

## **Impact of Payout Policy on Market Value**

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*This study examines the impact of dividend payout on the market value of selected Bangladeshi firms. Generalized method of moments (GMM) technique have been applied to estimate the dynamic regression models using a panel data of 198 companies listed on the Chittagong Stock Exchange (CSE) during 2003 to 2015. A statistically significant positive relationship is found between pay out and market value of the sample companies. Therefore, the Dividend Irrelevance Proposition of Modigliani and Miller have been rejected for the Bangladeshi firms in our sample. The findings of this study which are in disagreement with the dividend irrelevance theory hint to the fact that the Bangladesh financial market is not fully efficient. Panel data set and dynamic model used to analyze the financial market in case of Bangladesh is novel.*

**JEL Codes:** C23, C58, E44, G32, L21

### **1. Introduction**

Dividend policy is one of the most important financial policies applied by the management of corporate entities to fulfill their financial goals (Baker, 2009). Along with investment opportunities which offer alternatives to a dividend policy, circumstances encompassing an individual firm will play an important role in the decisions of the management. Although cash dividends are thought to be the most prominent among dividends, prevailing conditions may induce the management of the firm to use other types of dividends, such as share dividends or share repurchase or use them along with cash dividends (Broyles and Broyles, 2003). The seminal paper by Modigliani and Miller (1961) studies the relationship between dividend policy and the market value of the company which is one of the most frequently cited and quoted papers in this discussion. The "Dividend Irrelevance Theory" proposed by them remains till date one of the most rigorously debated issues in the discussion of dividend policies of corporate entities and has been extensively examined by researchers for a complete understanding due to its importance and contribution to the financial management sphere. The main proposition of the theorem mentioned above is that the market value of the stock of the company remains unchanged regardless of whether dividends have been distributed or not. It is generally understood that wealth maximization of the relevant stakeholders is the key goal of the management of the corporate entity for which they pursue certain financial policies (Ward, 1993) and the exact path the management follows to achieve the above goal depends on the prevailing financial climate to which the corporation caters to.

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The opinions of finance scholars widely divided in terms of acceptance or rejection of the dividend irrelevance theorem. Scholars such as Black and Scholes (1974), Higgins (1974), Miller and Scholes (1978 and 1982), Miller and Rock (1985) and Bernstein (1996) posit their support for the theorem, while Koch and Shenoy (1999) and Dyl and Weigand (1998) offer strong statistical evidence that dividends and market value of the firm are linked. The dividend and earnings declaration process actually adds a compounding factor for empirical studies examining the above theory and a number of strategies have been applied to isolate the effect of dividend policy from the earnings announcement. Pettit (1972) divided his sample into numerous portfolios consistent with the degree and direction of change for both dividends and earnings; Aharoni and Swary (1980) examine a sample in which the dividend and earnings were announced on different dates; Brown, Finn and Hancock (1977) and Kane, Lee and Marcus (1984) survey the market reaction to synchronized dividend and earnings announcements in their effort to segregate the impact of dividend from the impact of earnings. These earlier studies do not take company's tendency to exclude dividends into account (Lobo, Nair and Song, 1986; Nissim and Ziv, 2001) and many of them focus on a particular dividend type only (Miller and Modigliani, 1961; Horne and McDonald, 1971; Partington, 1985; Holder, Langrehr and Hexter, 1998). Moreover, their sample size is somewhat not satisfactory for making a generalized proposition as mentioned by Marsh and Power (1999).

The determinants of dividend payout policy can be diverse in nature and contextual researches in case of Bangladesh have recently started to flourish. A study by Misir (2012) on selected companies listed on the Dhaka Stock Exchange (DSE) and the Chittagong Stock Exchange (CSE) finds that current earnings and liquidity are the main factors which influence the dividend payout policy. Khan et al. (2011) in an earlier study on the Dhaka Stock Exchange (DSE) determined that movements in the share prices are influenced by dividends, retained earnings and other factors. Huda and Abdullah (2014) examine the relationship between ownership structure and dividend policy in the context of the Chittagong Stock Exchange, and determine that director's ownership has a significantly positive influence on dividends per share, whereas there is a significantly negative influence on dividends per share in case of institutional ownership.

Dividend policy may matter because for mature companies with highly stable cash flows, paying out too little of operating cash flow may cause managers to over invest. On the other hand for companies in higher growth or riskier businesses, paying out too much may reduce financial flexibility. Aside from a corporate entity's dividend policy, which despite the empirical disagreement between researchers in finance remains a strong indicator of the entity's financial performance, the actual announcement of dividends and earnings introduces another variable into any probable analysis: the dividends and the earnings. During a cursory examination, the variables may appear to further complicate any proposed models. On the other hand, the introduction of these additional variables into the proposed models may serve as an improved indicator of the relationship between dividends and the market value of the entity since higher earnings, in conjunction with higher dividend payouts, signals the confidence of the target markets in the ability of the entity in achieving its targets.

