THE ANOMALIES OF STOCK MARKET PRICES: AN EMPIRICAL STUDY OF COMMERCIAL BANKS IN NEPAL

Project Work

Submitted for the partial requirement of the course entitled

Research Seminar in Finance

Master of Philosophy in Management

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By

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Kathmandu, Nepal

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DECLARATION

I hereby declare that this study entitled **"The Anomalies of Stock Market Prices: An Empirical Study of Commercial Banks in Nepal**" embodies the results of my confide research work carried out as a partial fulfillment of the requirements of the course entitled *Research Seminar in Finance,* Masters of Philosophy in Management, Kathmandu University School of Management. No part of the research has been submitted to any other University / Institution by me or by anybody and conferred with any degree.

Dipendra Karki May, 2013

RECOMMENTADATION

This research report entitled THE ANOMALIES OF STOCK MARKET PRICES: AN EMPIRICAL STUDY OF COMMERCIAL BANKS IN NEPAL has been prepared by Mr. DIPENDRA KARKI under my guidance and supervision and it embodies the result of his investigation conducted during the period he studied as an MPhil candidate of the School of Management. The research is of the standard expected of a candidate for the course on *Research Seminar in Finance* and has been prepared in the prescribed format of the School of Management. I, hereby, recommend it in partial fulfillment of the requirements for the course entitled *Research Seminar in Finance* for evaluation.

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Radhe Shyam Pradhan, Ph.D.

Professor

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Kathmandu, Nepal. Dipendra Karki

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LIST OF ABBREVIATIONS AND SYMBOLS

ADF	Augmented Dickey-Fuller
AMEX	American Stock Exchange
ARMA	Autoregressive Moving Average
BOK	Bank of Kathmandu
BPS	Book value per share
CAPM	Capital Asset Pricing Model
CD	Before dividend tax cash dividend per share
CRSP	Centre for Research in Security Prices
CV	Coefficient of variation
DPS	Dividends per share
DW	Durbin-Watson
EBL	Everest Bank Limited
ECM	Error Correction Model
EMH	Efficient Market Hypothesis
EPS	Earning per share
F/Y	Fiscal Year
FEM	Fixed Effect Model
GDP	Gross Domestic Product
GLS	Generalized Least Square
HBL	Himalayan Bank Limited
IMF	International Monetary Fund
INF	Inflation
IR	Interest rate
LSDV	Least Square Dummy Variable
MPS	Market price per share
NABIL	NABIL Bank Ltd
NBB	Nepal Bangladesh Bank Limited
NBL	Nepal Bank Limited
NCC	Nepal Credit and Commerce Bank Limited
NEPSE	Nepal Stock Exchange Limited
NI	NEPSE index
NIB	Nepal Investment Bank Limited
NIC	Nepal Industrial and Commercial Bank Limited
NRB	Nepal Rastra Bank
NSBI	Nepal SBI Bank Limited
NYSE	New York Stock Exchange

NZSE	New Zealand Stock Exchange
OLS	Ordinary Least Square
P	Market price per share
P/E	Price earnings ratio
REM	Random Effect Model
SCB	Standard Chartered Bank (Nepal) Ltd
SD	Before dividend tax stock dividend per share point basis
SEBON	Securities Board of Nepal
TSE	Tokyo Stock Exchange
USA	United States of America
VIF	Variance Inflationary Factor
μ	Mu
α	Alpha
β	Beta
γ	Gamma
ε	Epsilon
Σ	Sigma
σ	Standard deviation
χ	Chi

CHAPTER ONE
INTRODUCTION

1.1 General Background

The pricing implication of common stocks has drawn considerable attention since the publication of seminal work of Markowitz (1952) - the mean-variance portfolio theory. Since then there is an ongoing debate on whether the market risk factors explain better or there are some other anomalies influencing common stock prices. Gonedes (1972) investigated the relationship between the efficient capital market and accounting information. The study reported that the reliability of market reactions as a means of evaluating the informational content of accounting numbers is predicated upon the possibility of conditioning, so that investors will react in a particular manner to accounting numbers. Thus, announcement of earnings and dividends is helpful to investors to predict their future return. There is a theoretical links between financial reporting and stock return (Nicholas & James, 2004). The information contained in earning provides information to determine share value, which represents the present value of expected future dividends (Beaver, 1968). Easton & Harris (1991) were considered the earning as an explanatory variable for stock prices.

Similarly, a number of studies have been conducted to examine the effect of macroeconomic variables on the stock markets of industrialized as well as developing economies. Some studies showed that there is in fact a relationship between stock returns and certain macroeconomic indicators, those studies were mostly conducted in developed economies, Fama and Schwert (1977), among many others, found a negative relationship between stock returns and inflation in the US market, But what about less developed economies? Some studies showed no relationship between the economies and the financial markets of less developed countries, like Asian markets, Fung and Lie (1990) explained this by saying that "macroeconomic factors can't be reliable indicators for stock market price movements in the Asian markets because of the inability of stock markets to fully capture information about the change in macroeconomic fundamentals". The relevance of the studies conducted on the stock market behavior in developed and big capital markets is yet to be seen in the context of smaller, developing and under-developed capital markets. The stock market behavior in such type of markets is thus one of the important areas of the study in finance. Thus, it is felt necessary to study the behaviour of stock market prices in the context of smaller and under-developed capital markets.

The relationship between the stock price and financial and non- financial variables is very important to study for many reasons. First, it helps policy makers understand the full effect of prevailing and upcoming policies and regulations. Second, if investors were aware of this relationship and fully understood it, then they will make more informed investment decisions thus reducing their exposure to risk. And third, knowing which force leads the other can help in reducing the shock factor because the public will be somewhat aware of what might happen in the economy or the financial market and thus will be able to take protective measures.

Avadhani (1996) stated that Capital Market is a wide term comprise of all operations in the new issues and stock market. The stock market serves as a veritable tool in the mobilization and allocation of savings among competing uses which are critical to the growth and efficiency of the economy (Alile, 1984). Through mobilization of resources the stock market promotes economic growth by providing avenue to pool large and long term capital through issuing of shares and stocks and other equities for industries in dire need of finance to expand their business. Thus, the overall development of the economy is a function of how well the stock market performs and empirical evidences have proved that development of the capital market is sine qua non for economic growth. While developed economies have fully explored the mobilization of resources through the capital market, the developing countries are yet to fully usurp the benefits of raising capital via the capital market.

Stock prices volatility has received a great attention from both academicians and practitioners over the last two decades since it can be used as a measure of risk in financial markets. Over recent years, there has been growing interest in the modeling of time-varying stock return volatility. Schwert (1989) concluded that there is a volatility puzzle regarding common stock prices. The puzzle highlighted by the results was that stock volatility is not more closely related to other measures of economic volatility. It seems that pricing volatility does not follow any pattern. In some cases, volatility is closely related with macroeconomic variables and in some cases macroeconomic variables have no impact upon volatility. What factors are responsible for these changes in volatility? Every individual specially related with capital market in this or that way, tries to get answer to these questions. There are several studies which examined the stock prices volatility. Officer (1973) correlated these changes to the volatility of macroeconomic variables. Similarly, many others attempted to relate changes in stock prices, including Pindyck (1984), Poteba and Summers (1986), French , Schwert and Stambaugh (1987), Bolleslev, Engle and Wooldridge (1988), and Abel (1988).

Globalisation and financial sector reforms in Nepal have guided in a change in the financial architecture of the economy. In the contemporary scenario, the activities in the financial markets and their relationships with the real sector have assumed significant importance. Since, the inception of the financial sector reforms in the beginning of 1980's, the implementation of various reform measures including a number of structural and institutional changes in the different segments of the financial markets. This leads to the number of banks and financial institutions come in to operation, widening of network of participants call for a reexamination of the relationship between the stock market and the financial and non financial variables in Nepal. Correspondingly, researches are also being conducted to understand the current working of the economic and the financial system in the new scenario. The analysis on stock markets has come to the fore since this is the most sensitive segment of the economy and it is through this segment that the country's exposure to the outer world is most readily felt. This study is an endeavour in this direction.

This study focuses to find out the relationship between stock prices and financial and macroeconomic variables. Varying evidences of relationship between financial and macroeconomic variables and stock prices were widely documented in the existing literature. The outcome of most studies suggests that with minor degrees of variation- there is a relationship between fundamental macroeconomic variables and stock market returns. For example, there exists a positive relationship between stock prices and economic output (Foresti, 2006), as well as a negative relationship between inflation and stock returns (Hoguet, 2008). Researchers were successful in finding a relationship between stock prices and the different macroeconomic and financial indicators in countries like Lithuania (Pilinkus, 2009), Brazil (Chatrath, 2002), and Jordan (Maghayreh, 2003). Due to variations in results, it was found difficult to determine which specific variable could be consistent indicator to determine stock market prices. Viewed in this perspective, the study devoted to explore the relationship between stock prices and financial and macroeconomic variables may be very rewarding one.

1.2 Statement of the problem

Stock market facilitates the situation of country's economy. When stock market is booming, the economy is good, on the other hand, when stock market is declining, the economy is bad. It also represents the national policy towards industrial as well as stock market policy, which is formulated by government rules and regulations of different sector. If the stock price change is dependent on their past values, there exists a trend or pattern in the price movement which are profitable to the security analyst. The study is confined to test whether the stock price changes of the individual securities are independent or dependent.

In the situation of independent behavior of stock price changes, general or institutional investors such as mutual funds can easily drop their technical analysis functions shift to restrict their efforts in acute fundamental analysis. When successive price changes shows dependence, security analyst can just perform technical analysis and discern profitable patterns. In this way, preciously being well informed about the price behavior of the market, investment analysis function becomes simple. Besides it, researcher, shareholders and financial institutions, insurance companies may also benefit in one way or the other from this study by obtaining valuable information too.

The empirical studies have found that variables relating to firm characteristics have significant explanatory power for average stock returns. The most prominent variables associated with firm characteristics are firm size, book-to-market equity, cash flow yield and earnings-to-price ratio. Among the several contradictions, earlier one was Basu's (1977) evidence that when common stocks were sorted on earnings-to-price ratios, future returns on high earnings-to-price stocks were observed higher than that predicted by the CAPM. Reinganum (1981) reported excess returns on common stocks as a monotone increasing function of earnings-to-price defined as the ratio of earnings per share to market price per share. On the contrary, Chan, Hamao and Lakonishok (1991) observed earnings-to-price ratio to loose its significance in predicting stock returns. Similarly, Foster (1973) demonstrated low earning growth stocks to have significantly lower standard deviations and betas than higher earnings growth stocks. The study concluded that not only did low earnings growth stocks yield higher average returns than high earnings growth stocks, but they also did perform significantly better than high earnings growth stocks in bear market. However, the studies have failed to give unanimous conclusion regarding earnings-to-price effect on common stock prices.

Black (1976) and Christie (1982) argued that financial leverage partly explains the variations in stock market prices. Finally, Stattman (1980), and Rosenberg, Reid, and Lanstein (1985) demonstrated high average returns for stocks with high book-to-market equity ratios that were not captured by their betas. In later period, Chan, Hamao, and Lakonishok (1991) revealed that the ratio of cash flow to price, in addition to book-to-market equity, could explain stock returns in Japan.

Besides firm specific variables, studies also suggest that there is significant relationship between macroeconomic variables and stock returns. The underlying theoretical constructs establish a link between macroeconomic volatility and stock returns based on transmission mechanism between the key macroeconomic variables, namely, inflation, interest rate, and gross domestic product (GDP).

Fisher (1930) found that stock prices are positively related to inflation, and hence stock investment can be used as a hedge against inflation. Jaffe and Mandelkar (1976), Nelson (1976), and Fama and Schwert (1977), among others, have argued that stock returns are inversely related to inflation. Similarly, Fama (1981) documented the negative relationship between stock returns and inflation. The evidences have suggested three dominant hypotheses, namely, tax effect, proxy effect, and the reverse causality hypotheses, explaining the negative effects of inflation on stock returns. This argument shows a contrary opinion to the priori expectation of Fisher hypothesis which assumes that stock returns are positively related to inflation, and hence stock investment can be used as a hedge against inflation.

The proxy effect of Fama (1981) explained that real activity is positively related to common stock returns, but negatively related to inflation through the money demand effect. As a result, a negative relation between stock returns and inflation is possible to observe. In an attempt to establish a dynamic linkage between stock prices and macroeconomic variables, Ibrahim and Aziz (2003) reported a positive relationship between stock prices and inflation in the context of Malaysia. The study demonstrated that the observed positive relation between stock prices and inflation could provide better hedge against inflation for investors from stock investment in Malaysia.

In relation to interest rate effect, several studies argue in favor of inverse relationship between stock returns and level of interest rates. For example, Thorbecke (1997) demonstrated that liquidity in the economy could increase with reduction in interest rates. This extra liquidity could be channeled to the

stock market thus driving up the demand and prices of stocks. Gan, Lee, Yong and Zhang (2006) observed that interest rate in the economy could determine stock returns consistently. Similarly, Kandir (2008) demonstrated a negative relationship between stock returns and interest rate. Such a negative relation implies that investors tend to invest less in stocks when interest rates go up causing stock price to fall. Though there are these evidences associated with interest rate effects, the studies also reveal that interest rate changes may not be enough to influence stock-price misalignments. For example, Bernanke and Gertler (2001) argued that the volatile nature of stock prices makes them hard to predict and that monetary authorities should only change interest rates in reaction to stock price movements, when they expect such movements to affect inflation. Goodfriend (1986) also noted no stable correlation between stock returns and short-term interest rates, as a result it would be difficult for interest rates to target stock price changes appropriately. Because of these controversies, this study attempts to identify the interest rate effect on Nepalese stock market.

The empirical evidences in relation to real sectors' influence proxied by GDP on the stock returns also document mixed results. It is argued that stock prices respond to the volatility in GDP. In this context, Gjerde and Saettem (1999) observed a significant positive association between the GDP, industrial production and stock prices. Contrary to these findings, in an attempt to examine effects of macroeconomic variables on stock returns, Flannery and Protopapadakis (1988) reported no relation between stock returns and real GDP.

The studies on common stock pricing behaviour of small and emerging capital markets lacked unanimous conclusion. Chaudhary (1996) found that the volatility in different smalls markets are explained by different variables. Negakis and Kambouris (1994) investigated and modeled various GARCH processes to measure the volatility in small market and concluded that it is the transmission of volatility shocks of the developed markets. Rao (2008) analyzed the volatility persistence in emerging equity markets in comparison to equity returns in the developed market and concluded that small markets exhibit significant own spillover effects. Even though, Platt (1998) found that one of several barriers to conduct a research in developing markets is unavailability of large samples and concluded that country income is the best predictors of functioning of stock markets and emerging markets have very low correlation with developed stock markets.

The recent studies have found evidences of both trend-following and contrarian behavior among various investor groups. Securities are bought by trend followers upon price appreciation and sell them upon depreciation, while contrarians trade in the opposite way. Such trading behavior has been found in both domestic and international markets. Moreover, prices in these markets have been found to be much more that the stocks' fundamental values. Indeed in some markets, prices exhibit common movements that are hard to explain by movements in fundamentals (Watanabe, 2008). Thus the behavior of stock market is volatile, but till now its causes are unclear. Are fundamentals working to influence stock market prices? If yes, which fundamentals are more influential? If fundamentals are not influential, then what else is responsible for changing stock prices over time? The conclusions of the studies are not unanimous in most of the cases. Thus, this study aims to fill such a research gap by examining the influences of different firm specific and macroeconomic factors on common stock prices in Nepalese context. To sum up, the study basically deals with following issues:

1. What is the historical information embraced by the market value of the share?
2. How far the market values of the shares are explained by the book value per share as shown in the balance sheet?
3. How sensitive are the stocks of the commercial banks about the given change in the market as a whole?
4. How risky is the investment on commercial banks stocks for general investors?
5. Is there any relationship between price earnings ratio and cross-section of common stock returns?
6. Is there any consistency in explanatory power of earnings per share, book value per share, and dividend per share when considered individually and when considered together?
7. What is the direction and magnitude of causal relationship between stock market returns and macroeconomic variables such as inflation, interest rate, and gross domestic product?
8. Do stock prices in Nepal offer a hedge against inflation?
9. How do stock prices vary with interest rate?
10. Does the real GDP have significant power to predict common stock returns in Nepal?
11. What are the views of market participants such as investors, executives and security businesspersons in relation to preferences toward types of stock market choice for trading, stock market efficiency, and factors affecting stock returns in Nepal?

1.3 Objective of the study

The major objective of this study is to analyze the cross-sectional variation in stock market prices of commercial banks in Nepal with respect to firm specific and macroeconomic variables. However, the specific objectives are as follows.

1. To analyze the market share price behavior and movement of the Nepalese stock market.
2. To analyze the sensitivity of the share price in relation to the market.
3. To analyze the relationship of cross-section of stock prices with price earnings and evaluate whether inclusion of this variable subsume the effect of earnings per share, book value per share, cash dividend and stock dividend per share.
4. To examine the causal relationship between stock market returns and macroeconomic variables such as real GDP, inflation, and interest rate.
5. To analyze the views of market participants such as executives, investors, and security businesspersons in relation to preferences toward type of stock market choice, stock market efficiency, and factors affecting stock returns in Nepal.

1.4 Organization of the study

The study has been organized into five chapters. Chapter one is the introduction chapter that includes general background, statement of problems, objectives of the study, and organization of the study. The chapter two consists of conceptual review, review of literatures related to studies in global context as well as the review of studies in Nepalese context. Besides, this chapter ends up with concluding remarks associated with the findings and major ideas of the studies. Chapter three deals with research methodology applied in the study. This chapter includes introduction of research methodology, research design, nature and sources of data, selection of the banks, statistical tools, and models used in the study, methods of analysis and limitations of the study. Chapter four covers the analysis and presentation of data. It includes introduction, analysis of secondary data, primary data and concluding remarks. Chapter five presents summary, conclusion and recommendation of the study.

CHAPTER TWO
CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURE

This chapter provides conceptual framework of the study and deals with review of empirical studies associated with the determinants of stock market prices. This chapter has been organized into three sections. The first section briefly explains conceptual framework of the various factors and stock prices. Second section consists of review of related studies. The third section presents concluding remarks of the overall literature review.

2.1 Conceptual framework

Many general investors are puzzled about the stock market prices in the market. The investor's main dilemma is that whether or not to invest in the particular asset/ assets, so that they can get better sustainable and fair return of their investment with bearing minimum/zero risk. In this point of view, many people have been studying the way security price fluctuate for over a century. Charles Mackay (1841) assembled a book of readings about Tulip-mania and some equally famous market "bubbles" which had a self-explanatory title: Extraordinary Popular Delusions and the Madness of Crowds. In contrast to Mackey's astonishing stories, French mathematician named Louis Bachelier (1900) set a forth formal models in which security prices were random outcomes that had probabilities attached to them. There are several reasons for stock market volatility. It is very difficult to exactly find out the reason of volatility of stock market and its consequences and remedies. Models like; Efficient Market Hypothesis (EMH), Random Walk theory, Non-Random Walk Theory and Dow Theory attempted to describe about the stock valuation and its movements.

As the underlying theory suggests, the investors allocate resources into assets based on the 'object' and 'theory' of choice. Mean and variance associated with an asset's returns are the objects of choice. They indicate the risk-return combination of an investment. On the other hand, theory of choice guides on selecting utility maximizing risk-return combination of an investment that is the most preferable one for investors. The basic foundation for asset pricing theory was laid down by Markowitz (1952) through a seminal work entitled 'Portfolio Selection'. Markowitz portfolio theory asserts that the riskiness of a single asset is entirely different from that of a portfolio of assets. According to this theory, a single asset may be very risky when held in isolation, but not much risky when held in combination with other assets in a portfolio.

2.1.1. Firm specific variables and stock prices

Basu (1977) and Banz (1981) observed that the price-to-earnings ratio and the market capitalization of common equity (firm size), respectively, provided considerably more explanatory power on prediction of stock prices. Ball (1978) stated that the firm with higher earnings-to-price ratio is also expected to have higher stock prices. In contrast, Chan, Hamao and Lakonishok (1991) reported no conclusive evidence about earnings-to-price effect on common stock returns in Japan.

Baker and Wurgler (2004b) showed that the disappearance of dividends can be explained by lower market valuations of payers during such periods. Companies pay dividends in order to raise the stock prices of their shares above their fundamental values. Baker and Wurgler (2004a) noted that the increase in the value of a company paying dividends reflects the risk assessment by investors. Indeed, dividend-paying firms are considered less risky than non-payers ones. Thus, investors who prefer cash dividend payments during gloomy period as an indicator of the firm's safety and therefore are more willing to pay dearly to buy dividend-paying stocks.

Though controversial, the findings collectively represent a set of facts that stand as a challenge for alternative asset pricing models. Some studies employ cross-sectional regression technique to represent these ad hoc effects in the following form:

$$R_i = b_0 + b_1 \beta_i + b_2 \Sigma C_{ij} + e_i \qquad \ldots\ldots\ldots\ldots (2.2)$$

Where C_{ij} represents firm's characteristics j (earnings per share, book value per share, cash dividend per share, stock dividend per share, price earnings ratio etc.) for stock i. Based on the established relationships from findings of previous studies, this study also posits a negative relationship of stock prices with price to earnings ratio, Cash dividend per share and stock dividend per share but the study hypothesizes a positive relationship of stock prices with earnings per share and book value per share.

2.1.2. Macroeconomic variables and stock prices

The dynamic relationships between macroeconomic variables and stock market returns have been widely discussed and debated. Elton and Gruber (1991) stated that the determinants of share prices are the required rate of return and expected cash flows. Economic variables which impact future cash flows and required returns can therefore be expected to influence share prices.

Gross domestic product (GDP) is one of the fundamental macroeconomic variables employed in the past studies to trace out macroeconomic influences on stock market prices. It is used as a proxy of real aggregate economic activity in an economy. Higher GDP represents economic prosperity of the country and stock returns are expected to influence positively. The empirical studies associated with macroeconomic influences on stock returns have suggested mix evidences about GDP influence. For example, Flannery and Protopapadakis (2002) found no role of GDP to explain the common stock returns in USA. On the contrary, Ibrahim and Aziz (2003) found positive long-term relation between GDP and stock returns in Malaysia. Similarly, McMillan (2005) reported a significant positive relation between GDP and stock returns.

The interest rate (IR) risk is another important financial and economic factor affecting the value of common stocks. Mukherjee and Naka (1995) observed that changes in both short-and long-term government bond rates would affect the nominal risk-free rate and thus affect the discount rate resulting into a change in stock prices. Reily and Brown (2000), however, argued that cash flows from stocks could change along with interest rates and it would not be certain whether this change in cash flows would augment or offset the change in interest rates. Though controversies exist about exact relationship between interest rates and stock market returns, this study hypothesizes a negative relationship between interest rates and stock prices basically for two reasons. First, the reduction in interest rates reduces the cost of borrowing and thus serves as an incentive for expansion. This will have a positive effect on future expected returns for the firm. Second, as considerable stocks investments are made with borrowed money, hence an increase in interest rates would make stock transactions more costly. Investors will require a higher rate of return before investing. This will reduce the demand for stock investment and thus lead to decline in stock prices.

Besides interest rate (IR) and GDP, the rate of inflation (INF) is another interrelated macroeconomic variables influencing stock market activity and hence the common stock prices. As the worth of rupees gets reduced due to high money supply i.e. inflation, it is expected that the stock prices would be high in the time of high inflation. This implies the positive relationship between inflation and stock prices. In contrast to this, some other findings propose three dominant hypotheses, namely, tax effect, proxy effect, and the reverse causality, explaining the effects of inflation on stock market returns. The tax effect hypothesis argues that inflation introduces a corporate tax liability and reduces real after-tax earnings, thus reducing common stock returns. The proxy effect hypothesis explains

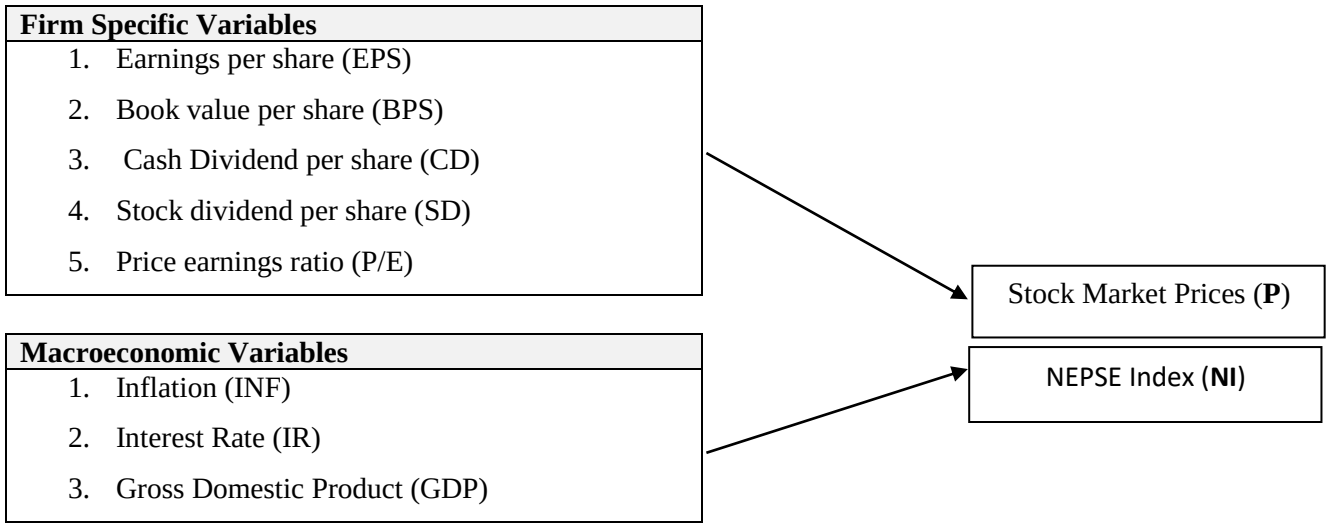
that real activity is positively related to common stock returns, but negatively related to inflation through the money demand effect. Similarly, reverse causality hypothesis states that future economic activity is correlated with increased domestic borrowing or increased supply of money. This simply means that an increase in domestic borrowing or issuance of money has inflationary effects that dampen real activity. However, the studies by Geyser and Lowies (2001), Ibrahim and Aziz(2003), and many others found positive relation between stock prices and inflation. This study also assumes positive relation between stock prices and inflation.

The studies report no unanimous view in relation to major determinants of stock market prices. The major factors affecting stock prices are categorized into two parts- the factors relating to firm characteristics and the macroeconomic variables. The schematic diagram of the relationship between stock prices and these factors are shown in Figure 2.1.

