MANAGEMENT DYNAMICS
A Peer-reviewed Journal of Management and Economics
Published by
Shanker Dev Campus
Tribhuvan University, Nepal

Earnings, Size, and Book-to-Market Effects on Banking Stock Returns in Nepal

Surya Bahadur Rana, Ph.D
Asst. Professor and Head of Department
Faculty of Management, Tribhuvan university
Butwal Multiple Campus, Butwal, Nepal
Corresponding e-mail: surryabrana@gmail.com

Article Info
Received: 26 Feb. 2021
Revised: 17 March 2021
Accepted: 20 March 2021

DOI: https://doi.org/10.3126/md.v24i1.47556

Keywords:
book-to-market, earnings-yield , fixed effect , random effect, size, stock return

ABSTRACT

This study attempts to examine the effect of earnings, size, and book-to-market equity on common stock returns of banking sector firms in Nepal. Using the sample of 21 commercial banks in Nepal consisting of 231 firm-year observations over the 2010-2020 periods and based on the panel data fixed-effect estimation with AR(1) disturbances, the study reveals that earnings and size have significant positive effects on common stock returns of the banking sector in Nepal. However, the study reveals significant negative book-to-market equity effects on cross-sectional banking stock returns in Nepal. The positive earnings effect implies that banks with higher earnings yields have higher stock returns. Similarly, the positive size-effect implies that larger banks outperform the smaller banks in Nepal. Similarly, the negative book-to-market effect on common stock returns observed in this study implies that banks with lower value creation have lower stock returns.

1. INTRODUCTION

The stock market serves as an important channel for accumulating and allocating capital for productive use. The stock market stimulates savings and investment by generating information about possible investments and capital allocation. Demirguc-Kunt and Maksimovic (1996) argue that stock markets offer risk-diversification and reduce liquidity risk by facilitating the easy allocation of savings into investments, thereby removing constraints and providing

incentives for the savers and users of funds. Thus, the establishment and effective operation of the stock market is highly appreciated in a market economy for the effective and efficient transformation of savings into investments.

In the context of Nepal, the secondary market -particularly the Nepal Stock Exchange Limited (NEPSE)- has completed its 27 years of operational history since 1994. Over the years, individual and institutional investors' participation in stock market trading has gradually increased. Investors in the stock market of Nepal and around the globe are primarily interested in attractive and consistent rates of returns from their investments. However, the stock returns are affected by many factors, such as macroeconomic, industry-related, and firm-specific factors. So, it is necessary for investors to analyze and understand the factors affecting stock returns along with their pricing implications.

The asset pricing theories have drawn substantial academic interest since the inception of the capital asset pricing model (CAPM) developed by Sharpe (1964) and subsequently promoted by Linter (1965), Mossin (1966), and Black (1972). The CAPM posits that common stock returns are solely determined by stock beta - a measure of market risk. Empirical studies in the early 1970s (for example, Black et al., 1972; Blume & Friend, 1973; Fama & Mcbeth, 1973, among others) have also recorded the evidence consistent with the CAPM. However, the central prediction of the CAPM became doubtful in the late 1970s when studies documented alternatives other than beta to explain stock returns. The earlier evidence inconsistent with the CAPM was documented by Basu (1977) and Banz (1981), and in the later period, Fama and French (1992), among others. Basu's (1977) evidence concerning earnings effect, in the case of NYSE-listed firms, introduced the idea that a significant negative relationship exists between price-to-earnings ratios and average stock returns. Similarly, Banz (1981), for the first time, demonstrated a significant size effect on stock returns of NYSE-listed firms over the 1926-1975 periods. Based on the pooled OLS estimates, the study observed larger risk-adjusted returns for small-sized firms than those of large-sized firms. Numerous studies evolved after the discovery of a size premium in the U.S. equity markets. For example, Corhay et al. (1988) in the case of the United Kingdom, Calvet and Lefoll (1988) in the case of Canada, and Chan et al. (1991) in the case of Japan have shown the existence of side effects. Besides earnings and side effects, the book-to-market equity also justifies substantial power in predicting cross-sectional stock returns. Some of the earlier studies which have documented significant book-to-market equity effects on stock returns include Stattman (1980), Rosenberg et al. (1985), DeBondt and Thaler (1987), and Fama and French (1992), among others.

