

# Fundamentals of Common Stock Pricing: Evidence from Commercial Banks of Nepal

*Dipendra Karki*

Lecturer, Nepal Commerce Campus

## **Abstract**

*This study relates cross-sectional differences in stock prices of Nepalese commercial banks to the underlying behavior of six fundamental variables: earnings per share, book value per share, cash dividend per share, stock dividend per share, price earnings ratio, and firm size. This study uses secondary sources of data. The balanced panel data from commercial banks including 150 observations are used for the period of 2000-2014. The earnings per share and stock dividend per share are the more significant determinants of stock prices of commercial banks in Nepal. The performance of the stock dividend is especially noteworthy; this variable is statistically and economically the most important of the six fundamental variables investigated.*

**Key words:** Dividend, Earnings per share, Fixed Effect Model, Stock price

## **INTRODUCTION**

### **Background of the Study**

Stock prices prophecy has received a considerable attention from both academicians and practitioners since it can be used as a measure of risk in financial markets. The pricing implication has come into limelight 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. There is a theoretical links between financial reporting and stock prices (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 and Harris (1991) considered the earning as an explanatory variable for stock prices. Among several firm specific characteristics, the earlier most prominent ones in determining stock prices are; earnings-to-price ratio (Basu, 1977), book-to-market equity ratio (Stattman ,1980), dividend (Friend & Puckett, 1964), and firm size defined by market

value of equity (Banz, 1981).

Though, the studies conducted in developed economies showed that there is in fact a relationship between stock prices and certain macroeconomic indicators (Fama and Schwert, 1977), many studies showed no relationship between the economies and the financial markets of less developed countries like Asian markets. Stocks do well or poorly in the future because the businesses behind them do well or poorly-nothing more, and nothing less (Graham, 1973). Similarly, Fung and Lie (1990) explained that macroeconomic factors can't be reliable indicators for price movements in the Asian markets because of the inability of stock markets to fully capture information about the change in macroeconomic fundamentals. The stock market behavior in the context of smaller, developing and under-developed capital markets is thus one of the important areas of the study in finance. In this context, this study aims to examine the predictive power of the firm specific fundamentals in determining the stock prices in Nepal.

Since the adoption of economic liberalization policy in the beginning of 1980s, Nepal has guided towards 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. The initiation of financial sector reform program has brought number of structural and institutional changes in 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 fundamental determinants of stock prices in Nepal. Correspondingly, few researches are also being conducted to understand the current working of the economic and the financial system in the new scenario of Nepal. Nepalese studies, however, the results of prior studies are not unanimous as widely documented in the existing literatures in other markets.

### ***Statement of the Problem***

The empirical studies have found that variables relating to firm characteristics have significant explanatory power for average stock prices including Basu (1977) and many others. Hence, there is a need to explore whether the earnings power of the firm alone can predict stock prices, or inclusion of other fundamental variables including firm size and dividends subsume the effect on stock returns in the context of stock market in Nepal.

Nepalese stock market is primarily dominated by the banking sector. With the growing number of commercial banks in the country, a question as to whether their performance influence stock market's volatility has become relevant. Nepalese stock market has passed through different stages. Major political changes occurred during this study period and the market index (NEPSE) has witnessed significant ups and downs. Though the study is based on commercial banks but many of the analytical methods and approaches used can undoubtedly be of great use to other sectors of listed companies in Nepalese stock market. Compared to other related studies available in Nepal this study has segregated the dividend into cash dividend and stock dividend

to analyze the comparative strength and preference of investors one above other while determining stock prices. To sum up, the study basically deals with following issues:

- How sensitive are the stocks of the commercial banks about the given changes in the earnings as a whole?
- How far the market prices of the shares are explained by the book value per share as shown in the balance sheet?
- What is the extent of possibility that companies with generous dividend distribution policies consistently sell at a premium over those poorly payout? Is the reverse ever true?
- What is the level of consistency in explanatory power of earnings per share, book value per share, cash dividend per share, stock dividend per share, price earnings ratio, and firm size when considered individually and when considered together?

### ***Objective of the Study***

The major objective of this study is to analyze the fundamental variables that affect stock prices of commercial banks in Nepal. The specific objectives are as follows.

To examine the explanatory power of firm specific variables namely; earnings per share, book value per share, cash dividend per share, stock dividend per share, price earnings ratio and firm size in determining the stock prices of commercial banks when considered individually and when considered together.

## **REVIEW OF LITERATURE**

Many general investors are puzzled about the stock 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. Bachelier (1900) set a forth formal model in which security prices were random outcomes that had probabilities attached to them. There are several factors in determining stock market prices. The basic foundation for 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.

Earnings related strategies have a long tradition in the investment community. The most popular of these strategies, which calls for buying stocks that sell at low multiples of earnings, can be traced back at least to Graham and Dodd (1940) who proposed that a necessary but not a sufficient condition for investing in a common stock is a reasonable ratio of price to average earnings. The author advocated that a prudent investor should never pay as much as 20 times earnings and a suitable multiplier should be 12 or less. A numerous empirical evidences have enquired on the earnings effect on stock returns.

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 by the company. The expected receipt of dividend income is an incentive for investing in a given stock, particularly if the yield on investment exceeds the return offered on other alternative investments. Basu (1977) 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) revealed 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.

Banz (1981) reported a negative relationship between firm size, measured by market value of equity, and common stock returns. Though controversial, the findings collectively represent a set of facts that stand as a challenge for alternative pricing models. Some studies employ cross-sectional regression technique to represent these ad hoc effects as:

$$P_i = b_0 + b_1 \beta_i + b_2 \Sigma C_{ij} + e_i \dots\dots\dots (1)$$

Where  $C_{ij}$  represents firm's characteristics  $j$  for stock  $i$ .

