Is any relationship among stock prices and micro and macro variables of Fuel and Power firm's of Bangladesh?

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Abstract: *This study attempts to determine the influence on stock prices by various factors for listed companies in DSE in fuel and power sector. Secondary data are taken for five years from 2013 to 2017 for all the variables. This study applied correlation and multiple regression method to test the hypotheses where Stock price is the dependent variable. Independent variables are of two kinds; Micro variables- Earning per share, Net asset value, Return on equity and Macro variables- Interest rate, Exchange rate, and Money supply. The outcome of the study shows that micro variables have a significant impact on firm's stock prices.EPS and NAV has a positive correlation with stock price. There is no significant impact of ROE and Macro variables on stock price. The findings in this study could be helpful for the policy makers and potential investors which demands further study.*

***Keywords:*** *stock price, Earning per share, Net Asset Value, variables*

I.   Introduction

Stock market is a key indicator of economic development. If stock market is liquid and slacken, it can foster long term growth (Fuchs-Schundeln and Funke, 2003); Stock prices of different firms are the most common topic in the capital market in any financial sector. Continuous increase in the world trade and capital movements has made the stock price movements' dependant on various predictors. Maximization of wealth through returns on the investments is the main motto of the investors. To earn maximum profits investors need information either internal or external which can be draw from the company's financial report and from the stock market together. (Emamgholipour, M. et al., 2013). During the life of six decades, Bangladesh stock market has experienced two vicious crashes–one in 1996 and another in 2010-11. According to some existing studies, Bangladesh stock market cannot be explained with established theories. Money making psychology of investors played a significant role in the incident of 2011. From the prior research, (Joshep, and Vezos, 2006) explained that Foreign exchange (FX) rate and interest rate risks are vital financial and economic factors influencing the value of common stocks. The outcome of the study indicate a significant and negative relation between stock prices and inflation and output growth negatively and significantly affect stock prices. (Dimitrios Tsoukalas, 2003) Exchange rate, industrial production, money supply, and consumer prices were used as macroeconomic factors and reveal a strong relationship between stock prices with those factors. The aim of this study is to uncover the relationship among the stock prices and determinants (earning per share, Return on equity, Net asset Value, Interest rate, exchange rate, and money supply). To identify the influence on stock prices of different variables some statistical test will be run through the SPSS. In this study firm's earning per share, return on equity, net asset value are taken as micro variables and exchange rate, interest rate, money supply (M2) are taken as macro variables.

II.   Research Objective

The objective of the study is to examine how much influence of predictors (Earning per share, Net Asset Value, Return on Equity, Exchange rate, Interest Rate and money supply) have on stock prices.

III. Conceptual Framework
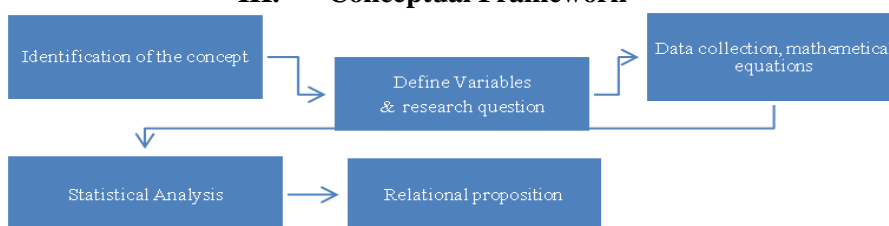
Identification of the concept

There are many factors which can influence the daily price of the stock. Investors are concerned in the fluctuation of stock price and the predictors of the stock price movement. In order to make some profit they need to understand which factors influence the most in volatility of the stock price. In this study firm's Earnings per share, Return on equity, Net asset values are in exercise as Micro variables. On the other hand exchange rates, interest rates and Money supply (M2) are in use of Macro variables. Therefore, stock prices of 13 listed companies are dependant variables and other two categories (micro and macro) of variables are independent variables.