Studies during recent periods have also established earnings yield, size, and book-to-market equity as the prominent variables in explaining cross-sectional stock returns. For example, Chou et al. (2004) and Guan et al. (2007) showed a significant negative size-effect and significant positive book-to-market equity and earning-yield effects on stock returns. Similarly, Wong et al. (2006) revealed the significant positive effect of book-to-market equity in the case of China. Moreover, in an attempt to confirm the size and book-to-market effects in the case of New Zealand over the 1995-2004 period. Nartea et al. (2009) demonstrated a

strong and positive book-to-market effect but no strong size effect on stock returns. In a more recent period, using panel data in the context of the USA and Turkey, Senyigit and Ag (2014) observed significant size and book-to-market effects on stock returns in the case of the USA but not in Turkey.

As opposed to developed capital markets around the globe, there are few empirical works associated with factors affecting the cross-section of stock returns in the context of Nepal. One of the earlier studies includes Pradhan (1993), who, using the data from 17 companies listed in NEPSE over the period 1986-1990, showed that larger stocks have lower profitability. In the latter study, using the data from a cross-section of 40 enterprises listed in NEPSE over the 1996-2000 periods, Pradhan and Balampaki (2004) revealed a significant positive effect on earnings yield and firm size and a negative effect of book-to-market equity on stock returns. Similarly, Gautam (2017) demonstrated a positive relationship between size and stock returns and a negative relationship between book-to-market equity and stock returns in the case of a cross-section of banking firms in Nepal over the period 2009-2016. In a more recent period, Chettri (2019), using a balanced panel data of 12 commercial banks and 11 other sector firms in Nepal over the 2009-2018 periods, revealed the significant and negative effects of size and book-to-market equity in the case of non-financial firms and significant negative impact of only book-to-market equity in case of financial firms. Moreover, Dangol and Acharya (2020) showed the significant negative effects of size and book-to-market equity for a panel of 12 commercial banks in Nepal over the period 2006-to 2015.

Thus, studies have established the prominent role of earnings, size and book-to-market equity factors in predicting stock returns in the context of the developed capital market, and so is the case of Nepal. However, cited empirical evidence has produced mixed results. The results are sensitive to the selection of sample enterprises, length of data points used and methodological approaches used in the study to define and measure the variables. Moreover, several past studies were carried out in emerging and developed stock markets worldwide. The studies of this type are limited to a few numbers in the case of Nepal. The findings derived from the studies in developed stock markets are yet to be tested for their robustness in the context of Nepal's smaller but developing stock market. Further studies are, thus, necessary in the case of Nepal to explore which of these factors can capture significant variations in common stock returns.

Moreover, many of the cited studies in the context of Nepal have taken into account the sample from all sectors' firms listed in NEPSE irrespective of the nature of the firms sampled, while others have attempted to compare the stock return performance of financial firms against other firms in response to the impact of firm-specific variables. Unlike these studies in Nepal, the present study attempts to use samples from the cross-section of commercial banks listed in NEPSE. The main reason behind selecting commercial banks in this study is that they occupy larger shares in total market capitalization. According to the Monthly Report of NEPSE as of mid-July 2020, commercial banks captured 48.47% shares in total market capitalization among 11 sectors' firms listed in NEPSE. The larger share of banking stocks

in total market capitalization signifies the role of banking stocks in influencing the overall direction of the stock market in Nepal. Though the studies such as Gautam (2017) and Dangol and Achrya (2020) used samples from commercial banks, the banking firms included in the study were relatively smaller in number. So, this study makes additional efforts to reexamine the role of earnings, size, and book-to-market equity factors in explaining stock returns using a more recent dataset from relatively larger cross-sections of commercial banks listed in the Nepal Stock Exchange Limited.

The rest of this study is organized as follows: the second section deals with the methodological issues of the study; the third section analyzes and discusses the study results; and finally, the fourth section provides the study conclusion and implications of study findings.

2. RESEARCH METHODS

2.1 Population, Sample and Data Source

The population of this study constitutes all 27 commercial banks operated in Nepal till mid-July 2020. Out of 27 commercial banks, the study has considered a cross-section of 21 commercial banks as the sample and six commercial banks, namely Nepal Bank, Rastriya Banijya Bank, NIC Asia Bank, Civil Bank, Century Commercial Bank and Mega Bank, have been excluded from the sample.