Figure 2.1

Conceptual Framework for Factors Influencing Stock Prices

This figure shows the conceptual framework of the study. Firm characteristics refer to the earnings per share, book value per share, cash dividend per share, stock dividend per share, and price earnings ratio. Macroeconomic variables include inflation, interest rates, and gross domestic product. All these firm specific and macroeconomic variables are expected to determine the stock prices.



As shown in Figure 2.1, the variation in stock prices can be explained by the factors relating to firm specific characteristics and the macroeconomic variables.

2.2 Review of literature

This section provides a review of major empirical studies associated with firm specific and macroeconomic influences on cross-section of common stock returns. The review of literature has been presented on periodical basis. Therefore the following sections cover the major studies undertaken a) before 1990s, b) during 1990s, c) 2000 onwards, and d) Major Studies conducted in Nepalese context

2.2.1 Review of major studies till 1990s

The major studies conducted till 1990s has been summarized in the following table 2.1

Table 2.1

Review of the Major Studies till 1990s

This table summarizes the major studies conducted until 1990s. The first column presents the studies and second columns presents the major findings of the studies.

Study	Major Findings
Fisher (1930)	The results concluded that there is a positive one-to-one relationship between rate of inflation and stock prices.
Gordon and Shapiro (1956)	The current stock price equals the present value of its future dividends.
Basu (1977)	There is a significant negative relation between price-to-earnings ratios and stock prices.
Ball (1978)	Earnings-to-price explains the portion of expected returns that is in fact compensation for risk.
Banz (1981)	Small firms have significantly larger risk adjusted returns than large firms.
Chen, Roll and Ross (1986)	The results showed a long-term equilibrium relationship exists between stock prices and macroeconomic variables and inflation is significant in explaining the expected returns.
Chawala and Srinivasan (1987)	Both dividend and retained earnings significantly explain the variations in share price in chemical industry.
Aggarwal, Hiraki and Rao (1988)	Portfolios of high earnings-to-price stocks outperformed those with low earnings-to-price stocks.
Jaffe, Keim and Westerfield (1989)	The earnings yield effects were significant in both January and non-January months
Schwert (1989)	The study noted weak evidence that macro-economic volatility could help predict stock returns.

Details of the studies have been presented as following:

Fisher (1930) conducted the study regarding the behavior of stock market prices and explained how the market rate of interest and inflation affected the stock prices. As the rate of inflation rises, the nominal rate of interest also goes up. Consequently, real rate of interest remained the same in the long run. Thus, it was concluded that there was a positive one-to-one relationship between rate of inflation and stock prices.

According to the model of Gordon and Shapiro (1956), the current stock price equals the present value of its future dividends. They assumed that the dividend is a constant fraction of the profits carried out by the company. The expected receipt of dividend income is an incentive for investing in a given stock, particularly if the yield on the investment exceeds the return offered on other alternative investments like savings accounts. Investors may pay a premium for shares in issue.

The first extensive study of the relation between price-to-earnings and subsequent total returns was published by Basu (1977) showing that price-to-earnings ratios might explain stock market prices and found that, for the sample of NYSE firms, there was a significant negative relation between price-to-earnings ratios and average returns. As the study observed if one had followed this strategy of buying the quintile of lowest price-to-earnings stocks and selling short the quintile of highest price-to-earnings quintile stocks, based on annual rankings, the average annual abnormal returns would have been 6.75 percent over 1957 to 1975 period.

Ball (1978) started the empirical enquiry into the earnings effect and argued that earnings related variables like the earnings-to-price ratio could be used as proxies for expected returns. In that case, earnings-to-price ratio explains the portion of expected return that is in fact compensation for risk variables omitted from the tests. A valid question, then, is whether a documented relation between average returns and earnings-to-price is due to the influence of earnings-to-price, or whether earnings-to-price is merely a proxy for other explanatory variables of expected returns.

Banz (1981) examined the relationship between total market value of equity and common stock prices. The study included all common stocks quoted on the NYSE for at least five years between 1926 and 1975. Data were derived from monthly returns file of the Center for Research in Security Prices (CRSP) of the University of Chicago. Using pooled cross-sectional and time series regression, the study reported that small NYSE firms have significantly larger risk adjusted returns than large NYSE firms. The study found negative statistical association between returns and firm size.

Chen, Roll and Ross (1986) contributed to the fact that a long-term equilibrium relationship exists between stock prices and relevant macroeconomic variables, namely, term structure of interest rate, industrial production, inflation, among others, between 1953 and November 1984 to explain the US stock market returns. The study revealed that industrial production and measure of unanticipated inflation could explain significantly the expected returns. They found that asset prices react sensitively to economic news, especially to unanticipated news.

Chawala and Srinivasan (1987) studied the impact of dividend and retention on share price. They took 18 chemicals and 13 sugar companies and estimated cross section relationship for the year 1969 and 1973. The basic objectives of the study were to set a model to explain share price, dividend, and retained earnings hypothesis to examine the structural changes in estimated relation overtime. They found that in the case of chemical industry the estimated coefficients had the correct sign and the coefficient of determination of all the equations were very high. It implies that stock price and dividend supply variation could be explained by their independent variables. But in the case of sugar industry, they found that the sign for retained earnings is negative in both years. The conclusion made was dividend hypothesis holds well in the chemical industry. Both dividend and retained earnings significantly explain the variations in share price in chemical industry. They pronounced that impact of dividend is more pronounced than that of the retained earnings but the market has started shifting towards more weight for retained earnings.

Aggarwal, Hiraki, and Rao (1988) provided the evidence of significant earnings-to-price effect for a sample of 574 firms listed in the first section of the Tokyo Stock exchange during the period from 1974 to 1983. Including the firms only with positive earnings in the sample, the study revealed that portfolios of high earnings-to-price stocks could outperform those with low earnings-to-price stocks even after controlling for differences in systematic risk and size across portfolios.

Jaffe, Keim, and Westerfield (1989) evaluated the relation between size and earnings-to price effect on stock returns by using CRSP monthly stock return data for relatively a longer period from 1951 to 1986. The study was confined to earnings per share data from the COMPUSTAT files and the Contemporary Research file for the 1967-1986 periods and from the “back data” versions of these two files for the 1950-1966 period. Over the entire period, the study reported a significant earnings-to-price effect in both January and other eleven months.

Schwert (1989) examined the relation of stock volatility with respect to real and macroeconomic volatility. Using the monthly standard deviation of stock returns on Standard and Poor's composite portfolio from January 1928 through December 1987, and daily estimates of returns from February 1885 through December 1927 on the Dow Jones composite portfolio, the study examined whether the financial assets volatility could predict macroeconomic volatility or vice versa. The macroeconomic variables used in the study were Producer's Price Index (PPI) inflation, monetary base growth and the industrial production growth. The study indicated a significant relationship between stock returns and PPI inflation during sub-period 1953-1987. For the rest of the period, the PPI were found to have no power to explain the financial assets return. Thus, study noted weak evidence that macroeconomic volatility could help predict stock and bond returns volatility.

2.2.2 Review of major studies during 1990s

Chan, Hamao and Lakonishok (1991) attempted to study cross-sectional differences in stock returns in the context of stock market in Japan using four variables, namely, earnings-to-price, cash flow yield, size and book-to-market equity. The study used monthly data on stocks listed in the Tokyo Stock Exchange (TSE) from January 1971 to December 1988. The results indicated that high earnings-to-price stocks could outperform low earnings-to-price stocks. Small stocks achieved substantially higher returns than large stocks. However, regression analysis produced a striking result. The earnings-to-price effect was not significant across the different regression models and it was not even significant when earnings-to-price was the only independent variable. Among the four variables investigated, it was hardest to disentangle the effect of the earnings-to-price variable.

Easton & Harris (1991) were considered the earning as an explanatory variable for returns. They investigated whether prior period dividend to beginning stock price ratio can explain stock return or not? In other words, is it possible to predict future dividend and stock price through dividend or not? It was concluded that earning is an important elements for stock valuation and it can be used as an explanatory variable for stock return.

Fama and French (1992) evaluated the joint roles of market beta, size, earnings yield, leverage, and book-to-market equity in the cross-section of average returns by using all non-financial firms in the intersection of the NYSE, AMEX and NASDAQ returns file from the CRSP and COMPUSTAT files covering the period from July 1963 to December 1990. The study revealed that the relation between

average return and book-to-market equity was strongly positive. The regressions results also confirmed the importance of book-to-market equity in explaining the cross-section of average stock returns. The major studies conducted during 1990s has been summarized in the following table 2.2

Table 2.2

Review of the Major Studies During 1990s

This table summarizes the major studies conducted during 1990s. The first column presents the studies and second columns presents the major findings of the studies.

Study	Major Findings
Chan, Hamao and Lakonishok (1991)	The performance of book-to-market equity was found reasonably significant in explaining the stock returns.
Easton and Harris (1991)	The study confirmed the earning is an important elements for stock valuation and it can be used as an explanatory variable for stock return.
Fama and French (1992)	Book-to-market equity is important in explaining the cross-section of average stock returns and it is found stronger than size effect.
Kothari, Shanken and Sloan (1995)	The study noted that relationship between book-to-market equity and returns is weaker and less consistent than that in Fama and French (1992).
Davis (1994)	The study revealed significant relationship between book-to-market equity, cash flow yield and earnings yield, and subsequent returns. The study also demonstrated January seasonal in the explanatory power of these variables.
Lakonishok, Shleifer and Vishny (1994)	The glamour stocks outperformed value stocks because market consistently over estimated future growth rates of glamour stocks relative to value stocks.
Fama and French (1995)	The study showed that within book-to-market equity groups, small stocks tend to be less profitable than big stocks.
Mukherjee and Naka (1995)	They found that a long-term equilibrium relationship exists between the Japanese stock market and the six macroeconomic variables.
La Porta (1996)	The low earnings growth stocks beat high earnings growth stock significantly when stocks are sorted by expected growth rate in earnings.
Maysami and Koh (2000)	The study concluded that changes in the macroeconomic variables can predict the stock market movements.

Kothari, Shanken and Sloan (1995) presented a different view on cross-sectional variations in common stock returns. The study examined whether book-to-market equity could capture cross-sectional variation in average returns over a longer 1947 to 1987 period. The study noted that the relationship between book-to-market equity and returns was weaker and less consistent than that in Fama and French (1992).

Davis (1994) in an attempt to examine the cross section of common stock returns, used data from July 1940 to June 1963 with respect to book values, earnings, book-to-market equity, earnings-to-price, among others, during Pre-COMPUSTAT era. The study found significant relationship between certain variables such as book-to-market equity, cash flow yield and earnings-to-price, and subsequent returns during the period. Earnings-to-price displayed significant explanatory power in the regression analysis as well. The study also demonstrated a January seasonal in the explanatory power of several of the independent variables; much of the book-to-market equity, and earnings-to-price effects were in January.

Lakonishok, Shleifer and Vishney (1994) examined whether glamour stocks have negative returns around subsequent earnings announcements, and value stocks have positive returns. This was consistent with the market having the wrong expectations initially. Value Strategies call for buying stocks that have low prices relative to some measure of value (i.e. earnings, dividends, historical prices, or book assets). The sample period covered in the study was from the end of April 1963 to the end of April 1990. Using returns data from CRSP and accounting data from COMPUSTAT for universe of stocks in NYSE and AMEX, the authors found that glamour stocks did underperform relative to value stocks over 1968-90 period.

Fama and French (1995) analyzed whether the behavior of stock prices, in relation to size and book-to-market equity, reflect the behavior of earnings. The study focused on six portfolios formed yearly from a simple sort of firms into two groups on market equity and another simple sort into three groups on book-to-market equity. Using NYSE, AMEX and NASDAQ stocks data from 1963 to 1992, the study showed that size and book-to-market equity were related to profitability. The result confirmed that firms with high book-to-market equity tended to be persistently distressed and conversely, low book-to-market equity stocks were found to be associated with sustained strong profitability.

Mukherjee and Naka (1995) test the dynamic relationship between six macroeconomic variables and the Japanese stock market, by employing a vector error correction to a model of seven equations. They found that a long-term equilibrium relationship exists between the Japanese stock market and the six macroeconomic variables such as exchange rate, money supply, inflation, industrial production, long-term government bond rate and call money rate.

La Porta (1996) examined whether investors make the type of systematic mistakes that are consistent with the errors in expectation hypothesis when they forecast growth in earnings. The study used returns data from CRSP monthly NYSE, AMEX tape. Annual portfolio returns were constructed by compounding monthly returns. The study revealed earnings growth as only significant variable in multivariate regressions when it was combined with size, book-to-market equity, and cash-flow-to-price ratio. The regression results confirmed the role of the expected rate of earnings growth in explaining stock returns.

Maysami and Koh (2000) concluded that changes in the macroeconomic variables can predict the stock market movements. As Maysami and Koh study for the case of the U.S., Singapore, and Canada, it could be inferred that the significant influence of the macroeconomic variables on the stock market index is rather empirically proven for the developed countries. Nonetheless, the empirical finding for the case of the developing economies is still a puzzle. Despite the existence of a unidirectional causality from economic activities to stock market, there are also a substantial number of studies that show a significant relationship, running from stock market to economic variables.

2.2.3 Review of major studies during 2000s

Bilson et al. (2001) used value weighted world market index and some macroeconomic variables for explaining stock returns in selected emerging markets. Findings suggested that goods prices and real activity (GDP) have limited ability to explain the variation in returns. Money supply has greater importance, while the most significant variables are the exchange rate and the world market return.

Geyser and Lowies (2001) examined the relationship between share prices and inflation within a sample of firms listed in Namibian and Johannesburg Stock Exchanges. Their findings revealed a strong positive correlation between inflation and stock prices of Namibian firms. In South Africa, companies belonging to the mining sector cannot be served as an inflation hedge, whereas stock prices of firms in other sectors are slightly positively correlated with inflation.

The major studies conducted 2000s onwards have been summarized in the following table 2.3.

Table 2.3

Review of the Major Studies During 2000s

This table summarizes the major studies conducted during 2000s. The first column presents the studies and second columns presents the major findings of the studies.

Study	Major Findings
Bilson et al. (2001)	Their Findings suggested that goods prices and real activity (GDP) have limited ability to explain the variation in returns.
Geyser and Lowies (2001)	Their findings revealed a strong positive correlation between inflation and stock prices of Namibian firms.
Flannery and Protopapadakis(2002)	The study demonstrated the significant negative effect of real gross national product on volatility.
Jarmalaite (2002)	The study found that the association between returns and earnings differs substantially among the three countries: Lithuania, Latvia, and Estonia.
Wongbangpo and Sharma (2002)	The Results suggested that, in the long-run, stock prices are positively related to growth in output.
Ibrahim and Aziz (2003)	The study found a positive long-run relationship between stock prices and industrial production and between stock prices and inflation.
Maghayereh (2003)	Macro-economic variables were found significant in predicting stock prices.
Chen et al. (2005)	Their result showed that yield spread is not a significant determinant for stock prices.
Gan, Lee, Yong and Zhang (2006)	The results indicated that New Zealand stock returns are consistently determined by interest rate, money supply and real gross domestic product.
Fama and French (2008)	The study reported significant positive coefficient of book-to-market equity implying that higher book-to-market stocks have higher returns than lower book-to-market stocks.
Kandir (2008)	The study documented no significant effect of industrial production, money supply and oil price index on stock returns.
MarianVorek (2009)	The analysts have discovered that there is a negative correlation between the stock's yield and its level of price earnings ratio.
Alagidede and Panagiotidid (2010)	Found a positive long-run relationship between stock prices and inflation in five African countries (Tunisia, Egypt, South Africa, Kenya, and Nigeria).

Flannery and Protopapadakis (2002) evaluated the effect of macroeconomic variables on the daily returns to a broad equity market index over the 1980-1996 periods. The study included daily returns for the value-weighted NYSE, AMEX, NASDAQ market index obtained from CRSP. The study reported the significant effect of consumer price index, producer price index, and money supply on market value weighted returns. All three significant coefficients were negative indicating that higher than anticipated inflation or money supply depressed equity values. The study also demonstrated the significant negative effect of real gross national product on volatility.

Jarmalaite (2002) examined the relationship between accounting numbers and returns in the Baltic stock markets. The stock markets of three countries were investigated: Lithuania, Latvia, and Estonia. Evidence from this study suggested that the association between returns and earnings differs substantially among the three countries. Estonia shows the highest value relevance while Lithuania shows the lowest. The association in Latvia seems to be very similar to Estonia but it has high standard errors making the results less acceptable.

Wongbangpo and Sharma (2002) investigated the relationship between stock prices and some macroeconomic factors in five ASEAN countries (Indonesia, Malaysia, Philippines, Singapore and Thailand). Results suggested that, in the long-run, stock prices are positively related to growth in output. In the short-run, stock prices are found to be functions of past and current values of macroeconomic variables.

Ibrahim and Aziz (2003) in an attempt to establish a dynamic linkage between stock prices and macroeconomic variables in the case of Malaysia, analyzed standard and well-accepted methods of co-integration and vector auto-regression. The study considered the interactions between the Malaysian equity market and four macroeconomic variables including real output, money supply, price level and exchange rate. The study used data from January 1977 to August 1997. The study found a positive long-run relationship between stock prices and industrial production. This result was as per expectation and as such the study reasoned that real industrial production growth affect firm's expected future cash flow positively. It also reported a positive relationship between stock prices and inflation in context of Malaysia.

Maghayereh (2003) investigated the long run relationship between the Jordanian stock prices and selected macroeconomic variables, such as, interest rates, inflation and industrial production, by

using Johansen's co-integration analysis and monthly time series data over the period from January 1987 to December 2000. The results suggested a co-integration of stock price index with macroeconomic variables and provided a direct long run equilibrium relation with stock price index. Additionally, the study concluded that macroeconomic variables could be significant in predicting stock prices as such that stock price variability being fundamentally linked to economic variables.

Chen et al. (2005) adopted the yield spread to measure the term structure effect on the Taiwanese hotel stock returns. Their yield spread is derived from a subtraction of 10-year government bond yield and 3-month treasury bills rate. Their result shows that yield spread is not a significant determinant for stock prices. This could be due to the point highlighted by Mukherjee and Naka (1995) who propose that changes in both short and long term rates are expected to affect the discount rate in the similar way.

Gan, Lee, Yong and Zhang (2006) examined the relationship between the New Zealand Stock Exchange (NZSE) index and a set of macroeconomic variables during the period of January 1990 to January 2003 using time series data on inflation, long-term interest rate, short-term interest rate, real gross domestic product, and narrowly defined money supply. The co-integrated test indicated the existence of long run relationship between NZSE index and the macroeconomic variables. The study observed that New Zealand stock returns could be consistently determined by the interest rate, money supply and real gross domestic product.

Fama and French (2008) assessed the effect of book-to-market equity in different approach and studied that whether the past changes in book-to-market and price did contain independent information about the expected cash flows that could enhance the estimates of expected stock prices. The study used data from 1926 to 2006 and examined the effect in terms of share issue, changes in price and book equity per share and new issue of shares. The study reported significant positive coefficient of book-to-market equity implying that higher book-to-market stocks could have higher returns than lower book-to-market stocks.

Kandir (2008) investigated the role of macroeconomic factors in explaining Turkish stock prices. The macroeconomic variables used in the study were growth rate of industrial production index, change in consumer price index, growth rate of narrowly defined money supply, change in exchange rate, and interest rate. The study used data for all non-financial firms for the period from July 1997 through

June 2005. Three portfolios were formed according to the rank of the firms by book-to-market equity, earnings yield, and leverage ratio. The study revealed significant effects of exchange rate and interest rate on stock returns. Similarly, inflation rates were found positively related to the stock prices. The study demonstrated a negative relation between stock returns and interest rate meaning that investors tended to invest less in stocks when interest rate rise causing stock prices to fall.

Marian Vorek (2009) examined the strategy of value investing and its prediction for stock performance, especially in connection with falls in stock prices. The study prepared estimates of a common stock's intrinsic value by multiplying the respective multiplier (e.g. P/E, P/S, P/CF, P/BV) times the respective actual quantity of stock's earnings, sales, cash flow, book value, etc. The test on historic yields of stocks with their level of price earnings ratio was conducted. The results found that there is a negative correlation between the stock's yield and its price earnings ratio. He derived the investments strategies from undervalued basic fundaments which are expected to determine the stock price. This was typical for stocks traded with discount and at low multiples of sales (Price to Sales), book value (Price to Book Value), earnings (Price Earnings) and cash flow (Price Cash Flow). From long term prospective, the investment strategies based on the investments into stocks with low multiples result in comparably higher annual return. Success of these strategies was illustrated as on picture below.

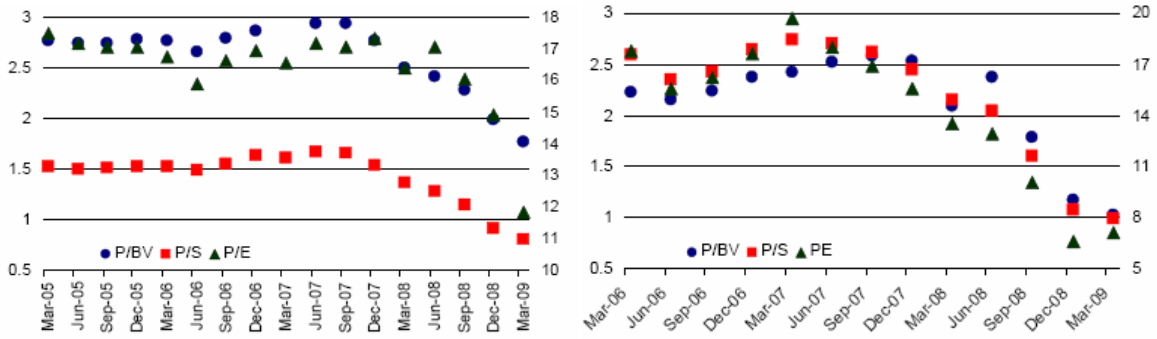


Fig. 2.2 Development of trading multiples of S&P 500 index and PX index (March 2005 – March 2009)

There was a decline in trading multiples of S&P 500 and PX prior to the current crisis. The multiples of S&P 500 peaked in summer 2007, when stocks were traded at 3 times multiple of book value, which means that investors valued the company 3 times higher than its accounting value of the equity. Price earnings and sales multiples amounted to 17, 1.6 respectively. Then, in September the trading multiple fell down to 1.8 for book value multiple, 12 for price earnings ratio and 0.6 for sales multiple.

In a very recent year, Alagidede and Panagiotidid (2010) provide evidence of a positive long-run relationship between stock prices and inflation in five African countries (Tunisia, Egypt, South Africa, Kenya, and Nigeria) and they conclude that common stocks in these countries represent a hedge against rising consumer price.

To sum up, the studies on firm specific variables have not documented consistent results. Some of these studies found that fundamental characteristics associated with firms are significant in explaining the common stock returns where others do not. Similarly, many of these studies have documented that macroeconomic variables do influence stock market prices and hence the stock returns, though the results are not consistent. Some found that inflation has significant effect on stock market returns while others found that real sector activity proxied by GDP captures much of the variation. Though there findings are available in many developed foreign stock markets, the effect of macroeconomic indicators are yet inconclusive in Nepalese stock market. Hence, this study attempts to reexamine the association among these variables in predicting stock prices in the context of Nepal.

2.2.3 Review of Nepalese studies

On the contrary to the number of studies associated with cross-sectional and macroeconomic volatility of stock prices in context of other developed capital markets, there are few empirical works in the context of Nepal. This sub-section provides review of empirical works associated with cross-sectional variation in common stock returns in context of Nepalese stock market.

In an attempt to address the stock market behavior in a small capital market in the context of Nepal, Pradhan (1993) examined relationship of market equity, market value to book value, price-earnings ratio, and dividends with liquidity, leverage, profitability, assets turnover and interest coverage ratio. The study was based on the data derived from the 17 companies listed in Nepal Stock Exchange (NEPSE) for the period 1986 to 1990. The study, among others, used simple linear regression to test whether profitability are significantly related to market equity. The study documented that larger stocks have lower profitability, meaning that returns are negatively related to the market value of equity. However, the study also noted that returns on larger stocks are less variable than that on smaller stocks. A brief overview on some related studies with their major findings is provided in the Table 2.4.

Table 2.4

Review of Nepalese Evidences on Stock Market Prices

This table summarizes the major studies conducted in Nepal. The first column presents the studies and second columns presents the major findings of the studies.

Study	Major Findings
Pradhan (1993)	Larger stocks have lower profitability as such that returns are negatively related to the market value of equity.
Manandhar (1998)	There is significant negative relationship between market capitalization and DPS.
Pradhan (2003)	Strong dividend effect and very weak retained earnings effect in determining market price of the share indicating attractiveness of dividends among Nepalese investors.
Baskota (2007)	There is no persistence of volatility in Nepalese stock market and the stock price movements are not explained by the macro-economic variables.
Basnet (2007)	Market price per share (MPS) is well explained by dividend and returns.
Adhikari (2009)	Nepalese capital market is still at infant stage, few stockbrokers and investors use to play role to influence market price of share.
Bhattarai and Joshi (2009)	The study documented both short-run and long-run interdependence among stock index and some macroeconomic variables.

Manandhar (1998) studied on dividend policy and value of the firm to identify some financial variables that are significant to the value of the firm. The study was based on the secondary financial data of top ten companies of the year 1995/1956 on the basis of traded amount. The result of the study was found as DPS and ROE have positive impact on market capitalization while EPS, P/E, and D/P has negative impact on market capitalization. For dividend, it was concluded that there is significant negative relationship between market capitalization and DPS.

Pradhan (2003) attempted to determine relative importance of dividends and retained earnings in determining market price of the share. He used cross section data of 29 companies from 1994 to 1999 with the total of 93 observations. The result showed the customary strong dividend effect, and very weak retained earnings effect, indicating attractiveness of dividends among Nepalese investors.

Baskota (2007) considered the NEPSE data during 1994 to 2006 and analyzed the effect of trading days, trading volumes, base money supply, interest rate, inflation and industrial production by means of regression analysis. The study concluded that there is no persistence of volatility in Nepalese Stock Market and stock price movements are not explained by macro-economic variables. Further, the study conducted event analysis for selected political incidents and concluded that the politics is not only the factor that explains the stock price moment in Nepal.

Basnet (2007) study considered effect of EPS, DPS and Cash flow on stock prices and concluded that market price per share (MPS) is well explained by dividend and returns. But the extent of dividend and retained earning effect is different in different industry. Dividend leads to significant positive effect on MPS and earning announcements helps to increase the stock price. It further concluded that the high price of the stock of financial institutions is the high dividend offered by this sector.