According to Modigliani and Miller (1961), under perfect market situation, the dividend policy of a firm is irrelevant as it does not affect the value of the firm. They argue that the value of the firm depends on the firm's earnings which result from its investment policy. However, Gordon (1962) postulated dividend relevance theory which indicated that investors are different towards current dividends and retention of earnings. The study concluded that investor value the present dividend more than future capital gain. Friend and Puckett (1964) used the regression model:  $P_t = a + bD_t + CR_t$  ----- (2), that exhibited the strong dividends effect and relatively weak retained earnings effects on stock pricing.

Chan, Hamao and Lakonishok (1991) examined the cross-sectional differences in stock returns in Japan using four variables, namely, earnings-to-price, cash flow yield, size and book-to-market equity. 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. Among the four, it was hardest to disentangle the effect of the earnings-to-price variable.

In an attempt to study the cross-section of average stock returns, Fama and French (1992) evaluated the joint roles of market beta, size, earnings yield, leverage, and book-to-market equity. The study revealed that the relation between average

stock return and book-to-market equity was strongly positive. Further, Fama and French (1995) showed that size and book-to-market equity were related to profitability. The Firms with high book-to-market equity tended to be persistently distressed and conversely, low book-to-market equity stocks were found to be sustained with strong profitability. Gomes, Kogan and Zhang (2003) found significantly negative relation between stock returns and firm size. The study also confirmed the importance of the book-to-market ratio in addition to the size in explaining the cross-sectional properties of stock returns.

The effect of company characteristics on common stock returns in Indian context was analyzed by Kumar and Sehgal (2004). The study also revealed a strong negative relationship between firm size and stock returns. The empirical results, however, provided a mixed picture in relation to value effect. The returns on the portfolio sorted on book-to-market equity were almost identical; however, a strong and positive value effect emerged for earnings-to-price sorted portfolio. Fama and French (2008) 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. Marian (2009) examined the strategy of value investing and its prediction for stock performance. The results found that there is a negative correlation between the stock's yield and its price earnings ratio.

The impact of firm specific variables on stock prices of Iran was studied by Ebrahim and Chadegani (2011) using cross-section and panel data regression models. The results showed that in some years, shareholders pay special attention to dividends. Moreover, the study found a significant relationship between current period earning divided by stock price at the beginning of the stock market period and stock return. Thus, results theoretically supported the existence of relationship between earning, dividend and stock return.

Mgbame and Ikhata (2013) conducted a study to examine if Book values per share, Dividend per share and Earnings per share have a significant effect on stock volatility in Nigeria. They found enough evidences to reject the assumptions of conditional normality in stock prices data series and accepted the existence of stock volatility. In an attempt to explain cross-section of expected returns in Bangladesh Hasan et al. (2014) conducted a study regarding the size and value effect. The results found that small size firms with high book to market ratio tend to provide higher average monthly returns than big size firms. The study also evidenced that the size and value premium have very strong power to explain cross-section of expected stock returns in Bangladesh.

Though there findings are available in many developed economies, the effect of fundamental firm specific variables on common stock pricing is still inconclusive.

### ***Review of Nepalese Studies***

On the contrary to the developed capital markets, there are few empirical works in the context of Nepal. The relative importance of dividends and retained earnings in determining stock price in Nepalese context was studied by Pradhan (2003). The result showed the customary strong dividend effect, and very weak retained earnings effect,

indicating attractiveness of dividends among Nepalese investors.

Basnet (2007) concluded that market price per share (MPS) is well explained by dividend and retained earnings. It further concluded that the high price of the stock of financial institutions is the high dividend offered by this sector. Adhikari (2009) found that dividend announcement does convey some significant information and the market tries to adjust itself to new pieces of information as and when they become available. There is positive return following the announcement of cash dividend. However, the study by K.C. (2009) revealed that book-to-market equity is the most significant positive determinants of stock returns in Nepalese stock market. Joshi (2012) found that the impact of dividends is more pronounced than that of retained earnings in the context of Nepal. Dividend has a significant effect on market stock price in both banking and non-banking sector.

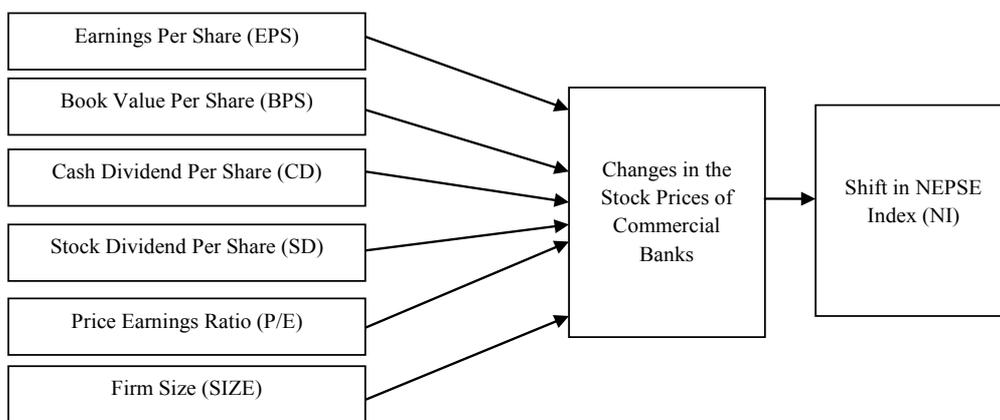
To sum up, the studies on fundamental variables have not documented consistent results. Some of these studies found that fundamental characteristics associated with firms are significant in explaining the common stock returns where others do not. Not only the little is known in Nepalese context but also the effect of such fundamental variables vary across the studies as in the case of developed capital markets.

