expected number.

(E) = R stands for random; figure in the parentheses indicate the numbers of random criteria fulfilled.

YES stands for one criteria fulfilled.

ANNEX - 6
Opinion Questionnaire
A survey of efficient stock Market Hypothesis and the Share Price movement: In context of Nepal

Name (optional):……
Position: …… Institution: …….

1) Do you think the movement in share price in NEPSE is sensitive to new information?

a) Yes ☐ b) No ☐ c) Don't know ☐

2) Do you think that a lack of pertinent information; rumor and whim play a significant role in pricing shares?

a) Yes ☐ b) No ☐ c) Don't know ☐

3) Please consider the following factors affecting the share price in Nepal and rank in order of their importance.

Very importance less Imp.

1 2 3 4 5

a) Announcement of Dividend. ( )
b) Issue of bonus share and right share. ( )
c) Information regarding changes in management. ( )
d) Company Earning. ( )
e) Political instability. ( )

4) In Nepal, current market price of share can be used: (Please rank in order of their importance by assigning 1 to the most important one and so on)

a) To predict future prices. ( )
b) To predict future average return. ( )
c) To differentiate good and bad shares. ( )
d) To make buy and sell decision. ( )
e) Other (Please specify) ( )

5) Are you aware of fundamental and Technical analysis technique of securities?

a) Yes ☐ b) No ☐

If yes, which of the following technique you follow while making investment in shares?

a_1) Fundamental analysis ☐ a_2) Technical analysis ☐ a_3) ☐Both

6) Some investor who analyze past pattern in the movement of share price are able to "beat the market" without using financial information.

a) Yes ☐ b) No ☐ c) Don't know ☐

7) In Nepal most of the listed companies don't disclose price sensitive information on time what would you like to suggest for such practice? Please make a tick mark in any one of the following:

a) Fine and penalty ☐
b) Suspend trading for certain time period ☐
c) De-list the company ☐
d) Other (please specify) ☐

8) What would you like to suggest for revival of the security market from the current recession? Please rank in order of importance

Very importance less Imp.

1 2 3 4 5

a) Investor should be self-conscious and only invest after detailed analysis (not on rumors and whim). ( )
b) Listed companies should conduct timely AGM and provide fair Financial reports. ( )
c) Establish another stock exchange center outside of Kathmandu ( )
d) Initiating Computer Assisted Trading System (CAST) ( )
e) Other (Please specify) ( )

9) Do you think that the Nepalese investors are aware of the research of stock market prices?

a) Yes ☐ b) No ☐ c) Don't know ☐

10) In Nepalese stock Market, share price change is not random phenomenon, what do you think, are the major reasons? (Pleases rank in order of importance by assigning 1 to the most important and so on)

a) Stock market is in early stage of development. ( )
b) Excessive speculative behaviour of the investor ( )
c) Hidden information ( )
d) Lack of professionalism ( )
e) Poor performance of market intermediaries ( )
f) Others (Please specify) ( )

11) Please specify how far do you agree or disagree with following statement. Please make tick mark on appropriate box as per following scheme.

1= Strongly Agree 2= Agree 3= Neutral
4= Disagree 5= Strongly Disagree

S.No.	Statement	1	2	3	4	5
1.	In Nepal majority of investors do not care whether company disclose information.					
2.	Information on favorable future prospect would increase market price if share.					
3.	Access to inside information can lead to greater returns					
4.	Stock market is adversely affected by the present political instability and other unfavorable events existing in Nepal.					
5.	Dividend has strong effect in market share price than retained earning.					
6.	To develop efficient security market concerned authorities should control price manipulation and encourage the listed companies to disclose adequate information to investors.					

12) Any other comments/ suggestions for making Nepalese stock market efficient.

……
……
……
……
……
……
……
……

Thank you very much for your time and cooperation.