Adhikari (2009) has explained that Nepalese capital market is still at infant stage, few stockbrokers and investors use to play role to influence market price of share. Many investors use to buy/sell common stock based on market price trends without going through balance-sheet and other statements of accounts.

Bhattarai R.C. and Joshi N.K. (2009) conducted a study to examine the dynamic relationship among the stock market and macroeconomic factors for the stock market of Nepal. The study documented both short-run and long-run interdependence among stock index and some macroeconomic variables. The estimated results suggest unidirectional short-run (positive) causal relationship running from consumer price index (CPI) to stock index but reverse causality in the long run (from stock index to CPI), supporting the widely-held view that stock returns are a hedge against inflation.
These findings associated with the studies on firm specific fundamental and macroeconomic influences on common stock returns in the context of Nepal also vary across the studies as in the case of developed capital markets.

2.3 Concluding Remarks

The study on the behavior of stock market prices can be traced back to 1930, when Fisher explained how the market rate of interest and inflation affected the stock prices (Fisher, 1930). A large body of evidence suggests that the common stock returns are significantly explained by a number of firm specific factors and macroeconomic variables. Among other, Banz (1981) and Fama and French (1992) have postulated significant effect on cross-section of common stock returns. Similarly, studies by Chan, Hamao and Lakonishok (1991), Fama and French (1992; 1995; 2008), and other have documented the significant price earnings and book-to-market equity effects on the cross-section of common stock returns. Despite of inconsistency of findings among several studies, the majority of them provide some consensus in relation to price earnings ratio and dividend per share on common stock returns.

In addition to the firm specific characteristics' effect, the studies have also documented the impact of some leading macroeconomic variables on stock market returns. For example, Ibrahim and Aziz (2003) reported significant positive relation of stock market returns with inflation and negative relation with money supply indicating that money supply contributes to the inflation uncertainty. Chen (1991) found significant positive relation between stock returns and change in real economic activity measured by real GDP. Similarly, Kandir (2008) demonstrated a negative relationship between stock returns and interest rate. Despite these revelations, no consistencies have been observed among the studies in terms of the influences of different factors on stock market prices. This indicates that there is further research gap to examine the influences of different factors in determining stock prices.

Though aforesaid findings are available in developed and developing economies, there are only some studies of this type in the context of Nepal. Therefore, the findings derived from the studies in developed stock markets are yet to be tested for their relevancy in the context of smaller, immature and developing stock markets. This study is an attempt to identify the most persistent factors explaining stock prices and to evaluate the roles of firm specific and macroeconomic variables with a slightly different set of variables and data of more recent period. This study also extends existing literature by adding firm specific variables: book value per share and uniquely segregation of total dividend per share as cash dividend per share and stock dividend per share. In doing so this research study would not only be able to meet the academic requirement, but also contribute in the practical aspect of the capital market and stock market prices.

CHAPTER THREE
RESEARCH METHODOLOGY

This chapter discusses different aspects of the research methodology including research design, data collection and data analysis methods. This chapter has been divided into six sections. First section provides a description of research design used in the study. Second section deals with nature and sources of data. Third section describes the population and sample along with the selection of enterprises for the purpose of study. Similarly, fourth section describes method of analysis including the empirical models. Section five explains the variables and their measurement criteria. Finally, section six presents limitations of the study. The details of the research methodologies adopted are given in the following paragraphs.

3.1 Research design

This study has employed descriptive and causal comparative research designs to deal with the fundamental issues associated with factors influencing common stock prices in the context of Nepal. The descriptive research design has been adopted for fact-finding and searching adequate information about factors affecting common stock prices. This design has also been employed to assess the opinions, perceptions, and characteristics of respondents with respect to market preferences and market efficiency including factors affecting common stock prices in Nepal. Besides, an effort has also been made to describe the nature of pooled stock prices of 10 commercial banks consisting of 130 observations during fiscal year 1999/2000 to 2011/2012, with respect to firm specific variables such as earnings per share, book value per share, cash dividend per share, and stock dividend per share along with price earnings ratio. This study is also based on correlational research design. This design has been adopted to ascertain and understand the directions, magnitudes and forms of observed relationship between common stock prices and firm specific variables.

This study has also employed causal comparative research design to determine the effect size of firm specific variables on cross-sectional common stock prices and to examine whether it is possible to predict common stock prices on the basis of information about firm specific and macroeconomic variables. This study further aims to test the existing theoretical status based on the statistical model thus the positivism research paradigm has been followed. The detailed methodological issues are discussed extensively in respective sections of this study.

3.2 Nature and sources of data

This study is an empirical research based on secondary as well as primary data. The basic purpose of primary sources of information analysis is to survey the opinions of stakeholders on stock market prices with respect to overall efficiency of the stock market in Nepal and to analyze their perceptions with respect to factors affecting common stock prices. The secondary sources of data have been employed to understand the form of observed relation and to analyze predictive power of firm specific and macroeconomic variables in explaining common stock prices.

Based on the literature review presented in chapter two, the stock prices of the commercial banks are influenced by several factors and among them bank specific variables and macro-economic variables are found to be more important. The necessary data related to bank specific variables have been collected from the individual bank's annual reports, reports published by Nepal Rastra Bank, and the reports available from SEBON. The data related to macroeconomic variables such as GDP, inflation, and interest rates have been collected from economic survey published by ministry of finance-Government of Nepal, and database of IMF and World Bank. The study is based on the panel data of 10 commercial banks of Nepal for the total period of 13 years from fiscal year 1999/200 to 20011/2012. Thus, the study primarily deals with the secondary data. This method has been popularly used by previous researchers in predicting the stock prices of listed companies such as Fama (1977), Rosenberg, Reid, and Lanstein (1985), Chan, Hamao and Lakonishok (1991), Chen et. al. (2005) and Kandir (2008) among many others.

A] Secondary data

The secondary data for firm specific variables including stock market data have been obtained from financial statements of the sample banks' annual reports and from the database of Nepal Stock Exchange (NEPSE) Limited and Securities Board of Nepal (SEBON) provided in their respective websites. Overall, the period covered in study with respect to firm specific variables ranges from fiscal year 1999/200 to 20011/2012. Data on macroeconomic variables have been obtained from the sample bank's annual reports and from the publications of NRB, SEBON, NEPSE , IMF and World Bank.. The secondary data were also obtained from different web-sites, namely www.sebon.gov.np, www.nrb.org.np, www.nepalstock.com, www.cbs.np, and www.mof.gov.np. The detail of secondary data associated with stock prices and firm specific variables are provided in Appendix C and that of macroeconomic variables are shown in Appendix D.

3.3 Selection of enterprises

The sample firms for this study purpose are commercial banks. Those banks are selected as follows:

3.3.1 Criteria for selecting sample commercial banks.

The sample commercial banks that have been used for the study purpose are selected on the basis of availability of required information and data as per the criterion shown in table 3.1. The first column stands for serial number, criteria for selecting the bank are shown in second column and corresponding conditions are described in third column respectively.

Table 3.1

Criteria for selecting sample banks

S.N.	Criteria	Condition
1.	Type of bank	The Bank in the sample should be a commercial bank.
2.	Establishment	Bank should be the one that has already been established by 1998 B.S.
3.	Financial Statement	Bank should not be one that has not published its financial statement regularly.
4.	Stock Trading	The Bank should listed NEPSE and traded its stock prior to 2000 B.S.

3.3.2 Selection of commercial banks

The sample firms for this study purpose are commercial banks. There are thirty two **c**ommercial banks in operation in Nepal till date. Ten commercial banks established till 1998 have been taken as the sample banks. Since other banks came in operation after this period and due to unavailability of data of the same period, those banks were excluded from the sample and balanced panel data from 2000 to 2012 have been collected. During this period, Nepalese banking industry passed through different stages. Major political changes occurred during this period and there has been observed fluctuation in stock prices of commercial banks. Due to this scenario, the aforesaid sample period seems to be appropriate for analyzing the determinants of stock prices of commercial banks.

On the basis of the criteria given in Table 3.1, the commercial banks that are selected to examine the behaviour of stock market prices are shown in table 3.2. The names of the banks are shown in second column followed by the date of establishment in third column. The data collection period that has been collected for study are expressed in fourth column with headings fiscal years. The total number of observations during the fiscal year period has been reported in last column of this table.

Table 3.2

Study Period and Number of Observations

This table presents the study period and number of observations with respect to selected banks.

S.N.	Name of Bank	Estd.	Study Period	No. of Obs.
1	NABIL Bank Limited	1984	2000-2012	13
2	Nepal Investment Bank Limited	1986	2000-2012	13
3	Standard Chartered Bank Nepal Limited	1987	2000-2012	13
4	Himalayan Bank Limited	1993	2000-2012	13
5	Nepal SBI Bank Limited	1993	2000-2012	13
6	Nepal Bangladesh Bank Limited	1994	2000-2012	13
7	Everest Bank Limited	1994	2000-2012	13
8	Bank of Kathmandu Limited	1995	2000-2012	13
9	Nepal Credit & Commerce Bank Limited	1996	2000-2012	13
10	Nepal Industrial & Commercial Bank Limited	1998	2000-2012	13
	Total			**130**

3.4 Methods of Data Analysis

This section briefly discusses data analysis methods. The main purpose of data analysis in this study is to explore the predictive power of firm specific variables in explaining common stock prices for selected enterprises in the context of stock market in Nepal. Besides, the study also attempts to identify and analyze co-integration and causal relationship between stock market prices represented by NEPSE Index (NI) and a set of three macroeconomic variables, namely, inflation, interest rate, and real GDP. Therefore, this section deals with statistical and econometric models used for the purpose of analysis of both primary and secondary data.

The objectives of this section are (a) to outline the data analysis techniques that will be particularly applied in chapter four and (b) to appropriately match the selected data analysis methods to the types of data collected and research questions as outlined in chapter one. Zikmund (1997) suggested that the choice of the methods of statistical analysis depends on (a) the type of question to be answered, (b) the number of variables, and (c) the scale of measurement. Thus, based on these criterion descriptive statistics, cross-sectional, time series regression, and econometric models (panel data regression models) have been used as the methods of analysis. The descriptive statistics and econometric models have been explained as follows:

3.4.1. Descriptive statistics

This study has used the summary of descriptive statistics associated with dependent and independent variables of sample firms to explain the cross-sectional characteristics of these variables during the sample period. The descriptive statistics such as mean, median, standard deviations, minimum and maximum values of the variables- market price per share, earnings per share, book value per share, cash dividend per share, stock dividend per share, and price earnings ratio have been used to describe the characteristics of sample firms during the period 1999/00 through 20011/12. Besides, the study also has employed descriptive statistics associated with macroeconomic variables and stock market prices for the study period to explain the characteristics of these variables.

3.4.2. Correlation analysis

As stated in section 3.1 of the present chapter, this study is also based on correlational research design. This design has been basically adopted to identify the direction and magnitude of relationship between different pairs of variables. For this purpose, correlation analysis has been used. It is a statistical tool to identify direction and magnitude of relation between two set of variables. It shows how two variables move together and also shows the degree of association between them. The relationship has been explained by using bivariate Pearson correlation coefficient. The value of correlation coefficient ranges from -1 to +1. If correlation coefficient is exactly -1, two variables are said to have perfect negative correlation as such that they move together exactly into opposite direction. On the other hand, if correlation coefficient is +1, the variables are said to be perfectly positively related.

3.4.3. Analysis of portfolios formed

Secondary data analyses are also based on the analysis of univariate sort of portfolios formed on earnings per share, book value per share, cash dividend per share, stock dividend per share, and price earnings ratios. For the purpose of univariate sort of portfolios, total 130 observations of all sample banks over the period from 1999/00 through 20011/12 have been grouped into three equal groups of portfolios. The univariate sorts of the portfolios have been used to study the pattern of movement in cross-section of common stock prices with respect to firm specific variables. At each sort, the properties of stock prices movement has been observed and analyzed with respect to the movement in firm specific variables.

3.4.4. Econometrics models

The econometric models employed in this study intends to analyze the relationship between cross-section of common stock prices and the firm specific explanatory variables such as EPS, BPS, CD, SD & P/E. In addition to ordinary least square (OLS) method, Panel data regression models have been also used in this study. The balanced panel data from 10 commercial banks for the period of 2000 to 2012 have been considered. Asteriou (2006) argues that panel data models being more efficient methodology to control the chance of biased results by providing more degree of freedom on pooling the data. Based on the panel data, first of all pooled OLS model has been estimated in order to analyze overall impact of bank specific and macro-economic variables on stock prices of the banks without considering bank and time specific effect.

a. Ordinary Least Square (OLS) Model:

In order to explain the effect size of firm specific explanatory variables such as earnings per share, book value per share, cash dividend per share, stock dividend per share, and price earnings ratios on cross-section of common stock prices, the empirical regression model (Davis (1994)) of the form specified in equation (3.1) has been used.

$$P_{it} = \alpha + b_{1t} EPS_{it} + b_{2t} BPS_{it} + b_{3t} CD_{it} + b_{4t} SD_{it} + b_{5t} P/E_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots (3.1)$$

Where,

P_{it} = Market price per share (P) for bank i at time t.

α = Constant term, assume to be constant over time.

EPS_{it} = Earnings per share (EPS) for banks i at time t.

BPS_{it} = Book value per share (BPS) for banks i at time t.

CD_{it} = Cash dividend per share (CD) for banks i at time t.

SD_{it} = Stock dividend per share (SD) for banks i at time t.

P/E_{it} = Price earnings ratio (P/E) for banks i at time t.

$\varepsilon_{i.t}$ =Stochastic error term assumed to have zero mean constant variance and normal distribution.

and b_{1t}, b_{2t}, b_{3t}, b_{4t}, and b_{5t} are the respective parameters of the explanatory variables to be estimated.

i = 1 to 10 banks

t = 2000-2012

The cross-sectional variations in stock prices associated with earnings per share, book value per share, cash dividend per share, stock dividend per share, and price earnings ratios have been

examined by using a total of ten specifications of equation (3.1). First five specifications include simple linear regression of stock prices on earnings per share, book value per share, cash dividend per share, stock dividend per share, and price earnings ratios individually. Multiple regressions of specification six to ten have been used to evaluate the joint role of firm specific variables in different specifications to predict the stock prices respectively.

b. Pooled OLS Model:

In panel data analysis, the simple ordinary least square regression have been conducted by pooled regression model to identify the impact on stock prices by different independent variables excluding the impact of industry and time effects. The regression analysis starts from the following pooled regression model including firm specific and macroeconomic variables all together:

$$P_{it} = \alpha + b_{1t}\, EPS_{it} + b_{2t}\, BPS_{it} + b_{3t}\, CD_{it} + b_{4t}\, SD_{it} + b_{5t}\, P/E_{it} + b_{6t}\, GDP_{it} + b_{7t}\, INF_{it} + b_{8t}\, IR_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots (3.2)$$

Where,

P_{it} = Market price per share (P) for bank i at time t.

α = Constant term, assume to be constant over time.

EPS_{it} = Earnings per share (EPS) for banks i at time t.

BPS_{it} = Book value per share (BPS) for banks i at time t.

CD_{it} = Cash dividend per share (CD) for banks i at time t.

SD_{it} = Stock dividend per share (SD) for banks i at time t.

P/E_{it} = Price earnings ratio (P/E) for banks i at time t.

GDP_{it} = Gross domestic product (GDP) for bank i at time t.

INF_{it} = Inflation (INF) for bank i at time t.

IR_{it} = Interest rate (IR) for bank i at time t.

$\varepsilon_{i.t}$ =Stochastic error term assumed to have zero mean constant variance and normal distribution.

and b_{1t}, b_{2t}, b_{3t}, b_{4t}, b_{5t} b_{6t}, b_{7t}, and b_{8t} are the respective parameters of the explanatory variables to be estimated.

i = 1 to 10 banks

t = 2000-2012

c. One-Way Fixed Effect Regression Model (FEM):

In order to identify the industry effects on stock prices, one way fixed effect model of panel data analysis has been conducted. This model identifies the impact of different independent variables to the dependent variable in the case of heterogeneity among the cross sectionals units that is different banks in this study. To find out the impact of industry effects, one way fixed effect model need to add individual dummy variables for each unit or bank. Point to be noticed here is that, total banks used in this study are ten and created only 9 (total no. of bank used in the study less one). The reason behind deducting one dummy variable is to avoid the dummy variable trap. Dummy variables trap is the condition or situation of perfect collinearity. In equation (3.2) the intercept is constant over time. But in reality the intercept might be different based on the characteristic of different banks. In order to reflect the bank specific effect the following one-way fixed effect regression model has been estimated:

$$P_{it} = \alpha_i + b_{1t}\,EPS_{it} + b_{2t}\,BPS_{it} + b_{3t}\,CD_{it} + b_{4t}\,SD_{it} + b_{5t}\,P/E_{it} + b_{6t}\,GDP_{it} + b_{7t}\,INF_{it} + b_{8t}\,IR_{it} + \delta_i B_i + \varepsilon_{it} \quad \ldots\ldots\ldots \ldots\ldots(3.3)$$

In this model the subscript *i* is added in intercept to show that the intercept might be different with bank specific reasons and $\delta_i B_i$ represents dummy variable for the bank where $B_i = 1$ if the cross-sectional unit = 1 and 0 other wise and it has been used in a similar way for remaining dummies (B_i). Coefficients of unit dummies can also adjusted to the coefficient of benchmark to find out the coefficients of other banks. If the intercept value of b_1 i.e. actual intercept of NABIL is taken as benchmark then other 'du_n' coefficients are the intercept of other banks different from the benchmark (i.e. NABIL). This can be calculated as (β_1+ du_n, where n = 2, 3, 4, . . 9) for finding out the intercept of other banks. However, the assumption here is that the firm specific different intercepts do not vary over time i.e. time invariant.

d. Two-Way Fixed Effect Regression Model:

In order to identify the industry effects as well as time effect on stock prices, Two-Way Fixed Effect Model of panel data analysis has been conducted. This model identifies the impact of different independent variables to the dependent variable having the heterogeneity among the cross sectionals units (different industry types) as well as the time trends. In addition to unit dummy as in equation 3.3, this model also add time dummy in order to capture the time trends. Actually, the intercept might

be changed due to time effect (i.e. changes in different dimensions of stock prices determinants which might affect the stock prices of the banks over a period of time). Such model is called time variant model or two- way fixed effect model (Gujrati, Porter and Gunasekar, 2012) which is written as follows:

$$P_{it} = \alpha_{it} + b_{1t}\, EPS_{it} + b_{2t}\, BPS_{it} + b_{3t}\, CD_{it} + b_{4t}\, SD_{it} + b_{5t}\, P/E_{it} + b_{6t}\, GDP_{it} + b_{7t}\, INF_{it} + b_{8t}\, IR_{it} + \delta_i B_i + \delta_t T_t + \varepsilon_{it} \quad \ldots\ldots\ldots (3.4)$$

In this model, in intercept term *t* is added along with *i* in equation *(3.3)* to reflect both the bank and time specific effect in predicting stock prices of the commercial banks. The term $\delta_t T_t$ represents time dummy. The total time dummies used in the model are 12 (t-1). One dummy has been reduced in order to avoid the problem of dummy variable trap. Coefficients of the time dummies can also be adjusted to the coefficient of benchmark to find out the coefficients of other years.

e. Random Effect Regression Model (REM):

In above two previous models, this study used large numbers of dummy variables and if the dummy variables lack the true model or lack to capture the overall knowledge then the result will not be consistent. To avoid the lacking form the analysis this random effect model has been used. Random effect model express these ignorance through the disturbance term. The random effect model (REM) has also been estimated to overcome the problem (loss of degree of freedom) of inclusion of dummy variables to reflect the bank and time specific effect in the intercept term as above in equation (3.3) and (3.4). Here, intercept b_1 is fixed. The individual differences in the intercept values of each industry are reflected in the error term υ_{it}. Hence, the total residuals $\omega_{it} = \varepsilon_{it} + \upsilon_{it}$. The following random effect model has been estimated:

$$P_{it} = \alpha_i + b_1\, EPS_{it} + b_2\, BPS_{it} + b_3\, CD_{it} + b_4\, SD_{it} + b_5\, P/E_{it} + b_6\, GDP_{it} + b_7\, INF_{it} + b_8\, IR_{it} + \delta_i B_i + \delta_t T_t + \omega_{it} \quad \ldots\ldots\ldots (3.5)$$

where, $\omega_{it} = \varepsilon_{it} + \upsilon_{it}$

In this model $\alpha + u_i$ represents the α_i as in the case of model *(3.3)* and u_i denotes the individual difference in the intercept values of each bank. Before choosing fixed effect model or random effect model for further analysis, Hausman (1978) test has been conducted to test the null hypothesis that the unobserved effect is uncorrelated with the explanatory variables. If this hypothesis is not rejected, it indicates to choose the random effect model (REM).

As the conclusion of data analysis process, it can be summarized that simple OLS regression will be conducted in the beginning. The Autocorrelation and Multicollinearity test shall be conducted on the model. If any discrepancies are found, then pooled OLS regression model of panel data analysis will be conducted. Similarly, The Fixed Effect Least-Square Dummy Variable (LSDV) Model will be run to use its finding in Hausman Test. The Hausman Test will be carried out to choose whether to use Fixed Effect or Random Effect Model. After this, a test for Serial Correlation (Breusch-Godfrey/Wooldridge test) and Heteroskedasticity (Breusch-Pagan test) will be computed to confirm whether pooled OLS model or random effect model (REM) is appropriate for the study.

f. Models to analyze macroeconomic variables

As one of major objectives of this study is to ascertain the predictive power of macroeconomic variables to explain the variability in common stock prices and to identify whether there exist long-run equilibrium between stock prices and macroeconomic variables, the methodology employed to examine the long-run equilibrium is the cointegration test and Error Correction Model (ECM). The modeling strategy adopted in this study is based on the widely used Engle-Granger methodology (Engle and Granger, 1987). The steps involved for cointegration test are described as follows

i. Estimation of regression equation

First, the regression equation has been estimated in order to explain the influence of macroeconomic variables such as gross domestic product (GDP), Inflation (INF) and interest rate (IR) on stock market prices represented by NEPSE Index (NI) as follows.

$$NI_t = \alpha + \alpha_1 GDP_t + \alpha_2 INF_t + \alpha_3 IR_t + \varepsilon_t \qquad \ldots\ldots\ldots\ldots (3.6)$$

Where,

NI_t = NEPSE Index (NI) at time t.

α = Constant term, assume to be constant over time.

GDP_t = Gross domestic product (GDP) at time t.

INF_t = Inflation (INF) at time t.

IR_t = Interest rate (IR) at time t.

ε_t =Stochastic error term with the conventional statistical properties.

and α_1, α_2, and α_3 are the respective parameters of the explanatory variables to be estimated.

t = 2000-2012

ii. Unit Root Test

In second step, it is important to determine whether the variables used are stationary or non-stationary. If a series is non-stationary, then all the usual regression results suffer from spurious regression problem. To this end, the augmented Dickey-Fuller (ADF) test of stationarity is performed both on the levels and the first differences of the variables (Dickey and Fuller, 1981). The objective of carrying out a cointegration analysis is to determine the order of integration of the variables. Loosely speaking, a series $\{y_t\}$ is said to be integrated of order 1 (unit root) denoted as $I(1)$ if the series is not stationary while the first difference $\{\Delta y_t\}$ appear to be stationary. A series in integrated of order d , $I(d)$ if it can be difference d times to achieve stationarity. The ADF unit root tests uses the various specifications of the following regression:

$$\Delta y_t = \beta + \delta_t + \alpha\, y_{t-1} + \sum_{i=1}^{k} \varphi_i\, \Delta y_{t-i} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.7)$$

Where,

y_t = the level of the variable under consideration,
t= time term,
ε_t = normally distributed random error term with zero mean and constant variance.

iii. Cointegration Test

In the third stage, cointegration test is performed to identify the existence of a long-run relationship. Cointegration came to the limelight of time series econometrics through the work of Engle and Granger (1987) and Johansen (1988) seminal papers. Cointegration test is conducted to ascertain if there is any long-run relationship between two or more non- stationary time series (Karki, 2012). The existence of a long-run or equilibrium relationship among a set of non-stationary time series implies that their stochastic trends must be linked. Individually, the series may drifts or wander apart, but in the long run they will move together to restore equilibrium, since, equilibrium relationship means that the variable cannot move independently of each other. This linkage among the stochastic trends necessitates that the variables are cointegrated (Enders, 2004)). The cointegration test is two-step procedures which involve estimating the cointegrating regression equation (3.6) using Ordinary Least Squares (OLS) and then conducting unit root tests for the residuals $\hat{\varepsilon}_t$. According to Engle and Granger (1987), the stationarity of the residuals of the regression implies that the series are cointegrated.

iv. Error Correction Model (ECM)

The error correction model help to capture the rate of adjustment taking place among the various variables to restore long-run equilibrium in response to short-term disturbances in the impact of macroeconomic variables on stock market prices of Nepal. According to the Granger representation theorem (Granger, 1983; Engle and Granger, 1987), if a set of variables are cointegrated, then there exists a valid error-correction mechanism. Hence, a necessary and sufficient condition for cointegration is the existence of an error correction mechanism (ECM). If dependent variable *NI* is denoted as y_t and the entire explanatory variables in equation (3.6) as x_t , there exist an error-correction representation of the form:

$$\Delta y_t = \alpha_1 + \phi_1 (\beta' z_{t-1}) + \sum_{i=1}^{k} \varphi_j' \Delta z_{t-j} + \nu_t$$

$$\Delta x_t = \alpha_2 + \phi_2 (\beta' z_{t-1}) + \sum_{i=1}^{k} \lambda_j' \Delta z_{t-j} + \upsilon_t \qquad \text{.....(3.8)}$$

Where ν_t and υ_t are well-behaved error terms and $|\phi_1| + |\phi_2| \neq 0$. Since all terms in the ECM are I(0) 'stationary', there is no inferential problem and it can be estimated by the OLS method. The error correction models above describe how y_t and x_t behave in the short-run consistent with a long-run cointegrating relationship. A significant error correcting parameter indicates that cointegration indeed exist among the variables. Hence, ECM also serves as a confirmatory test for cointegration.

