

Stock Price Adjustment to Corporate Accounting Disclosure: A Quantitative Study on Dhaka Stock Exchange (DSE), Bangladesh

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DOI: 10.5296/ijafr.v5i2.8258

URL: <http://dx.doi.org/10.5296/ijafr.v5i2.8258>

Abstract

This study has been designed to detect whether corporate accounting disclosures through annual report influence stock price movement in Dhaka Stock Exchange. To conduct our study, we gathered a series of panel data from 2010 through 2014 of 25 private commercial banks. Least square regression analysis has been done by incorporating fixed effect and random effect models and six models have been developed through Hausman Test. The resulting output revealed that “Earning per share”, “Return on equity” and “Net asset value per share” (book value) positively influenced stock price movement during our study period but “Earning per share” and “Net asset value per share” jointly can explain highest variation in stock price movement in DSE. Although past few studies showed weak form of market efficiency in DSE, this study conveys a positive movement of Bangladesh stock market from weak form towards strong form of efficiency.

Keywords: *Earning per share, Net asset value per share, Random effect model, Stock price movement, Market efficiency.*

1. Introduction

Stock price volatility has become a common phenomenon in Dhaka Stock Exchange (DSE); even it was also seen during last few couple of years. DSE experienced two big crashes in 1996 and 2011. Chowdhury and Abdullah (2011); Haque and Faruquee (2013); Haque and

Faruquee (2013) found that Weak market regulation, limited number of good IPOs and its overpricing, lack of accounting knowledge of the investors and presence of syndicate, corruption in regulatory organization, insider trading, unskilled investor and intervention of Bangladesh bank, faulty listing method, revaluation of asset before company's listing, high premium on issuance of right share, stock split, stock price manipulation, Investors' high expectation and irrational behavior cause undue increase in market index and ultimately result in great fall in Stock market. Ghosh, Bose and Shahriar (2012) also revealed that price manipulation, insider trading, faulty financial statement, improper dividend policy and lack of appropriate policy by central bank hampered smooth operation in Bangladesh capital market. Yartey (2008) concluded that Stock market accelerates economic growth by providing a boost to domestic savings and increasing the quantity and quality of investment. Central bank of Bangladesh and Securities & Exchange Commission took have been working for few years to stabilize the stock market in Bangladesh but still now the market is unstable.

Although some factors that are beyond control of the retail investors caused market crashes, irrational behavior of the investors is also responsible for the share price fluctuation. A several number of research studies by Ball and Brown (1968); Collins, Maydew and weiss, (1997); Zhou (2004); Yu and Huang (2005); Sharma and Singh (2006) and Sharma (2011) revealed that there was a strong link between accounting disclosure and stock price movement. That is; market values of stock prices are influenced by the corporate accounting disclosure in developed and developing countries. Consequently, to some extent the usages of accounting information while determining market value of a particular stock can provide an idea of market efficiency and reduce the investment risk of the retail investors. Banking sector and stock market development are closely related (Demirguc-Kunt and Levine, 1996). Moreover, banking sector is a very prominent and dominating sector in Bangladesh stock market and retail investors have greater interest in trading stocks of various listed commercial banks in DSE. This study has been designed to explore stock market behavior towards profitability and book value disclosures in corporate annual report so that the current form of efficiency of the market can be identified.

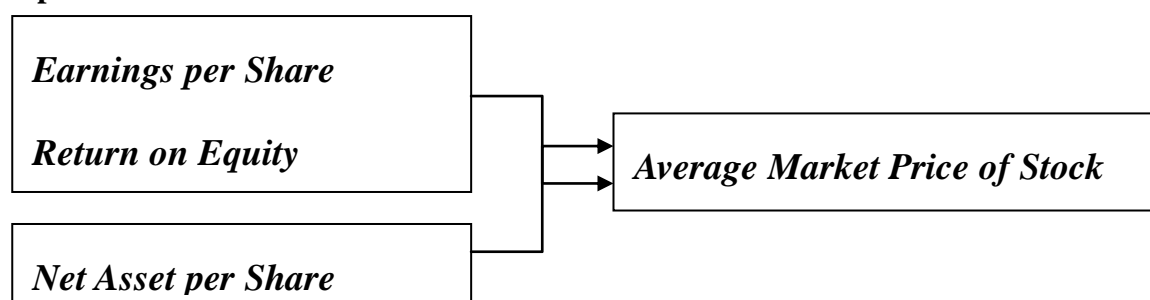
2. Literature Review and Hypothesis Development