Definition of the Variable

Variables	Definition of Variables
Stock Price	cost of purchasing a security on an exchange
EPS	Earnings per share (EPS) represent the amount of earnings attributable to each outstanding share of a company's stock.
ROE	Return on Equity (ROE) is calculated by dividing profit after tax with to each outstanding share of a company's stock
Net Asset Value	The net asset value (NAV) represents the net value of an entity, and is calculated as the total value of the entity's assets minus the total value of its liabilities.
Exchange rate	An exchange rate is the price of a nation's currency in terms of another currency.
Interest rate	Interest rate is the amount charged, expressed as a percentage of principal, by a lender to a borrower for the use of assets. Interest rates are typically noted on an annual basis.
M2	M2 is a calculation of the money supply that includes all elements of M1 as well as "near money." M1 includes cash and checking deposits, while near money refers to savings deposits, money market securities, mutual funds and other time deposits

Statistical Analysis

To obtain the research objective statistical tool (SPSS) version 20 is used to run the analysis.

Relational Proposition

Firm's value reflects on stock prices of the companies and the values depend on the internal as well as external factors. External factors such as exchange rates, interest rates and money supply can indirectly influence the stock prices. In order to get a thorough understanding secondary data are taken for the period of five years instead of one year. In this study researcher tries to figure out whether any relationship exists among stock prices and these two categories (micro & macro) of variables. Some hypotheses are drawn to study the predictors that influence stock prices and statistical analysis has been used to test the hypothesis.

IV. Research Question

The research question is: Is there a relationship among stock prices, micro and macro variables?

V. Research Hypotheses

The intention of this study is to explore whether the micro and macro factors significantly influencing stock prices in an efficient stock market with reference to listed companies on the Dhaka Stock Market. The study was conducted through secondary data with an analysis of annual reports of listed companies. Data was gathered from the annual reports of 13 fuel and power sector companies for the consecutive five years (2013 to 2017).

Null Hypotheses

There is no significant relationship among stock prices and micro and macro variables. (H0)

Sub Hypotheses

* There is no significant relationship between stock price and the earnings per share.(H01)
* There is no significant relationship between stock price and return on equity.(H02)
* There is no significant relationship between stock price and Net Asset Value. (H03)
* There is no significant relationship between stock price and exchange rate.(H04)
* There is no significant relationship between stock price and interest rate.(H05)
* There is no significant relationship between stock price and money supply (M2).(H06)

VI. Literature Review

The study specified which is conducted by Sharif, Purohit, & Pillai (2015) variables of return on equity, book value per share, dividend per share, dividend yield, price earnings, and firm size affecting the share price in the Bahrain market significantly. Edward Attah Botchwey (2014) selected randomly 36 listed companies from Ghana Stock Exchange and the study revealed that share price is positively related to the dividend of the companies. Higher dividends payments create demand for corresponding share of the firms as a result this creates pressure on stock price moving upward. In this study primary data was used by questionnaire and secondary data consist of journals, national tax journal, journal of finance and corporate finance. One of the research findings is that investor's psychology plays a vital role in stock price movements. It is indicating that stockholders are considered to have great influence on stock price through their expectation about dividend. (Bitok,et al, 2011). One of the studies is conducted on Public Bank Berhad, a listed bank in Malaysia to investigate whether there is any correlation between Public Bank Berhad's EPS and a stock price for a relatively long time period of 19 years. Even though, there are some boundaries in the use of EPS as an investment analysis tool, it can be concluded that EPS is a classical model, which is important and relied upon by investment analysts to measure the performance of business entities. From the study of A. Seetharaman and John Rudolph Raj it is revealed that there is a very strong positive correlation between Public Bank Berhad's EPS on it stock prices and that there is a major impact of earnings announcement on Public Bank Berhad's stock prices. Another study carried out on selected 17 variables which appear to be of use for the movement of stock price in Bangladesh capital market. The study is done through SPSS dimension reduction (or factor analysis) and from the research it is unveiled that there are 5 core factors which influence the stock price. The obtained factors are: Industry Performance, Market Influences, Company Performances, Investor Decisions, and Financial Considerations. The aim of the study is to find out whether there is a correlation between EPS and stock price movement in the capital market. The result came that EPS is highly correlated to stock price movement in the capital market. It is also explored in the study that the investors should consider about three main factors which are company information & performance, risk management and continuous monitoring of stock performance.(Md. Shariful Islam, Mohammad Abdus Salam & Md. Mahmud Hasan). According to Dr. Pankaj Kumar earning per share has found to be a very strong predictor of market price of share, while price earnings ratio impact considerably on the forecast of market price of share of selected companies of auto sector as a whole. Sample size of the study was eight companies of auto sector based on Nifty auto index and the time frame of five consecutive financial years from 2011- 12 to 2015-16. In this research to determine the effect of EPS and P/E ratio on market share of selected companies of auto sector statistical tool regression analysis is done. From the study of Md. Saiful Islam, Md Lutfor Rahman, conclusion can be drawn that NAV has great influence on volatility of share prices, whereas face value, market lot size should not have any impact in determining the market volatility. The study has been conducted using 92 companies for the period of 2000 to 2009. To measure the scale of volatility researchers has been used standard deviation. According to the results of the study done by Lina Hani Warrad, market valuation measures of Jordanian banks have a significant effect on banks' stock prices. The analysis found out that Dividends per share (DPS), book value per share and dividend yield also had a major effect on stock price, while there was no significant effect caused by EPS, P/E, and market/book ratio. Md. Mahmudul Alam, Md. Gazi Salah Uddin, constructed a study on fifteen developed and developing countries. For all of the countries it is found that interest rate has significant negative relationship with share price. Maysami-Koh (2000), investigated that the impacts of the interest rate and exchange rate on the stock returns and showed that the exchange rate and interest rate are the predictors in the stock prices. According to Thorbecke (1997), Using vector autoregression (VAR) model, he showed that monetary policy indicator exerted real and important effects on stock returns, at least in the short run. He found that in every case expansionary monetary policy had strong effect on the ex-post stock returns. Multi-factor model revealed that the same was true for the ex-post returns as well. This implies the fact that monetary policy affects the accessibilityconditions of the firms. Patelis (1997) revealed in his study that in the long run, monetary policy indicators had significant impact on future returns. Bomfim (2000) on the contrary found that stock markets tend to be less unpredictable to the policy announcements on earlier days of announcements. In his paper, Blanchard (1981) presented that it was the policy that caused the change in the stock market and output level. Chancharoenchai et al. (2005) used six Asian countries and their stock returns,