3.4.5 Diagnostic checking of the models

One of the assumptions of the regression models specified in above equations is that the random error terms (ε_{it}) are normally distributed with zero mean and equal variance. This assumption asserts that expected values of disturbance terms are not significantly different from zero. These random error terms are assumed to work as surrogates for all those variables that are omitted from the models but that collectively affect the dependent variable. Diagnostic checking is the process of validating the model. This study has employed several statistical tests of significance for this purpose. These tests include the test of autocorrelation, tests of multicollinearity and the test of overall significance of the model. The appraisal of regression models have been performed as described in the following section.

a. Test of autocorrelation

The term autocorrelation refers to the correlation between members of series of observations ordered in time as in time series data or in space as in cross-sectional data (Gujarati, 1995). In the context of regression analysis, the classical linear regression model assumes that such autocorrelation must not exist in random error terms. The assumption of no autocorrelation is often found to be violated in time series regression, though this problem is not more sounded in cross-sectional regression. However, in cross sectional data, the problem of spatial autocorrelation might be observed by chance. Such autocorrelation is the correlation in space rather than over time. In the presence of autocorrelation, the regression coefficients do not give unbiased estimates.

Durbin and Watson (1951) have provided a statistical test of the autocorrelation known as Durbin-Watson (DW) statistic. The problem of autocorrelation has been detected by *DW* statistic specified in equation (3.9).

$$DW = \frac{\sum_{it=2}^{t=n} (e_{it} - e_{it-1})^2}{\sum_{it=1}^{t=n} e_{it}^2} \qquad \text{……...(3.9)}$$

The equation (3.9) is simply the ratio of the sum of squared differences in successive error terms to the residual sum of square (RSS). Similarly, the number of observations in the numerator of the DW statistic is '*n–1'* because one observation is lost in taking successive differences. This test specifies a lower bound 'd_L' and upper bound 'd_U' of computed *DW* statistic. If computed *DW* statistic is less than or equal to 'd_L' there is the evidence of positive autocorrelation. On the other hand, if computed *DW* statistic is greater than or equal to '$4 - d_L$', there is the strong evidence of negative autocorrelation. However, if the computed *DW* statistic lies between 'd_U to '$4 - d_U$', there is no evidence to support the problem of autocorrelation. This study follows the similar procedures suggested by Durbin-Watson to detect the problem of autocorrelation.

b. Test of multicollinearity

One of the assumptions of multiple linear regression analysis is that no multicolinearity exists among the explanatory variables. If the problem of multicolinearity exists, data used in multiple regression analysis sometimes cannot provide decisive answers. This problem exists because of high inter-correlations among explanatory variables. When the explanatory variables are highly inter-correlated,

it becomes difficult to disentangle the separate effects of each of the independent variables on the dependent variable (Gujarati, 1995). In the presence of multicolinearity, the overall measure of goodness of fit as denoted by adjusted coefficient of determination (*Adj.* R^2) can be very high though one or more of the regression coefficients is statistically insignificant.

For the purpose of this study, the problem of multicollinearity has been detected by examining Variance Inflationary Factor (*VIF*) of each explanatory variable. *VIF* shows the speed with which variances and covariances increase. It has been calculated as specified in equation (3.10).

$$VIF = \frac{1}{(1-R^2)} \qquad \ldots\ldots\ldots\ldots (3.10)$$

In equation (3.10), *R* is the correlation coefficient between each pair of two explanatory variables. *VIF* shows how the variance of an estimator is inflated by the presence of multicollinearity. As correlation between two explanatory variable approaches 1, the *VIF* approaches to infinity. If a set of independent variables is uncorrelated (that is, $R = 0$), then VIF would be 1, and it is the perfect indication of no multicollinearity. Large *VIF* is the indicator of multicollinearity. As a general rule, the *VIF* usually greater than 10 shows the serious problem of multicollinearity. Therefore, if the *VIF* is observed to be less than 10, this study assumes that there is no severe problem of multicollinearity.

c. Test of overall significance of the model

It is necessary to test the joint hypothesis that all regression coefficients are simultaneously significant. This is called the test of overall significance of the model. This can be done by using adjusted coefficient of determination (*Adj.*R^2) and *F*- statistics. The adjusted coefficient of determination has been used to identify the percentage of total variation in dependent variable that has been explained jointly by all explanatory variables. The statistical significance test of this joint explanatory power has been conducted by using *F*-statistic. The *p*-value of *F*-test has been examined to confirm whether the regression models are significant at 1, 5 and 10 percent level. Generally, higher value of *Adj.* R^2 and significant *F*-statistic indicate the better explanatory power of the model. However, in empirical analysis it is not usual to obtain very high *Adj.* R^2 but find that some of the regression coefficients either are statistically insignificant or have sign that are contrary to a priori expectations. Therefore, in this study, more concern has been paid to the logical or theoretical relevance of the explanatory variables to the dependent variable and their statistical significance.

3.4.6 Definitions of the key terms

The definitions and justification of incorporating the variables used in the above models have been explained in this section. This section explains the firm specific and macroeconomic variables employed in the study along with their measurement criteria. The descriptions of the variables are as follows:

3.4.6.1 Dependent variable

Following are the dependent variables used in the model:

a. Stock Price (P_{it})

The cross-section of stock prices has been used as dependent variable of the study. It is the market price per share of each individual bank representing the sample. Consequently, the stock returns have been defined as the rate of change in market price of common stock of a firm during period *'t'* over the period *'t-1'*.

b. NEPSE Index (NI)

NEPSE Index (NOI) is a market value weighted index composed of the shares of listed companies from different sectors in the Nepalese stock exchange. It gives the investor a general idea about the direction and performance of the market. It is computed by dividing the total market value of all listed companies in the market for the current period over the total market value of companies included in the index for the previous period (1994). This index has been used in NEPSE since the trading session in 1994, where the closing prices in that session were used as a reference point. While measuring the impact of macroeconomic variables on stock prices, NEPSE Index has been representing stock prices in this study

3.4.6.2 Independent variables

The independent variables are categorized into firm specific and macroeconomic variables.

i. Firm specific variables

Following are the firm specific variables used in the model:

a. Earnings per share (*EPS*)

Comparing the price of two stocks is meaningless. Similarly, comparing the earnings of one company to another really doesn't make any sense. Using the raw numbers ignores the fact that the two companies undoubtedly have a different number of outstanding shares. It makes more sense to look at

earnings per share (EPS) for use as a comparison tool. The earnings per share is calculated by taking the net earnings and divide by the outstanding shares.

$$EPS = \frac{Net\ Earnings}{Outstanding\ Shares}$$

The EPS is helpful in comparing one company to another, assuming they are in the same industry, but it doesn't tell you whether it's a good stock to buy or what the market thinks of it. The priori expected sign of this measure is positive.

b. Book value per share (BPS)

Book value per share is just one of the methods for comparison in valuing of a company. The book value per share only looks at the equity on the balance sheet. Conceptually, book value per share is similar to net worth, meaning it is assets minus debt, and may be looked at as though what would occur if operations were to cease.

$$Book\ Value\ Per\ Share\ (BPS) = \frac{Total\ Shareholder's\ equity}{Total\ Outstanding\ Shares}$$

The priori expected sign of this measure is positive.

c. Cash dividend per share (CD)

The sum of declared cash dividends for every ordinary share issued. Cash dividend per share (CD) is the total cash dividends paid out over an entire year (including interim dividends but not including special dividends) divided by the number of outstanding ordinary shares issued. CD can be calculated by using the following formula:

$$Cash\ Dividend\ Per\ Share\ (CD) = \frac{Sum\ of\ cash\ dividends\ over\ a\ period}{Total\ outstanding\ shares}$$

The priori expected sign of this measure is positive.

d. Stock dividend per share (SD)

The sum of declared stock dividends for every ordinary share issued. Stock dividend per share (SD) is the total stock dividends paid out over an entire year divided by the number of outstanding ordinary shares issued. SD can be calculated by using the following formula:

$$Stock\ Dividend\ Per\ Share\ (SD) = \frac{Sum\ of\ stock\ dividends\ over\ a\ period}{Total\ outstanding\ shares}$$

The priori expected sign of this measure is positive.

e. Price-earnings ratio (*P/E*)

The price-earnings (P/E) ratio looks at the relationship between the stock price and the company's earnings. The P/E is the most popular metric of stock analysis, although it is far from the only one that should consider. The P/E ratio is calculated by taking the market share price and dividing it by the company's EPS.

$$P/E = \frac{Stock\ Price}{EPS}$$

The P/E gives an idea of what the market is willing to pay for the company's earnings. The higher the P/E the more the market is willing to pay for the company's earnings. Some investors read a high P/E as an overpriced stock and that may be the case, however it can also indicate the market has high hopes for this stock's future and has bid up the price. Conversely, a low P/E may indicate a "vote of no confidence" by the market or it could mean this is a sleeper that the market has overlooked. Known as value stocks, many investors made their fortunes spotting these "diamonds in the rough" before the rest of the market discovered their true worth. The priori expected sign of this measure is negative.

ii. Macroeconomic variables

As per the literature, macro-economic factors have also been shown to explain significant variation in commercial bank's stock prices. The following commonly used macro-economic variables have been used in this study as the independent variables:

a. Gross domestic product (GDP)

GDP is used as a proxy of real aggregate economic activity in an economy. Higher GDP represents economic prosperity of the country and stock returns are expected to influence positively. Ibrahim and Aziz (2003), McMillan (2005) and many others found positive significant positive relation between GDP and stock returns. The priori expected sign of this measure is positive.

b. Inflation *(INF)*

In literature inflation has been used as one of the macro-economic variables as predictor of stock prices. Alagidede and Panagiotidid (2010) found a positive long-run relationship between stock prices and inflation. The priori expected sign of this variable is positive.

c. Interest rate (IR)

The interest rate (IR) risk is another important financial and economic factor affecting the value of common stocks. The reduction in interest rates reduces the cost of borrowing and thus serves as an incentive for expansion. This will have a positive effect on future expected returns for the firm. Similarly, as considerable stocks investments are made with borrowed money, hence an increase in interest rates would make stock transactions more costly. Investors will require a higher rate of return before investing. This will reduce the demand for stock investment and thus lead to decline in stock prices. The priori expected sign of this measure is negative.

B] Primary data

The primary data used in this study are generated through field study and online questionnaire survey based on structured questionnaire collected from the respondents. The questionnaire survey has been conducted to record the opinions, perceptions, and characteristics of investors, executives, and security businesspersons with respect to stock market phenomenon. Total 110 questionnaires were distributed to investors, executives and security businesspersons in Nepalese. The set of questionnaires contained total of 10 questions of mixed type options such as personal information, closed-end multiple choice, Likert scale items, and open-end options. Most of the responses were collected from online survey method. The primary data are even used to determine the significance of the variables that were taken into consideration for the purpose of predicting stock market prices of commercial banks in Nepal. The description of respondents' profile and response rate is given in Table 3.1.

Table 3.3
Response rate of questionnaire survey

S.N.	Type of respondents	Distributed	Returned	Response rate
1	Investors	40	25	62.50%
2	Executives and employees	60	40	66.67%
3	Brokers and Security Business Persons	10	5	50%
	Total	**110**	**70**	**63.64%**

As the Table 3.3 indicates, 25 questionnaires out of 40 distributed to investors, 40 questionnaires out of 60 distributed to executives and employees, 5 questionnaires out of 10 distributed to brokers and security business persons were returned leading to an overall response rate of about 64% percent. Details of questionnaire contents are given in Appendix A.

3.5 Limitations of the study

There is no consistency on using explanatory variables of stock prices in the prior studies. However, the variables used in this study are based on prior studies as mentioned above. It has not been possible to incorporate all the explanatory variables available in the literature due to limitations of availability of data. As such, the explanatory variables included in the model as presented above may not explain the full effect on stock prices of commercial banks.

Among the commonly used variables also, the form of the data taken doesn't show a similar pattern such as most of the studies have taken simply the dividend per share (DPS) as explanatory variable while as in some cases cash dividend per share (CD) was taken. In this study, dividend is segregated in two parts cash dividend per share (CD) and stock dividend per share (SD) and included in the model independently. Though inclusion of these varriables has extended the existing theoretical models, it has not been tested yet in international researches. Thus it is considered as one of the limitations of the study.

The numbers of observation used in the study are only 130 due to unavailable of balanced panel data which might influence to obtain effective result. Due to these limitations the result of this study may not be generalized in other research context. The dependent variables stock prices are also expected to be influenced by stock beta, firm size, book-to-market equity, and earnings-to-price, and regulations, and other market structure variables. Incorporating these variables would certainly enrich the study. This indicates that, further research work can be conducted in Nepalese context considering these factors in the aforesaid models.

CHAPTER FOUR
PRESENTATION AND ANALYSIS OF DATA

This chapter provides systematic presentation and analysis of primary and secondary data to deal with various issues associated with common stock prices in the context of Nepalese commercial banks. In order to examine the accurate degree of influence of the different variables on stock market prices, secondary data has been collected and analyzed in a systematic way by using statistical and econometric tools as defined in chapter three and presented in this chapter. It is divided into four sections. The first section deals with presentation and analysis of secondary data associated with firm specific variables. The second section deals with presentation and analysis of secondary data associated with macroeconomic variables including the explanation of corresponding results. The third section covers the analysis of primary data and presents the results of questionnaire survey. Finally, the fourth section discusses on the concluding remarks associated with findings from primary and secondary data analysis.

4.1 Analysis of Secondary Data

This section attempts to analyze the secondary data associated with firm specific variables and stock prices to observe the cross sectional relationship between these variables. It also analyzes the bidirectional causal relationship between stock market prices and macroeconomic variables. The methods used for this purpose are descriptive statistics, correlational analysis, analysis of portfolios formed on one-way and two-way sorts of firm specific variables, cross sectional regression analysis and autoregressive models to test bidirectional causality. A detail issue of findings from data analysis has been dealt in the respective sections.

4.1.1 Firm specific effects on common stock prices

Ball (1978) stated that the firm with higher earnings-to-price ratio is also expected to have higher stock prices. Basu (1977) and Banz (1981) observed that the price-to-earnings ratio and the market capitalization of common equity (firm size), respectively, provided considerably more explanatory power than beta on prediction of stock prices. In contrast, Chan, Hamao and Lakonishok (1991) reported no conclusive evidence about earnings-to-price effect on common stock returns in Japan. Baker and Wurgler (2004b) showed that the disappearance of dividends can be explained by lower market valuations of payers during such periods.

Thus, the empirical evidences have documented no consistent effects of firm specific variables on stock prices. Though controversies exist among findings from these studies in the context of developed and growing stock markets around the world, little is known about these phenomena in the context of Nepalese stock market. Therefore, this section is devoted to examining the effects of firm specific variables on common stock prices in the context of Nepal by analyzing secondary data associated with variables under consideration. This section is broadly divided into five subsections. First subsection provides descriptive statistics associated with firm specific variables while second subsection deals with direction and magnitude of association among these variables based on correlation analysis. Third subsection describes the properties of stock prices with respect to firm specific variables based on the portfolio formed on one-way sorts. Fourth subsection provides the results of cross-sectional regression analysis and finally fifth subsection shows the analysis and presentation of data using panel data analysis models.

a. Descriptive statistics

As this study has employed descriptive research design, among others, descriptive statistics have been used to describe the characteristics of stock prices and firm specific variables during the study period. The descriptive statistics used in this study consists of mean, median, standard deviation, and minimum and maximum values associated with variables under consideration. Table 4.1 summarizes the descriptive statistics of firm specific variables used in this study during the period 1999/2000 through 2000/2012 associated with 10 sample firms listed in NEPSE.

In table 4.1, market price per share of the sample banks ranges from minimum Rs 94 to maximum Rs 6830 with an average of Rs 1202.88 and standard deviation of Rs 1230.14. The wider range of market price of share implies that the firm included in the sample varies in terms of their market share price. The Table 4.1 also reveals that earning per share of the firms varies significantly. It ranges from minimum negative Rs 84.77 to maximum positive Rs 176 with a mean value and standard deviation of Rs 50.63 and Rs 42.59 respectively. The firms also differ in terms of their book value per share. Book value per share has average value of Rs 195.76 per share with a minimum to maximum range of negative Rs 364 per share to Rs 512 per share respectively. The firms reveal similarities in terms of their before dividend tax cash dividend per share and before dividend tax stock dividend per share (in percentage).

Table 4.1
Descriptive Statistics of Firm Specific Variables associated with 10 Sample Firms during the Period 1999/00 through 20011/12

This table shows descriptive statistics- mean, median, standard deviation, minimum and maximum values- of firm specific variables associated with 10 sample firms listed in the population of NEPSE till mid-April 2013 with 130 observations for the period 1999/00 through 2011/12. P is the market price per share of common stock, , EPS is the earnings per share, BPS is the book value price per share, CD is the cash dividend per share, SD is the stock dividend per share, PE refers to price earnings ratio defined as the market price per share divided by corresponding earning price per share, and N refers to the number of observations.

Variables	P	EPS	BPS	CD	SD	PE
N	130	130	130	130	130	130
Mean	1202.88	50.63	195.76	21.15	31.87	43.05
Median	845.00	40.00	194.00	10.00	21.05	20.92
Std. Dev.	1230.14	42.59	131.21	29.70	35.20	89.78
Minimum	94	-84.77	-364	0.00	0.00	-162.16
Maximum	6830	176.00	512	130.00	140.00	656.25

Source: Data on firm specific variables in Appendix C

Cash dividend has average ratio of 21.15 percentage per share with a minimum to maximum range of zero percentage to 130 percentage per share respectively, whereas stock dividend per share falls within the range of minimum zero percentage to maximum 140 percentage per share with an average percentage of 31.87. Similarly, price earnings ratio has mean value of 43.05 times and standard deviation of 89.78 with minimum to maximum range of negative 162.16 to positive 656.25 times. It also indicates that firms differ significantly in terms of their price earnings ratio.

Table 4.1.1
Company-wise Stock Market Prices

This table presents the market price per share of the 10 commercial banks for the period of 2000-2012.

Year	NABIL	NIB	SCB	HBL	NSBI	NBB	EBL	BOK	NCC	NIC
2000	1400	1401	1985	1700	1165	1502	171	998	105	550
2001	1500	1150	2144	1500	1500	1100	145	850	110	399
2002	700	760	1575	1000	401	490	151	254	110	245
2003	740	795	1640	836	255	360	150	198	108	220
2004	1000	940	1745	840	307	354	172	295	115	218
2005	1505	800	2345	920	335	265	93	430	120	366
2006	2240	1260	3775	1100	612	199	218	850	94	496
2007	5050	1729	5900	1740	1176	550	293	1375	316	950
2008	5275	2450	6830	1980	1511	1001	322	2350	457	1284
2009	4899	1388	6010	1760	1900	280	345	1825	335	1126
2010	2384	705	3279	816	741	265	332	840	275	626
2011	1252	515	1800	575	565	266	264	570	167	520
2012	1355	511	1799	653	635	121	326	628	126	468

Source: Data from the annual reports of respective commercial banks.

Table 4.1.2

Year-wise average value of the firm specific variables and data on macroeconomic variables

This table shows the average value of each firm specific variable and the data on macroeconomic variables for the period 1999/00 through 2011/12. P is the market price per share of common stock, , EPS is the earnings per share, BPS is the book value price per share, CD is the cash dividend per share, SD is the stock dividend per share, PE refers to price earnings ratio defined as the market price per share divided by corresponding earning price per share, NI is the NEPSE Index, INF is the Inflation, IR is the interest rate, and GDP is the gross domestic product.

Year	P	EPS	BPS	CD	SD	PE	NI	INF	IR	GDP
2000	1180.1	57.42	227.1	24.50	43.16	94.12	360.7	2.48	3.32	234.57
2001	1090.3	47.56	210.3	18.75	30.26	55.00	348.4	2.69	5.36	235.87
2002	594	34.27	205.4	16.50	22.50	50.48	227.5	3.03	3.55	234.21
2003	559.7	40.47	208.9	21.43	22.80	23.46	204.9	5.71	3.95	242.89
2004	649.4	44.15	200.8	22.00	22.00	70.96	222	2.84	3.70	273.55
2005	795.6	45.63	182.5	23.91	29.91	24.49	286.7	6.84	3.94	304.65
2006	1200.5	48.02	174.3	31.35	37.90	38.29	386.8	7.56	3.25	324.92
2007	2121.6	59.74	172.2	24.36	42.86	79.12	683.9	6.10	2.77	363.91
2008	2627	69.06	182.5	19.57	40.90	37.28	963.4	10.91	2.35	434.02
2009	2197.8	68.64	210.1	15.73	38.38	32.84	749.1	11.61	6.80	436.75
2010	1156.1	53.33	193.7	19.82	30.57	20.82	477.7	9.98	8.13	532.58
2011	732.4	44.18	181	21.36	24.91	16.86	362.9	9.55	8.52	622.50
2012	732.9	45.77	196.1	15.66	28.22	15.96	389.7	7.70	1.15	626.17

The table 4.1.1 shows the variability in stock prices of each commercial bank during the span of time i.e from 1999/2000 to 2011/2012. Most prominently, it has been observed that the banks which have started the commercial operations earlier and have higher portfolios on balance sheet do have higher stock prices in the market. Similarly, average values of each firm specific variables and data on macroeconomic variables have been illustrated in table 4.1.2.

b. Correlation Analysis

The firm specific variables used in this study, particularly, market price per share, earning price per share, book value per share, before dividend tax cash dividend per share, before dividend tax stock dividend per share, and price earnings ratio are all scaled version of market price per share or market value of equity. Therefore, it is reasonable to expect some kind of statistically significant relationship among these pairs of variables. This section therefore is devoted to explaining the direction and magnitude of relationship among different pairs of these firm specific variables including stock prices. The correlation analysis has been performed for this purpose. Table 4.2 presents the value of bivariate Pearson correlation coefficient between different pairs of firm specific variables of 10 sample banks with 130 observations during the period 1999/2000 through 2011/2012.

Table 4.2

Bivariate Pearson Correlation Coefficients of Firm Specific Variables observed for 10 Sample Banks during the Period 1999/00 through 2011/12

This table reveals the bivariate Pearson correlation coefficients between different pairs of firm specific variables. P, EPS, BPS, CD, SD and PE which are as defined in the Table 4.1. The correlation coefficients are based on the data on P, EPS, BPS, CD, SD and PE from 10 sample banks listed in NEPSE till mid-April 2013 with 130 observations for the period 1999/00 through 20011/12. '' sign indicates that correlation is significant at 5 percent level and '**' indicates that correlation is significant at 1 percent level.*

	P	EPS	BPS	CD	SD	PE
P	1.00					
EPS	0.718**	1.00				
BPS	0.595**	0.732**	1.00			
CD	0.603**	0.810**	0.637**	1.00		
SD	0.776**	0.852**	0.720**	0.861**	1.00	
PE	-0.092*	-0.258**	-0.346**	-0.162	-0.178*	1.00

Source: Data on firm specific variables in Appendix C

In table 4.2, market prices per share of common stocks are positively related to earning per share, book value per share, cash dividend per share and stock dividend per share and the relationships are significant at 1 percent level. On the other hand, market prices per share are significantly negatively related to price earnings ratio. From among given set of four firm specific variables (that is, earning per share, book value per share, cash dividend per share and stock dividend per share), the stock dividend per share reveals stronger positive relation with market price per share than other. This suggests that the information contents of stock dividend more significantly influence the stock prices. The sign of coefficient is positive as to the priori expected sign. In the case of Nepalese commercial banks, the strong positive relationship may be due to the information content and boost up of investor's confidence with assumptions that the company will perform better in future.

Table 4.2 also indicates that correlations among different pairs of explanatory variables are also statistically significant except that of between price earnings ratio and before dividend tax cash dividend per share. All other correlations are statistically significant at 1 percent level except the correlation between stock market price and price earnings ratio and correlation between price earnings ratio and before dividend tax stock dividend per share which are significant at 5 percent level. Among firm related fundamental variables, the highest positive correlation coefficient is recorded at 0.852 between earnings per share and before dividend tax stock dividend per share and the highest negative correlation accounted at 0.258 between price earnings ratio and earnings price per share. The result of high positive correlation between earnings per share and before dividend tax

stock dividend per share supports the fact that if the company earns more than it will be able and provides more stock dividend per share. The highest negative correlation between price earnings ratio and earnings price per share suggested that if the company has high price earnings ratio i.e. market value of share is unexpectedly higher than the earnings per share such company's share price of the market shall be decreased as the investors realize the position and get other better investment alternatives. The other correlations are relatively lower and are statistically significant. Gujarati (1995) states that high correlations (in excess of 0.8) are a sufficient but not necessary condition for the existence of multicollinearity because it can exist even though the correlations are comparatively low (less than 0.5). However, correlations being observed among different pairs of explanatory variables in Table 4.2 give sufficient evidence to believe that the problem of multicollinearity may not exist in the analysis.

c. Analysis of portfolios formed

Properties of stock market prices with respect to firm specific variables have been analyzed in this subsection by forming five equal percentiles portfolios based on one-way sorts of earnings per share, book value per share, before dividend tax cash dividend per share, before dividend tax stock dividend per share and price earnings ratio. The characteristics of market price per share and standard deviations associated with each of these univariate sorts of portfolios are described below.

i. Properties of portfolios sorted on earnings price per share

Earnings price per share has been used as a proxy for common stocks returns. For the purpose of analyzing and examining the relationship of earnings per share with stock prices and other firm specific variables, three equal group portfolios were sorted by earnings per share. The portfolio groups corresponding to each of the firm specific variables are reported in Table 4.3. This shows that market price of common stocks increase with earnings per share when it moves from lowest group portfolio to the highest group portfolio. The stock prices on lowest earning per share portfolio is Rs. 445 and it shows a clear pattern of increment with earnings per share that reaches to maximum Rs. 2326 in highest earnings per share portfolio. The results indicate that banks with higher level of earnings per share have higher market price per share than those with lower earnings per share. This result is consistent with the postulates that stock returns are larger for the firms with larger stock beta and earnings per share and confirms with earlier studies by Black (1972) and Black, Jensen and Scholes (1972).

Table 4.3
Portfolio Sorted on Earnings Price per Share

The table presents lowest, intermediate and highest portfolios based on the earnings price per share that include total 10 sample firms with 130 observations for the period from 1999/00 to 2011/12. The variables are earnings per share (EPS),market price per share (P),book value per share (BPS),before dividend tax cash dividend per share (CD), before dividend tax stock dividend per share (SD) and price earnings (P/E) ratio. 'n' denotes to the number of observations in each portfolio. The EPS has been divided into three categories on the basis of its minimum and maximum value and the average of different bank specific variables are calculated as the mean values of corresponding banks that fall in the respective portfolio.