### Theoretical Framework

Based on the literature review, the major factors affecting stock prices considered in this study 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), and Firm size (SIZE). The schematic diagram of the relationship between stock prices and these factors are shown in Figure 1.

Figure 1

Theoretical Framework of the Study



Dependent Variable	Stock Price					
Independent Variables	EPS	BPS	CD	SD	P/E	SIZE
Expected relationship	+'ve	+'ve	+'ve	+'ve	-'ve	-'ve

## RESEARCH METHODOLOGY

### *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 Nepal. The descriptive research design has been adopted for fact-finding and searching adequate information about variables in the study. This study further aims to test the existing theoretical status based on the statistical model thus the positivism research paradigm has been followed.

### *Nature and Sources of Data*

This study is an empirical research based on secondary data. The firm (bank) specific variables have been collected from the individual bank's annual reports, reports published by NRB, and SEBON. The stock prices are collected from Nepal Stock Exchange (NEPSE). The study is based on the panel data of 10 commercial banks for the period of 15 years from F/Y 1999/2000 to 20013/14.

### *Population and Sampling*

There are thirty commercial banks operating in Nepal till this study period though few have recently initiated merger process. The sample 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 1.

*Table 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 1999 A.D.
3.	Financial Statement	Bank should not be one that has not published its financial statement regularly.
4.	Stock Trading	The Bank should listed in NEPSE and traded its stock prior to 2000 A.D

On the basis of the criteria given, the selected commercial banks are shown in Table 2.

*Table 2*

*Selected Sample Banks, Study Period and Number of Observations*

S.N.	Name of Bank	Estd.	Study Period	No. of Obs.
1	NABIL Bank Limited	1984	2000-2014	15
2	Nepal Investment Bank Limited	1986	2000-2014	15
3	Standard Chartered Bank Nepal Limited	1987	2000-2014	15
4	Himalayan Bank Limited	1993	2000-2014	15
5	Nepal SBI Bank Limited	1993	2000-2014	15

S.N.	Name of Bank	Estd.	Study Period	No. of Obs.
6	Nepal Bangladesh Bank Limited	1994	2000-2014	15
7	Everest Bank Limited	1994	2000-2014	15
8	Bank of Kathmandu Limited	1995	2000-2014	15
9	Nepal Credit & Commerce Bank Limited	1996	2000-2014	15
10	NIC Asia Bank Limited	1998	2000-2014	15
Total				150

Only 13 banks were established prior to 1999 A.D. Agricultural Development Bank and Nepal Bank limited listed their shares in NEPSE very recently and started trading of shares only by 2011 and 2012 A.D. respectively. Whereas, Rastriya Baniija Bank still isn't issuing its shares to the public. Due to unavailability of data these three banks were excluded from the sample.

### **Methods of Data Analysis**

The econometric models have been employed in this study to analyze the relationship between common stock prices and the firm specific variables; EPS, BPS, CD, SD, P/E, and LnSIZE.

#### *Pooled OLS Model*

It has been conducted to have at least a baseline comparison model in this study. The regression analysis started from the following model:

$$P_{it} = \alpha_0 + \beta_i X_{it} + \varepsilon_{it} \dots \dots \dots (3)$$

Where,

$P_{it}$  = Dependent variable (Common Stock market prices) for bank  $i$  at time  $t$

$\alpha_0$  = Constant term, assumed to be constant over time

$\beta_i$  = Coefficient of bank specific characteristics

$X_{it}$  = Vector of bank specific variables of bank  $i$  at time  $t$

$\varepsilon_{it}$  = Stochastic error term assumed to have zero mean, constant variance and normal distribution. Subscript  $i$  is the  $i$ th subject (bank) i.e. 1, 2, 3.....and  $t$  is time period for the variables. Here,  $i$  takes the value from 1 to 10 representing sample banks i.e. the cross-sectional units; and  $t$  ranges from 2000 to 2014.

#### *One-Way Fixed Effect Model (FEM)*

In above model (3) the intercept is assumed to be constant over time. But in reality the intercept might be different based on the characteristic of different banks. In order to identify the bank specific effects, one way fixed effect model has been conducted.

$$P_{it} = \alpha_0 + \alpha_i \beta_{it} + \beta_i X_{it} + \sum_{i=1}^9 \delta_i \beta_i + \varepsilon_{it} \dots \dots \dots (4)$$

This model shows 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 is 1 and 0 other wise and it was used in a similar way for remaining dummies ( $B_j$ ). Total dummy variables used were 9 (total number of banks used in the study less one).

The reason for deducting one dummy variable was to avoid the dummy variable trap. Dummy variables trap is the condition or situation of perfect collinearity.

The one-way fixed effect model can also be presented in detail form considering all the explanatory variables in the study as follows;

$$P_{it} = \alpha + \beta_{1t}EPS_{it} + \beta_{2t}BPS_{it} + \beta_{3t}CD_{it} + \beta_{4t}SD_{it} + \beta_{5t}P/E_{it} + \beta_{6t}LnSIZE_{it} + \sum_{i=1}^9 \delta_i \beta_i + \varepsilon_{it} \dots (4.1)$$

*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 has been conducted. In addition to unit dummy as in equation 4, this model also add time dummy in order to capture the time trends. Such model is called time variant model or two- way fixed effect model (Gujrati, Porter and Gunasekar, 2012) which is written as follows:

$$P_{it} = \alpha + \beta_{1t}EPS_{it} + \beta_{2t}BPS_{it} + \beta_{3t}CD_{it} + \beta_{4t}SD_{it} + \beta_{5t}P/E_{it} + \beta_{6t}LnSIZE_{it} + \sum_{i=1}^9 \delta_i \beta_i + \sum_{t=1}^{14} \delta_t T_t + \varepsilon_{it} \dots (4.2)$$

The term  $\delta_t T_t$  represents time dummy. The total time dummies used in the model are 14 (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.