The data on the market price per share, earnings per share, market equity and net worth required for this study were derived from the audited financial statements and annual reports of each bank on their respective websites. The study aims to use the balanced panel data of sample banks covering at least ten continuous years until 2020. However, data before 2012 for Civil Bank and Mega Bank and those before 2013 for Nepal Bank and Century Commercial Bank were unavailable on their respective websites. Similarly, NIC Asia Bank consolidated data (after the merger of NIC Bank and Bank of Asia) were only available since 2013. So, data points for these banks did not cover the balanced panel length of at least ten years.

Moreover, Rastriya Banijya Bank, a government-owned bank, does not trade in NEPSE and its share price data are unavailable. Therefore, these banks were excluded from the sample. Thus, the study is based on 11 years of balanced panel data of the remaining 21 commercial banks, covering 231 firm-year observations over the 2010-2020 periods.

2.2 The Model and Definition of Variables

This study uses balanced panel data set of commercial banks in Nepal as multiple cross-sectional entities measured repetitively over 11 years. Therefore, this study employs the panel data regression estimation procedures to analyze earnings-to-price, firm size and book-to-market equity effects on banking stock returns in Nepal. The conventional linear regression model leads to biased estimates when dependent variables have dependencies on unobserved independent variables. Using the panel data regression model, such dependencies and omitted variable bias can be controlled because the model can control for unobserved heterogeneity varying across cross-sectional units but not over time (Baltagi, 2005).

In contrast to OLS regression, panel data regression is based on some systematic model selection procedures. Primarily, there are three variations of the panel data model: pooled OLS, fixed effect and random effect estimates. The pooled OLS estimation procedure considers the time-series dimension and the cross-sectional dimension of the data under the assumption that cross-sectional or time-specific effects do not exist. With this assumption, pooled OLS model appears as follows:

$$R_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 B/M_{it} + \beta_3 E/P_{it} + \varepsilon_{it} \quad (1)$$

Equation (1) represents a linear relationship of the dependent variable with independent variables and error terms. R_{it} is the stock return of bank' *i*' observed at a time '*t*.' The stock return normally consists of the dividend yield and the capital gain yield. However, for the purpose of this study, the dividend yield components of stock returns have been excluded because of missing observations on dividend payments. Hence, the stock returns have been defined as the percentage change in market price per share of bank' i' during year '*t*' over the year' *t-1*'. $SIZE_{it}$ represents the firm size of bank' *i*' observed at time '*t*' Firm size is measured in different ways, such as the size of total assets, size of sales, and size of the market value of equity. However, in most of the past studies, firm size has been defined in terms of market equity as originated by Banz (1981). Therefore, firm size in this study has also been defined in terms of the natural logarithm of market equity. B/M_{it} is the ratio of book equity to market equity of bank '*i*' at time '*t*.' It is calculated as book equity divided by corresponding market equity. E/P_{it} is the earnings-to-price ratio, also termed as earnings yield, of bank '*i*' at time '*t*.' It is measured as earnings per share divided by market price per share. In Equation (1), *a* is the intercept; β_1, β_2, and β_3 are the respective parameters to be estimated; and ε_{it} represents the error terms that have zero expected value, unit variance and are uncorrelated with each other and with independent variables.

In the presence of a time-series effect or cross-sectional effect in panel data, heterogeneity in cross-sectional units is not captured in regressors. As a result, it may violate the assumption of no heteroscedasticity and no autocorrelation. In such a case, the pooled OLS estimator remains no longer the best. Alternatively, the fixed effect or random effect model allows a tactic to treat these problems by examining data's fixed effect or random effect properties. This estimation model is called one-way fixed-effect or random effect estimation, as represented by Equations (2) and (3), respectively.

Fixed effect model:

$$R_{it} = (\alpha + u_i) + \beta_1 SIZE_{it} + \beta_2 B/M_{it} + \beta_3 E/P_{it} + v_{it} \quad (2)$$

Random effect model:

$$R_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 B/M_{it} + \beta_3 E/P_{it} + (u_i + v_{it}) \quad (3)$$

In Equations (2) and (3), u_i is a fixed effect or random effect term corresponding to the time or cross-sectional unit. In the fixed-effect model, the cross-sectional specific effect is treated

as time-invariant. Therefore, it is included as a part of the constant term. In this model, u_i is correlated with other regressors and the model is estimated using within-effect estimation methods. On the other hand, in the case of the random effect model, the cross-sectional effect is assumed to be uncorrelated with any regressors and hence u_i is treated as the cross-sectional specific random element of the residual term. The value of a and βs are the same across cross-sectional units and the difference among cross-sectional units or time periods exists due to the differences in cross-sectional specific errors.