	Portfolios Sorted by EPS		
	Lowest (≤ 28.00)	Intermediate (>28.00 ≤ 60.00)	Highest (>60.00)
P	445	910	2326
BPS	96	198	298
CD	2.36	12.86	50.15
SD	5.91	24.86	66.98
PE	86.09	20.72	22.97
n	43	44	43

Source: Data on firm specific variables in Appendix C

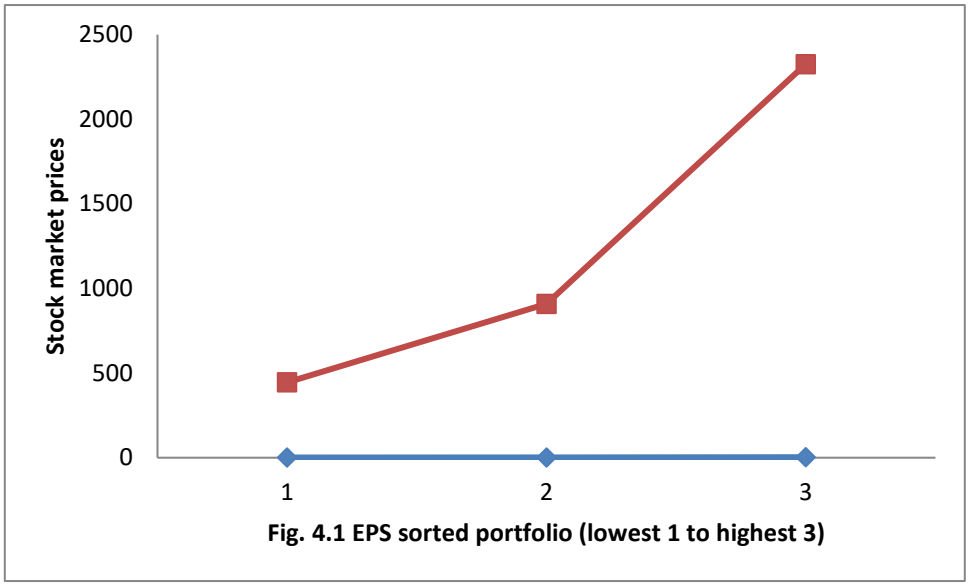
Table 4.3 also indicates the pattern of movement of other firm specific variables with respect to earnings per share. As the results show, book value per share, before dividend tax cash dividend per share and before dividend tax stock dividend per share also increase with earnings per share from lowest portfolio to highest portfolio. The book value per share in lowest earnings per share portfolio is equal to 96, which has been increase to 198 in intermediate portfolio and 298 in highest portfolio. Before dividend tax cash dividend per share increases from 2.36% in lowest portfolio to 50.15% in highest portfolio. Similarly, before dividend tax stock dividend per share increases from 5.91% in lowest portfolio to 66.98% in highest portfolio. The results in general imply that firms with high earnings per share have higher book value per share, higher market price per share and provide higher dividend to its shareholders. However, price earnings ratio shows the initial movement in opposite direction with earnings per share. Price earnings ratio decreases from lowest portfolio to intermediate portfolio from 86.09 times to 20.72 times and then slightly increases in highest portfolio to 22.97 times.

Figure 4.1 shows the graphic pattern of movement in market price per share with respect to earnings per share in three earnings per share sorted portfolios. The market price of common stock line shows a trend of upward movement to the right with increase in earnings per share from portfolio lowest to highest (1 to 3). This implies that market price per shares are higher for the firms with higher earnings per share.

Figure 4.1

Trend of Movement in Cross-Section of Average Market Price per Share with Respect to Three Earnings per Share Sorted Portfolios of 10 Sample Banks during the Period 1999/00 through 2011/12

This figure shows the plot of average market prices of stock associated with each of the three EPS sorted portfolios. The vertical axis measures the stock prices and horizontal axis measures the size of EPS sorted three portfolios from lowest portfolio 1 to highest portfolio 3. Each dot on the upward moving line in the figure shows plot of stock prices corresponding to EPS.



ii. Properties of portfolios sorted on book value per share

The book value per share has been measured by book net-worth of the firm divided by number of shares outstanding. In order to examine the properties of movement in stock prices and other firm specific variables with respect to book value per share, three equal group portfolios were formed on the basis of univariate sorts by book value per share. The portfolio groups corresponding to each of the firm specific variables are reported in Table 4.4.

The market prices per shares show a general pattern of movement into same direction with firm's book value per share. In other words, the common stock prices increase with book value per share. The market price per share for the lowest size portfolio (that is, portfolio 1) is Rs. 447 and it has been increased to Rs. 2220 in the highest size portfolio (that is, portfolio 3). The results in general indicate that the bank's having higher book value per shares have higher stock prices. Stattman (1980) and Rosenberg, Reid, and Lanstein (1985) find that average returns on U.S. stocks are positively related to the ratio of a firm's book value of common equity, BE, to its market. value, ME. Chan, Hamao, and Lakonishok (1991) find that book-to-market equity, BE/ME, also has a strong role in explaining the cross-section of average returns on Japanese stocks. In Nepalese context also the result is consistent with these studies.

Table 4.4
Portfolios Sorted by Book Value per Share

The table presents lowest, intermediate and highest portfolios based on the book value per share that include total 10 sample firms with 130 observations for the period from 1999/00 to 2011/12. The variables are earnings per share (EPS), market price per share (P),book value per share (BPS),before dividend tax cash dividend per share (CD), before dividend tax stock dividend per share (SD) and price earnings (P/E) ratio. 'n' denotes to the number of observations in each portfolio. The BPS has been divided into three categories on the basis of its minimum and maximum value and the average of different bank specific variables are calculated as the mean values of corresponding banks that fall in the respective portfolio.

	Portfolios Sorted by BPS		
	Lowest (≤ 150)	Intermediate (>150 ≤ 233)	Highest (>233)
P	447	908	2220
EPS	17.7	39.34	93.36
CD	2.51	13.63	46.45
SD	5.42	23.70	65.30
PE	73.86	33.03	23.66
n	42	44	44

Source: Data on firm specific variables in Appendix C

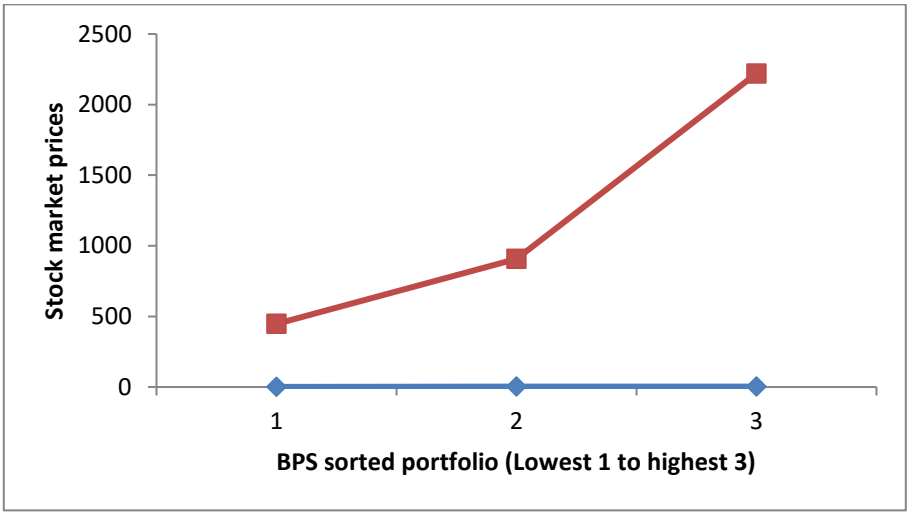
In addition to the pattern of movement in stock prices, Table 4.4 also indicates the patterns of movement in other firm specific variables with the variable; book value per share. The results indicate that earnings per share, cash dividend per share and stock dividend per share increase with increase in book value per share. The earnings per share for small firm size portfolio is 17.7 which has been increased to 93.36 in large firm size portfolio. Similarly, cash dividend per share ratio has been increased from 2.51 in small firm size portfolio to 46.45 in large firm size portfolio. On the other hand, stock dividend per share has been increased significantly from 5.42 in small size portfolio to 65.30 in large firm size portfolio. The price earnings ratio in lowest firm size portfolio has average value of 73.86, which has been declined to 23.66 in the highest firm size portfolio.

The relationship of movement in stock market prices with respect to book value per share is graphically depicted in Figure 4.2. The stock market prices line shows a general upward trend which implies that common stock prices increase with the book value per share. As the graph shows, the pattern of increase in stock prices from portfolio 1 to 2 seems to have a steady linear slope. However, the slope of line has been increased significantly when moved from portfolio 2 to 3. This implies that the rate of increment in stock prices is larger in portfolio 2 to 3. The general pattern of movement in stock prices is in increasing trend. Therefore, the stocks having higher book value per shares have higher stock prices.

Figure 4.2

Trend of Movement in Cross-Section of Average Market Price per Share with Respect to Three Book Value per Share Sorted Portfolios of 10 Sample Banks during the Period 1999/00 through 2011/12

This figure shows the plot of average market prices of stock associated with each of the three BPS sorted portfolios. The vertical axis measures the stock prices and horizontal axis measures the size of BPS sorted three portfolios from lowest portfolio 1 to highest portfolio 3. Each dot on the upward moving line in the figure shows plot of stock prices corresponding to BPS.



iii. Properties of portfolios sorted on dividend per share

Dividend price per share has been used as a proxy for common stocks prices. In this study, dividend per share has been segregated in to cash dividend and stock dividend per share. However, for forming the portfolio annual cash dividend and stock dividend has been added to give up the total as dividend per share (DPS). For the purpose of analyzing and examining the relationship of dividend per share with stock prices and other firm specific variables, three equal group portfolios were sorted by earnings per share. The portfolio groups corresponding to each of the firm specific variables are reported in Table 4.5.

Table 4.5 shows that market prices of common stocks increase with dividend per share share when it moves from lowest group portfolio to the highest group portfolio. The market share price on lowest dividend per share portfolio is Rs. 412 and it shows a clear pattern of increment with dividend per share that reaches to maximum Rs. 2094 in highest dividend per share portfolio. The results indicate that banks with higher level of dividend per share have higher market price per share than those with lower dividend per share. This result is consistent with the findings of Baker and Wurgler (2004b) which postulates that dividend paying forms are considered less risky than non-payers ones and investors make the risk assessment accordingly. High dividend paying companies have higher stock prices.

Table 4.5

Portfolio Sorted on Dividend per Share

The table presents lowest, intermediate and highest portfolios based on the dividend price per share that include total 10 sample firms with 130 observations for the period from 1999/00 to 2011/12. The variables are dividend per share (DPS), earnings per share (EPS), market price per share (P), book value per share (BPS), and price earnings (P/E) ratio. 'n' denotes to the number of observations in each portfolio. The DPS has been divided into three categories on the basis of its minimum and maximum value and the average of different bank specific variables are calculated as the mean values of corresponding banks that fall in the respective portfolio.

	Portfolios Sorted by DPS		
	Lowest (≤ 20%)	Intermediate (>20% ≤50%)	Highest (>50%)
P	412	1004	2094
EPS	16.4	40.23	90.84
BPS	77.68	197.14	299.72
PE	79.89	30.01	22.42
N	43	43	44

Source: Data on firm specific variables in Appendix C

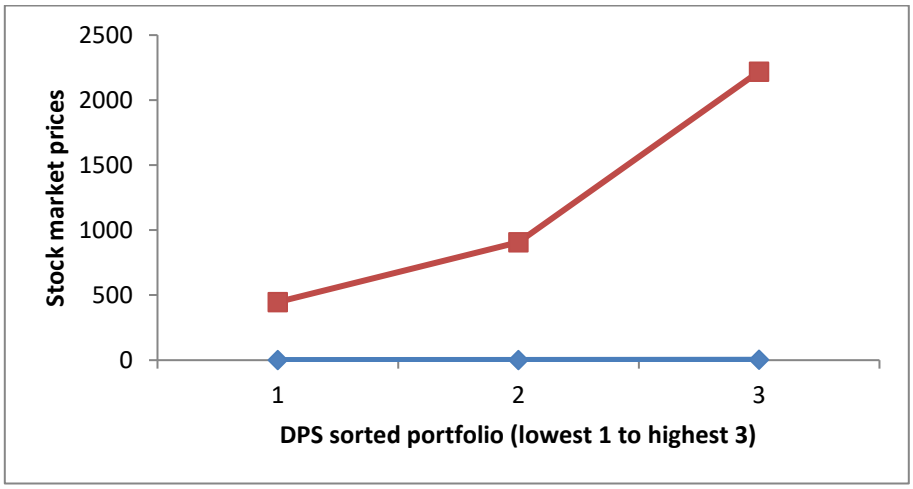
Table 4.5 also indicates the pattern of movement of other firm specific variables with respect to earnings per share. As the results show, earnings per share and book value per share also increase with dividend per share from lowest portfolio to highest portfolio. The earnings per share in lowest dividend per share portfolio is equal to Rs. 16.40, which has been increase to Rs. 40.23 in intermediate portfolio and Rs. 90.87 in highest portfolio. The book value per share in lowest dividend per share portfolio is equal to Rs. 77.68, which has been increase to Rs. 197.14 in intermediate portfolio and 299.72 in highest portfolio. The results in general state that firms with high dividend per share have higher earnings per share and higher book value per share. However, price earnings ratio shows the opposite direction with dividend per share. Price earnings ratio decreases from lowest portfolio to intermediate portfolio from 79.89 to 30.01 and further decreases to 22.42 in highest portfolio. The results in general imply that high dividend paying banks' stocks are not overpriced.

Figure 4.3 shows the graphic pattern of movement in market price per share with respect to dividend per share in three dividend per share sorted portfolios. The market price of common stock line shows a trend of upward movement to the right with increase in dividend per share from portfolio lowest to highest (1 to 3). This implies that market price per shares are higher for the firms with higher dividend per share.

Figure 4.3

Trend of Movement in Cross-Section of Average Market Price per Share with Respect to Three Dividend per Share Sorted Portfolios of 10 Sample Banks during the Period 1999/00 through 2011/12

This figure shows the plot of average market prices of stock associated with each of the three DPS sorted portfolios. The vertical axis measures the stock prices and horizontal axis measures the size of DPS sorted three portfolios from lowest portfolio 1 to highest portfolio 3. Each dot on the upward moving line in the figure shows plot of stock prices corresponding to DPS.



ii. Properties of portfolios sorted on price earnings (P/E) ratio

The price earnings ratio has been measured by market price per share divided by earnings per share. In order to examine the properties of movement in stock prices and other firm specific variables with respect to P/E ratio, three equal group portfolios were formed on the basis of sorts by price earnings ratio. The portfolio groups corresponding to each of the variables are reported in Table 4.6.

Table 4.6

Portfolios Sorted by Price Earnings Ratio

The table presents lowest, intermediate and highest portfolios based on the price earnings ratio that include total 10 sample firms with 130 observations for the period from 1999/00 to 2011/12. The variables are price earnings (P/E) ratio, earnings per share (EPS), market price per share (P), book value per share (BPS), cash dividend per share (CD), and stock dividend per share (SD). 'n' denotes to the number of observations in each portfolio. The P/E has been divided into three categories on the basis of its minimum and maximum value and the average of different bank specific variables are calculated as the mean values of corresponding banks that fall in the respective portfolio.

	Portfolios Sorted by P/E		
	Lowest (≤ 16.5 times)	Intermediate (>16.5 ≤ 30 times)	Highest (>30 times)
P	732	1173	1740
EPS	55.44	54.53	41.19
BPS	180.95	234.02	169.66
CD	23.47	24.37	15.12
SD	30.88	34.75	29.78
N	44	43	43

Source: Data on firm specific variables in Appendix C

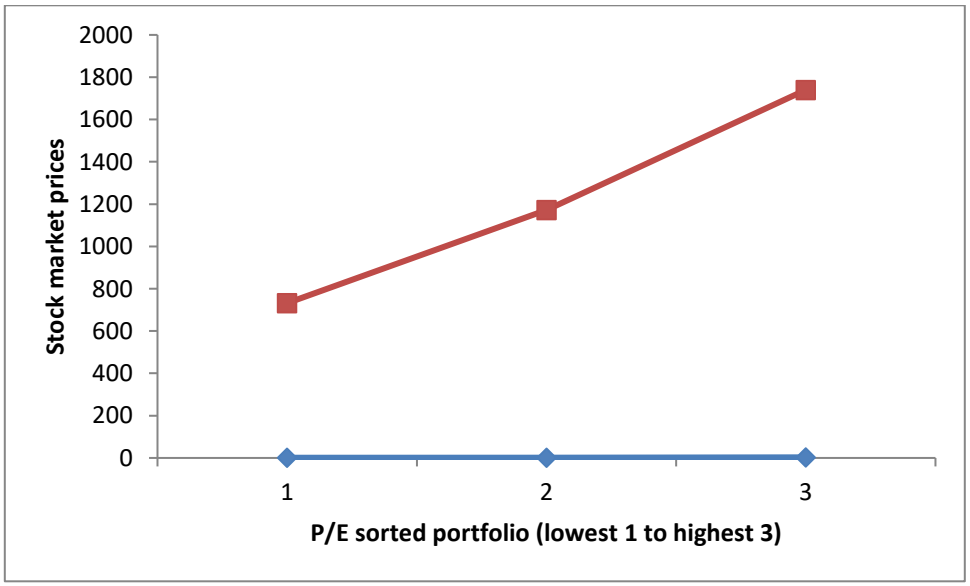
The market prices per shares show a general pattern of movement into same direction with firm's price earnings ratio. The market price per share for the lowest size portfolio (that is, portfolio 1) is Rs. 732, for the intermediate size portfolio Rs. 1173 and it has been increased to Rs. 1740 in the highest size portfolio (that is, portfolio 3). The results in general indicate that the bank's having higher price earnings ratio have higher stock prices. Marian Vorek (2009) found a negative correlation between stock's yield and its level of price earnings ratio. In Nepalese context the result is inconsistent with this study.

As shown in table 4.6, the value of earnings per share decreases with the increase in P/E ratio. The earnings per share decreases from 55.44 (in lowest portfolio) to 54.53 (in intermediate portfolio). It further decreases to 41.19 in highest portfolio. The pattern of movement in stock prices with other variables; book value per share, cash dividend per share and stock dividend per share has puzzling results. Their value are in increasing trend with increase in P/E ratio moving from lowest portfolio to intermediate portfolio but decrease in highest portfolio. The results in general imply that the stock prices of banks having higher price earnings ratio are overpriced. The relationship of movement in stock market prices with respect to price earnings ratio is graphically depicted in Figure 4.2.

Figure 4.4

Trend of Movement in Cross-Section of Average Market Price per Share with Respect to Price Earnings Ratio Sorted Portfolios of 10 Sample Banks during the Period 1999/00 through 2011/12

This figure shows the plot of average market prices of stock associated with each of the three P/E sorted portfolios. The vertical axis measures the stock prices and horizontal axis measures the size of P/E sorted three portfolios from lowest portfolio 1 to highest portfolio 3. Each dot on the upward moving line in the figure shows plot of stock prices corresponding to P/E.



The stock market prices line shows a general upward trend which implies that common stock prices increase with the price earnings ratio. As the graph shows, the pattern of increase in stock prices from portfolio 1 to 3 seems to have a steady linear slope. Therefore, the banks having higher stock prices have higher price earnings ratio.

d. Cross-sectional regression analysis

This study starts with secondary data analysis based on cross-sectional regression model specified in chapter three. In order to test the statistical significance and robustness of the results, it basically deals with regression results from various specifications of the models to examine the estimated relationship of stock prices with firm specific variables for cross-sectional data of 10 sample banks that include 130 observations during the period 1999/2000 through 2011/2012. In this section, an attempt also has been made to test the validity of the model through statistical test of significance such as *t*-test, *F*-test, adjusted coefficient of determination (*Adj*. R^2), and the test of autocorrelation and multicollinearity.

The regression results have been reported in Table 4.7 . The model specifications I through V report the simple regression results, where stock prices have been regressed on various firm specific variables individually. The specifications VI through X report the multiple regression results, where various firm specific variables taken together have been used as regressors. The full version of the model has been reported in specification X, where all the firm specific variables have been used as explanatory variables.

The simple regression result of stock prices on earnings per share (EPS) in specification I shows a positive relationship of stock prices with EPS. The slope coefficient of EPS is significant at 1 percent level which implies that stock prices increase with earning per share. The reported *F*-statistic (136.533) is also significant at 1 percent level meaning that the model explains better the stock prices. This result is consistent with the studies by Basu (1977, 1983), Banz (1981), Reinganum (1981), Lakonishok and Shapiro (1986), and Jaffe, Keim, and Westerfield (1989). Similarly, the regression result of stock prices on book value per share in specification II shows a positive relationship between stock prices and book value per share and the regression coefficient of book value per share is statistically significant at 1 percent level. The reported *F*-statistic (70.236) is also significant at 1 percent level, the adjusted coefficient of determination is 0.349. It implies that 34.9 percent of the total variations in common stock prices are captured by book value per share.

Table 4.7

Estimated Relationship from Cross-Sectional Regression of Stock Prices on Earning per Share, Book Value per Share, Cash Dividend per Share, Stock Dividend per share, and Price Earnings Ratio for 10 Sample Banks with 130 Observations during the Period 1999/00 through 2011/12

$$Model: P_{it} = \alpha + b_{1t} EPS_{it} + b_{2t} BPS_{it} + b_{3t} CD_{it} + b_{4t} SD_{it} + b_{5t} P/E_{it} + e_{it}$$

This table shows regression results of stock prices on five firm specific variables based on pooled cross-sectional data of 10 banks listed in NEPSE with 130 observations from the year 1999/00 to 2011/12. The regression results consist of various specifications of the models in the form of simple and multiple regressions. The reported values are intercepts and slope coefficients of respective explanatory variables with t-statistics in the parentheses. Dependent variable is the stock price denoted as P_{it}, and independent variables are Earning per Share (EPS_{it}), Book Value per Share (BPS_{it}), before dividend tax Cash Dividend per Share (CD_{it}), before dividend tax Stock Dividend per share (SD_{it}), and Price Earnings Ratio (P/E_{it}). The reported results also include the values of F-statistics (F), adjusted coefficient of determination (Adj. R^2), and standard error of estimates (SEE). The single asterisk (*) sign indicates that result is significant at 1 percent level, and double asterisk (**) sign indicates that result is significant at 5 percent level.

	Dependent Variable: Stock Price								
Specification	**Intercept**	***EPS***	***BPS***	***CD***	***SD***	***P/E***	***F***	***Adj. R^2***	***SEE***
I	152.133 (1.297)	20.752 (11.685*)					136.533*	0.512	859.033
II	110.450 (0.705)		5.580 (8.381*)				70.236*	0.349	992.335
III	675.031 (6.354)			24.959 (8.545*)			73.016*	0.358	985.449
IV	338.816 (3.667*)				27.108 (13.902*)		193.260*	0.598	779.508
V	1256.897 (10.50*)					-1.255 (-1.040*)	1.082*	0.001	1229.748
VI	37.695 (0.279)	17.590 (6.797*)	1.403 (1.670)				70.615*	0.519	853.094
VII	220.574 (1.481)		3.335 (4.125*)	15.580 (4.363*)			49.583*	0.430	929.043
VIII	281.873 (2.781*)			-10.388 (-2.322*)	34.942 (9.228*)	0.626 (0.818)	68.541*	0.611	767.233
IX	141.152 (1.135)	8.588 (2.628**)	0.151 (0.198)	-14.120 (-3.097*)	28.106 (6.313*)		55.900*	0.630	748.316
X	20.165 (0.139)	9.200 (2.813*)	492 (0.623)	-14.348 (-3.165*)	27.295 (6.127*)	1.253 (1.591)	45.774*	0.634	743.779

Source: Data on firm specific variables in Appendix C

In another simple regression result of specification III, common stock prices are observed to be positively related with before dividend tax cash dividend per share and coefficient is again significant at 1 percent level. The result indicates that 35.8 percent variations in common stock prices are captured by cash dividend per share. The regression of common stock prices on before dividend tax stock dividend per share in specification IV shows a positive relationship between stock prices and stock dividend per share and the coefficient is significant at 1 percent level. The result shows, 59.8 percent variability associated with common stock prices are explained by stock dividend per share. In specification V, simple regression with price earnings ratio is negatively related with stock prices and the coefficient is statistically significant at 1 percent level. However, only 1 percent variability

associated with common stock prices are explained by price earnings ratio. In all simple regressions, except specification V, despite of statistical significance of *F*-value the firm specific variables such as earnings per share, book value per share, cash dividend per share, and stock dividend per share individually explains variations in common stock prices as indicated by adjusted R^2 in the respective model specifications.

The results of simple regressions in model specifications I through V establish the robustness of results obtained in the analysis of one-way sort of portfolios formed on earnings per share, book value per share, cash dividend per share, stock dividend per share and price earnings ratio. As an additional check of the robustness of results, two or more firm specific variables have been included as explanatory variables in multiple regressions of specifications VI through X. When both earnings per share and book value per share are included as explanatory variables in specification VI, both variables still maintain their observed direction of relation with stock returns, but only the coefficient of earnings per share is significant at 1 percent level. Further, the inclusion of book value per share and cash dividend per share as explanatory variable in specification VII also shows that these variables have retained their observed direction of relationship and statistical significance. However, the explanatory power of the models has been declined in specifications VII with the inclusion of these variables. The use of three variables namely cash dividend per share, stock dividend per share and price earnings ratio together as repressors in specification VIII has provided an important insight into the regression results. The results indicate that cash dividend per share and stock dividend per share still maintain their statistical significance because coefficients are again significant at 1 percent level, while price earnings ratio looses its statistical significant and the observed direction of relationship is positive. However, surprisingly the coefficient of cash dividend per share changes its observed sign to negative. These results suggest that earnings per share, cash and stock dividend per share consistently predict the stock returns where as price earnings ratio does not.

In specification IX, four variables, namely earnings per share, book value per share, cash dividend per share, and stock dividend per share have been used as explanatory variables. The results show that stock prices have significant positive relation with earnings per share and stock dividend per share and significant negative relation with cash dividend per share. It reveals the fact that earnings per share, cash dividend and stock dividend are still a significant predictor of stock prices. Specification X represents full form of the model 3.1, where all firm specific variables are included

as predictors. The regression results of specification X again establishes the economic and statistical significance of earning per share, cash dividend per share and stock dividend per share in predicting stock prices while the performance of other variables are poor.

This study hypothesized that stock prices are positively related to earnings per share, book value per share, cash dividend per share, and stock dividend per share and negatively related with price earnings ratio. Thus, the observed relationship of common stock prices with earnings per share, book value per share, and stock dividend per share is according to priori sign expectation although the priori sign expectations do not hold consistently with other firm specific variables. Among all, earnings per share have been observed as the best predictors because coefficients are statistically and economically significant across all the specifications.