**Random Effect Regression Model (REM):**

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 (4.1) and (4.2). Here, intercept  $\beta_i$  is fixed. The individual differences in the intercept values of each industry are reflected in the error term  $u_{it}$ . Hence, the total residuals  $\omega_{it} = \varepsilon_{it} + u_{it}$ . The following random effect model has been estimated:

$$P_{it} = \alpha + \beta_{1t}EPS_{it} + \beta_{2t}BPS_{it} + \beta_{3t}CD_{it} + \beta_{4t}SD_{it} + \beta_{5t}P/E_{it} + \beta_{6t}LnSIZE_{it} + \delta_i B_i + \delta_t T_t + \omega_{it} \dots (4.3)$$

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

In this model  $\alpha + u_i$  represents the  $\alpha$  as in the case of model (4.1) 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. If this hypothesis is not rejected, it indicates to choose the random effect model (REM).

**RESULTS**

**The Pattern of Common Stock Prices**

The structure and pattern of common stock prices of sample banks associated with the study period 1999/00 to 2013/14 are analyzed and tabulated in the Table 3. It shows the variability in stock prices of each commercial bank. The stock of Standard Chartered Bank has the highest average market price of Rs. 3030 followed by NABIL (Rs.2243), and EBL (Rs.1428) and the lowest of NCC Bank (Rs.220). Similarly, rhe

banks having higher stock prices do possess higher variations (S.D.) in their stock prices.

Table 3

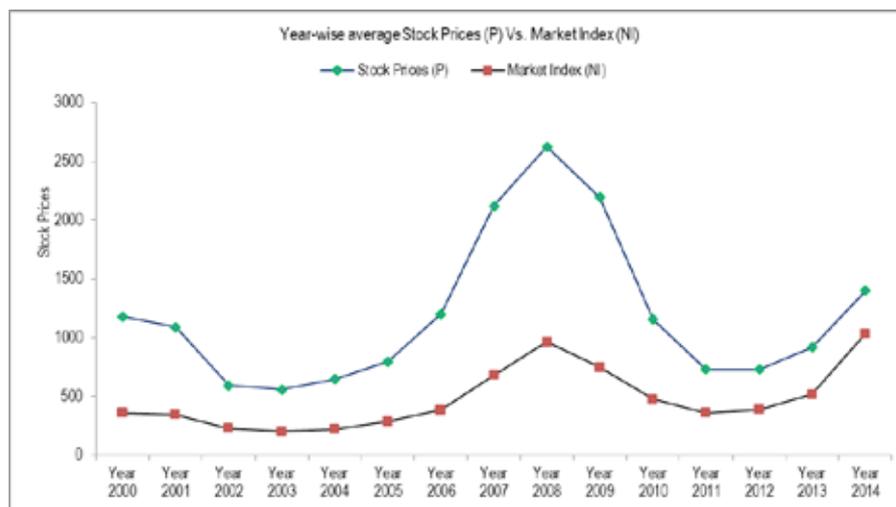
Stock Prices of Selected Commercial Banks for the Period 1999/2000 to 2013/2014

Year	NABIL	NIB	SCB	HBL	NSBI	NBB	EBL	BOK	NCC	NICA	Mean	S.D.
2000	1400	1401	1985	1700	1165	1502	995	998	105	550	1180	551.71
2001	1500	1150	2144	1500	1500	1100	650	850	110	399	1090	606.26
2002	700	760	1575	1000	401	490	405	254	110	245	594	437.35
2003	740	795	1640	836	255	360	445	198	108	220	560	462.77
2004	1000	940	1745	840	307	354	680	295	115	218	649	499.64
2005	1505	800	2345	920	335	265	870	430	120	366	796	682.58
2006	2240	1260	3775	1100	612	199	1379	850	94	496	1201	1102.87
2007	5050	1729	5900	1740	1176	550	2430	1375	316	950	2122	1879.75
2008	5275	2450	6830	1980	1511	1001	3132	2350	457	1284	2627	1996.13
2009	4899	1388	6010	1760	1900	280	2455	1825	335	1126	2198	1863.91
2010	2384	705	3279	816	741	265	1630	840	275	626	1156	982.16
2011	1252	515	1800	575	565	266	1094	570	167	520	732	499.92
2012	1355	511	1799	653	635	121	1033	628	126	468	733	527.34
2013	1815	784	1820	700	850	300	1591	553	223	554	919	602.95
2014	2535	960	2799	941	1280	700	2631	564	642	970	1402	889.93
Mean	2243	1077	3030	1137	882	517	1428	839	220	599	1197	1178.12
S.D.	1562.46	514.11	1788.19	465.96	510.49	394.79	862.86	601.12	159.96	333.31		

The average stock price of the selected banks is highest for the year 2008 with the value Rs. 2627 followed by year 2009 (Rs.2198), and year 2007 (Rs.2122) and the lowest Rs.560 is observed for the year 2003. It is noteworthy that the Nepalese stock market has jumped to the all-time high 1175.38 points on August, 2008. This empirical evidence asserts that the market prices of the stocks of those selected banks in 2008 were also soared to the higher values along with market index.

Figure 2

Trend of Movement of Average Prices (P) of Sample Banks and Market Index (NI)



As shown in the above figure 2, the pattern of average stock prices (P) and NEPSE

Index (NI) both nearly resemble with each-other. The figure provides the evidence that “Nepalese stock market is mostly dominated by the stock of listed commercial banks”.