treasury bills and government bonds from January 1987 to December 1996. Using auto-regressive conditional heteroskedasticiy-type model, they revealed that interest rate had some predictive power in case of predicting excess returns.

VII. Research Methodology

Research methodology refers to the dealings to obtain answers to the hypotheses and the tasks needed to complete   the different components of the research process. This chapter is organized as follows- research design, population and sample, data collection and data analysis.

Research Design

To achieve answers to research problems a research design is planned, structured and strategy of investigation will take place. In this empirical design where secondary data will be analyzed will establish the fact what is already known in the subject area. The research is designed to perform correlation test, multiple regression analysis for the hypotheses test. The aim of the study is to explore the relationship between the stock price and micro and macro variables. The study intends to find out the strength of the relationship between the variables.

Sample Design

The study considers 13 fuel and power companies listed with DSE (Dhaka Stock exchange), which comprises 70% (13 out of 19) of the total listed companies with DSE under fuel and power industry. For the purpose of analysis secondary data have been considered from the period of 2013 to 2017. It is worth mentioning here that the stock prices of the companies are taken as a closing price of the end of each year for the thirteen companies. The prevailing exchange rate, interest rate and money supply for the same time period are selected for use in the research.

VIII. Model Specification

Regression equation has been attempted to set a relationship between dependant and independent variables.

$$Y \text{ (Stock Price)} = \beta_0 + \beta_1 * EPS_t + \beta_2 * ROE_t + \beta_3 * NAV_t + \beta_4 * ER_t + \beta_5 * IR_t + \beta_6 * M2_t + \dots + \ddot{e}_t$$

Where,

β_0 =constant term

$\beta1, \beta2, \beta3, \beta4, \beta5, \beta6$ = coefficient

EPS= Earnings per share in the period of t

NAV=Net asset Value in the period of t

ER= Exchange rate in the period of t

IR= Interest Rate in the period of t

M2= Money Supply in the period of t

$\ddot{e}$ = Error Term in the period of t

In this study, stock price (Y) has been taken as a dependent variable. Independent variables are considered for this study is Earnings per share (EPS), return on equity (ROE), and Net Asset Value (NAV) at the micro level and Interest rate, Exchange rate and Money supply (M2) has been taken as an independent variables at the macro levels.

The annual reports of the thirteen local companies listed on the Dhaka Stock Exchange were analyzed to identify the earnings per share, return on equity and net asset value. From the website of Bangladesh Bank data of exchange rate, interest rate and M2 were taken.