Taking the above issues into consideration, this paper examines the relationship between dividend policy and market value of companies in the context of Bangladesh using a panel data of 198 companies listed in Chittagong Stock Exchange over a period of 13 years. Detailed analytical studies in the context of the Chittagong Stock Market have not been previously undertaken; especially those which assess the relation between market value

and dividend policy of listed firms, therefore, a study related to the enlisted companies of Chittagong Stock Exchange may help the managers to identify an optimal dividend policy. The key distinctive contributions that we make in this paper can be summarized as following: i) price earnings ratio as well as stock return which are used as proxy of market value in assessing the impact of dividend policy on them; ii) the paper also considers the impact of shareholding pattern, age and size of the company as they are important predictors of dividend policy; iii) the Generalized-Method-of Moments (GMM) estimators developed by Arellano and Bond (1991) has been used in this paper which yields consistent and efficient estimates in the presence of arbitrary heteroscedasticity and endogeneity problems that are expected to be present in such firm level data and may make the estimated results biased; iv) this study significantly contributes in dividend policy decisions by elaborating the dynamic roll of payout on stock price volatility in financial sector of Bangladesh.

The results show that payout has a statistically significant positive correlation with Price Earnings Ratio as well as Stock Return which are used as proxy of market value for the sample companies and thus negates the validity of Dividend Irrelevance Theory in the context of Bangladesh. The Shareholding Pattern has an insignificant relation with Price Earnings Ratio even though it has got insignificant relation with Stock Return.

The rest of the paper is organized as follows: section 2 explains prior studies; section 3 discusses the methodology and variables; data and sample selection are discussed in section 4; section 5 highlights the empirical results and discusses the findings and finally section 6 concludes the paper.

## 2. Literature Review

### 2.1 International Market Perspectives

Modigliani and Miller's dividend irrelevance theorem (1961) is a prominent topic among scholars and researchers. The empirical study by Watts (1973) confirmed the relationship between unanticipated dividend changes, future earnings and nonstandard earnings on shares in companies that disclose unexpected dividend changes. Examining 310 firms over a 23 year period from June 1945 to June 1968, the study establishes that unexpected variation in dividend provides minor information relating to future earnings and anomalous return around dividend announcements are absent. Black and Scholes (1974) examined the impact of dividend policy on stock prices by creating 25 portfolios from companies listed in the New York Index (NYI) during 1931 to 1966 and classified them into five groups consistent with their cash dividend policies and each group was then again subdivided into five classes according to risk. The study determines that the companies that increase their dividends make the assumption that share prices will not increase and share prices may undergo a momentary change in response to a dividend change since the market may take it as a sign about future earnings. Miller and Scholes (1978 and 1982) while examining the link between taxes and dividends also check the effect of dividend policy on the market value of a company and posit that the dividend is an instrument for assigning missing information on income to the markets. The earnings information contained in the dividend provides a forecast about future earnings.

Dividend policy has consistently received attention in the literature (Chidi, Agu and Ande, 2013; AITroudi and Milhem, 2013; Ramadan, 2013; Zakaria, Muhammad and Zulkifli, 2012). Bernstein (1996) suggests that if firms do not pay dividends from income for an extended

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time period, the impact on shareholders' wealth will be absent or very insignificant. Conroy, Eades and Harris (2000) studied pricing effects of instantaneous earnings and dividend announcement in the Japanese market with a sample of 3,890 observations from 1988 to 1993 and found an impact of earnings on dividends in their explanation of market response. They also determined that earnings announcements can convey sufficient information to the markets which make the dividends appear as an additional indicator. Their findings additionally specify that dividend expectations provide additional information about future earnings. Chen, Firth and Gao (2002) used a sample of 1,232 listed companies in China from 1994 to 1997 and their study reveals that movements in stock prices are meticulously associated with unpredicted earnings and cash dividends play a limited role, whereas share dividends are used to modify signals of former profits.