## Descriptive Statistics

Table 4

*Descriptive Statistics of the Variables for the Period of 2000 to 2014*

Variables	Mean	Median	Minimum	Maximum	Std. Dev.	N
<b>Dependent Variable</b>						
Stock Market Prices	1197.24	850	94	6830	1178.12	150
<b>Fundamental Variables</b>						
Earnings per share	50.35	40	-84.77	176	40.55	150
Book value per share	197.58	193	-364	512	28.34	150
Cash dividend per share	21.08	10.20	0.00	130	28.34	150
Stock dividend per share	29.02	20	0.00	140	33.64	150
Price-earnings ratio	40.49	21.40	-162.16	656.25	83.87	150
Firm Size	104.25	69.46	11.84	476.87	86.42	150

**Note:** This table shows descriptive statistics- mean, median, standard deviation, minimum and maximum values of firm specific fundamental variables. Size refers to paid up capital (in 10 million) of the company and N refers to the number of observations.

In Table 4, market price per share of the sample banks ranges from minimum Rs 94 to maximum Rs.6830 with an average of Rs. 1197.12 and standard deviation of 1178.12. It implies that the sample banks varies remarkably in terms of their stock price. It also reveals that earning per share of the banks varies significantly. It ranges from minimum negative Rs. 84.77 to maximum Rs. 176 with a mean value and standard deviation of Rs 50.35 and 40.55 respectively. The firms also differ in terms of their book value per share. Book value per share has average value of Rs 197.58 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 cash dividend and stock dividend per share. Cash dividend per share has average ratio of 21.08% with a minimum to maximum range of 0 to 130% respectively, whereas stock dividend per share falls within the range of minimum zero to maximum 140% with an average of 29.02%. Similarly, price earnings ratio has mean value of 40.49 times and standard deviation of 83.87 with minimum to maximum range of -162.16 to 656.25 times. It also indicates that firms differ significantly in terms of their price earnings ratio. As shown in Table 4, firm size of the sample banks ranges from minimum Rs 11.84 crore to maximum Rs. 476.87 crore with an average of Rs. 104.25 crore and standard deviation of 476.87. It also shows that the bank included in the sample varies significantly in terms of their size as well.

## Correlation Analysis

Table 5 summarizes the correlation matrix with Pearson correlation coefficients

in the lower left triangle and Spearman rank correlation coefficients in the upper right triangle.

*Table 5*  
*Pearson and Spearman Correlation Matrix*

	P	EPS	BPS	CD	SD	PE	SIZE
P	1	0.810**	0.778**	0.676**	0.732**	0.266**	-0.036
EPS	0.722**	1	0.815**	0.758**	0.743**	-0.201*	-0.011
BPS	0.599**	0.734**	1	0.720**	0.745**	-0.032	-0.170*
CD	0.616**	0.815**	0.641**	1	0.713**	-0.084	0.084
SD	0.745**	0.823**	0.685**	0.825	1	-0.025	-0.084
PE	-0.082	-0.249**	-0.341**	-0.155	-0.155	1	-0.050
SIZE	-0.081	-0.066	-0.101	-0.079	-0.187*	-0.139	1

**Note:** Bi-variate Pearson correlation coefficients are in the lower left triangle and Spearman rank correlation coefficients are in upper right triangle. '\*' sign indicates that correlation is significant at 5 percent level and '\*\*' indicates that correlation is significant at 1 percent level.

Both Pearson and Spearman correlation coefficients indicate the significant relationship between the Stock Price and Earnings per share, Book value per share, Cash dividend per share and Stock dividend per share. Price earnings ratio shows the expected negative sign but the relationship with stock prices is not significant in the case of Pearson correlation coefficients (-0.082). However, relationship between price earnings ratio and stock prices is found significantly positive (other than expectation) in the case of Spearman rank correlation coefficient (0.266). There is no significant relationship found between stock price and Size of the bank in both Pearson (-0.081) and Spearman correlation coefficient (-0.036) though the priori expected negative sign is maintained. In Spearman rank correlation coefficients, Earnings per share (EPS) shows the most significant and stronger positive relation ( $\rho = 0.810$ ) with market price per share than other variables and in Pearson correlation coefficients, among given set of variables, the stock dividend per share reveals significant and stronger positive relation ( $r = 0.745$ ) with stock price per share than other. This suggests that the information contents of earnings per share and stock dividend more significantly influence the stock prices.

### **Analysis of Portfolios Formed on One-way Sorts**

Properties of stock prices with respect to firm specific variables have been analyzed by forming five equal percentiles portfolios based on one-way sorts of earnings per share, book value per share, cash dividend per share, stock dividend per share, price earnings ratio and size of the firm. The portfolio groups illustrating the average value corresponding to each of the firm specific variables are reported in Table 6. It shows that market price of stocks increase with EPS, BPS, CD, SD, and PE ratio but relate inversely with bank Size when it moves from lowest percentile group portfolio 1 to the highest percentile group portfolio 5. The average stock price on lowest EPS portfolio is Rs.324 and it shows a clear pattern of increment with EPS and that reaches

to maximum Rs. 2578 in highest earnings portfolio. The results indicate that banks with higher level of EPS have higher stock price per share and vice versa. This result is consistent with the postulates that stock prices are larger for the firms with larger earnings per share and confirms with prior studies by Basu (1977) and Mgbame and Ikhatua (2013). The results indicate that banks with higher level of cash and stock dividend per share have higher market price per share and vice versa. This result is consistent with the findings of Baker and Wurgler (2004b) and Gordon (1962) which postulates that dividend paying forms are considered less risky than non-payers ones and investors are more willing to pay dearly to buy dividend paying stock. Further, Investors value the present dividend more than future capital gain.