Kumar and Hundal (1986) conducted a research study on Asian share market and found a positive impact of earning per share, dividend per share, net asset per share and leverage ratios on market prices of shares. A positive link between earning per share and market value of stock was also disclosed showing that earning per share had greater impact on retail investors in determining the value of a particular stock (Malhotra, 1987; Baskin, 1989; Tuli, Nishi and Mittal, 2001; Seetharaman and Rudolph, 2011). In another study by Ohlson (1995) in Australia found that book value was more significant than earnings of the organization in equity valuation. But Lew and Zarowin (1999) revealed deterioration in the relative importance of book value and earning reporting in determining the market value of shares because of faulty accounting systems; Piotroski and Roulstone (2004) drew a conclusion that market prices of the stock depend on demand-supply forces of a particular security in the stock market.

Perry and Nolke (2006) stated that fair value accounting closely related with market value of stock than that of historical cost accounting reporting. Several researchers concluded that earnings reporting i.e. earning per share, dividend per share, return on equity, and book value of the companies influenced the market value of shares (Svensson and Larsson, 2009; AL-Shubiri, 2010; Sharma, 2011; Bhatt and Sumangula, 2012). Besides accounting information, some macro and micro economic factors also affected market value of shares (AL-Shubiri, 2010). Andriantomo and Yudianti (2013) conducted a study on Indonesia Stock Exchange and found relevance of book values and earnings to the companies' stock value. In an another study in Sweden by Halonen, Pavlovic and Persson (2013) revealed that Accounting data (i.e. earnings per share and mostly net asset value per share) could explain a high portion of stock price movement in Swedish stock market. But a negative relationship between net asset value per share and stock price change was found by a study in Dhaka Stock Exchange consisting of 105 companies from 2000 to 2010 by Miah (2012). Most recently in a study in Pakistan by Riaz, Liu, and Khan (2015); Omura (2005) found that book value of share and earnings per share have statistically significant influence on the market price of stock

So, it is found that although book value per share and stock price movement is positively linked in various developed and developing countries but in Dhaka Stock Exchange book value per share and stock price are negatively linked that represents a irrational behavior by the retail investor and finally resulted in market crash in 2011. Even after this big crash, Dhaka Stock Exchange represented stock prices volatility during last few years. This study is designed to unwrap the current scenario of DSE in order to creating awareness among the retail investors to adjust stock prices to new accounting disclosure with a view to establishing rational behavior in the stock market. Finally to reach our research objectives, we have developed the following conceptual framework and research hypotheses where earning per share, return on equity, return on asset and net asset per share are used as independent variables and average market prices are used as dependent variable.

Conceptual framework



H₁: Profitability disclosure has significant positive impact on share market price.

H₂: Net asset value per share positively influences the market value of corporate share.

3. Research Methodology

This study is mainly a quantitative one based private commercial bank industry in Bangladesh. There are 30 listed private commercial banks in Bangladesh; out of them 25

banks has been selected based following judgment sampling approach. The reason behind using judgment sampling approach is to ensure highest uniformity and consistency in financial reporting among the selected banks and the rest five banks are excluded because of their inconsistencies in financial reporting. To run our regression, profitability information (i.e. EPS, ROE and ROA) and Book value per share (i.e. Net asset value per share) have been used as independent variables and average share price of the selected banks is dependent variable.