ANNEX - 7

Number of Response to Field Survey Based on Questionnaire

Q.No.	Stems	Securities Businesspersons	Non-Securities Businesspersons	Total
1	a	39 (81)	50 (82)	89 (82)
	b	8 (7)	4 (7)	12 (11)
	c	1 (2)	7 (11)	8 (7)
	Total	48 (100)	61 (100)	109 (100)
2	a	10 (22)	15 (25)	25 (24)
	b	29 (64)	41 (63)	70 (67)
	c	6 (13)	4 (12)	10 (9)
	Total	45 (100)	60 (100)	105 (100)
5	a	31 (76)	31 (54)	62 (63)
	b	10 (24)	26 (46)	36 (37)
	Total	41 (100)	57 (100)	98 (100)
	a_1	14 (45)	8 (26)	22 (35)
	a_2	0 (0)	3 (10)	3 (5)
	a_3	17 (55)	20 (64)	37 (60)
	Total	31 (100)	31 (100)	62 (100)
6	a	10 (24)	10 (18)	20 (20)
	b	27 (66)	38 (67)	65 (65)
	c	4 (10)	9 (15)	13 (13)
	Total	41 (100)	57 (100)	98 (100)
7	a	20(45)	25 (42)	45 (44)
	b	19 (43)	26 (44)	45 (44)
	c	5 (12)	8 (14)	13 (12)
	Total	44 (100)	59 (100)	103 (100)
9	a	1 (2)	6 (10)	7(7)
	b	29 (71)	39 (67)	68 (69)
	c	11 (27)	13 (23)	24 (24)
	Total	41 (100)	58 (100)	99 (100)

Source: Based on information contained in questionnaire.

Note: (i) Q.No. Indicates question number referred to in the questionnaire and stems indicate the choices specified in each question.

(ii) Figure in the parentheses indicates percentage over total responses.

ANNEX - 8

Rank wise Number of Responses to Field Survey Based on Questionnaire

Q.No.	Stems	Sector	Rink wise No. Of Responses					Total Responses	Weighted Value	Mean Weight	Overall Rank
			1	2	3	4	5				
3	a	SBP	11	10	4	15	7	47	138	2.94	3
		NSBP	14	12	8	16	6	56	156	2.79	3
		Total	25	22	12	31	13	103	294	2.85	3
	b	SBP	14	12	9	9	2	46	111	2.41	1
		NSBP	13	16	8	12	1	50	122	2.44	2
		Total	27	28	15	21	3	96	233	2.43	2
	c	SBP	-	4	8	12	14	38	150	3.95	5
		NSBP	-	6	10	14	17	47	183	3.89	5
		Total	-	10	18	26	31	85	333	3.92	5
	d	SBP	12	11	13	8	3	47	120	2.55	2
		NSBP	16	14	15	4	2	61	115	1.89	1
		Total	28	25	28	12	5	108	235	2.18	1
	e	SBP	7	9	13	10	9	48	149	3.10	4
		NSBP	12	13	9	6	20	60	189	3.15	4
		Total	19	22	22	16	29	108	338	3.13	4
4	a	SBP	2	15	11	12	2	42	123	2.93	2
		NSBP	8	14	15	22	2	61	179	2.93	3
		Total	10	29	26	34	4	103	302	2.93	4
	b	SBP	25	6	3	4	2	40	72	1.80	1
		NSBP	8	15	21	14	4	60	177	2.95	4
		Total	33	21	22	18	6	100	249	2.49	2
	c	SBP	4	9	15	6	5	39	116	2.97	4
		NSBP	14	20	4	8	14	60	168	2.80	2
		Total	18	29	19	14	19	99	284	2.87	3
	d	SBP	11	3	11	11	6	42	124	2.95	3
		NSBP	30	7	15	5	4	61	129	2.12	1
		Total	41	10	26	16	10	103	253	2.46	1
	e	SBP	2	3	4	6	26	41	174	4.24	5