*Table 6*

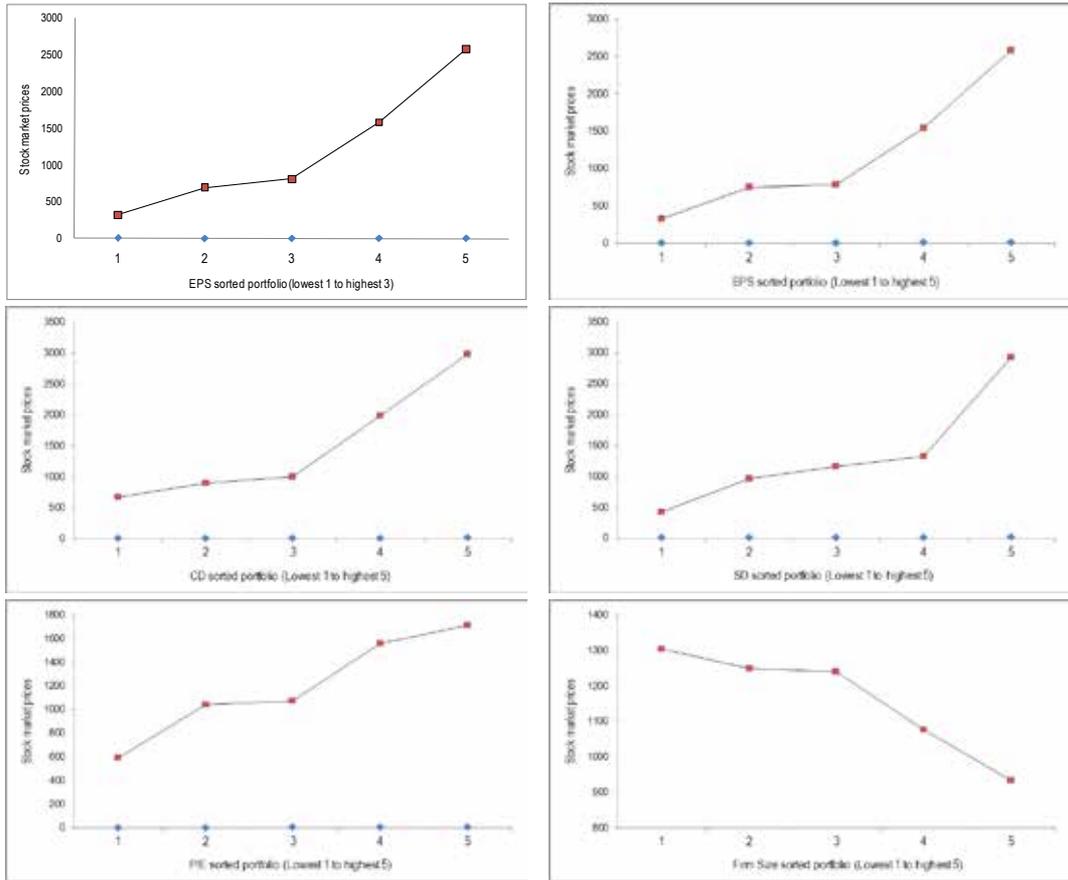
*Properties of Stock Prices for Portfolios Sorted by Fundamental Variables*

Portfolio sorted by	Low				High
	1	2	3	4	5
EPS	3.52	28.75	41.21	65.30	113.84
P	324	696	813	1585	2578
N	31	29	30	30	30
BPS	34.87	152.08	193.13	244.90	362.90
P	322	748	788	1544	2584
N	30	30	30	30	30
CD	1.56	12.32	21.72	39.58	88.75
P	671	896	998	1988	2981
N	69	20	22	23	16
SD	0.61	12.98	25.26	44.07	95.22
P	435	967	1162	1328	2932
N	47	26	31	23	23
PE	2.54	15.96	21.69	30.02	129
P	594	1042	1074	1561	1711
N	30	30	30	29	31
SIZE	29.12	52.61	103.30	177.45	290.08
P	1304	1249	1240	1076	933
N	37	38	35	22	18

**Note:** This table presents the common stock prices sorted into five equal percentile group portfolios by six fundamental variables. For cash dividend the five portfolios are formed as: 1 (< 10%), 2( $\geq 10\% \leq 15\%$ ), 3( $> 15\% \leq 25\%$ ), 4( $> 25\% \leq 50\%$ ) and 5( $> 50\%$ ) and for stock dividend the portfolios are formed as : 1(< 10%), 2( $\geq 10\% < 20\%$ ), 3( $\geq 20\% \leq 30\%$ ), 4( $> 30\% < 60\%$ ) and 5( $\geq 60\%$ ).

Figure 3

Trend of Average Market Price with Respect to One-way Sorted portfolios



**Note:** Each dot on the upward moving line in the figure shows plot of stock prices corresponding to five sorted portfolios of fundamental variables.

The price of common stock line shows a trend of upward movement to the right with increase in earnings per share, Book value per share, Cash dividend, stock dividend per share, and Price earnings ratio from portfolio lowest to highest (1 to 5). This implies that stock prices are higher for the banks with higher EPS, BPS, CD, SD and PE ratio. The figure shows the declining pattern of average stock prices with increase in size of the bank. Hence, the banks having larger capital size have found lower market price of the share.

### Econometric Models

In order to test the statistical significance in the panel data analysis, firstly, pooled OLS regression has been performed for various specifications of the models. One-way fixed effect, two-way fixed effect, and random effect model then conducted to identify the bank specific and time variant effect on stock prices.