Finally, the appropriate model among pooled OLS, fixed effect and random effect are selected on the basis of several tests. In this process, *F*-test (Chow, 1960) is employed for fixed effect against the null of 'pooled OLS is appropriate' and the L.M. test (Breusch & Pagan, 1980) for random effect against the null of 'pooled OLS is appropriate.' In the absence of sufficient statistical evidence to reject the null in both the tests, the final estimation is based on the pooled OLS model. In an otherwise situation, the final decision about employing a fixed-effect model or random effect model is based on the Hausman specification test (Hausman, 1978). The null hypothesis of this model presumes that the random effect model is appropriate. So, the random effect model is selected in the absence of sufficient statistical evidence to reject the null hypothesis. In otherwise cases, the fixed-effect model is selected.

Equation (1), (2) and (3) specified above assume the following reasonable a priori hypothesis:

$$\Delta Rit\ \Delta SIZEit < 0;\quad \Delta Rit\ \Delta B/Mit > 0;\ \text{and}\ \Delta Rit\ \Delta E/Pit > 0 \qquad (4)$$

The priority sign expectation in Equation (4) implies that there is a positive correlation between stock returns and book-to-market equity, stock returns and earnings-to-price ratios, and a negative correlation between stock returns and firm size. Other methodological issues are dealt with in the respective section.

3. RESULTS AND DISCUSSION

3.1 Results of Descriptive and Correlation Analysis

Table 1 reports the descriptive statistics associated with each variable of interest observed for 21 commercial banks over 11 years, consisting of 231 firm-year observations. The sampled banks have an overall mean return of negative 4.82% ranging from a minimum negative 111.18% to a maximum positive 127.15%, with a standard deviation of 43.48%. The decomposition of the variations in stock returns into between and within components shows that much of the variations in stock returns are associated with variations within banks over the periods than the variations between banks. On the other hand, variations associated with SIZE, B/M and E/P are both due to variations between banks and variations within banks.

Table 1

Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
R	Overall	-0.0482	0.4348	-1.1118	1.2715	N= 231
	Between		0.0636	-0.1626	0.1348	n = 21
	Within		0.4303	-0.9974	1.0885	T = 11
SIZE	Overall	2.8021	0.9463	0.6163	4.7140	N= 231
	Between		0.6024	1.9837	4.0509	n = 21
	Within		0.7405	1.2220	4.2114	T = 11
B/M	Overall	0.4403	0.3891	0.0735	3.4813	N= 231
	Between		0.2656	0.1549	1.4671	n = 21
	Within		0.2897	-0.6401	2.4546	T = 11
E/P	Overall	0.0613	0.0710	-0.2936	0.6230	N= 231
	Between		0.0443	0.0136	0.2399	n = 21
	Within		0.0562	-0.2458	0.4444	T = 11

The firm-specific variables (R, SIZE, B/M and E/P) used in this study are all scaled versions of market equity. Therefore, expecting a statistically significant relationship between these variables is sensible. This section analyzes the direction and magnitude of the relationship among different pairs of variables. Table 2 presents the results of the correlation analysis.

Table 2

Correlation Matrix

Variables	*R*	*SIZE*	*B/M*	*E/P*
R	1.000			
SIZE	0.662*	1.000		
B/M	-0.616*	-0.399*	1.000	
E/P	-0.302*	-0.208*	0.722*	1.000

Note. '*' signs indicate that correlation coefficients are significant at 1% level.

The results show a significant positive relationship between stock returns and firm size at a 1 percent level and the significant negative relationship between book-to-market equity and earnings-to-price. Among the given set of explanatory variables, the firm size reveals a moderately strong positive relationship and book-to-market equity reveals a moderately strong negative relationship with stock returns. However, the earnings-to-price ratio reveals a statistically significant negative relation; the correlation is lower. Table 2 also indicates that explanatory variables are also significantly correlated. Among them, the highest correlation (0.722) exists between book-to-market equity and earnings-to-price, and, though statistically significant, other correlations are relatively lower. Gujarati (1995) states that high correlations (above 0.8) are a sufficient but not necessary condition for the existence of multicollinearity because they can exist even though the correlations are comparatively low (less than 0.5). However, lower correlations observed among explanatory variables in Table 2 provide sufficient evidence to believe that the problem of multicollinearity may not exist in the analysis.