Sets of data were designed for each company to find out the correlation between the dependent and independent variables. The aim is to also determine the strength of the relationship among the variables. Correlation statistics is used to measure the relationship among the dependant and independent variables. From the research of Taylor (1990) it is concluded that in medical and scientific research correlation analysis is one of the most broadly used statistical method. It is used to detect the degree of connection among the variables.

To test the hypotheses and examine the collected data regression analysis has been done. The whole set of data has been analyzed using SPSS (version)

IX. Results

A correlation matrix of all variables included in the analysis is presented in table 1 below, which is calculated based on data of 65 observations. The table shows that stock price is negatively related with interest rate and is positively associated with return on equity, earning per share, Net asset value, Exchange Rate and M2.

Table 1. Pearson Correlation Coefficient between variables of 13 DSE listed companies

		stock price	EPS	ROE	NAV	Exchange Rate	Interest Rate	M2
stock price	Pearson Correlation	1	.796**	.568**	.823**	.052	-.050	.055
	Sig. (2-tailed)		.000	.000	.000	.680	.692	.661
EPS	Pearson Correlation	.796**	1	.605**	.836**	.191	-.165	.180
	Sig. (2-tailed)	.000		.000	.000	.128	.190	.150
ROE	Pearson Correlation	.568**	.605**	1	.663**	-.072	.099	-.099
	Sig. (2-tailed)	.000	.000		.000	.572	.436	.434
NAV	Pearson Correlation	.823**	.836**	.663**	1	.123	-.136	.138
	Sig. (2-tailed)	.000	.000	.000		.327	.280	.272
Exchange Rate	Pearson Correlation	.052	.191	-.072	.123	1	-.801**	.878**
	Sig. (2-tailed)	.680	.128	.572	.327		.000	.000
Interest Rate	Pearson Correlation	-.050	-.165	.099	-.136	-.801**	1	-.987**
	Sig. (2-tailed)	.692	.190	.436	.280	.000		.000
M2	Pearson Correlation	.055	.180	-.099	.138	.878**	-.987**	1
	Sig. (2-tailed)	.661	.150	.434	.272	.000	.000	
. Correlation is significant at the 0.01 level (2-tailed).								

X. Regression Results

The table-1 represents a summary of regression model used in this study. It reveals that R² value of .727 meaning that 72.7 % of the variation in stock price can be explained by EPS, ROE, NAV, Exchange rate, Interest rate and M2.The table also suggests that there is a significant effect of EPS and NAV on stock prices. This is because the significance level for these hypotheses is lower than the level of significance (0.01), so the null hypotheses for the H01 and H03 are rejected. Finally the table shows that there is no significant effect on stock prices of ROE, exchange rate, interest rate and money supply. Because the significant level of these hypotheses is greater than the significance level (0.01), hence null hypotheses for H02, H04, H05, and H06 are accepted. The overall model is statistically significant it is obvious from the result (significant level is less than .01), therefore rejecting the null hypotheses (H0).

Table 2: Model Summary

Model	R Square	Adjusted R Square	F	Sig.	Decision
H0	.727	.699	25.345	.000ᵇ	Rejected
Model	**Beta**		**T**	**Sig**	**Decision**
constant			.165	.870	
H01	.370		2.835	.006	Rejected
H02	-.024		-.248	.805	Accepted
H03	.545		3.978	.000	Rejected
H04	-.161		-.575	.568	Accepted
H05	.437		.516	.608	Accepted
H06	.484		.458	.649	Accepted

XI. Limitations of the study

The outcome of this study could be subject to further argue and scrutiny. Only thirteen companies and a period of 5 years, our results could be weak to assume about the fuel and power sector. Another limitation could be drawn that in this study only few micro and macro variables are used where as other factors like dividend per share, inflation, and stock market environment etc could also be used. Overall results can be enhanced by including new explanatory variables.

XII. Conclusion

The present study has conducted to examine the effect of micro and macro variables on stock prices of fuel and power sector companies. It can be concluded that micro factors like EPS & NAV have strong impact on stock prices. But macro variables have no significant impact on stock prices. These results could vary as only thirteen companies are taken for the test. Conclusion cannot be drawn with this short sample size and only one industry category. Nevertheless, investors should be also aware about the stock market performance, company performance, risk factors, diversified stock portfolio and other related issues before investing in stock market.

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