### **Pooled OLS Model**

The regression results have been reported in Table 7. The model specifications I through VI report the simple regression results, where stock prices have been regressed on various firm specific variables individually. Specification VII represents the multiple regression model, where all the firm specific variables have been used as explanatory variables.

*Table 7*

*Pooled OLS Regression of Stock Prices on Firm Specific Variables for 10 Sample Banks for the Period of 2000 to 2014.*

Indep. Variables	Regression Results						
	I	II	III	IV	V	VI	VII
Intercept	140.69 (1.32)	71.93 (0.49)	657.66 (6.93***)	440.52 (5.17***)	1243.96 (11.64***)	1486.19 (2.87***)	-716.42 (-1.86*)
EPS	20.98 (12.71***)						10.84 (3.42***)
BPS		5.70 (9.11***)					1.29 (1.68*)
CD			25.59 (9.51***)				-8.47 (-2.01**)
SD				26.08 (13.57***)			19.34 (5.15***)
P/E					-1.15 (-1.00)		1.76 (2.22**)
LnSIZE						-66.82 (-0.57)	152.32 (1.96*)
F	161.43***	83.01***	90.34***	184.17***	1.01	0.32	39.14***
Adj. R2	0.52	0.36	0.38	0.55	0.01	0.002	0.61
SEE	817.52	946.16	931.49	789.05	1178.10	1180.81	739.80

**Note:** 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 *Pit*, and independent variables are: Earnings per Share (*EPSit*), Book Value per Share (*BPSit*), Cash Dividend per Share (*CDit*), Stock Dividend per share (*SDit*), Price Earnings Ratio (*P/Eit*), and Firm Size (*LnSIZE*). The reported results also include the values of *F*-statistics (*F*), adjusted coefficient of determination (*Adj. R2*), and standard error of estimates (*SEE*). The triple asterisk (\*\*\*) sign indicates that result is significant at 1 percent level, double asterisk (\*\*) sign indicates that result is significant at 5 percent level, and single asterisk (\*) sign indicates that result is significant at 10 percent level.

The simple regression result of stock prices on earnings per share (EPS) in specification I shows a positive relationship. The slope coefficient of EPS (20.98) is significant at 1 percent level which implies that stock price increases with increase in earnings per share. In general it implies that Rs.1 increase in EPS leads to Rs.20.98 increase in stock prices. The adjusted coefficient of determination is 0.52. It implies that 52 percent of the total variations in common stock prices are captured by earnings per share. The reported *F*-statistic (161.43) is also significant at 1 percent level meaning that the model explains better the stock prices. This result is consistent with

the studies by Kumar and Sehgal (2004), and Mgbame & Ikhatua (2013).

Similarly, the regression specification II shows a positive relationship between stock prices and BPS and the coefficient of BPS (5.70) is statistically significant at 1 percent level. The reported F-statistic (83.01) is also significant at 1 percent level and the adjusted coefficient of determination is 0.36. It implies that 36 percent of the total variations in common stock prices are captured by book value per share. The positive and significant relationship between BPS and stock prices found in this study is consistent with the prior studies by Fama & French (1992). In specification III and IV common stock prices are observed to be positively related with cash dividend and stock dividend per share. Coefficients of CD (25.59) and SD (26.08) are significant at 1 percent level and shows that 55 percent variability associated with common stock prices are explained by stock dividend per share. The regression results on dividend support the prior studies by Gordon and Shapiro (1956), and Baker and Wurgler (2004b).

In specification V, simple regression with price earnings ratio is negatively related with stock prices though the coefficient (-1.15) is statistically insignificant. Moreover, only 1 percent variability associated with common stock prices are explained by price earnings ratio. This result supports the findings of negative relationship by many earlier studies including Marian (2009). However, as reported by Chan, Hamao, and Lakonishok (1991) there is no statistically significant and conclusive evidence about P/E effect on common stock returns. The simple regression result of stock prices on firm size in specification VI also shows a negative relationship though the coefficient (-66.82) is not statistically significant. Similarly, the coefficient of adjusted R<sup>2</sup> is found very low (0.002). This result of negative relationship is consistent with the studies by Banz (1981).

In all simple regressions, the explanatory variables show the expected customary sign of relationship with stock prices. The findings establish the robustness of results obtained in the analysis of one-way sort of portfolios formed on EPS, BPS, CD, SD, P/E, and SIZE. In multiple regression VII, all the firm specific variables are included as predictors. The regression results of specification VII again establish the economic and statistical significance of earnings per share, and stock dividend per share in predicting stock prices while the performance of other variables are poor when included together in the model. The reported F-statistic (39.14) is also significant at 1 percent level and adjusted R<sup>2</sup> (0.61) meaning that the model explains better the stock prices. Thus, among all the variables, earnings per share and stock dividend per share are found to be the best predictors because coefficients are statistically and economically significant across all the specifications.

Statistically, fixed effects are always a reasonable thing to do with panel data (they always give consistent results) but they may not be the most efficient model to run. Random effects will give better P-values as they are a more efficient estimator, so we should run random effects if it is statistically justifiable to do so. Table 8 presents the comparative regression results of OLS model, fixed effect model and random effect model.