		NSBP	3	1	2	14	35	55	242	4.4	5
		Total	5	4	6	20	61	96	416	4.33	5
8	a	SBP	25	10	6	6	-	47	87	1.85	1
		NSBP	9	15	21	16	-	61	166	2.72	2
		Total	34	25	27	22	-	108	253	2.34	4
	b	SBP	16	12	13	5	-	46	99	2.15	2
		NSBP	19	16	14	10	-	59	133	2.25	1
		Total	35	28	27	15	-	105	232	2.21	1
	c	SBP	15	9	12	7	-	43	97	2.26	3
		NSBP	10	11	13	25	-	59	171	2.90	3
		Total	25	20	25	32	-	102	268	2.63	2
	d	SBP	6	7	13	17	-	43	127	2.95	4
		NSBP	5	15	17	20	-	57	166	2.91	4
		Total	11	22	30	37	-	100	293	2.93	3
	e	SBP	-	-	-	-	45	45	225	5	5
		NSBP	-	-	-	-	55	55	275	5	5
		Total	-	-	-	-	100	100	500	5	5
10	a	SBP	17	7	8	5	6	43	105	2.44	1
		NSBP	19	9	10	10	13	61	172	2.82	2
		Total	36	15	18	15	19	104	277	2.66	1
	b	SBP	7	9	11	7	3	37	101	2.73	3
		NSBP	17	14	10	11	8	60	159	2.65	1
		Total	24	23	21	18	11	97	260	2.68	2
	c	SBP	5	7	5	12	15	44	157	3.57	5
		NSBP	8	11	14	9	15	57	183	3.21	5
		Total	13	18	19	21	30	101	340	3.37	5
	d	SBP	11	12	4	6	7	40	106	2.65	2
		NSBP	11	16	12	9	10	58	165	2.84	3
		Total	22	28	16	15	17	98	271	2.47	3
	e	SBP	5	12	11	8	5	41	119	2.90	4
		NSBP	9	10	22	16	10	56	176	3.14	4
		Total	14	22		24	15	97	295	3.04	4

Source: Based on information contained in questionnaire.

Note: Q.No. Indicates question number referred to in the questionnaire and Stems indicate the choices specified in each question.
SBP represents Securities Businesspersons and
NSBP represents Non- Securities Businesspersons.

ANNEX - 9

Responses of Securities Businesspersons and Non-Securities Businesspersons with respect to Efficient Stock Market Hypothesis and Stock Price Movement in context of Nepal

S.No.	Observation	R	1	2	3	4	5	Total
1.	In Nepal majority of investors do not care whether company disclose information.	SBP	13	17	12	2	1	45
		NSBP	16	22	12	6	2	58
		Total	29	32	24	8	3	103
2.	Information on favorable future prospect would increase market price if share.	SBP	17	26	2	0	0	45
		NSBP	23	33	2	0	0	58
		Total	40	59	4	0	0	103
3.	Access to inside information can lead to greater returns	SBP	16	26	3	0	0	45
		NSBP	20	36	2	0	0	58
		Total	36	62	5	0	0	103
4.	Stock market is adversely affected by the present political instability and other unfavorable events existing in Nepal.	SBP	12	22	8	2	1	45
		NSBP	18	29	8	3	0	58
		Total	30	51	16	5	1	103
5.	Dividend has strong effect in market share price than retained earning.	SBP	11	23	6	5	0	45
		NSBP	18	29	6	5	0	58
		Total	29	52	12	10	0	103
6.	To develop efficient security market concerned authorities should control price manipulation and encourage the listed companies to disclose adequate	SBP	26	16	2	1	0	45
		NSBP	28	22	6	2	0	58
		Total	51	38	8	3	0	103

Source: Based on Information contained in questionnaire

Note: (i) R indicate Respondent, SBP represent Securities Businesspersons and NSBP represents Non-Securities Businesspersons.

(ii) S.No. Indicate sub-question of number 11 as shown in questionnaire.

(iii) The Scale value of 1,2,3,4 and 5 indicate strongly agree, agree, Neutral, Disagree and strongly disagree respectively.