Notwithstanding the results of the above studies, the researcher believes that the Dividend Irrelevance Theory is idealistic because of its confidence on the efficiency of the financial markets. The study by Gordon (1959) is one of the most prominent in this regard who categorized three reasons why investors want to buy shares, namely both dividends and earnings; dividends; and earnings. He examined the effect of these three using data from four industries during 1951 to 1954 and his results demonstrates that inferring a logical structure in the common stock pricing would be difficult from the data under the first hypothesis (dividends and earnings). But an increase in the dividend with a corresponding reduction in retained earnings is not found to raise the value of a share under the second hypothesis (dividends). And finally, the third hypothesis (earnings) states that an investor buys income per share when he acquires a share of stock. He collects the cash dividend and obtains the retained earnings in its share value. Overall, the paper stipulates that the dividend hypothesis is precise regardless of the accuracy of the earnings hypothesis. Additional work conducted by Gordon (1962 and 1963) also propounds against the Dividend Irrelevance Theorem. He states that the dividend policy and investment policy are consistent, but investment policy alone cannot affect the market value of a company.

Linter (1962) states that the value of one dollar received by shareholders as dividend is more than that as retained earnings. Pettit (1972) provides evidence that variations in dividend levels convey vital information to market applicants using announcement dates of all dividend changes for a set of 625 New York Stock Exchange (NYSE) firms from January 1964 to June 1968. His results show that the current prices in efficient markets replicate all available information published and consequently, the announcement of a change in the dividend is reflected in the share price. Brown, Finn and Hancock (1977) scrutinize the relationship between dividend, earnings and abnormal returns using a sample from Australia from 1963 to 1972. They use an event study to examine abnormal returns around the dividend announcements through Smearing Regression Analysis. Their study indicates that even though a change in both dividends and earnings has an optimistic relationship with abnormal returns, only the effect of dividend is statistically noteworthy. Blume (1980) examines the relationship between dividend policy and total returns through Cross-sectional Regressions and finds that the risk-adjusted returns on dividend-paying stock improves in anticipation of the dividend yield, whereas the average return on all dividend-paying issues are approximately the same as the non-dividend paying issues.

Aharony and Swary (1980) examine whether quarterly dividend changes deliver information beyond the time provided by quarterly earnings announcements. Their results show that the market reacts positively to dividend rises and vice versa and the market's reaction to a decrease in dividend is greater than that to the dividend increase. However, their findings

do not specify any difference in market reaction to earnings announcement before and after dividend announcement. Supporting the above findings, Asquith and Mullins (1983) find that the market reaction to primary dividends is low within ten days from the dividend announcement and information provided by both dividend and earnings are partially reciprocal. The paper by Kane, Lee and Marcus (1984) also analyses the market reaction to earnings and dividend announcements within ten days of each other with a sample of 352 observations of quarterly dividend and earnings announcements between fourth quarters of 1979 and second quarter of 1981. They find that the market evaluates both the dividend and earnings announcements together and changes in dividends and earnings have a substantially positive relationship with the cumulative abnormal return.

Ang and Peterson (1985) explore the relationship between stock returns and yield by investigating the role of dividend as a substitution for risk. Using long-run expectation data on return and yield from The Value Line Investment Survey for the companies from 1973 to 1983, they determine that the return for companies allocating high cash dividends is high. Baskin (1989) uses both cross section and time series analysis to measure the consequence of dividend policy on the instability of common stocks in the US from 1967 to 1986 using data for 2,344 US firms. His results show a strong and inverse relationship between dividend yields and stock price unpredictability. Marsh and Power (1999) investigates the relationship between stock prices and dividend for a panel sample of 56 large UK companies from January 1968 to December 1996 and their results demonstrate that there is a co-integrating relationship between share prices and share dividend. Using UK data as well, Lonie et al (1996) examines the capital market reactions to a combination of simultaneous dividend and earnings declarations. They examine the impact of dividend and earnings by dividing the sample into six portfolios consistent with changes in earnings and dividends as follows and conclude that a company's declarations on increases in both earnings and dividends earn highest positive and highest abnormal returns, whereas its announcements on the deterioration in earnings and dividends earn highest negative abnormal returns. Amihud and Murgia (1997) study the impact of dividend and earnings declaration in the German market to check whether price movements accompany dividend and earnings based on a sample of 200 companies from 1988 to 1992 and unanticipated dividends and earnings is shown to have an impact on share price movements. Their findings also appear to indicate that the dividend announcement is a greater marker for current earnings than early earnings declaration.