The explanatory power of the model indicated by adjusted coefficient of determination have also been improved in the specifications where earnings per share is explanatory variable along with other firm specific variables, and it is the best in model X where adjusted R^2 is 0.634. Overall, price earnings ratio has been observed as poor predictor of stock prices because its effects have been subsumed by earnings per share in multiple regressions.

i. Model Specification test:

F-statistics (F=45.774 and p-value 0.000 < 5 %) confirmed that the overall regression model is highly significant. Thus, based on above mentioned tests, the fitted model seems to be valid and there is no specification biased.

ii. Test of Multicollinearity:

In a multiple regression analysis, the problem of multicollinearity is more prominent. Therefore, the diagnostic check of the model has been conducted using variance inflationary factor (VIF) of explanatory variables to detect the multicollinearity problem, if any, associated with multiple regressions of specification VI through X. The values of VIF associated with several specifications of the model are reported in Table 4.8. The result shows that variance inflationary factors (VIF) of explanatory variables across all the model specifications are significantly lower than 10. Therefore, there is no evidence of Multicollinearity in the regression model.

Table 4.8

Durbin-Watson Statistics and Variance Inflationary Factors of the Model Specifications I through X

This table shows values of Durbin-Watson 'd' statistics and variance inflationary factors to diagnose the problems of autocorrelation and multicollinearity associated with model specifications I through X. DW-statistic is the computed value of 'd' statistics. d_L and d_U are respectively the lower bound and upper bound critical value of 'd'. Durbin and Watson (1951) have tabulated the lower and upper limits of critical value for number of observations going from 6 to 200 and upto 20 explanatory variables. Therefore, the reported d_L and d_U are for 150 observations corresponding to given number of explanatory variables at 1 percent level of significance. VIF represents variance inflationary factors.

Specification	Explanatory Variables	DW-statistic	d_L	d_U	4-d_U	VIF
I	*EPS*	0.624	1.611	1.637	2.363	1.000
II	*BPS*	0.476	1.611	1.637	2.363	1.000
III	*CD*	0.563	1.611	1.637	2.363	1.000
IV	*SD*	0.635	1.611	1.637	2.363	1.000
V	*P/E*	0.310	1.611	1.637	2.363	1.000
VI	*EPS*	0.618	1.598	1.651	2.349	2.153
	BPS					2.153
VII	*BPS*	0.547	1.598	1.651	2.349	1.682
	CD					1.682
VIII	*CD*	0.771	1.584	1.665	2.335	3.871
	SD					3.892
	P/E					1.033
IX	*EPS*	0.769	1.571	1.679	2.321	4.461
	BPS					2.326
	CD					4.225
	SD					5.657
X	*EPS*	0.784	1.557	1.693	2.307	4.524
	BPS					2.511
	CD					4.230
	SD					5.732
	P/E					1.166

Source: Data on firm specific variables in Appendix C, and Durbin and Watson (1951).

iii. Test of Autocorrelation:

In cross-sectional regression, data are often collected on the basis of a probability sample of cross-sectional firms so that there is no prior reason to believe that the error term pertaining to one firm is correlated with the error tem of another firm. If by chance such a correlation is observed in cross-sectional firms, it is called spatial autocorrelation, that is, correlation in space rather than over time. However, it is important that the ordering of the data must have some logic, or economic interest, to make sense of any determination of whether spatial autocorrelation is present or not. In this study, cross-sectional data have the ordering over time so that there is a need to detect the problem of autocorrelation, and it has been confirmed by using Durbin-Watson (DW) *d*-statistic.

According to Durbin and Watson (1951), if computed *DW* is less than lower bound critical value (d_L), there is enough evidence to believe that the problem of positive autocorrelation exists. If it lies

between d_U to $4\text{-}d_U$, there is no evidence of autocorrelation. However, if computed DW falls in between of lower and upper bound critical value, the result is inconclusive as to whether the problem of autocorrelation exists or not. Table 4.8 indicates that computed DW for all the model specifications falls in between 0 to d_L so that there is evidence of significant positive autocorrelation. The term autocorrelation, often known as serial correlation, is the correlation between members of series of observations in time. Regression model assumes that such autocorrelation does not exist in the error term. This assumption of no autocorrelation is violated here. In the presence of autocorrelation the least squares estimators of regression parameters no longer continue to be efficient. Therefore usual t and F tests are no longer valid. So, we use different way to make appropriate analysis of the data, which is described below.

iv. Test of Heteroscedasticity:

An important assumption of the classical linear regression is the assumption of no heteroscedasticity. If there is heteroscedasticity ordinary least squares (OLS) estimators of regression parameters no longer continue to be efficient. Therefore usual t and F tests are no longer valid.

Table 4.9

Result of White's Test for Heteroscedasticity

	χ^2	p-value
Model: without macroeconomic variables	94.724	0.000
Model: including macroeconomic variables	104.016	0.000

The above table showing the result of White's test for heteroscedasticity illustrates the χ^2 values 94.724 and 104.016 for the regression model without macroeconomic variables and with macroeconomic variables respectively. The highly significant p-values; 0.000 for both the models guides us to reject null hypothesis suggesting presence of heteroscedsticity. Baltagi (1995) concluded that OLS model may become inefficient in the presence of heteroscedasticity and further tests are to be exercised.

For the remedial of autocorrelation as well as heteroscedasticity, it is appropriate to use the generalized least square (GLS) method over the OLS method using panel data analysis method. Thus, a generalized least square (GLS) is estimated in this study. This is because GLS estimates takes into deliberation and correct for the problems of heteroscedasticity, autocorrelation and contemporaneous correlation (Beck & Katz, 1995; Magalhaes & Africano, 2007).

4.1.2 Empirical Analysis and Results from Panel Data Analysis

In order to test the statistical significance of the results, panel data analysis has been used as described in chapter three. In panel data analysis, it basically deals with regression results from various specifications of the model. Firstly, the analysis has been done with the pooled ordinary least square model, secondly, fixed effect model with both one way and two way and lastly, the analysis has been conducted by using random effect model to examine the relationship of stock prices with firm specific variables and macroeconomic variables separately and jointly for cross-sectional data of 10 sample firms that include 130 observations during the period 1999/00 through 2011/12. In this section, an attempt also has been made to test the validity of the model through statistical test of significance such as *t*-test, *F*-test, adjusted coefficient of determination (*Adj.* R^2), and the test of autocorrelation, multicollinearity, heteroskedasticity (Breusch-Pagan test). Furthermore Hausman test statistics also have been conducted to test whether to use fixed effect or random effect model and to confirm the validity of the results.

Table 4.10, 4.11 and 4.12 below report the results of the regressions of stock prices as outlined in chapter three. Table 4.10 presents the comparative regression results of OLS model, fixed effect model and random effect model without considering macroeconomic variables. Table 4.11 presents the comparative regression results of OLS model, fixed effect model and random effect model considering all the explanatory variables i.e. including the macroeconomic variables. Table 4.12 presents comparative regression results of pooled OLS, FEM and REM with or without macroeconomic variables.

Bank specific variables

The first bank specific variable is the earnings per share *(EPS)*. From table 4.10 which excluded the macroeconomic variables, the sign of this coefficient is positive and statistically significant in pooled OLS, one-way fixed and random effect model. However the sign is negative in two-way fixed effect model where the coefficient is also not statistically significant. There is no any bank and time specific impact of earnings per share on stock market prices. As like table 4.10, the sign of coefficients of earnings per share remains the same, if all the macro-economic variables are added in all four models as presented in table 4.11. However, these coefficients are not statistically significant. Table 4.12 shows all positive signs of EPS coefficients with none of them are statistically significant when macroeconomic variables are added in the model.

Table 4.10

Comparison of Regression Results Considering Firm Specific Variables only

This table shows regression results of stock prices on five firm specific variables based on panel data of 10 commercial banks with 130 observations for period 2000-2012. The regression models include pooled OLS, one-way and two-way fixed effect model and random effect model. The reported values are intercepts and slope coefficients of respective explanatory variables with standard error in the parentheses. Dependent variable is the market prices of stock (P), and independent variables are earnings per share (EPS), book value per share (BPS), cash dividend per share (CD), stock dividend per share (SD) and price earnings ratio (P/E). The single asterisk (*) sign indicates that result is significant at 10 percent level, double asterisk (**) sign indicates that result is significant at 5 percent level, and triple asterisk (***) sign indicates that result is significant at 1 percent level.

Independent variables	Regressions			
	Pooled OLS	One-way Fixed#	Two-way Fixed	Random Effect
const	20.1646	692.612*	781.355**	20.1646
	(145.183)	(367.022)	(345.468)	145.183
EPS	9.19962***	9.54934**	-4.47803	9.19962***
	(3.27057)	(3.83841)	(3.22946)	3.27057
BPS	0.492495	0.0788774	2.84677***	0.492495
	(0.790806)	(0.893818)	(0.720411)	0.790806
CD	-14.3482***	-25.658***	-12.1964***	-14.3482***
	(4.53386)	(5.51337)	(4.55496)	4.53386
SD	27.2947***	28.4997***	19.6694***	27.2947***
	(4.4546)	(4.82338)	(3.79599)	4.4546
P/E	1.25278	1.50356*	0.986645	1.25278
	(0.787658)	(0.777443)	(0.602287)	0.787658
n	130	130	130	130
Adj. R^2	0.6344	0.6623	0.8189	

Source: Self calculation based on the data on appendix-C

One-way fixed effect model presents bank specific effect and two-way fixed effect model presents both the bank and time effect on the dependent variables i.e. stock market prices.

Table 4.12 illustrates that the coefficients of EPS are insignificant in all three models when macroeconomic variables are included in the model, although they have shown the positive sign. The coefficients in all three models are positive and statistically significant when macroeconomic variables are excluded. It implies that when the impact of macro-economic factors such as GDP growth, inflation, and interest rate is considered, the impact of earnings per share on stock prices of the banks tends to decrease.

Table 4.11

Comparison of Regression Results considering all Explanatory Variables

This table shows regression results of stock prices on five firm specific variables and three macro-economic variables based on panel data of 10 commercial banks with 130 observations for period 2000-2012. The regression models include pooled OLS, one-way and two-way fixed effect and random effect model. The reported values are intercepts and slope coefficients of respective explanatory variables with standard error in the parentheses. Dependent variable is the market prices of stock (P), and independent variables are earnings per share (EPS), book value per share (BPS), cash dividend per share (CD), stock dividend per share (SD), price earnings ratio (P/E), gross domestic product (GDP), inflation (INF), and interest rate (IR). The single asterisk (*) sign indicates that result is significant at 10 percent level, double asterisk (**) sign indicates that result is significant at 5 percent level, and triple asterisk (***) sign indicates that result is significant at 1 percent level.

Independent variables	Regressions			
	Pooled OLS	One-way Fixed#	Two-way Fixed	Random Effect
const	-264.21	589.731	1042.71**	-264.21
	(230.8)	(375.394)	(504.243)	(230.8)
EPS	4.98193	3.53419	-4.47803	4.98193
	(3.029)	(3.51328)	(3.22946)	(3.0291)
BPS	1.67861**	1.54634*	2.84677***	1.67861**
	(0.740778)	(0.821442)	(0.720411)	(0.740778)
CD	-9.05539**	-20.7682***	-12.1964***	-9.05539**
	(4.17252)	(4.91624)	(4.55496)	(4.17252)
SD	23.8951***	25.0228***	19.6694***	23.8951***
	(4.04606)	(4.27625)	(3.79599)	(4.04606)
P/E	1.88436**	1.95605***	0.986645	1.88436**
	(0.722638)	(0.691884)	(0.602287)	(0.722638)
GDP	-1.77217***	-1.93448***	-2.48249	-1.77217***
	(0.631953)	(0.596866)	(1.86733)	(0.631953)
INF	169.554***	174.707***	151.123	169.554***
	(30.1891)	(28.814)	(121.697)	(30.1891)
IR	-54.0982*	-55.5242*	-16.2126	-54.0982*
	(29.7832)	(28.0831)	(55.3206)	(29.7832)
n	130	130	130	130
Adj. R^2	0.706990	0.741907	0.6623	

Source: Self calculation based on the data on appendix-C

One way fixed effect model presents bank specific effect and two way fixed effect model presents both the bank and time effect on the dependent variables i.e. stock market prices.

Table 4.12

Comparison of Regression Results with and without Macro-economic Variables

This table shows regression results of stock prices on five firm specific variables and three macro-economic variables based on panel data of 10 commercial banks with 130 observations for period 2000-2012. The regression models include pooled OLS, fixed effect and random effect model. The reported values are intercepts and slope coefficients of respective explanatory variables with standard error in the parentheses. Dependent variable is the market prices of stock (P), and independent variables are earnings per share (EPS), book value per share (BPS), cash dividend per share (CD), stock dividend per share (SD), price earnings ratio (P/E), gross domestic product (GDP), inflation (INF), and interest rate (IR). The single asterisk (*) sign indicates that result is significant at 10 percent level, double asterisk (**) sign indicates that result is significant at 5 percent level, and triple asterisk (***) sign indicates that result is significant at 1 percent level.

Independent Variables	Regressions					
	Pooled OLS	Pooled OLS	Fixed effect	Fixed Effect	Random effect	Random Effect
const	-264.21	20.1646	76.1642	273.408	-264.21	20.1646
	(230.8)	(145.183)	(246.956)	(187.724)	(230.8)	145.183
EPS	4.98193	9.19962***	3.53419	9.54934**	4.98193	9.19962***
	(3.029)	(3.27057)	(3.51328)	(3.83841)	(3.0291)	3.27057
BPS	1.67861**	0.492495	1.54634*	0.0788774	1.67861**	0.492495
	(0.740778)	(0.790806)	(0.821442)	(0.893818)	(0.740778)	0.790806
CD	-9.05539**	-14.3482***	-20.7682***	-25.658***	-9.05539**	-14.3482***
	(4.17252)	(4.53386)	(4.91624)	(5.51337)	(4.17252)	4.53386
SD	23.8951***	27.2947***	25.0228***	28.4997***	23.8951***	27.2947***
	(4.04606)	(4.4546)	(4.27625)	(4.82338)	(4.04606)	4.4546
P/E	1.88436**	1.25278	1.95605***	1.50356*	1.88436**	1.25278
	(0.722638)	(0.787658)	(0.691884)	(0.777443)	(0.722638)	0.787658
GDP	-1.77217***		-1.93448***		-1.77217***	
	(0.631953)		(0.596866)		(0.631953)	
INF	169.554***		174.707***		169.554***	
	(30.1891)		(28.814)		(30.1891)	
IR	-54.0982*		-55.5242*		-54.0982*	
	(29.7832)		(28.0831)		(29.7832)	
Adj. R^2	0.706990	0.6344	0.741907	0.6623		

Source: Self calculation based on the data on appendix-C

The positive relationship between earnings per share and stock prices in Nepalese banking context reveals that the stock prices increases due to increase in earnings per share of the banks. The result is consistent with the findings of Easton and Haris (1991).

Similarly, the sign of the coefficients of book value per share *(BPS)* are positive in all the case and are statistically significant when macroeconomic variables are added in the model (Table 4.11).. It indicates that that the book value per share has positive role to predict the stock prices in the Nepalese banking industry. The finding supports the study of Chan, Hamao and Lakonishok (1991).

There is a negative and significant coefficient of the cash dividend per share *(CD)* in all the regressions presented in the above tables. The estimated coefficient is – 12.1964 in two way fixed effect model as presented in table 4.10. When one way and pooled OLS models are considered the coefficients are -25.658 and -14.3482 respectively. The impact of cash dividend per share on stock prices seems to be more significant but has the negative sign. The cash dividend per shares impacts negatively on stock prices. The finding contradicts the study of Basnet (2007) in Nepalese context.

The positive relation of the stock dividend per share with stock market prices implies that as the bank increases stock dividend the stock prices also increase. The coefficients of stock dividend per share are positive and statistically significant for all the cases presented in above tables. However, the strength has decreased with the inclusion of macroeconomic variables (Table 4.12). The positive relationship of stock dividend per share with stock prices is as per the priori expectation. This finding supports the findings of different studies such as Gordon and Sharpio (1956), Chawala and Srinivasan (1987), and Pradhan (2003). The result maintains the statement quoted by Pradhan (2003) as there is a strong dividend effect in determining market price of the share indicating attractiveness of dividends among Nepalese investors.

The coefficients of price earnings ratio have all positive sign but are only significant when macroeconomic variables are added in the model (Table 4.12). This study contradicts the prior hypothesis of negative relationship between price earnings ratio and stock prices. The results contradicts the findings of Ball (1978), Davis (1994), and Marian Vorek (2009). However, it may be noted that they have taken the earnings to price ratio instead of price to earnings. In this study the effect of price earnings ratios are subsumed by the market price per share of the stock.

As explained in chapter three panel data model has been used for the analysis of secondary data. There are mainly three panel data models namely pooled OLS model, fixed effect model and random effect model. In order to confirm the appropriate model for this study joint significance of differing group intercepts (F statistics), Hausman test statistics, and Breusch-Pagan (BP) test statistics have been computed.

The Hausman test to choose a better model in between fixed effect and random effect for analysis purpose has been performed. This test basically finds whether the unique errors are correlated with regressors. The null hypothesis is they are not. The hypothesis for this test is can be simplified as:
H_1: Fixed effect model is superior to random effect model

Table 4.13

Result of Hausman Test

	Chi-square	p-value
Model: without macroeconomic variables	19.7882	0.1369
Model: with including macroeconomic variables	26.7267	0.0788

The p-values are 0.13 and 0.0788 for the models with and without macroeconomic variables respectively. The Correlated Random Effects - Hausman Test results are interpreted on the basis of chi-square value and according to it, we fail to reject null hypothesis. Since the null hypothesis that GLS estimates are consistent could not be rejected, it is concluded that random effect model is appropriate.

Correspondingly, Breusch-Pagan test for homoskedasticity shows the absence of heteroscedasticity. The null hypothesis for the Breusch-Pagan test is homoskedasticity which can be summarized as:
H_1: There is presence of heteroskedasticity.

Table 4.14

Result of Breusch-Pagan (BP) Test

	Chi-square	p-value
Model: without macroeconomic variables	0.37567	0.5399
Model: with including macroeconomic variables	1.12609	0.2886

The p-values are 0.5399 and 0.2886 for models with and without macroeconomic variables respectively which guides us to accept null hypothesis suggesting there is no presence of heteroskedsticity. Thus, based on these test results panel data analysis -random effect (GLS) model have been found to be adequate in this study.

4.2 Macro-economic variables

Gross domestic product (GDP) is one of the important elements which creates the competitive business environment and there will have impact on stock prices. Similarly, other variables inflation and interest rates do impact on stock prices (represented by NEPSE index in the Nepalese context).

a. Descriptive statistics

Descriptive statistics for the NEPSE index and macroeconomic variables over the sample period are reported in Table 4.15. It shows that the NEPSE index ranges from minimum 204.90 to maximum 963.40 with a mean value of 435.669 over the sample period. The volatility in NEPSE index indicated by coefficient of variation has been noted at 0.525 during the period, which is the highest among all other macroeconomic variables. The inflation during the period ranges from minimum 2.48 to maximum 11.61 with an average of 6.698 for the period. The coefficient of variation of the inflation is only 0.21. Similarly, interest rate varies within the range of 1.15 to 8.52 percent with the coefficient of variation of 0.508 during the period. The volatility with respect to real GDP is the 0.386. The volatility with respect to inflation is the minimum 0.021. The results indicate that stock market have been more volatile during the study period than other macroeconomic variables.

Table 4.15
Descriptive Statistics of Macroeconomic Variables

This table shows the descriptive statistics of stock market prices and selected macroeconomic variables over the study period from 1999/00 to 2011/12. The variables are stock market prices measured in terms of NEPSE index, inflation (INF), interest rate (IR) defined as the average interbank lending rates and the gross domestic product (GDP).

Statistics	NEPSE Index	Inflation (INF)	Interest Rate (IR)	GDP (per capita $)
Mean	435.669	6.698	4.368	374.351
Median	362.900	6.840	3.700	324.920
Std. Deviation	228.690	3.241	2.219	144.53
Coeff. of variation	0.525	0.021	0.508	0.386
Skewness	1.293	0.024	0.819	0.775
Kurtosis	1.035	-1.255	-0.134	-0.757
Minimum	204.90	2.48	1.15	234.209
Maximum	963.40	11.61	8.52	626.168
KS Statistic	0.981	0.643	0.963	0.621
***p*- value**	0.291	0.802	0.312	0.835

Source: Data on macroeconomic variables in Appendix D.

Kolmogorov-Smirnov (KS) test of normality shows that distribution of time series data are normal in all cases. The *p*-values for *KS* statistics are greater than 10 percent in all cases which do not reject the normality hypothesis meaning that time series are normally distributed.

b. Correlation analysis

Table 4.16 reports the bivariate Pearson's correlation coefficient between different set of macroeconomic variables used in the study. The correlation coefficients indicate that inflation has significant positive relationship with NEPSE index and the relationship is statistically significant at 5 percent level. The significant positive correlation observed between NEPSE index and inflation supports with the priori expectation where it was assumed that stock market moves in the direction to that of inflation. This result is consistent with Ibrahim and Aziz (2003), Maysami, Howe and Hamzah (2004) and Kyriacou, Madsen and Mase (2006), and contradicted with Schwert (1981), Adel (2004) and Coleman and Tetty (2008). Moreover, the observed positive relationship in this study gives a primary indication that stock investments in Nepal may offer a hedge against inflation. Similarly, the observed significant positive relationship between NEPSE and real GDP is consistent with priori expectation. This result is consistent with Adel (2004), Gan, Lee, Yong and Zhang (2006) and Pilinkus (2009), among others, who reported reliably positive relationship between stock market returns and real activity proxied by GDP, and inconsistent with earlier studies by Flannery and Protopapadakis (2002) who observed significant negative relationship between real GDP and stock market returns. This result again gives an approximate indication that development in real sector activity may contribute positively to the stock market.

Table 4.16

Correlation Coefficient of Different Pairs of Macroeconomic Variables

This table presents bivariate Pearson's correlation coefficient between different pairs of macroeconomic variables used in the study. The definitions of variables are as stated in the Table 4.15. sign indicates that correlation is significant at 1 percent level.*

Variables	NEPSE	INF	IR	GDP
NEPSE	1.000			
INF	0.665*	1.000		
IR	-0.029	0.357	1.000	
GDP	0.358	0.741*	-0.310	1.000

Source: Data on macroeconomic variables in Appendix D.

Similarly, the result indicates that relationship between interest rate and NEPSE index is negative as it was hypothesized. However, the observed negative relationship is not statistically significant. This result approximately indicates that interest rate level in Nepal does not have any role to predict the stock market returns. Among macroeconomic variables used in this study, the interest rate has been observed to be significantly negatively related with inflation and real GDP while significantly positive relationship has been observed between real GDP and inflation. The observed negative

relationship between interest rate and GDP may give a meaningful conclusion that decrease in interest attracts most investors toward real sector investment. However, statistical inferences about the causal relationship between different pairs of these macroeconomic variables cannot be drawn simply based on the correlation analysis. Hence, these issues have been further explored in the next several sections of this chapter.

The regression results have been reported in Table 4.17 . The model specifications I through III report the simple regression results, where stock prices represented by NEPSE index (NI) have been regressed on different macroeconomic variables individually. The full version of the model has been reported in specification IV, where all the macroeconomic variables have been used as explanatory variables.

Table 4.17

Estimated Relationship from Cross-Sectional Regression of Stock Prices (NI) on Gross Domestic Product, Inflation, and Interest Rate with Observations during the Period 1999/00 through 2011/12

Model: $NI_t = \alpha + b_{1t}\, GDP_t + b_{2t}\, INF_t + b_{3t}\, IR_t + e_t$

This table shows regression results of stock prices (NI) from the year 1999/00 to 2011/12. The regression results consist of various specifications of the models in the form of simple and multiple regressions. The reported values are intercepts and slope coefficients of respective explanatory variables with t-statistics in the parentheses. Dependent variable is the stock price represented by annual NEPSE Index denoted as NI_t, *and independent variables are Gross Domestic Product (GDP), Inflation (INF), and Interest Rate (IR). The reported results also include the values of F-statistics (F), adjusted coefficient of determination (Adj.* R^2*), and standard error of estimates (SEE). The single asterisk (*) sign indicates that result is significant at 1 percent level, and double asterisk (**) sign indicates that result is significant at 5 percent level.*

Dependent Variable: NEPSE Index							
Specification	**Intercept**	***GDP***	***INF***	***IR***	***F***	***Adj. R^2***	***SEE***
I	223.79*	0.565988*			18.78217*	0.1211	206.776
	(4.292)	(4.334)					
II	121.573*		46.934*		101.5922*	0.4381	165.333
	(3.537)		(10.08)				
III	448.650*			-2.971	0.1065	-0.007	221.33
	(10.14)			(-0.326)			
IV	269.166*	-0.429*	68.439*	-29.937*	52.710*	0.5460	148.621
	(6.565)	(-3.06)	(10.75)	(-4.52)			

Source: Data on macroeconomic variables in Appendix D

The priori expected sign of GDP, INF and IR holds true for each individual regression specification model. In multiple regression model IV, the sign of GDP coefficient gets changed. Similarly, in this study of panel data analysis in table 4.11, the GDP coefficient is negative and significant in all models. Including the GDP with other variables inflation and interest rate, the sign of GDP

coefficient gets changed to negative in all models and the estimated coefficient of GDP growth is insignificant in two-way fixed model. The GDP growth of Nepal has remained minimum 2.8 % and maximum 5.8 % during 2003 to 2012. There has not been encouraging growth of economy during the study period. There has been a competition in Nepalese banking sector primarily due to increase in number of banks and financial institutions within a short period of time. Though there is no encouraging growth of GDP the result indicates that GDP has contribution in increasing the stock prices. Thus, the observed negative relationship of GDP growth and stock prices violates the priori expectation and the finding contradicts with the findings of Chen, Roll and Ross (1986), Schwert (1989), La porta (1996), and Gan, Lee, Yong and Zhang (2006). However, the result supports the findings of Bilson et al. (2001), Flannery and Protopapadakist (2002) and Baskota (2007). Baskota explained on his study that stock price movements are not explained by the macroeconomic variables.

Future economic activity is correlated with increased domestic borrowing or increased supply of money. This simply means that an increase in domestic borrowing or issuance of money has inflationary effects that dampen real activity. In the end, stock market prices also rise due to rise in the inflation. As it has already been noted the positive and a significant relationship between inflation and stock prices, the priori expected relationship would also be positive. As expected the coefficient is found to be positive and significant in all the regressions as presented in the above tables however the estimated coefficient is found insignificant only in case of two way fixed model reflecting the importance of time factor. This results support the findings of Geyser and Lowies (2001) and Maysami, Howe, and Hamzah (2004).