3.2 Panel Data Model Selection

As discussed in the research methods section, panel data regression is based on three estimation methods: pooled OLS, random effect and fixed effect estimates. This section first reports the estimated results from all three methods and then selects the most appropriate one among them.

Table 3 reports the estimated regression results using pooled OLS estimate, random effect estimate, and fixed effect estimate. All three estimates reveal positive and significant effects of size and earnings yield on stock returns at 1% level, and the effect size is larger under pooled OLS estimate than other estimation methods. Similarly, the results demonstrate negative and significant book-to-market effects on stock returns at 1% level. Further, the effect size of B/M is also more or less similar under all the methods. The F-test and Wald Chi-square test statistics reveal that all the regressors are jointly significant in predicting the stock returns. However, R-square (65.44%) is higher for Pooled OLS results among all estimation methods.

The pooled OLS method assumes no differences among several cross-sectional units (banks). So, they are pooled into a single unit to use OLS. However, such an assumption is preventive because it does not demonstrate various effects specific to time periods and cross-sectional units (Asteriou & Hall, 2007). Taking into account the possibility of cross-sectional and time-specific effects, Baltagi (2005) suggests that the random effect model is appropriate if cross-sectional units are drawn randomly from a large population.

Table 3

Results of Pooled OLS, Random Effect and Fixed Effect Estimation [Dependent variable: Stock returns (R_{it})]

Variables	Pooled OLS	Random effect (GLS)	Fixed effect (Within)
Constant	5.5938*	6.0218*	6.2676*
	(0.1178)	(0.1135)	(0.1004)
SIZE	0.3295*	0.1909*	0.1096*
	(0.03371)	(0.0309)	(0.0292)
B/M	-1.5663*	-1.5237*	-1.4689*
	(0.1409)	(0.1248)	(0.1161)
E/P	4.8653*	3.9090*	3.2189*
	(0.7243)	(0.6294)	(0.5781)
F –stat	143.28*	108.21*	94.65*
Wald Chi-square	N/A	324.64*	N/A
R-square	0.6544	0.5651	0.5784
RMSE	0.4318	0.3473	0.3078

Note. Reported values are estimated coefficients; standard errors are in parentheses; '*' signs indicate that results are significant at 1% level.

In the context of this study, the population size of commercial banks is smaller and limited to 27. Among them, 21 banks are purposively selected to satisfy the length of data points

required to construct a balanced panel. In such a case, Baltagi (2005) also suggests using a fixed-effect model if the dataset is specific and narrower, and inferences are restricted to a specific dataset. So, before concluding, it is necessary to select the best model. This can be done by examining the RMSE of the model and selecting the one with the lowest RMSE. From this perspective, the fixed-effect model seems better as it has a lower RMSE (0.3078). However, this study relies on the most rigorous model selection criteria for panel data regression.

As discussed earlier, Breusch-Pagan LM, Hausman test and F-test have been used and the test results are reported in Table 4. As it can be seen, the L.M. test rejects the null of 'pooled OLS model is appropriate.' So, the L.M. test supports the random effect model.

Table 4

Results of LM Test, Hausman Test and F Test

Breusch Pagan LM test (H_0: Pooled OLS model is appropriate H_1: Random effect model is appropriate)		Appropriate Model
Chi-squre p-value	121.10 0.000	Random effect
Hausman test (H_0: Random effect model is appropriate H_1: Fixed effect model is appropriate)		Appropriate Model
Chi-square p-value	149.80 0.000	Fixed effect
F test (H_0: Pooled OLS model is appropriate H_1: Fixed effect model is appropriate)		Appropriate Model
F (20, 207) p-value	11.98 0.000	Fixed Effect

The result of the Hausman test for random versus fixed-effect model suggests that the fixed effect model is appropriate as there is sufficient statistical evidence to reject the random effect model at 1% level. Finally, the F-test result also recommends favor of the fixed-effect model as it rejects the null of 'pooled OLS model is appropriate.' Hence, the fixed-effect model demonstrates strong statistical evidence against both pooled OLS and random effect models. Therefore, the final analysis in this study is based on the fixed-effect model.

3.3 Estimated Regression Results

Before validating the results of the fixed-effect model, several diagnostic tests of the model have been employed. Table 5 reports the results of the heteroscedasticity, autocorrelation and multicollinearity test of the fixed-effect model.