Azhagaiah and Priya (2008) examine the relationship between dividend policy and shareholders' wealth in the Indian chemical sector by scrutinizing the impact of variation in dividend policy on shareholders' wealth of dividend paying and non-paying companies along with the effect of retained earnings and historical performance. Using a sample of 21 companies from the National Stock Exchange (NSE) and 28 companies from the Bombay Stock Exchange (BSE) for the period 1997 to 2006, their study find that the wealth of shareholders of dividend paying chemical companies increased in comparison to that of their dividend non-paying counterparts in the long run and the commencement of dividend payments had a significantly positive impact on shareholders' wealth for the duration of the study. Researches on Nigerian listed firms have focused on the dividend irrelevance theory in their findings (Adefila, Oladipo and Adeoti, 2013; Adaramola, 2012). However, Oyinlola and Ajeigbe (2014) found a positive significant relationship between dividends per share and stock price in Nigeria.

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By using Fixed Effect Model as a static and Generalized Method of Moments as a dynamic regression model on 133 listed firms over a 10-year period from 2001 to 2010 in the Tehran Stock Exchange Asadi and Maryam (2015) found that the most important determinants of dividends are market risks with a negative association, followed by market to book value, and firm size with positive associations. The variable of government ownership has a negative coefficient, and is statistically insignificant. It means that affiliated firms to the governments generally tend to pay fewer dividends, which is not significant. Therefore, the determinants of dividend decisions are not significantly different between the two groups of firms. Manzoor (2015) in the Pakistan context shows that changes in stock prices in relation to earnings and dividend announcements, are not random but follow a pattern, which allows the negative abnormal returns to be earned from trading around earnings and dividend announcement date. The analyses also concludes that positive and negative earning information disclosure are unable to influence the stock market effectively, and therefore cannot fully reflect the changes on the stock price, and investors can get abnormal returns by using this earning information during the event window. In a study on the Karachi Stock Exchange, Ali et al (2015) determined that Dividend per Share and Retention Ratio have an insignificant relationship with Share Market Prices. Dividend Payout Ratio has a significant positive relationship with Share Prices as supported by the Bird in hand Theory which suggested that owners give preference to a dollar of estimated dividends over a likely dollar of capital gains.

Using the 'event study methodology' at Indian firms Anwar et al (2015) examined the effect of cash dividend announcements on stock returns (abnormal returns, if any) volatility that reflect investors' expectations of risk and return. The results provided strong support for 'Signaling' and 'Risk Information' hypotheses conveying that the volatility of stock returns increased post cash dividend announcement due to decline in firm's risk. No significant results were reported for stock returns volatility due to dividend announcements. Hamid et al (2017) conclude that in the Pakistan context, dividend payout ratio, market value, interest volatility and inflation volatility have positive significant correlation with price volatility. Common Effect Model shows that dividend payout and interest volatility has a significant positive impact on share prices. Whereas the Fixed Effect Model is a more appropriate fit than the Random Effect Model, and the model indicates that dividend payout ratio has significant positive impact and market volatility has significant negative impact on stock prices. GMM results also support the fixed and random effect outcomes with more robustness.

Hashemijoo et al (2012) study a sample of 84 companies from 142 consumer product companies listed in the main market of Bursa Malaysia to examine the relationship between share price volatility with two main measurements of dividend policy, dividend yield and payout. The results of this study showed significant negative relationship between share price volatility with two main measurements of dividend policy which are dividend yield and dividend payout. Moreover, a significant negative relationship between share price volatility and size is found. Based on the findings of this study, dividend yield and size have the most notable impact on share price volatility amongst predictor variables. Hunjra et al (2014) attempted to observe the effect of dividend yield, dividend payout ratio, return on equity, earning per share and profit after tax on stock prices in Pakistan. Four non financial sectors (Sugar, Chemical, Food and Personal Care, Energy) were selected. A sample of 63 companies listed at the Karachi Stock Exchange was analyzed for the period of 2006 - 2011. The results indicate that dividend yield and dividend payout ratio which are both measures of dividend policy have significant impact on stock price. Dividend yield is negatively related

with stock price and dividend payout ratio is positively related with stock price which means that these results are against the dividend irrelevance theory. For other independent variables, profit after tax and earnings per share have significant positive impact on stock price and return on equity which shows positive insignificant impact on stock price.