With respect to interest rate effect, it is believed that a reduction in interest rates (IR) induces an injection of liquidity into the economy as such that this extra liquidity could be channeled to the stock market thus driving up the demand and prices of stocks. With the assumption that an increase in interest rate position tends to decrease of banking sector. The observed sign in the present study is negative and statistically significant in all the regression models as presented in the table 4.12. The observed relationship between interest rate *(IR)* and stock prices is in line with priori expectation. Thus, *IR* is found to be one of the important variable to determinants share market prices of Nepalese banking system. This results support the findings of several studies, for example, Thorbecke (1997), Smal and Jager (2001), and Kandir (2008).

4.2.1 Analysis of cointegration between stock market prices and macroeconomic variables

The empirical studies associated with macroeconomic influences on common stock returns have observed a causal relationship between stock prices and macroeconomic variables. For example, Jefferis and Okeahalam (2000) examined the effect of macroeconomic variables and found that stock prices have positive long-term relationship with real GDP. Basically, the studies have demonstrated that a long-term cause and effect relationship exists between stock market prices and macroeconomic variables (for example, Chen, Roll, and Ross (1986), Hamao (1988), and Lee (1992), among others). Therefore, this study has also attempted to explore whether macroeconomic variables such as inflation, interest rate and real GDP could capture the variation in stock market returns. This study has conducted to test whether there exist long-run equilibrium between stock prices and macroeconomic varies. The methodology employed is the cointegration test and the modeling strategy adopted is based on the widely used Engle-Granger methodology (Engle and Granger, 1987). The steps involved for cointegration test are described as follows

a. Empirical Analysis and Findings

i. Stationarity/unit root test:

Many macroeconomic time series contain unit roots dominated by stochastic trends as developed by Nelson and Plosser (1982). Knowing that unit root tests are sensitive to the presence of deterministic regressors, three models are estimated. The most general model with an intercept (constant) and time trend is estimated first and restrictive models, i.e. with an intercept and without either intercept or trend, respectively, are estimated thereafter. Unit root tests for each variable then is performed on both levels and first differences of variables. Table 4.18 reports the results for the ADF test for the model without constant, with constant, and with constant and trend. It can be seen that the null hypothesis of non-stationarity cannot be rejected at the 5% level for the levels of all the variables. However, when first differences are taken, the null hypothesis of non-stationarity is rejected for all the variables. Hence it is concluded that the three variables are integrated of order one I(1). Similarly no autocorrelation is found within the variables which is tested with calculated rho (ρ) value by using formula; $D = 2 (1-\rho)$. If the value falls is close to 0 that will be the indication of negative autocorrelation and if it is close to 4 that will indicate positive autocorrelation. But if the value falls near to 2 no autocorrelation shall be revealed. This result is consistent to the finding of Nelson and Plosser (1982) that most of the macroeconomic variables are non-stationary at level, but they are stationary after first differencing.

Table 4.18
Results of unit root tests

Test	Variable	Augmented Dickey-Fuller (ADF)			
		Levels	Rho(ρ)	First Differences	Rho(ρ)
Without Constant	NI	-0.8309 (0.3562)	0.276	-2.9883 (0.0527)	0.031
	GDP	3.6715 (0.9992)	-0.277	-1.666 (0.0891)	-0.100
	INF	-0.0893 (0.6352)	-0.310	-4.2937 (0.0005)	-0.043
	IR	-1.0170 (0.2599)	0.063	-4.1659 (0.000)	-0.309
With Constant and no trend	NI	-0.2422 (0.1356)	0.138	-2.8576 (0.050)	-0.008
	GDP	1.1695 (0.9952)	-0.281	-2.7867 (0.0915)	-0.099
	INF	-1.6150 (0.4453)	-0.264	-4.3680 (0.0577)	-0.130
	IR	-2.2770 (0.1931)	0.117	-3.663 (0.0547)	-0.299
With Constant and Trend	NI	-3.5145 (0.0577)	-0.162	-2.8387 (0.1832)	-0.026
	GDP	-1.8254 (0.6289)	-0.274	-3.9593 (0.0485)	-0.651
	INF	-2.2220 (0.4382)	0.007	-4.4372 (0.0557)	-0.203
	IR	-1.9914 (0.5473)	0.078	-2.5974 (0.2815)	-0.483
Critical Values					
1%		-2.29			
5%		-2.04			
10%		-1.92			

Note: *Probabilities are in parentheses. Tests for unit roots have been carried out on Gretl software. The level data were estimated better using the ADF that allows with and without constant term and a deterministic time trend which the plot of the data indicates.*

ii. Cointegration test:

The ADF tests results for the above all variables indicates that they all are integrated of the same order, so, the study proceed to test for cointegration (long-run relationship) for the variables using the Engle and Granger integration technique,. First, it is to find the optimal order of the VAR model using lag determining criteria.

Table 4.19

Number of Optimal Lag Using Schwarz-Bayesian Criteria

Number of Lags	Schwarz-Bayesian Criteria	Akaike Criterion
2	13.113250*	12.896216*
1	13.201037	13.020175

** indicates amount of optimal lag*

According to the above table it can be claimed that optimal lag of the VAR model regarding the Schwarz –Bayesian criteria is two.

The test for cointegration has been conducted using the residuals based method of Engle and Granger (1987) with addition of time trend variable. According to Engle and Granger, if the residuals obtained from the above static regression are stationary, it implies that the variables are cointegrated. Hence, there is a tendency for the variables to move together in the long-run even though the variable may wander or drift individually apart. The result in table 4.20 shows that the null of a unit root doesn't corresponds to cointegration since p-value is 0.9817 which supports the null hypothesis of no stationary forresidual uhat. The results obtained using the Engle and Granger cointegration test is presented in table below.

Table 4.20

Cointegrating regression: OLS, using observations 2000-2012

i. Dependent variable: NI

	Coefficient	**Std. Error**	**t-ratio**	**p-value**
Const	168.983	215.312	0.7848	0.4552
GDP	0.431987	1.36782	0.3152	0.7602
INF	84.4149	33.8463	2.494	0.0373**
IR	-37.1018	27.3801	-1.355	0.2124
time	-42.5546	62.0661	-0.6856	0.5123

R^2 : 0.5812 Adjusted R^2 : 0.3717 Durbin-Watson: 1.6326

ii. Testing for a unit root in uhat

Dickey-Fuller test for uhat	unit-root null hypothesis: a = 1
model: (1-L)y = b0 + b1*t + (a-1)*y(-1) + e	1st-order autocorrelation coeff. for e: -0.025
estimated value of (a - 1): -0.980865	test statistic: tau_ct(3) = -1.5681
	p-value **0.9817**

***Note*:** no autocorrelation on uhat since rho (ρ) value = -0.025 and upon calculation of d= 2 (1-ρ), it comes very near to 2.

There is evidence for a cointegrating relationship if:

(a) The unit-root hypothesis is not rejected for the individual variables.

(b) The unit-root hypothesis is rejected for the residuals (uhat) from the cointegrating regression.

But, it is found that unit root hypothesis is not rejected for the residuals (uhat) from the cointegrating regression since its p-value is 0.9817. This implies that there no cointegration exists between macroeconomic variables and stock prices in the context of Nepal. Thus, error correction model (ECM) is no need to conduct which indicates the speed of adjustment if the variables are cointegrated.

4.3 Analysis of Primary Data

This section reports the results of questionnaire survey conducted among the individual investors, executives and security businesspersons in Nepalese stock market. Questionnaire survey was primarily designed to understand the perceived view of the respondents in relation to their buying and selling preferences, frequency of trading, perception of informational content, along with their attitudes toward factors affecting stock prices in Nepal. The respondents profile along with their personal characteristics and results of the survey are presented in following sections.

a. Respondent's profile

The survey was conducted in March-April 2013. The data analysis has been focused on self-administrated structure questionnaires (annexure). Out of the 110 questionnaires distributed to investors, executives, and security business persons 70 responses have been usable, i.e., approx.64 per cent of response rate. The questionnaire was divided into the following two key areas: (1) general questions relating to shareholders' perception for buying equity shares and market prices, and (2) specific questions relating to firm specific characteristics, macroeconomic information, and announcement of new public information and market reaction on share prices.

The respondents are classified as male and female categories. The classification of respondents on the basis of sex can help in analyzing the differences in their views regarding the impact of new information on share prices. With respect to sex of the respondents, 83 percent of the respondents belong to the male category, and 17 percent are in female categories. The profiles of the respondents are presented in Table 4.21.

Table 4.21 shows the general profile of the respondents whose responses are taken into consideration for the study. Table suggested that more than 82% respondents are male and only around 17% are female. Around 53% respondents are from 30 - 45 age groups. Around 33% are young investors below 30 years and around 14% are matured and above 45 years. Table also suggested that majority of the respondents (77.14%) work in private sector whereas 22.86% are employed in government service. Majority of the respondents i.e 45.71% have experience of below 5 years. Respondents are well educated. The table shows more than 77% of the respondents have bachelors or higher than bachelors degree.

Table 4.21
Profile of Respondents

This table presents the details of respondents profile in terms of gender, age group, experience and education.

Characteristics	Number	Percentage
Gender		
Female	12	17.14
Male	58	82.86
Total	**70**	**100**
Age group		
Below 30 years	23	32.86
30 to 45 years	37	52.86
Above 45 years	10	14.28
Total	**70**	**100**
Profession		
Government Service	16	22.86
Private Service	54	77.14
Total	**70**	**100**
Experience		
Below 5 years	32	45.71
5 to 10 year	24	34.29
Above 10 years	14	20.00
Total	**70**	**100**
Education		
Up to certificate	16	22.86
Bachelors	29	41.43
Masters	23	32.86
Above Masters	2	2.86
Total	**70**	**100**

b. Shareholders' perception on buying equity shares and market prices.

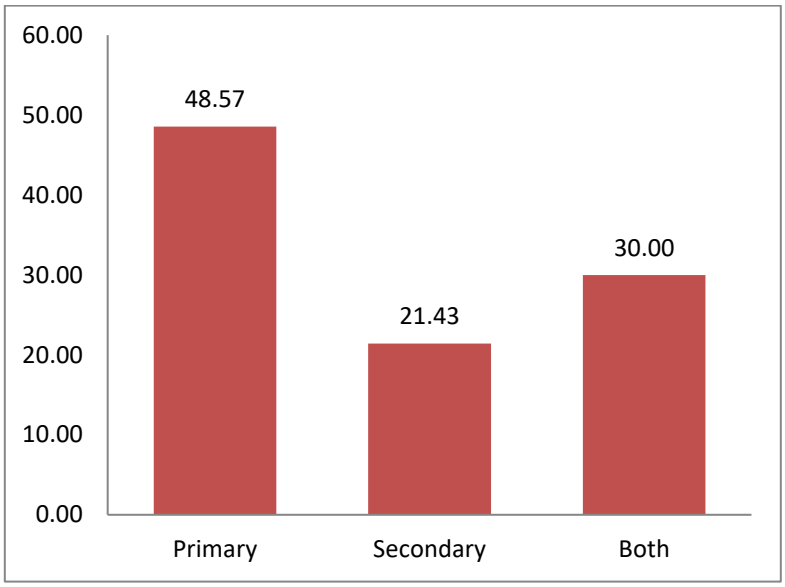
The total of nine questions was asked to examine the respondents' general perception on buying shares and influences of share price.

i. Market source to purchase equity share.

The respondents were asked about the market source;. primary, secondary or both markets, during purchase of the shares. The majority (48.57 per cent) of the respondents purchased the shares from the primary markets. However, 30% of the respondents used to purchase from both primary and secondary market and remaining 21.43 percent from secondary market. It indicates that the majority of the respondents are not actively participating in the share trading activities.

Fig. 4.5

Market source to purchase equity share



ii. Selection of investment opportunities

It has been asked to make the ranking on different investment opportunities from most important to least. Summary of the respondents' responses is presented in the table given below.

Table 4.22
Responses regarding the investment opportunities

Investment Options	No of Responses	Percentage
Bank Deposit	30	42.86
Gold and Silver	15	21.43
Bonds	0	0.00
Shares	5	7.14
Real Estate	17	24.29
Other	3	4.29
Total	**70**	**100.00**

Table 4.22 shows the responses regarding the different investment opportunities. Respondents were asked to rank among the different investment options listed in the questions. Only first rank summary status is presented in this table. Around 43% of the respondents were ranked bank deposit is the major option for investment followed by real estate (24.29%), gold and silver (21.43%), and shares (7.14%) only. None of the respondents ranked as a major option for investment for bonds.

iii. Corporate firm's share holding.

The respondents are asked about their holding the corporate firm's share. The majority (44.85%) of the respondents were holding commercial bank's shares alone. The more investors are holding the securities of more than four companies. Therefore, the shares of commercial banks, finance companies, insurance companies and development banks are more popular among the Nepalese investors whereas manufacturing and processing, and trading companies are less popular categories of shares in Nepalese stock market.

iv. Attendance of shareholders' annual general meeting.

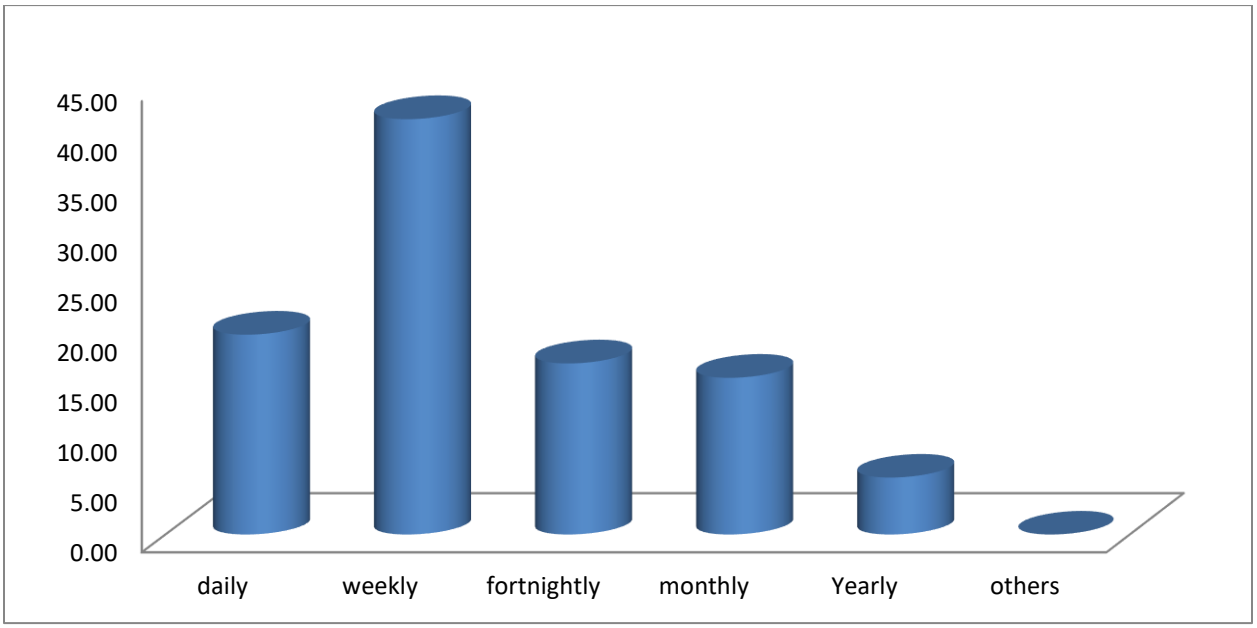
The majority of the respondents (58.57 percent) used to attend annual general meeting of corporate firms whose stocks they have. However, only 41.43 percent of the respondents do not attend the annual general meeting. It indicates that the shareholders are found to be active to obtain the corporate information through attaining the annual general meeting of the corporate firm.

v. Shares traded in the secondary market.

On top of that, the respondents asked shares traded in the secondary market in times. The majority of the respondents (41 percent) have traded shares on weekly basis, daily by 20 percent followed by 17 percent on fortnightly basis. It is revealed that more of the respondents are actively trade shares in the secondary market.

Fig. 4.6

Share trading in the secondary market



vi. Information dissemination to investors and influence on stock prices

The respondents were asked whether the corporate firms disseminate important information to investors/market on time, management protects shareholders' interest and legal provisions protect shareholders' interests or not. The details of the responses are presented in Table 4.23.

Table 4.23

Information dissemination, shareholders' interest and legal provisions

This table shows the responses on the given statements regarding information dissemination to the investors.

Statements	Percentage of respondents*		
	Yes	No	Don't know
Do you think that the corporate firms disseminate important information to investors/market on time?	58.57	41.43	0
Do you think that the stock indexes is affected by the different factors of information?	65.71	14.29	20.00
Do you feel the management protects shareholder's interest?	37.14	62.86	0

*These estimates are based on 70 responses.

The majority of the respondents (59 percent) felt that the firms practiced to disseminate important information to investors/market on time. The majority of the respondents (63 percent) opined that the stock index is affected by the different factors of information. Similarly, the majority of the respondents didn't believe that the management protects the shareholders' interest.

vii. Motive behind investing in the stocks

The respondents were asked to rank the different expectations behind the investment made on common stocks from most importance to least. Summary of the respondents' responses is presented in the table given below.

Table 4.24
Responses regarding the motive behind investing in the stocks

Determinants	No of Responses	Percentage
Expectation of cash dividend	19	27.14
Expectation of increase in market price	46	65.71
Expectation of bonus/right shares	5	7.15
Because of no opportunities to invest in other field	0	0
Because of less risk compared to others	0	0
Total	**70**	**100.00**

Table 4.24 shows the responses regarding the motive behind investing in the stocks. Respondents were asked to rank among the different motives listed in the questions. Only first rank summary status is presented in this table. Around 66% of the respondents were ranked expectation of increase in market price of stocks is the major motive for investment followed by expectation of cash dividend (27%), and expectation of bonus/right shares (7%) only. None of the respondents ranked no opportunities to invest in other fields and less risk in stocks as a major motive for investment in stock.

viii. Announcement of new public information and market reaction on share prices.

The respondents were provided with a list of 11 specific statements regarding announcement effect of firm specific new public information, macroeconomic information and market reaction on share prices by using a five-point Likert Scale Questionnaire at the end of the questionnaire. In order to highlight the significance of the selected statements of observations, mean value of responses for each statement of observation have been computed. The higher value of mean indicates that the statement is highly significance to majority of the respondents. Applying these criteria, the survey results are presented in table 4.25 in order of their significance.

The mean values of statements varied from 4.26 to 5.08. The majority of the respondents identified that market price of the stock is mainly affected by the announcement of stock dividends followed by announcement of right share issuance and announcement of accounting information. With respect to other statements such as 'Announcement of present macro-economic report by government", "Changes in capital gain tax", "Announcement of changes in cabinet (government)"; and "Announcement of changes in corporate tax rates" respondents considered as least influencing factors to determine market price of share. Therefore, the dividend related information i.e., cash dividend, stock dividend and announcements of earnings have a significant impact on the share price while the political and economic events influence less. Announcement of government policies do also have some influence on the share price.

Table 4.25

Announcement of new information and market reaction on share prices as viewed by all respondents.

This table reports mean weightage of the responses on the given statements. The mean values are calculated by assigning scores 1 through 5 for rankings from 'strongly disagree' to 'strongly agree' respectively and by multiplying each score by the fraction of responses within each rank. A score of 0 is assigned when a statement is not ranked.

S. No	Statements	Percentage of responses*					Mean	Rank
		Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1		
1	Stock price is affected by the announcement of cash dividend.	21.20	36.2	23.8	17.5	1.2	4.48	
2	Market price of the stock is affected by the announcement of stock dividends.	38.8	40.0	12.5	6.2	2.5	5.08	**1**
3	Stock price is affected by the announcement of accounting information.	36.20	33.80	25	2.5	2.5	4.98	**3**
4	Stock price in market is affected by the announcement of rights share issuance.	35.0	38.80	22.50	2.5	1.2	5.04	**2**
5	Market price of the stock is affected by the announcement of new corporate management leader/team.	32.5	40.0	21.2	6.20	0	4.98	
6	Share price is affected by the announcement of additional business expansion.	18.8	38.8	23.8	17.5	1.2	4.46	
7	Stock price is affected by the announcement of changes in corporate tax rates.	18.8	37.5	16.2	25.0	2.5	4.31	
8	Changes in capital gain tax affects share prices.	15.0	40.0	18.8	23.8	2.5	4.26	
9	Announcement of present macro-economic report by government affects share price.	15.0	37.5	23.8	21.2	2.5	4.26	
10	Market price of the stock is affected by the announcement of government's policies.	20.0	36.2	23.8	17.5	2.5	4.42	
11	Announcement of changes in cabinet (government) affects market price of the stocks	20.0	37.5	25.0	13.8	3.8	4.43	

*These estimates are based on 70 responses.

4.4 Concluding remarks

The results documented in this study support to the priori hypothesis with respect to role of firm specific characteristics, earnings per share, book value per share, stock dividend per share but contradict to the priori hypothesis with respect to cash dividend and price earnings ratio. The firm earnings per share showed persistently a positive relation with stock prices when portfolios were formed on one-way sorts of earnings per share. In simple cross sectional regression of stock prices on earnings per share, cash dividend per share, and stock dividend per share appeared to be significant and inclusion of macroeconomic variables did not affect the results. The results with respect to cointegration and causal relationship between stock market returns and macroeconomic variables revealed no cointegration and causality between stock market prices and macroeconomic variables i.e. GDP, inflation and interest rate. Hence, the stock market prices in Nepal are not determined exclusively by macroeconomic variables.

The survey results obtained in this study added somewhat positive results to that of secondary data analysis with respect to firm specific variables but contradict with the effect of macroeconomic variables which are seen less effective in secondary data analysis. The results indicated earnings position of the company as the most important firm specific factors explaining common stock prices followed by announcement of dividend. Most of the respondents have been found to have strong belief on impact of new information to price movement of the Nepalese stock market. Nepalese investors are found to be more aware of the new information announcements. The majority of respondents were holding securities of commercial banks more and holding the securities of more than four companies. The majority of the respondents are not satisfied with the information disseminated by the corporate firms. In the essence, the respondents believe that the share price is adjusted immediately after the announcement of new public information. Thus, the findings of primary data analysis indicate that the Nepalese stock market is sensitive to new public information.

To sum up, most of the findings related to firm specific characteristic in this study are consistent with many of the studies conducted in big and developed stock market context around the globe. However, no cointegration results illustrated in this study contradicts the previous findings of other studies conducted on developed economies. Therefore, it is worthwhile to note that nature of data and the specification of the models may themselves be responsible for the differences in results. Hence, conclusions drawn should be interpreted within these limitations.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The behavior of stock price series has always been a subject matter of controversial debate. The studies on pricing implication of common stocks began since the publication of seminal work of Markowitz (1952) - the mean-variance portfolio theory. Much attention have been paid in past in this regard to explore what determines common stock prices in the context of developed capital markets. However, little efforts have been made to explore this issue in the context of Nepalese stock market. Stock market in Nepal has been experiencing a bearish trend since last few years and has been more volatile than ever in past. Unfavorable political environment, monopoly market structure, very less practice of financial analysis among investors, immature and uncompetitive broker services, poor regulation and governance structure, lack of investment awareness program, and unbalanced structure of market are some of the major characteristics of Nepalese stock market. As a result, there exists an anomaly as to what affects stock prices in Nepal. Therefore, this study attempted to identify how different firm specific and macroeconomic variables affect stock prices in the context of Nepalese stock market. The bank specific variables include earnings per share, book value per share, cash dividend per share, stock dividend per share, and price earnings ratio. Similarly, the macro-economic variables included in the study are gross domestic product (GDP), inflation and interest rate.

This study relied on the use of both primary and secondary sources of data. The balanced panel data were used from ten commercial banks including 130 observations for the period of 2000 to 2012. Descriptive analysis was carried out to analyse the nature of the data. Bi-variate Pearson Correlation analysis was conducted to understand relationship among the indentified variables. Portfolio was sorted based on net interest margin and three portfolios i.e. lowest, moderate and highest portfolios were formed and comparative analysis was made to understand the relationship of the variables.

Panel data regression models were used considering stock prices as the dependent variable and other bank specific and macro-economic factors as the independent variables. Pooled OLS model, fixed effect models and random effect model were applied in order to examine cross sectional (bank) and time effect (period). The regressions were run to identify the effect size of these explanatory variables on common stock prices. Both parametric and non-parametric tests were used to test the significance

of the parameters and models. Validity of the model was tested and the fitted models were found to be significant. Model specification test was conducted using BP test and Hausman test. Both the test measures confirmed the adequacy of pooled OLS model and random effect model. However fixed (one way/ two way) models were also applied for comparative analysis of the empirical results. The study also attempted to evaluate the cointegrating relationship between stock market returns and macroeconomic variables such as GDP, inflation and interest rate in Nepal.

This study also analyzed the views of market participants such as executives, investors, and security businesspersons in relation to preferences toward type of stock market choice, stock market efficiency, and factors affecting stock returns in Nepal. A total of 110 self administered questionnaires were distributed to respondents. A total of 70 respondents provided their responses on different aspects of stock market activities, buying and selling behavior, market type preferences, and factors affecting common stock returns in Nepal.

The results indicate that the earnings per share, cash dividend, and stock dividend per share are the most significant predictor of common stock prices in Nepal across all the analyses and models. Similarly, the model used to analyze whether there is short or long-run equilibrium between macroeconomic variables and stock prices includes time series analysis of cointegration test using Engle and Granger integration technique. The study revealed that that there is no cointegration exists between macroeconomic variables and stock prices in Nepal.

Based on the analysis of the primary and secondary data and interpretation, the major findings of the study have been summarized as follows:

Major Findings

1. Through observation of key variables of financial statements, it is revealed that the company which has higher EPS, has also higher BPS, CD and P or vice versa. Likewise, analysis of stock dividend shows more per cent stock dividend issuing companies have comparatively higher P than the no stock dividend issuing companies. It is further observed that the companies having higher EPS have higher BPS, pay more cash dividend, shows stock dividend issuing behavior and ultimately resulted into better P than the low EPS companies and vice versa. The reasons behind these results are related to higher profitability of the company. The higher profitability is related to performance and market share of the business.

2. The portfolio analysis using one-way sorts on earnings per share, book value per share, dividend per share, and price earnings ratio shows that banks with high earnings per share, high book value per share, high dividend per share, and high price earnings ratio- have higher market price per share.

3. The simple regressions of stock prices on each of the firm specific variables, the study reveals a significant positive relationship of stock prices with EPS, BPS, CD and SD, and a significant negative relationship with price earnings ratios. The EPS, BPS, CD and SD coefficients are 20.752, 5.580, 24.959, and 27.108 respectively and all are significant at 1 percent level while price earnings ratio coefficient is -1.255 and is also significant at 1 percent level.