The data of profitability and book values of selected banks have been collected from the respective bank's financial statement that were published from 2010 through 2014 and market prices of the relevant bank's stock from 2010 through 2014 have been collected from Dhaka Stock Exchange. As corporate accounting information is published after ending date of a particular accounting period and it should be reflected on stock prices after publishing date. So, financial information for accounting period 2009, 2010, 2011, 2012, 2013 that were published from 2010 through 2014 and market prices of the selected bank's share from 2010 through 2014 have been collected accordingly. In data processing, three months stock's market prices of each bank from annual report publishing date have been converted into one simple average, as it is justified that financial information is mostly reflected on share prices during this period, and eventually we have got five yearly average market prices of each bank's stock for our study period. Finally, these set of data have created a series of panel data having 25 groups and 125 observations.

To test our research hypothesis, linear regression analysis has been used. As a series of panel data has been used in this study, both fixed effect and random effect models have been used to regress our dependent and independent variables. Finally appropriate models have been selected based on outcome of Hausman test. Before regression analysis, a multiple correlation analysis has been made to detect multicollinearity among the independent variables. A 5% level of significance has been ignored in both correlation and regression analysis.

4. Analysis and findings

The table one holds the output of multiple correlations analysis where the correlations are significant at 5% level of significance. The output has revealed that there was no significant relationship between return on asset and average stock price during our study period. For rest of the cases, correlations among the dependent variable and other independent variables are found significant. On the other hand, ROE and EPS as well as EPS and NAPS are significantly correlated. So, all the independent variables except ROA are more or less suffering from multicollinearity.

Table-1. Output of multiple correlations analysis

	ASPrice	ROE	ROA	EPS	NAPS
ASPrice	1.0000				
ROE	0.5146	1.0000			
ROA			1.0000		
EPS	0.5911	0.5950		1.0000	
NAPS	0.7394	0.2027		0.4942	1.0000

The outputs of regression analysis are summarized in table two. To neutralize the effect of multicollinearity, simple regression analysis for the three independent variables has been made by integrating one dependent and independent variable and outputs are summarized into first three models in table two. Lind, Marchal and Wathen (2010) explained that independent variables having correlation between 0.70 to -0.70 with other independent variables could be used in the same model at the same time to explain the changes in dependent variable. So, Model-4 and Model-5 both have been developed incorporating two independent variables. The last model-6 has been developed using all the three independent variables. The variable ROA has been excluded from regression analysis because of its no significant correlation with dependent variable.

Table-2. Summary output of Regression analysis

	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6
Fixed effect						
EPS	5.0709 (0.000)				6.1022 (0.000)	-0.6985 (0.619)
ROE		17.0332 (0.000)		14.2903 (0.000)	1.0941 (0.000)	15.5289 (0.000)
NAPS			2.7506 (0.000)	0.5971 (0.024)		0.5772 (0.032)
CONS.	197.8942 (0.000)	85.7583 (0.040)	-268.019 (0.001)	-38.2736 (0.469)	-129.7104 (0.040)	-29.8386 (0.593)
Overall R ²	0.3494	0.2648	0.5467	0.5498	0.8009	0.4740
Model	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
P-value						
Random effect						
EPS	7.2182				7.2357	5.3007

	(0.000)			(0.000)	(0.000)	
ROE	17.1110		12.8461		5.0002	
	(0.000)		(0.000)		(0.004)	
NAPS		2.4990	1.3400	0.9209	1.0944	
		(0.000)	(0.000)	(0.000)	(0.000)	
CONS.	122.1008	84.4287	-209.0363	-183.2419	-128.9027	-182.1956
	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Overall R ²	0.3494	0.2648	0.5467	0.6951	0.8081	0.8200
Model	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-value						
Hausman test						
Chi-square	8.38	0.02	1.01	18.72	5.50	29.60
	(0.0038)	(0.8972)	(0.3149)	(0.0001)	(0.0639)	(0.0000)