### 2.2 Bangladesh Market Perspectives

Studies in the context of Bangladesh are fewer relative to the studies focusing on dividends in other parts of the world; however they do serve to highlight important aspects of the financial markets of the country. In a study on Pharmaceuticals and Chemical companies listed on the Dhaka Stock Exchange, Chowdhury and Jannatunnesa (2017) find that firm size has a significant negative, and last year's dividend has significant positive relationship with dividend payout. However, dividend payout does not depend on firm growth, liquidity, profitability and P/E ratio of a firm. The results may have important implications for the improvement of investors' perceptions, which may assist them in their investment decisions in the researched industries. Uddin and Chowdhury (2005) in a study on 137 companies listed on the Dhaka Stock Exchange conclude that investor's do not gain value from dividend announcements. Hossain, Siddique and Rahman (2006) demonstrate that cumulative abnormal returns of most companies increase just before the dividend announcement date, but did not sustain in the dividend period. The sensitivity is prominent on the day after or the day before the declaration rather than the declaration day. Misir and Huq (2007) examine the importance of retained earnings and dividends on selected samples from the Dhaka Stock Exchange. Their study establishes that dividends explain stock price variation better than the retained earnings. Mollah (2007) concludes that announcement of dividends neither convey information to the market nor do investors consider dividend as signal. An important implication of this study is that the share price reaction to the earnings announcement is not similar to that of the other developed countries (Rashid and Rahman, 2008). In recent studies, Ali and Chowdhury (2010) try to determine the impact of dividend announcement and stock price reaction of banks, and conclude that dividend announcement does not convey any information due to strong contribution of insider trading as well as some other influencing factors in the Bangladesh capital market. In a study of selected commercial banks listed at the Dhaka Stock Exchange, Masum (2014) found that the relation between Dividend Yield and Stock Price is in contrast to the results of Khan et al (2011). Negative relation between Retention Ratio and Stock Price demonstrates that the shareholders want banks to pay dividends and when the banks retain that amount to fulfill their internal needs; this will negatively affect the stock prices.

### 3. Methodology

Many researchers (Ohlson, 1995; Collins, Pincus and Xie, 1999) discussed the role of equity on market value by applying a number of strategies to isolate the effect of dividend policy from the earnings announcement. In this study dynamic panel data analysis is applied in order to determine the factors affecting stock returns of the firms quoted in Chittagong Stock Exchange Market, since it is believed that the current stock returns are affected from the previous stock returns beyond other explanatory variables. From the diagnostic test, it is determined that the data suffers from serial correlation problem and heteroscedasticity exists. Return on stock is largely driven by past performance. A unit root test for panel data is conducted and found that the lagged value of the dependent variables with lag order 2 needs to be taken in order to remove the autocorrelation. Linear dynamic panel-data models

include lags of the dependent variable as covariates and contain unobserved panel-level effects, fixed or random. By construction, the unobserved panel-level effects are correlated with the lagged dependent variables, making standard estimators inconsistent. In such a case, more reasonable and preferred results are shown to be achieved by using a system GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998) which exploits an assumption about the initial conditions to obtain additional moment conditions that remain informative even for highly persistent series and thus have a considerable advantages over simple cross-section regressions or other estimation methods for dynamic panel data according to a growing consensus in the contemporary literature. Consider the Dynamic panel-data model:

$$y_{it} = \sum_{j=1}^p a_j y_{i,t-j} + \beta_1 x_{it} + \beta_2 w_{it} + v_i + \epsilon_{it}, i = \{1, \dots, N\}; t = \{1, \dots, T_i\} \quad (1)$$

Where,

*the  $a_1, \dots, a_p$  are parameters to be estimated*

*$x_{it}$  is a  $1 \times k_1$  vector of strictly exogenous covariates,*

*$\beta_1$  is a  $k_1 \times 1$  vector of parameters to be estimated,*

*$w_{it}$  is a  $1 \times k_2$  vector of predetermined covariates,*

*$\beta_2$  is a  $k_2 \times 1$  vector of parameters to be estimated,*

*$v_i$  are the panel – level effects (which may be correlated with  $x_{it}$  or  $w_{it}$ ), and*

*and  $\epsilon_{it}$  are i. i. d. with variance  $\sigma_\epsilon^2$ .*

The estimators use both the levels and a transform of the variables in the above equation as instruments and the transformation may be either the first difference or the forward-orthogonal deviations (FOD) transform. The usual and reasonable test for two-step system GMM is the Hansen (1982) J-test which basically tests for the joint validity of the instruments used and the structural specification of the model. In addition, no second order serial correlation (AR(2)) in the first difference of the disturbance term should be observed (Arellano and Bond, 1991) which checks the key identifying assumption that the level of the disturbances term are serially uncorrelated needed for some lagged instruments to be valid and GMM estimates to be consistent.

### 3.1 Variables Definition

#### 3.1.1 Dependent Variables

We prefer to rely on stock return and P/E Ratio rather than price only to check the impact of payout on share price isolating the impact of earning.