ANNEX - 10

Result of Chi-Square Test

Q.No.	Securities Businesspersons	Non-Securities Businesspersons	Total	d. f.	Computed Chi-Square	Value at 5% level	Remarks
1. a	**39**	**50**	**89**	**2**	**0.0017**	**5.991**	**Ho accepted**
b	**8**	**4**	**12**		**2.4948**		
c	**1**	**7**	**8**		**3.2285**		
Total	**48**	**61**	**109**		**5.7250**		
2. a	**10**	**15**	**25**	**2**	**0.0833**	**5.991**	**Ho accepted**
b	**29**	**41**	**70**		**0.0583**		
c	**6**	**4**	**10**		**1.2000**		
Total	**45**	**60**	**105**		**1.3416**		
3. a	**138**	**156**	**294**	**4**	**0.0124**	**9.488**	**Ho accepted**
b	**111**	**122**	**233**		**0.0981**		
c	**150**	**183**	**333**		**0.3300**		
d	**120**	**115**	**235**		**1.8686**		
e	**149**	**189**	**338**		**0.8712**		
Total	**668**	**765**	**1433**		**3.1803**		
4. a	**123**	**179**	**302**	**4**	**0.0070**	**9.488**	**Ho rejected**
b	**72**	**177**	**249**		**13.8484**		
c	**116**	**168**	**284**		**0.0147**		
d	**124**	**129**	**253**		**7.6215**		
e	**174**	**242**	**416**		**0.3076**		
Total	**609**	**895**	**1504**		**21.7992**		
5 a	**31**	**31**	**62**	**1**	**1.6979**	**3.841**	**Ho rejected**
b	**10**	**26**	**36**		**2.9242**		
Total	**41**	**57**	**98**		**4.6221**		
a_1	**14**	**8**	**22**	**2**	**1.6364**	**5.991**	**Ho accepted**
a_2	**0**	**3**	**3**		**3**		
a_3	**17**	**20**	**37**		**0.2432**		
Total	**31**	**31**	**62**		**4.8796**		

6 a	10	10	20	2	0.5477	5.991	Ho accepted
b	27	38	65		0.0024		
c	4	9	13		0.6544		
Total	41	57	98		1.2045		
7 a	20	25	45	2	0.0548	5.991	Ho accepted
b	19	26	45		0.0045		
c	5	8	13		0.0963		
Total	44	59	103		0.1556		
8 a	87	166	253	4	4.6734	9.488	Ho rejected
b	99	133	232		0.2450		
c	97	171	268		2.6367		
d	127	166	293		0.6244		
e	225	275	500		3.1846		
Total	635	911	1546		11.3641		
9 a	1	6	7	2	2.1233	5.991	Ho accepted
b	29	39	68		0.0426		
c	11	13	24		0.1932		
Total	41	58	99		2.3591		
10 a	105	172	277	4	0.9269	9.488	Ho accepted
b	101	159	260		0.3897		
c	157	183	340		4.1491		
d	106	165	271		0.2997		
e	119	176	295		0.0205		
Total	588	855	1443		5.7859		

ANNEX - 11

Result of Spearman's Rank Correlation Coefficient

Q.No.	Aspects	Computed Value
3.	**Factor affecting the share price**	**0.90**
4.	**Usefulness of current market price**	**0.10**
8.	**Revival of the security marker**	**0.90**
10.	**Random phenomenon of share price changes**	**0.80**

Source: Annex 9

Note A:

For Q. No. 3:

Since the degree of freedom is 5 for rank correlation coefficient, tabular value at 0.05 level of significance is 0.9.

For Q. No. 4:

Since the degree of freedom is 5 for rank correlation coefficient, tabular value at 0.05 level of significance is 0.9.

For Q. No. 8:

Since the degree of freedom is 5 for rank correlation coefficient, tabular value at 0.05 level of significance is 0.9.

For Q. No. 10:

Since the degree of freedom is 5 for rank correlation coefficient, tabular value at 0.05 level of significance is 0.9.

Note B:

The degree of relationship is significance if tabular value is less than computed value.

Note C:

For calculation, see Richard I. Levin and David S. Rubin, Statistics for Management, sixth edition, (New Delhi: prentice Hall of India Pvt. Ltd, 1995), 734 – 740.