Table 5 shows the result of the modified Wald test (Greene, 2000) for testing the existence of group-wise heteroscedasticity. The Chi-square test value (4.21) is not statistically significant, which means that the null of no group-wise heteroscedasticity cannot be rejected. So, the model is free from the problem of heteroscedasticity. On the other hand, the Wooldridge test for autocorrelation (Wooldridge, 2002) has a statistically significant value of F-statistic

(203.73), meaning that statistical evidence is sufficient to reject the null of no autocorrelation. Hence, the model is not free from the problem of autocorrelation. Finally, variance inflation factors (VIFs) for all regressors and the mean VIF are all less than 5, which provides evidence of no multicollinearity in the model.

Table 5

Results of Heteroscedasticity, Autocorrelation and Multicollinearity Tests

A. Heteroscedasticity (Modified Wald Test):	
Chi-square	4.21
p-value	0.126
B. Wooldridge Test for Autocorrelation:	
F (1, 20)	203.73
p-value	0.000
C. Multicollinearity Test	
Variable	VIF
Size	1.26
B/M	3.71
E/P	3.26
Mean VIF	2.74

Due to the autocorrelation problem encountered in the model, we estimate the fixed effect model with AR(1) disturbances that remove the autocorrelation. The results are reported in Table 6. As the results show, the SIZE coefficient has a positive sign and is significant. It implies that the size of the bank measured in terms of market equity affects banking stock returns positively. The SIZE coefficient of 0.5296 implies that a 1% increase in firm size is associated with a 0.53% increase in banking stock returns. The results also demonstrate that book-to-market equity negatively and significantly affects banking stock returns at 1% level. The effect size of book-to-market equity is larger as the B/M coefficient is negative 1.1144, indicating that a 1% increase in B/M is associated with a 1.11% decline in banking stock returns.

Table 6

Results of Fixed Effect Model with AR(1) Disturbances [Dependent Variable: Stock Return (R_{it})]

Variables	Coefficient	Std. Error	t-stat	p-value
Constant	4.5244*	0.0423	107.02	0.000
SIZE	0.5296*	0.0504	10.49	0.000
B/M	-1.1144*	0.1260	-8.84	0.000
E/P	0.4325**	0.1966	2.20	0.029
F –stat		235.61*		
Adj. R-square		0.7917		

Note. '*' sign indicates that results are significant at the 1% level, and '**' indicates that results are significant at the 5% level.

Moreover, the study result reveals positive and significant earnings-to-price effects on banking stock returns at a 5% level. The E/P coefficient (0.4325) implies that a 1% increase in E/P leads to a 0.43% increase in banking stock returns. The F-statistic (235.61) of the model is significant at a 1% level, which indicates that SIZE, B/M and E/P can jointly predict the variations in banking stock returns in Nepal over the study period. Moreover, adjusted R-square has also improved the fixed effect estimation with AR(1) disturbances. The model basically captures 79.17% of the total variations in banking stock returns.

The strong size and book-to-market effects captured in this study confirm some of the recent studies, such as Nartea et al. (2009), and Senyigit and Ag (2014), who also observed similar results in explaining cross-sectional stock returns. However, in terms of the observed direction of effects, these results contradict the prior hypothesis with respect to the role of firm size and book-to-market equity. The firm size showed persistently positive effects on banking stock returns, while book-to-market equity showed negative effects. Contrary documentations observed about the sign of the firm size and book-to-market effects in this study also contradict earlier studies in developed capital market contexts such as Banz (1981) and Chan et al. (1991), including some studies in a later period such as Chou et al. (2004), Wong et al. (2006), Guan et al. (2007), among others. However, in the context of Nepal, these results confirm many of the previous studies, including Pradhan and Balampaki (2004) and Gautam (2017). Moreover, the book-to-market equity effects confirm, while the firm size effects contradict those observed in Chettri (2019) and Dangol and Acharya (2020).

Finally, the significant and positive earnings-to-price effects on banking stock return recorded in this study confirm the priori expected hypothesis. This documentation is consistent with the earlier evidence of Basu (1977) with respect to the earning effects. The earning effects also confirm the findings of Guan et al. (2007) in a developed capital market context. Besides, this result is also similar to Pradhan and Balampaki (2004) but contradicts Gautam (2017) in the case of Nepal.