#### 3.1.2 Independent Variables

Two types of dividends (cash and share) per share are used as a proxy for dividends, namely cash dividend and stock dividend. For cash dividend, we have used dividend payout ratio as proxy. Companies are reluctant to cut dividends, since it can drive the stock price down and reflect poor management performances. If a company's payout ratio is over 100%, it is returning more money to shareholders than it is earning and will probably be forced to lower the dividend or stop paying it altogether. A company can weather a bad year without suspending payouts, and it is often in their interest to do so. It is therefore important to



consider future earnings expectations and calculate a forward-looking payout ratio to contextualize the backward looking one. Total asset and net asset value of firms are used as proxies of the size of a company. Age of company is used as control variable. Square term of age variable is also used to check any non-linear relationship. Institutional shareholding, public shareholding and government shareholding have been included to examine the relationship between shareholding pattern and price volatility and industry dummy is also used to isolate the effect of sector specific effects. It is inferred that the study variables may not be normally distributed, so taking log transformation might be helpful to encounter the normality assumption of the model. Stock dividend, dividend payout ratio, directors, public holding variables contain zero values, so the dependent variable stock return and total asset, NAV variables are transformed by taking the log. Certain macroeconomic developments and fluctuations, changes in local and overseas government policies and other similar changes may affect financial flexibility of firms and hence may affect earnings and dividend declaration and controlling for some of these variables could have made the results more robust. However, we have used sector and year dummies in our final models to control for these.

### 3.2 Hypotheses

The null hypothesis for this paper is:

**H<sub>10</sub>** = There is no significant statistical relationship between Payout and Stock Return or Price Earnings ratio (proxy of market value) of the sample companies in the Chittagong Stock Exchange.

## 4. Data and Sample Selection

The data was collected in several stages. The first stage was to select the sample of companies for the study. During the selected sample time frame of twelve years from January 2003 to December 2015, 208 listed companies were initially found in the CSE at the start of our study initially, all the listed companies in CSE were taken for the study. Then 198 sample listed companies from various sectors were selected using the Selective Index Method.

The next phase was to collect data related to the selected sample companies. Data pertaining to Price Earnings Ratio, Cash and Stock dividends percentage were obtained from the Chittagong Stock Exchange, while the data related to the various variables of the study, i.e. Age of company; Total Asset, Net Asset Value per Share, and Shareholding Pattern were obtained from the company annual reports and websites. Data was collected for all the 198 companies from 16 sectors, namely mutual fund, bank, engineering, IT, Textile, Tannery, Insurance, Paper, Telecom, Ceramics, Food, Fuel & Power, Finance, Pharma & Chemical, Cement, Service etc. Most sample firms start their financial years on January 1 and end either in December 31 or June 30. Data was collected for each company according to its own financial year, and then placed into calendar years that would correspond to most to the firm's own financial years. Table 1 gives summary statistics of all the variables that we have used in different models of our estimations followed by year wise and sector wise analysis of our proxies of market value.

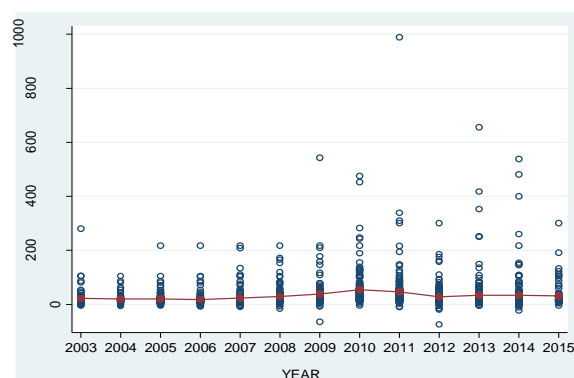
Table 1: Summary statistics of the regression variables

Variable	Obs	Mean	Std. dev.	Min	Max
Log(stock return)	1735	4.7	0.5	1.9	6.8
Log(P/E)	1692	3.1	0.8	-3.5	6.9
Log(NAV)	1704	3.3	0.9	.03	7.4
Stock dividend	1727	9.9	18.6	0	394.7
Cash dividend	1727	0.3	0.97	-16.6	20.8
Age	1736	21.2	12.3	1	66
Log(total assets)	1715	5.7	2.0	0.8	11.1
Public	1673	35.9	18.1	0	99
Director	1673	41.8	19.9	0	96.3

Fig 1(a) explores the trend in Price Earnings Ratio (P/E) of 198 companies from different sectors of Chittagong Stock Exchange (CSE) from 2003 to 2015. The P/E was stable from 2003 to 2007 and started to increase from 2008, which reached a peak value in 2010. Then the P/E started declining in 2011, although it started increasing slightly after 2012. Fig 1(b) explores the pattern of Price Earning (P/E) Ratio of different sectors in the CSE. The analysis has found that Engineering, Ceramics, Paper, Food and Fuel & Power sectors have high values compared to other sectors and contains outliers. Ratios of Bank, Mutual Fund, Textile and Insurance sectors appear to be steady during this period.