The first regression model of table two represents that Earning per share has positive coefficient under both fixed effect and random effect approach having p-value 0.000 and 0.000 respectively; that is, earning per share had significant positive impact on stock price movement during our study period and the values of the constants under each approach are statistically significant at 5% level of significance. And the overall probability-value of the model under both approaches has been seen significant. But the chi-square value and p-value of Hausman test are 8.38 and 0.0038 respectively which indicate that fixed effect approach is appropriate for the first model. If we draw our first model, it will take the following shape:

$$ASPrice = 197.89 + 5.0709 * EPS \text{ ----- (1)}$$

Here, the value of beta is 5.0709 representing that if the EPS is increased by one dollar, the approximate average value of the stock will be increased by 5.0709 dollar and the value of R-square (R²) is 0.3494 which denotes that our first model can explain 34.94% variation in average stock prices in DSE.

The third column of table-two represents the impacts of changes in return on equity on stock price movement in DSE. The coefficients (value of beta) of return on equity under both fixed and random effect model represent positive figure and their respective p-values are below .05 which indicates that the coefficients under both models are statistically significant. In the same way if we look at the constant values under fixed effect and random effect model, at 5% level of significance, both values under these two models are statistically significant. But the result of Hausman text indicates that Chi-square value is 0.02 and the resulting p-value is 0.8972 which denotes that random effect model is effective to explain the impact of return of equity on stock price movement in DSE. So, our second model will take the following form:

$$ASPrice = 84.4287 + 17.1110 * ROE \text{ ----- (2)}$$

Where, the value of beta is 17.1110 which symbolizes that one percent change in return of equity will cause approximately \$17.1110 increase in average stock price and the overall value of R-square is 0.2648 which represents that this model (i.e. return of equity) can explain 26.48% variation in stock price movement in DSE.

Accordingly, the fourth column of the table-two represents the impact of net asset value per share on the stock price movement in DSE. How changes in the value of net asset per share affect the changes in stock market prices are presented there. The coefficients of net asset per share under both random effect and fixed effect models are found statistically significant at 5% level of significance. The values of constant under both models represent negative figure but they are statistically significant as well. But if we look at Hausman test where see that the value of chi-square is 1.01 and the associated p-value is 0.3149 which denotes that random effect model is appropriate for net asset value per share to show the impact of the same on stock market price movement. So, the resulting equation is as follows:

$$ASPrice = -209.0363 + 2.4990 * NAPS \text{ ----- (3)}$$

Where, the value of beta is 2.4990 which explains that if the net asset per share of a company is increased by one dollar, the market value of the stock approximately will be increased by 2.4990 dollar. The overall R-square of the model is 0.5467 which specifies that this model can explain 54.67 % variation in stock market price movement and the probability value of the model is 0.0000 which shows that at 5% level of significance , this model is statistically sound.

The fifth column of table two holds the summary outputs of regression analysis under both fixed effects and random effects models by incorporating ROE and NAPS as independent variables. Where the coefficients of ROE and NAPS under both fixed effects and random effects models are positive as well as statistically significant at 5% level of significance. But the values of constant under both models are negative and only statistically significant under random effects model. The value of chi-square of Hausman test is 18.72 and its associated p-value is 0.0001 which denotes that fixed effects model statistically more appropriate than that of random effects model. So, the resulting regression model is as follows:

$$ASPrice = -38.2736 + 14.2903 * ROE + 0.5971 * NAPS \text{ ----- (4)}$$

The p-value of the model is 0.0000; that is, the model is statistically sound. The overall R-square is 0.5498 which denotes that 54.98% in stock price movement can be explained by ROE and NAPS jointly. The coefficient (value of beta) of ROE is 14.2903 what indicates that one percent change in ROE will cause \$14.2903 increase in stock price and the coefficient (value of beta) of NAPS is 0.5971 which denotes that one dollar increase in NAPS will cause 0.5971 dollar increase in stock market price.