*Table 8*  
*Comparison of Regression Results*

Independent variables	Regressions			
	Pooled OLS	One-way Fixed#	Two-way Fixed	Random Effect
const	-716.4160* (385.708)	-117.258 (505.060)	2458.76*** (709.879)	-716.416* (385.708)
EPS	10.8345*** (3.1690)	9.6240*** (3.6410)	-4.1610 (2.9461)	10.8354*** (3.1690)
BPS	1.2945* (0.7714)	0.9947 (0.8379)	2.4512*** (0.6732)	1.2945* (0.7714)
CD	-8.4686** (4.2092)	-21.3152*** (4.9670)	-7.1941* (4.1242)	-8.4686** (4.2092)
SD	19.3359*** (3.7563)	22.1914*** (4.0328)	15.0741*** (3.3174)	19.3359*** (3.7563)
PE	1.7550** (0.7903)	1.91667** (0.7596)	1.1650** (0.5623)	1.7550** (0.7903)
LnSIZE	152.322* (77.7458)	188.390** (77.8106)	-454.673** (177.127)	152.322* (77.7458)
n	150	150	150	150
Adj. R2	0.6057	0.649976	0.824066	
F	39.143***	19.446***	25.066***	

**Note: 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.**

From table 8, the sign of EPS coefficient is positive and statistically significant in pooled OLS, one-way fixed and random effect model. However, the coefficient is negative and statistically insignificant in two-way fixed effect model. This implies that there is no any bank and time specific impact of earnings per share on stock prices. The sign of the coefficients of book value per share (*BPS*) are positive and statistically significant across all the cases except one-way fixed effect model. It indicates that that the book value per share has positive role to predict the stock prices in the Nepalese banking industry. It supports the findings by K.C. (2009) in Nepal.

There is a significantly negative relationship of cash dividend per share (*CD*) in all the regressions models. It indicates that the cash dividend per shares impacts negatively on stock prices. The result here contradicts the priori expected sign of this study and also findings of Adhikari (2009) in Nepalese context. The coefficients of stock dividend per share are positive and statistically significant for all the cases. It implies that as the bank increases stock dividend the stock prices also increase. This finding supports the findings of prior studies including Friend and Puckett (1964), and Ebrahim and Chadegani (2011). The result is consistent with the findings of Pradhan (2003) who reported that 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 and are statistically significant in all cases. This study contradicts the prior hypothesis of negative

relationship between price earnings ratio and stock prices. The result contradicts the findings of Marian (2009). The sign of the coefficient of firm size (*LnSIZE*) is positive and statistically significant in pooled OLS, one-way fixed and random effect model. The positive and statistically significant coefficients of firm size contradict the priori expected sign of this study. The sign of *SIZE* coefficient (-454.673) is negative and statistically significant in two-way fixed effect model. The negative coefficients of firm size suggest that as the firm size increases the stock price decreases and vice versa. This result is consistent with the findings of Kumar and Sehgal (2004), and Hasan et.al (2014).

In panel data analysis, there are mainly three models namely pooled OLS model, fixed effect model and random effect model as used in this study. OLS is always a starting point, and it has been conducted in this study to have at least a baseline comparison model. Having panel data usually gives a convenient way to get rid of unobserved fixed effect. With pooled OLS the result will not get rid of fixed effects. The value of adjusted R<sup>2</sup> and F-test statistics also confirmed that the fixed effect model is adequate compared to OLS model. Further, to compare whether fixed effect or random effect model is appropriate for this study, Hausman test statistics was computed. This test is performed to choose a better model in between fixed effect and random effect for data analysis purpose. The hypothesis for this test can be written as:

H<sub>1</sub>: Fixed effect model is superior to random effect model.

*Table 9*  
*Result of Hausman Test*

	Chi-square ( $\chi^2$ )	p-value
Model: Fundamental variables and stock prices	27.8001	0.0001

The p-value is 0.0001. On the basis of chi-square value and test criteria, we cannot accept null hypothesis. It is concluded that fixed effect model is appropriate.

***Breusch-Pagan test for homoscedasticity***

Breusch-Pagan test for homoscedasticity shows the absence of heteroscedasticity.

H<sub>1</sub>: There is presence of heteroskedasticity.

*Table 10*  
*Result of Breusch-Pagan (BP) Test*

	Chi-square ( $\chi^2$ )	p-value
Model: Firm specific variables and stock prices	1.40093	0.2366

The p-value is 0.2366 which fail to reject null hypothesis suggesting there is no presence of heteroskedsticity. Thus, based on these test results panel data analysis method with fixed effect model has been found to be adequate in this study.

The summary of the results has been illustrated as below:

*Table 11*  
*Summary of Results*

Hypothesis	Independent variable	Dependent variable	Hypothesized relationship	Finding
H <sub>1</sub>	Earnings per share	Stock prices	Positive	Supported
H <sub>2</sub>	Book value per share	Stock prices	Positive	Supported
H <sub>3</sub>	Cash Dividend per share	Stock prices	Positive	Contradicted
H <sub>4</sub>	Stock Dividend per share	Stock prices	Positive	Supported
H <sub>5</sub>	Price earnings ratio	Stock prices	Negative	Non-conclusive
H <sub>6</sub>	Firm size	Stock prices	Negative	Non-conclusive

## Conclusions

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 with respect to cash dividend and price earnings ratio. The firm's earnings per share showed persistently a positive relation with stock prices when portfolios were formed on one-way sorts of earnings per share. In portfolio analysis, all the firm specific variables except the price earnings ratio maintain their priori expected relationship with stock prices. The correlational analysis also indicates that the variables used have maintained the relationship with stock prices as expected. In pooled OLS regression of stock prices, earnings per share, and stock dividend per share appeared to be positively significant with expected sign. Though significant, the price earnings ratio and firm size possess positive sign contrary to expected. The results indicated that the stock dividend and earnings position of the company are the most important fundamental factors that explain common stock prices in Nepal.

The result of the study concludes that the earnings and stock dividend are the more significant determinants of stock prices of commercial banks in Nepal. The effects of these variables on stock prices are consistent and statistically significant across all the analyses and all the specifications of the model. The performance of the stock dividend is especially noteworthy; this variable is statistically and economically the most important of the six firm specific variables investigated.

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