Figure 1: (a) shows trends in Price Earning (P/E) Ratio during 2003 to 2015 and (b) shows trends of Price Earning (P/E) Ratio by different sectors

a)



b)

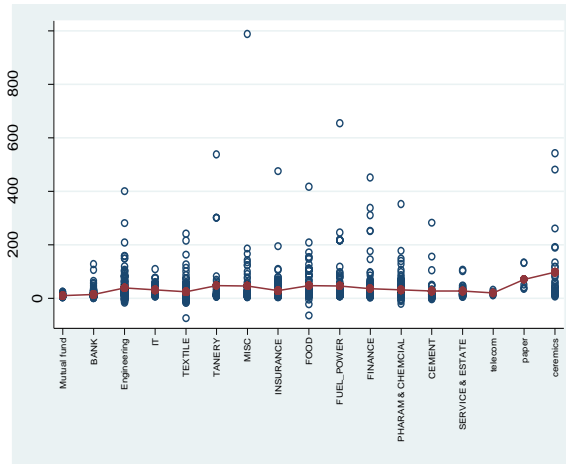
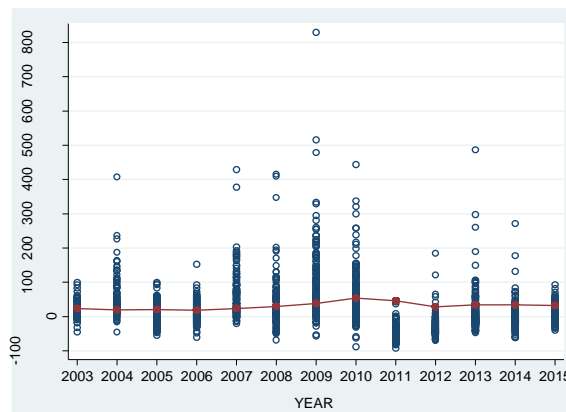


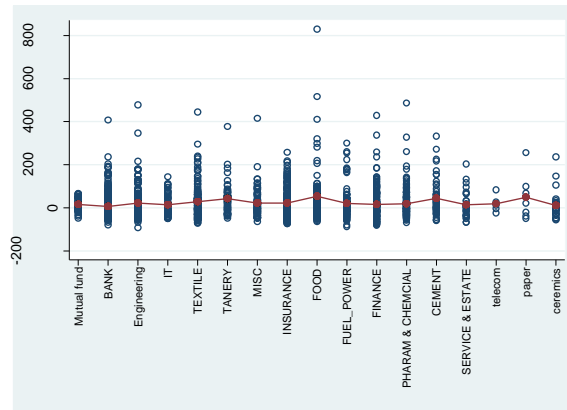
Fig 2(a) below demonstrates the pattern of stock return of selected shares of CSE. In 2004 and 2007 average stock return was around 70% and touched peak value in 2009. After high returns for consecutive two years in 2009 and 2010, it started to fall from 2011 and 2012. For 2013 to 2015 the stock return remained steady. Fig 2(b) illustrates the pattern of stock return of different sectors of the CSE during the study period. It is determined that Paper, Cement, Food and Tannery sectors have high returns compared to other sectors. Shares of Banks provided lowest returns during period of observation.

**Figure 2: (a) shows trends of Stock Return (%) during 2003 to 2015 and (b) shows trends of Stock Return (%) by different sectors**

a)



b)



#### 4.1 Checking Collinearity

Pearson’s Correlation Coefficient is a statistical measure of the strength of a linear relationship between paired data. Pearson coefficients are represented the same way as a correlation coefficient that is used in linear regression, ranging from -1 to +1. From Table 2, it is observed that there is no strong evidence of multicollinearity among the variables. The Correlation Coefficient between Net Asset Value (NAV) and Age of the Company are significantly positively related with a correlation coefficient of 0.186. Correlation between stock dividend and DPR is negative -0.15 and with total asset is positive 0.14. It is observed that a positive correlation exists between DPR and directors’ holdings with a value of 0.10. On the other hand, Institutional Holding and Age of the Company is positively related. All of the correlation coefficients are below 0.20.