The results documented in this study with respect to positive firm size effects need further explanation. As discussed before, firm size has been measured as the natural log of the market capitalization of banks' stock and the stock return is also a scaled version of the market price. Therefore, it is reasonable to believe that firm size positively affects the stock returns. This result implies that larger-sized banks in terms of market capitalization outperform the banks having small market capitalization in Nepal. Similarly, the positive earnings-to-price effect on cross-sectional banking stock returns demonstrated in this study implies that banks with higher earnings yield command higher stock returns. The negative book-to-market effect observed in this study also needs further explanation. Book-to-market is the ratio of book equity to market equity. It is the reciprocal of the price-to-book ratio, which represents the market value created by the firm relative to book equity. This ratio greater than 1 represents the higher market value creation relative to the book value. So, the book-to-market ratio can be interpreted as the reciprocal value created by the firm. A Higher in this ratio represents

a lower value. In this sense, a negative book-to-market ratio implies that banks with lower value creation have lower stock returns.

4. CONCLUSION AND IMPLICATIONS

This study examined the role of earnings, size and book-to-market equity in predicting banking stock returns in Nepal using the sample of 21 listed commercial banks on the Nepal Stock Exchange over the period 2010- 2020 with a total of 231 firm-year observations. Based on the panel data regression using fixed effect estimation with AR(1) disturbances, the study confirmed the significant role of firm size, book-to-market equity and earnings-to-price ratio in predicting cross-sectional banking stock returns in Nepal. The study demonstrated that firm size and earning-to-price ratio affect cross-sectional banking stock returns positively and significantly while book-to-market equity affects negatively.

The positive firm size effect implies that larger-sized banks in market capitalization outperform those with a small market capitalization in Nepal. Similarly, a positive earnings-to-price impact on cross-sectional banking stock returns implies that banks with higher earnings yield have higher stock returns than the banks with lower earnings yield. Finally, the negative book-to-market equity effects observed in this study mean that banks with lower value creation have lower stock returns.

The difference in results obtained in this study as compared to some of the previous studies in the context of Nepal is primarily due to the difference in sample size and length of data points used. This study was conducted within the framework of methodological limitation of panel data regression and relied only on the one-way group effect due to the short panel data available for the study. Therefore, based on this methodological limitation, this study recommends that future research efforts should be directed toward using long panel data to uncover the dynamics of two-way (group-specific and time-specific) effects on cross-sectional banking stock returns in Nepal.

REFERENCES

Asteriou, D., & Hall, S.G. (2007). *Applied econometrics: A modern approach using Eviews and microfit*. Palgrave Macmillan.

Baltagi, B. H. (2005). *Econometric analysis of panel data*. John Willey & Sons Inc.

Banz, R.W. (1981). The relationship between returns and market value of common stocks. *Journal of Financial Economics*, *9*(1), 3-18. https://doi.org/10.1016/0304-405X(81)90018-0

Basu, S. (1977). Investment performance of common stocks in relation to their price earnings ratios: A test of efficient market hypothesis. *Journal of Finance*, *32*(3), 663-682. https://doi.org/10.1111/j.1540-6261.1977.tb01979.x

Black, F. (1972). Capital market equilibrium with restricted borrowing. *The Journal of Business, 45*(3), 444-455. Retrieved March 13, 2021, from http://www.jstor.org/stable/2351499

Black. F., Jensen, M.C., & Scholes, M. (1972). The capital asset pricing model: Some empirical tests. In M. C. Jensen (Ed.), *Studies in the Theory of Capital Market*. Praeger.

Blume, M., & Friend, I. (1973). A new look at the Capital Asset pricing Model. *Journal of Finance*, *27*(1), 19-34. https://doi.org/10.111/j.1540-6261.1973.tb01342.x

Breusch, T. S., & Pagan, A. R. (1980). The lagrange multiplier test and its application to model specification in econometrics. *Review of Economic Studies, 47*(1), 239-253. https://doi.org/10.2307/2297111

Calvet, A., & Lefoll, J. (1988). Risk and return on Canadian capital markets. *Canadian Journal* of *Administrative Sciences*, *5(1)*, 1-12. https://doi.org/10.1111/j.1936-4490.1988.tb460.x

Chan, L.K.C., Hamao, Y., & Lakonishok, J. (1991). Fundamentals and stock returns in Japan. *The Journal of Finance*, *46*(5), 1739-1764. https://doi.org/10.1111/j.1540-6261.1991.tb04642.x

Chettri (2019). Explaining cross-section of stock returns: A comparative analysis of listed financial and non-financial firms in Nepal. *International Journal of Scientific and Research Publications, 9*(11), 592-599. https://doi.org/ 10.29322/IJSRP.9.11.2019.p9580

Chou, P. H., Chou, R. K., & Wang, J. S. (2004). On the cross-section of expected stock returns: Fama-French ten years later. *Finance Letters*, *2*(1), 18-22.