The summary outputs of regression analysis by integrating EPS and NAPS as independent variables are organized into sixth column of table two where the coefficients of both independent variables and the resulting values of constant under fixed and random effect models are statistically significant at our planned 5% level of significance. The resulting coefficients of the independent variables are positive but the values of constant are negative under both models. The probability values under both model denotes that both model are

statistically sound. The output of Hausman test represents that the chi-square value is 5.50 and the resulting p-value is 0.0639. So, at 5% level of significance, we can conclude that random effect model is statistically preferable. So, the resulting equation is as follows:

$$ASPrice = -128.9027 + 7.2357 * EPS + 0.9209 * NAPS \text{ ----- (5)}$$

The overall R-square of this model is 0.8081; that means 80.81% variation in dependent variables can be explained by EPS and NAPS. The coefficients (value of beta) of the independent variables denote that one percent increase in EPS will cause \$ 7.2357 increase in average stock market price and one dollar increase in net asset per share will result in \$ 0.9209 increase in average stock market price in DSE.

The last column of table two holds outputs of regression analysis under fixed effect and random effect models. Where, EPS, ROE and NAPS are used as independent variables together. The coefficient of EPS and value of constant under fixed effect model are not statically significant at our planned 5% level of significance. But the coefficients of ROE and NAPS are statistically significant. Under random effect model all the coefficients of independent variables and the value of constant are statistically significant. Although Probability values of both model denote that both model are statistically sound but the output of Hausman test represents that the value of chi-square is 29.60 and the associated p-value is 0.0000. So, at 5% level of significance, fixed effect model is statistically preferable and the resulting regression model is as follows:

$$ASPrice = -29.8386 + 15.5289 * ROE + 0.5772 * NAPS \text{ ----- (6)}$$

The value of overall R-square is 0.4740 which denotes that 47.40% variation in dependent variable can be explained by this model.

From our regression analysis, we have developed six regression models to explain stock market price movement in DSE. Now which model is best fitted needs to be identified. The first three models explain individual influence of the three independent variables on stock price movement in DSE. Where, overall R-square of each model represents that third model consisting NAPS can explain the highest 54.67% variation in dependent variable. Fourth and sixth model are suffering from insignificant constant values. Only the fifth model consisting of EPS and NAPS and having greatest R-square value 0.8081 can explain highest 80.81% variation in average stock price movement during our study period. Moreover, all the components of the model are statistically significant. So, the fifth model is best fitted model in this study and we can conclude that EPS and NAPS jointly can explain movement in stock market prices in Dhaka Stock Exchange, Bangladesh.

5. Conclusion

The study has been designed to investigate whether financial information disclosed through corporate accounting disclosures is reflected on the stock's market prices of various companies listed in DSE. Through our regression analysis, we have developed six regression models. Our fifth model consisting of EPS and NAPS can explain highest almost 80.81% volatility in stock market prices in DSE. Although fifth model can explain 80.81% variation

in stock prices, the constant value of this model is negative. And, this is because of a continual downward trend in stock prices after big crash in 2011. In an another study covering from 2000 through 2010, a negative relationship between net asset value per share and stock market price was found in DSE by Miah (2012). Last few studies by several researchers also concluded weak form of efficiency prevailing in DSE. But this study has revealed that EPS and NAVPS have significant positive influence on stock's market price movement in DSE. Although still now this stock market is unstable and has been passing through transitional period, our research findings denote a positive movement of Bangladeshi stock market from weak form towards strong form of efficiency. In various developed countries, where stock price movement and corporate accounting disclosure are positively linked and consequently stock markets are relatively stable than that of less developing and under developed countries. Although some factors that are beyond the control of retail investors can influence stock price movement in stock market, we can conclude that proper usages of accounting information in stock trading can reduce price volatility and investment risk of the retail investors in Bangladesh.

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