4. The multiple regression of complete form shows that only earnings per share, cash dividend and stock dividend per share are found to have significant explanatory power while book value per share, and price earnings ratio are not significant. The regression coefficient of earnings per share is 9.200 and coefficient of stock dividend per share is 27.295 and both are significant at 1 percent level. The regression shows significant negative relation with cash dividend per share. The coefficient of cash dividend is -14.348 and is significant at 1 percent level.

5. The results of cointegration test between macroeconomic variables and stock market prices suggest that there is no cointegration between stock market prices and macroeconomic variables. This suggests that stock price movements are not explained by the macroeconomic variables.

6. The comparison between the NEPSE index (NI), with the stock price (P) has also shown similar pattern and trends of movement. The movement of index and average P indicate that the Nepalese capital market is in support of the efficient market hypothesis.

7. The survey results indicate that majority of respondents prefer to buy shares in primary market and a good number of them prefer to trade in both primary and secondary markets. However, very few of them prefer to buy shares in secondary market only. The majorities of respondents were holding securities of commercial banks and were holding the securities of more than four companies. The shares of commercial banks, development banks, finance, and insurance companies are more popular among the Nepalese investors. The manufacturing and processing, hotel and trading companies are less popular categories of shares in Nepalese stock market.

8. Concerning to firm specific effects on stock prices, the respondents feel that announcement of stock dividend is the most important determinant of stock prices in Nepal followed by the announcement of right share issuance. The results based on the gender, age and different profile of the respondents also do not differ significantly with regard to importance of these factors.

5.2 Conclusions

The major conclusion of this study is that the earnings per share, stock dividend per share, and cash dividend per share are the most significant predictor of common stock prices in the context of stock market in Nepal. The results show the inconsistent relationship of price earnings ratio and book value per share with stock market prices, and hence their effects are not conclusive. On the other hand, earning per share, cash dividend per share, and stock dividend per share effect on common stock prices and are consistent across all the analyses and all the specifications of the model. The results indicate very strong role of earnings per share and stock dividend per share to explain common stock prices in Nepal. Similarly, cash dividend per share also has consistent significant negative relation with stock prices in all cases. The results associated with positive and significant relationship between stock prices and earnings per share support the findings of some earlier studies such as by Basu (1977, 1983), Banz (1981), Reinganum(1981), Lakonishok and Sapiro (1986), among others.

The study also concludes that macroeconomic variables and stock prices are not cointegrated. This shows that the stock prices movements in Nepal are not explained by the macroeconomic variables. In the simple cross-sectional regression, inflation has positive and interest rate has negative relation towards the influence of stock price. In the context of Nepal, the priori expected sign of inflation and interest rate holds true in all cases but the priori expected sign of GDP doesn't hold true when other variables are taken along in the model.

5.3 Recommendations

Based on the findings of this study, the following major recommendations have been proposed:

1. Common stocks are believed to be highly risky than the other types securities and asset investments. Moreover, at the same time, it has also given high rate of return than the other type's assets. The study reveals that the cross-section of stock prices can be explained by the size of earnings per share. Therefore, investors are recommended to examine the earnings factor proxied before making stock investment choice in the context of Nepal.

2. The analysis of write-in comments of the respondents indicates that unbalanced structure of market is also a major problem with stock market in Nepal because stock market is dominated by large numbers of firms from financial sector. Therefore, there is a need to create conducive environment to increase the participation of manufacturing sectors in Nepalese stock market. Besides, the results also indicate the need to establish competitive stock exchanges at private sector to facilitate price discovery process, to create an environment for developing professional financial analysis services, to make broker service matured and more competitive, to implement governance practice strictly, to extensively conduct the investor awareness program, and to promote the real sector participation in stock market.

3. This study used annual closing price of shares of common stock and annual closing NEPSE index to represent stock prices. Annual closing prices and stock indexes are suffered from high deviations and thus may inflate the results. Therefore, future studies should be directed towards computing prices from daily or weekly or monthly observations of closing prices.

4. The emerging capital markets are characterized by less frequent transactions termed as thin trading. In such markets the relationship between stock prices and explanatory variables is expected to be non-linear. However, this study has assumed linear relationship between them. In order to incorporate these issues, the future studies are suggested to apply non-linear models to test the predictive power of explanatory variables.

5. To evaluate the cross-sectional variations in stock prices, this study has used few firm specific variables. Inclusion of some other variables, for example cash flow to price (Chan, Hamao, and Lakonishok (1991)), leverage (Fama and French, (1992)), annual sales growth (Davis (1994)), sales-to-price and debt-to-equity ratio (Barbee, Mukherji, and Raines (1996)), may provide an important insight into the cross-sectional relationship of common stock prices in Nepal. Similarly inclusion of other macroeconomic variables such as unemployment rate (Gertler and Grinols (1982)), national saving and investment (Ewing (2002)), industrial production and money supply (Liu and Shrestha (2008)) also may provide important observations on the relationship between stock market prices and economic development. Therefore, future studies are recommended to include these variables as well.

6. This study used the observations from banking sectors only. The results are thus not representative of all sectors of the economy. Hence, future studies are suggested to include observations from other sectors as well.

7. This study employed Engle and Granger (1987) test for cointegration. As the number of observations limited to 13, the time series analysis is not as appropriate as with large number of observations which may impacts on the findings. The future study is suggested to incorporate significant number of observations for time series analysis and test the causality between stock market returns and macroeconomic variables.

8. To meet the basic purpose of primary sources of information analysis in the context of stock market prices in Nepal, this study has conducted the opinion survey among investors, executives, and securities businesspersons mostly concentrated in Kathmandu Valley. Future studies are suggested to extend the survey around other places of the country including broad categories of respondents such as stock market analyst, independent practitioners, and policy makers for the purpose to assess the wider range of opinions.

In conclusion, the need to understand the possible factors that could predict the stock prices movement in the context of Nepal is vital because the increased efficiency in stock market will consequently boost Nepalese economy.

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Appendix A

Survey questionnaire on '*The Anomalies of Stock Market Prices in Nepal'*

Dear Respondents,

I am a research scholar of Master of Philosophy (MPhil) Program of Kathmandu University. I am conducting a study on "*The Anomalies of Stock Market Prices: An Empirical Study of Commercial Banks in Nepal"* as a partial fulfillment of my MPhil degree. The purpose of this study is to examine how the various firm specific variables and macroeconomic variables affect the stock market prices of commercial banks in Nepali context. You are, therefore, humbly requested to complete this survey questionnaire. Your co-operation is highly appreciated. Your response is kept quite confidential and will be used at aggregate level only. If you would like to have a copy of findings, please indicate the same.

Thanking you,

Sincerely,

Dipendra Karki

March, 2013

A. Respondent's profile

a. Name (Optional): ……..
b. Sex: Male ☐ Female ☐
c. Age: (Please make a tick-mark)
   i) below 30 years ii) 30 to 45 years iii) above 45 years
d. Experience: (Please make a tick-mark)
   i) below 5 years ii) 5-10 years iii) above years
e. Institution: …… Profession……
   Contact: tel: ……. Email…….…….
   address:……..…

B. General questions:

(Relating to shareholder's perception for buying equity shares and market price)

1. Which market do you prefer to purchase the stocks ? (Please check below)

Primary market	Secondary market	Both

2. How do you priorities the following investment opportunities ? (Please rank the following in order of your priority of investment by assigning 1 to most important one and so on).

a. Bank deposit
b. Gold and silver
c. Bonds
d. Shares
e. Real estate
f. Others (please specify)

3. Which corporate firm's stock do you have ? (Please check as many as applicable)

	%		%
Commercial banks		Finance companies	
Insurance companies		Manufacturing and processing	
Hotel		Trading	
Development banks		Others	

4. Have you attended any annual general meeting of corporate firms of which you hold shares? (Please choose one).

a) Yes ☐ b) No ☐

5.How frequently do you buy or sell shares in secondary market ? (Please tick appropriate box).

a. Daily ☐ b. Weekly ☐ c. Fortnightly ☐

d. Monthly ☐ e. Yearly ☐ f. others (please specify)…….

6. Do you think that corporate firms disseminate important information to investors market on time?

a) Yes ☐ b) No ☐

7. Do you think that the stock indexes is affected by the different factors of information?

(Please make a tick mark)

a) Yes ☐ b) No ☐ c) Don't know ☐

8. Do you feel the management protects shareholder's interest ?

a) Yes ☐ b) No ☐

9. What is your major motive behind investing in the stocks? Please rank in order of importance.

Causes of interest **Lowest 1 2 3 4 5 Highest**

Expectation of cash dividend	
Expectation of increase in market price	
Expectation of bonus/right shares	
Because of no opportunities to invest in other fields	
Because of less risk compared to other investments	

10. What do you think are the factors affecting the share prices? Please rank in order of importance.

Causes affecting the share prices **Lowest 1 2 3 4 5 Highest**

a.	Announcement of earnings	
b.	Announcement of cash dividends	
c.	Announcement of bonus shares and rights issue	
d.	Political – Economic events	
e.	Announcement of changes in management of the company	

C. Specific questions: Relating to firm specific and macroeconomic variables and market reaction on stock prices. Please mark (√) on your choice.

1 = Strongly disagree **2** = Disagree **3** = Neutral **4** = Agree **5** = Strongly agree

S.No.	**Statements**	**5**	**4**	**3**	**2**	**1**
1	Stock price is affected by the announcement of cash dividend.					
2	Market price of the stock is affected by the announcement of stock dividends.					
3	Stock price in market is affected by the announcement of accounting information					
4	Stock price is affected by the announcement of right share issuance.					
5	Market price of the stock is affected by the announcement of new corporate management leader/team.					
6	Share price is affected by the announcement of additional business expansion					
7	Stock price is affected by the announcement of changes in corporate tax rates					
8	Changes in capital gain tax affects share prices					
9	Announcement of present macro-economic report by government affect share price					
10	Market price of the stock is affected by the announcement of government policies.					
11	Announcement of changes in cabinet (government) affects market price of the stocks.					

D. Any other suggestions and comments on an announcement of new unanticipated information and stock price adjustment?

... ...
.... ……………………………… ………………………….. ………………...

Thank You

Appendix B

Tables on different Regression Models

Table 1: Pooled OLS Regression or Constant Coefficient Model

Regression results of stock prices on five firm specific variables and three macro-economic variables based on panel data of 10 commercial banks with 130 observations for period 2000-2012. The regression models include pooled OLS model. The reported values are intercepts and slope coefficients of respective explanatory variables with standard error in the parentheses. Dependent variable is the stock price (P), and independent variables are earnings per share (EPS), book value per share (BPS), cash dividend per share (CD), stock dividend per share (SD), price earnings ratio (P/E), gross domestic product (GDP), inflation (INF), and interest rate (IR).

$$P_{it} = \alpha + b_{1t}\, EPS_{it} + b_{2t}\, BPS_{it} + b_{3t}\, CD_{it} + b_{4t}\, SD_{it} + b_{5t}\, P/E_{it} + b_{6t}\, GDP_{it} + b_{7t}\, INF_{it} + b_{8t}\, IR_{it} + \varepsilon_{it}$$

Panel (P_{it} = Stock Price)				
	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	-264.21	230.8	-1.1448	0.25457
EPS	4.98193	3.0291	1.6447	0.10263
BPS	1.67861**	0.740778	2.2660	0.02523
CD	-9.05539**	4.17252	-2.1702	0.03194
SD	23.8951***	4.04606	5.9058	<0.00001
P_E	1.88436**	0.722638	2.6076	0.01027
GDP	-1.77217***	0.631953	-2.8043	0.00588
INF	169.554***	30.1891	5.6164	<0.00001
IR	-54.0982*	29.7832	-1.8164	0.07178
R^2	70.70%			
F-statistics	39.91			

Significance codes: * Significant at 10%, ** Significant at 5%, *** Significant at 1%

Table 2: The One-Way Fixed Effect Least-Square Dummy Variable (LSDV) Model (Banks as Dummys)

Regression results of stock prices on five firm specific variables and three macro-economic variables based on panel data of 10 commercial banks with 130 observations for period 2000-2012. The regression models include one-way fixed effect model. The reported values are intercepts and slope coefficients of respective explanatory variables with standard error in the parentheses. Dependent variable is the market prices of stock (P), and independent variables are earnings per share (EPS), book value per share (BPS), cash dividend per share (CD), stock dividend per share (SD), price earnings ratio (P/E), gross domestic product (GDP), inflation (INF), and interest rate (IR).

The applied equation: $P_{it} = \alpha_i + b_{1t} EPS_{it} + b_{2t} BPS_{it} + b_{3t} CD_{it} + b_{4t} SD_{it} + b_{5t} P/E_{it} + b_{6t} GDP_{it} + b_{7t} INF_{it} + b_{8t} IR_{it} + \delta_i B_i + \varepsilon_{it}$

Panel (P_{it} = Stock Price)				
	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	589.731	375.394	1.5710	0.11901
EPS	3.53419	3.51328	1.0059	0.31661
BPS	1.54634*	0.821442	1.8825	0.06237
CD	-20.7682***	4.91624	-4.2244	0.00005
SD	25.0228***	4.27625	5.8516	<0.00001
P_E	1.95605***	0.691884	2.8271	0.00556
GDP	-1.93448***	0.596866	-3.2411	0.00157
INF	174.707***	28.814	6.0633	<0.00001
IR	-55.5242*	28.0831	-1.9771	0.05048
BankNIB	-682.326**	297.463	-2.2938	0.02367
BankSCB	547.199*	283.567	1.9297	0.05617
BankHBL	-888.168***	288.395	-3.0797	0.00261
BankNSBI	-514.319	327.834	-1.5688	0.11951
BankNBB	-1014.51***	348.412	-2.9118	0.00434
BankEBL	-174.731	310.958	-0.5619	0.57530
BankBOK	-792.663**	305.804	-2.5921	0.01081
BankNCC	-834.402**	354.405	-2.3544	0.02030
BankNIC	-781.747**	322.851	-2.4214	0.01707
R^2	74.19%			
F-statistics	22.813			

Significance codes: * Significant at 10%, ** Significant at 5%, *** Significant at 1%

Table 3: The Two-Way Fixed Effect Least-Square Dummy Variable (LSDV) Model (Banks and Years as Dummys)

Regression results of stock prices on five firm specific variables and three macro-economic variables based on panel data of 10 commercial banks with 130 observations for period 2000-2012. The regression models include two-way fixed effect model. The reported values are intercepts and slope coefficients of respective explanatory variables with standard error in the parentheses. Dependent variable is the market prices of stock (P), and independent variables are earnings per share (EPS), book value per share (BPS), cash dividend per share (CD), stock dividend per share (SD), price earnings ratio (P/E), gross domestic product (GDP), inflation (INF), and interest rate (IR).

The applied equation: $P_{it} = \alpha_{it} + b_{1t}\, EPS_{it} + b_{2t}\, BPS_{it} + b_{3t}\, CD_{it} + b_{4t}\, SD_{it} + b_{5t}\, P/E_{it} + b_{6t}\, GDP_{it} + b_{7t}\, INF_{it} + b_{8t}\, IR_{it} + \delta_i B_i + \delta_t T_t + \varepsilon_{it}$

Panel (P_{it} = Stock Price)				
	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1042.71**	504.243	2.0679	0.04116
EPS	-4.47803	3.22946	-1.3866	0.16855
BPS	2.84677***	0.720411	3.9516	0.00014
CD	-12.1964***	4.55496	-2.6776	0.00863
SD	19.6694***	3.79599	5.1816	<0.00001
P_E	0.986645	0.602287	1.6382	0.10444
GDP	-2.48249	1.86733	-1.3294	0.18664
INF	151.123	121.697	1.2418	0.21713
IR	-16.2126	55.3206	-0.2931	0.77006
BankNIB	-853.563***	254.251	-3.3572	0.00110
BankSCB	609.95**	241.189	2.5289	0.01296
BankHBL	-1029.86***	246.265	-4.1819	0.00006
BankNSBI	-763.021***	281.53	-2.7103	0.00788
BankNBB	-878.447***	296.722	-2.9605	0.00381
BankEBL	-292.475	267.492	-1.0934	0.27677
BankBOK	-989.254***	261.497	-3.7830	0.00026
BankNCC	-1107.14***	303.255	-3.6509	0.00041
BankNIC	-1032.05***	276.355	-3.7345	0.00031
factor(Year)2001	140.585	259.526	0.5417	0.58919
factor(Year)2002	-356.467	247.229	-1.4419	0.15238
factor(Year)2003	-669.032	405.609	-1.6495	0.10210
factor(Year)2004	-58.1997	239.917	-0.2426	0.80881
factor(Year)2005	-463.104	413.385	-1.1203	0.26520
factor(Year)2006	-173.796	488.9	-0.3555	0.72295
factor(Year)2007	892.242***	294.317	3.0316	0.00308
factor(Year)2008	871.79	714.364	1.2204	0.22511
factor(Year)2009	342.293	585.263	0.5849	0.55993
R^2	81.88%			
F-statistics	23.428			

Year dummies omitted due to exact collinearity: dt_10, dt_11, dt_12 & dt_13
Significance codes: * Significant at 10%, ** Significant at 5%, *** Significant at 1%

Table 4: Random Effect Model (REM)

Regression results of stock prices on five firm specific variables and three macro-economic variables based on panel data of 10 commercial banks with 130 observations for period 2000-2012. The regression models include Random Effect Model. The reported values are intercepts and slope coefficients of respective explanatory variables with standard error in the parentheses. Dependent variable is the stock price (P), and independent variables are earnings per share (EPS), book value per share (BPS), cash dividend per share (CD), stock dividend per share (SD), price earnings ratio (P/E), per capita gross domestic product (GDP), inflation (INF), and interest rate (IR).

$$P_{it} = \alpha_i + b_1 EPS_{it} + b_2 BPS_{it} + b_3 CD_{it} + b_4 SD_{it} + b_5 P/E_{it} + b_6 GDP_{it} + b_7 INF_{it} + b_8 IR_{it} + \delta_i B_i + \delta_t T_t + \omega_{it}$$

Panel (P_{it} = Stock Price)				
	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	-264.21	230.8	-1.1448	0.25457
EPS	4.98193	3.0291	1.6447	0.10263
BPS	1.67861**	0.740778	2.2660	0.02523
CD	-9.05539**	4.17252	-2.1702	0.03194
SD	23.8951***	4.04606	5.9058	<0.00001
P_E	1.88436**	0.722638	2.6076	0.01027
GDP	-1.77217***	0.631953	-2.8043	0.00588
INF	169.554***	30.1891	5.6164	<0.00001
IR	-54.0982*	29.7832	-1.8164	0.07178

Significance codes: * Significant at 10%, ** Significant at 5%, *** Significant at 1%

Breusch-Pagan test -

Null hypothesis: Variance of the unit-specific error = 0
Asymptotic test statistic: Chi-square(1) = 1.12609
with p-value = 0.28861

Hausman test -

Null hypothesis: GLS estimates are consistent
Asymptotic test statistic: Chi-square(8) = 26.7267
with p-value = 0.0788033

Appendix C

Data on firm specific variables used in the study

1. NABIL Bank Limited

Year	Price	EPS	BPS	CD	SD	P/E
2000	1400	84	251	55	55	16.67
2001	1500	59	216	40	60.11	25.42
2001	700	55	233	30	30	12.73
2003	740	85	267	50	50	8.71
2004	1000	93	301	65	65	10.75
2005	1505	105	337	70	70	14.33
2006	2240	129	381	85	85	17.36
2007	5050	137	418	100	140	36.86
2008	5275	116	354	60	100	45.47
2009	4899	113	324	35	85	43.35
2010	2384	84	265	30	70	28.38
2011	1252	71	225	30	30	17.63
2012	1355	84	269	40	60	16.13

2. Nepal Investment Bank Limited

Year	Price	EPS	BPS	CD	SD	P/E
2000	1401	54	303	25	50	25.94
2001	1150	33	276	0	0	34.85
2001	760	34	308	0	30	22.35
2003	795	40	216	20	20	19.88
2004	940	52	247	15	15	18.08
2005	800	40	201	12.5	12.5	20.00
2006	1260	59	240	20	55.46	21.36
2007	1729	63	235	5	30	27.44
2008	2450	58	223	7.5	40.83	42.24
2009	1388	37	162	20	20	37.51
2010	705	53	190	25	25	13.30
2011	515	39	171	25	50	13.21
2012	511	28	161	5	30	18.25

3. Standard Chartered Bank Nepal Limited

Year	Price	EPS	BPS	CD	SD	P/E
2000	1985	116	299	100	100	17.11
2001	2144	127	328	100	100	16.88
2001	1575	141	364	100	100	11.17
2003	1640	149	403	110	120	11.01

2004	1745	144	399	110	110	12.12
2005	2345	143	422	120	120	16.40
2006	3775	176	468	130	140	21.45
2007	5900	167	512	80	130	35.33
2008	6830	132	402	80	130	51.74
2009	6010	110	328	50	100	54.64
2010	3279	78	241	55	70	42.04
2011	1800	70	228	50	50	25.71
2012	1799	73	256	45	60	24.64

4. Himalayan Bank Limited

Year	**Price**	**EPS**	**BPS**	**CD**	**SD**	P/E
2000	1700	83	363	50	75	20.48
2001	1500	94	399	27.5	57.5	15.96
2001	1000	60	393	25	35	16.67
2003	836	49	444	1.32	25	17.06
2004	840	49	247	0	20	17.14
2005	920	48	240	11.58	31.58	19.17
2006	1100	59	229	30	35	18.64
2007	1740	61	265	15	40	28.52
2008	1980	63	248	25	45	31.43
2009	1760	62	257	12	43.56	28.39
2010	816	32	227	11.84	36.84	25.50
2011	575	45	200	16.84	36.84	12.78
2012	653	40	193	13.42	28.42	16.33

5. Nepal SBI Bank Ltd.

Year	**Price**	**EPS**	**BPS**	**CD**	**SD**	P/E
2000	1165	42	188	15	0	27.74
2001	1500	9	148	0	20	166.67
2001	401	10	195	0	0	40.10
2003	255	11	100	8	8	23.18
2004	307	14	91	0	0	21.93
2005	335	13	111	0	0	25.77
2006	612	18	121	5	5	34.00
2007	1176	39	132	12.59	17.59	30.15
2008	1511	28	161	0	0	53.96
2009	1900	36	195	2.11	42.11	52.78
2010	741	24	148	5	17.5	30.88
2011	565	25	154	5	17.5	22.60
2012	635	23	153	5	17.5	27.61

6. Nepal Bangladesh Bank Limited

Year	Price	EPS	BPS	CD	SD	P/E
2000	1502	116	330	0	100	12.95
2001	1100	83	206	5	55	13.25
2001	490	18	174	0	0	27.22
2003	360	20	190	0	0	18.00
2004	354	1	182	0	0	354.00
2005	265	1	33	0	0	265.00
2006	199	1	-217	0	0	199.00
2007	550	1	-364	0	0	550.00
2008	1001	80	-295	0	0	12.51
2009	280	116	60	0	0	2.41
2010	265	55	115	0	0	4.82
2011	266	10	112	0	0	26.60
2012	121	40	147	0	0	3.03

7. Everest Bank Limited

Year	Price	EPS	BPS	CD	SD	P/E
2000	995	35	171	0	20	28.43
2001	650	32	145	5	0	20.31
2001	405	33	151	0	20	12.27
2003	445	26	150	20	0	17.12
2004	680	46	172	20	0	14.78
2005	870	54	93	0	20	16.11
2006	1379	63	218	25	0	21.89
2007	2430	78	293	10	30	31.15
2008	3132	92	322	20	30	34.04
2009	2455	100	345	30	30	24.55
2010	1630	100	332	30	30	16.30
2011	1094	83	264	50	10	13.18
2012	1033	89	326	1.58	30	11.61

8. Bank of Kathmandu Limited

Year	Price	EPS	BPS	CD	SD	P/E
2000	998	39	195	0	31.58	25.59
2001	850	28	208	0	0	30.36
2001	254	2	172	10	10	127.00
2003	198	18	193	5	5	11.00
2004	295	28	218	10	10	10.54
2005	430	30	214	15	15	14.33
2006	850	44	231	18	48	19.32
2007	1375	44	165	20	20	31.25
2008	2350	60	223	2.11	42.11	39.17

2009	1825	55	206	7.37	47.37	33.18
2010	840	43	175	15	30	19.53
2011	570	45	179	16.75	34.75	12.67
2012	628	38	168	21.32	26.32	16.53

9. Nepal Credit and Commerce Bank Limited

Year	**Price**	**EPS**	**BPS**	**CD**	**SD**	P/E
2000	105	0.16	67	0	0	656.25
2001	110	0.59	73	0	0	186.44
2001	110	-11.35	-41	0	0	-9.69
2003	108	1.67	16	0	0	64.67
2004	115	0.49	27	0	0	234.69
2005	120	-0.74	37	0	0	-162.16
2006	94	-84.77	-44	0	0	-1.11
2007	316	-16.56	-73	0	0	-19.08
2008	457	35.63	49	0	0	12.83
2009	335	29.35	78	0	0	11.41
2010	275	30.28	109	0	0	9.08
2011	167	15.78	125	0	0	10.58
2012	126	12.69	131	0.26	5	9.93

10. Nepal Industrial and Commercial Bank Limited

Year	**Price**	**EPS**	**BPS**	**CD**	**SD**	P/E
Y00	550	5	104	0	0	110.00
Y01	399	10	104	10	10	39.90
Y02	245	1	105	0	0	245.00
Y03	220	5	110	0	0	44.00
Y04	218	14	124	0	0	15.57
Y05	366	23	137	10	30	15.91
Y06	496	16	116	0.53	10.53	31.00
Y07	950	24	139	1.05	21.05	39.58
Y08	1284	26	138	1.05	21.05	49.38
Y09	1126	28	146	0.79	15.79	40.21
Y10	626	34	135	26.32	26.32	18.41
Y11	520	38	152	20	20	13.68
Y12	468	30	157	25	25	15.60

Appendix D

Data on macroeconomic variables used in the study

Year	Nepse Index (NI)	Inflation (INF)	Interest Rate (IR)	Per Capita Gross Domestic Product (GDP)
2000	360.7	2.48	3.32	234.569
2001	348.4	2.69	5.36	235.868
2002	227.5	3.03	3.55	234.209
2003	204.9	5.71	3.95	242.886
2004	222	2.84	3.70	273.547
2005	286.7	6.84	3.94	304.649
2006	386.8	7.56	3.25	324.92
2007	683.9	6.10	2.77	363.913
2008	963.4	10.91	2.35	434.018
2009	749.1	11.61	6.80	436.753
2010	477.7	9.98	8.13	532.578
2011	362.9	9.55	8.52	622.495
2012	389.7	7.70	1.15	626.168