Chow, G.C. (1960). Tests of equality between sets of coefficients in two linear regressions. *Econometrica, 28*(3), 591-605.

Corhay, A., Hawawini, G., & Michel, P. (1988). The pricing of equity on the London Stock Exchange: Seasonality and size premium. In Dimson, E. (Ed), *Stock Market Anomalies* (pp 197-212). Cambridge University Press.

Dangol, J., & Acharya, B. (2020). The effect of firm-specific variables on stock returns of Nepalese banks. *Journal of Balkumari College, 9*(1), 1-12. https://doi.org/ 10.3126/jbkc.v9i1.30061

Debondt, W., & Thaler, R. (1987). Further evidence on investor overreactions and stock market seasonality. *The Journal of Finance*, *42*(3), 557-581. https://doi.org/10.1111/j.1540-6261.1987.tb04569.x

Demirguc-Kunt, A., & Maksimovic, V. (1996). Stock market development and financing choices of firms. *The World Bank Economic Review, 10*(2), 341-369. https://doi.org/: 10.1093/wber/10.2.341

Fama, E. F., & French, K.R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, *47*(2), 427-465. https://doi.org/10.1111/j.1540-6261.1992.tb04398.x

Fama, E. F., & MacBeth, J. (1973). Risk, return and equilibrium: Empirical test. *Journal of Political Economy*, *81*(3), 607-636. http://dx.doi.org/10.1086/260061

Gautam, R. (2017). Impact of firm specific variables on stock price volatility and stock returns of Nepalese commercial banks. *International Journal of Research in Business Studies and Management, 4*(6), 33-44.

Greene, W. H. (2000). *Econometric analysis*. Prentice Hall.

Guan, L., Hansen, D. R., Leikam, S. L., & Shaw, J. (2007). Stable betas, size, earnings-to-price, book-to-market and the validity of the capital asset pricing model. *Managerial Finance*, *33*(8): 595-614.

Gujarati, D.N. (1995). *Basic econometrics*. McGraw Hill Inc.

Hausman, J. A. (1978) Specification tests in econometrics. *Econometrica, 46*(6), 1251-1271.

Linter, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *The Review of Economics and Statistics*, *47(*1), 13-37. https://doi.org/10.2307/1924199

Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica*, *34*(4), 768-783. http://dx.doi.org/10.2307/1910098

Nartea, G.V., Ward, B.D., & Djajadikerta, H.G. (2009). Size, B.M., and momentum effects and robustness of the Fama-French three-factor model: Evidence from New Zealand. *International Journal of Managerial Finance*, *5*(2), 179-200. https://doi.org/10.1108/17439130910947895

Pradhan, R. S., & Balampaki, S. B. (2004). Fundamentals of stock returns in Nepal. *SEBON Journal, 1*(1), 8-24.

Pradhan, R.S. (1993). Stock market behavior in a small capital market: A case of Nepal. *The Nepalese Management Review*, *5*, 20-32.

Rosenberg, B., Reid, K., & Lanstein, R. (1985). Persuasive evidence of market inefficiency. *Journal of Portfolio Management*, *11*, 9-17. http://dx.doi.org/ 10.3905/jpm.1985.409007

Senyigit, Y. B., & Ag, Y. (2014). Explaining the cross section of stock returns: A comparative study of the United States and Trkey. *Procedia Social and Behavioral Sciences, 109*(1), 327-332.

Sharpe, W.F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, *19*(3), 425-442. https://doi.org/10.1111/j.1540-6261.1964.tb02865.x

Stattman, D. (1980). Book values and stock returns. *The Chicago MBA: A Journal of Selected Papers*, *4*, 25-45.

Wong, K. A., Tan, R.S.K., & Liu, W. (2006). The cross-section of stock returns on the Shanghai Stock Exchange. *Review of Quantitative Finance and Accounting*, *26*, 23-39. https://doi.org/10.1007/s11156-006-7031-4

Wooldridge, J. M. (2002). *Econometric analysis of cross section and panel data*. The MIT Press.