**Table 2: Pearson Matrix for Correlation Coefficient**

	EPS	NAV	STOCK	DPR	Director	Public	Age	Total Asset
EPS	1							
NAV	0.37*	1						
Stock dividend	0.13*	-0.02	1					
Cash dividend	0.02	0.01	-0.15*	1				
Director	0.07*	0.02	-0.06*	0.10*	1			
Public	-0.24*	-0.06*	-0.01	-0.04	-0.46	1		
Age	0.35*	0.19*	-0.02	0.03	-0.06*	-0.12	1	
Total asset	-0.01	-0.05*	0.13*	-0.05	-0.13	-0.02	0.02	1

**Note:** \* significant at the level of 5%.

To explore correlation structure further, VIF will be used to verify the collinearity assumption later (see table 3). There are four critical assumptions for the regression model: collinearity, normality, homoscedasticity and linearity (Gujarati, 2003). One of the most important problems facing the use of multiple regression analysis is the probability of collinearity between independent variables, so that they cannot be fully independent (Berenson et al., 2012). One of the methods used to test collinearity between independent variables is

Variance Inflation Factor (VIF) for each independent variable which quantifies the severity of multicollinearity in an ordinary least squares regression analysis. It provides an index that measures how much the variance (the square of the estimate's standard deviation) of an estimated regression coefficient is increased because of collinearity.

**Table 3: Variance Inflation Factor (VIF)**

Variable	VIF	Tolerance=1/VIF
Public	2.0	0.5
Director	2.0	0.5
AGE	1.1	0.9
Stock dividend	1.1	0.9
NAV	1.1	1.0
Total Asset	1.0	1.0
Cash dividend	1.0	1.0
<b>Mean</b>	<b>1.32</b>	

In general, when significant multicollinearity issues exists, the variance inflation factor will be greater than 5 for the variables involved, but this is not the case observed here. VIF for public holding and director holding is 2 and mean VIF for the model is around 1.32. It is vital to note that VIF is below 5 for every independent variable, meaning that the predictor variables are not inflated. It also implies that the variance is not large enough to stabilize the variables' collinearity. Hence, it can be concluded that the independent variables are free from the multicollinearity problem.

## **5. Empirical Results**

### **5.1 Stock Return as Proxy for Market Value**

#### **5.1.1 Testing Serial Correlation and Heteroscedasticity**

Serial correlation can be considered as a serious problem causing the standard errors of the coefficients to be smaller than they actually are with a higher R-squared value. A Wooldridge Test for serial correlation in panel-data models is conducted and found that the stock return variable suffers from serial correlation problem.

**H2o:** No first-order autocorrelation

F (1,171) = 81.98

P-Value=0.000

A Modified Wald Test for group-wise heteroscedasticity is also conducted which suggests that across panels there does not exist constant variance, i.e., there exists heteroscedasticity.

**H3o:** No presence of Heteroscedasticity

Chi-square (187) =1.44 e+33

P-Value=0.000

5.1.2 Unit Root Test Panel Data

Panel Unit Root testing emerged from time series unit root testing. The major difference is that the asymptotic behavior of the time-series dimension T and the cross-sectional dimension N need to be taken into consideration. The way in which N and T converge to infinity is critical if the asymptotic behavior of estimators and tests used for non-stationary panels is to be determined. The analysis is unable to conduct unit root test/ stationary test using the Levin-Lin-Chu, Harris-Tzavalis, Breitung, Breitung and Das, Im-Pesaran-Shin Fisher type due to imbalanced panels. The analysis performs Fisher-Type unit-root test of LOG of stock return variable. Where,

**H4o:** All panels contain unit roots

**H4a:** At least one panel is stationary

The test results in table 4 support inclusion of the lagged value of stock return to predict the model better and remove the autocorrelation problem.

**Table 4: Results from Fisher Type Unit Root Test**

		Lag order=3		Lag order=2		Lag order=1	
		Test Statistics	P-Value	Test Statistics	P-Value	Test Statistics	P-Value
Inverse chi-squared(334)	P	582.558	0.000	204.902	1.0	464.4694	0.000
Inverse normal	Z	-6.6516	0.000	4.2934	1.0	-6.6909	0.000
Inverse logit t(549)	L*	-11.6252	0.000	2.8945	0.998	-7.481	0.000
Modified inv. chi-squared	Pm	12.9161	0.000	-4.995	1.0	4.4148	0.000

It is observed from Table 5 that in all regression models, the lagged dependent variable i.e. the lagged stock return is found to be negative and statistically significant. This indicates that the lagged stock return of a company has negative contribution to current levels of return. Stock dividend and cash dividend are found to play important role which are positively and significantly associated with stock return and therefore reject the null hypothesis H1o of dividend irrelevance. Age of the Company has quadratic effect on stock return which becomes positive after a certain period, though insignificant. Public Share-Holding has negative impact on stock return. The study has considered NAV, Stock Dividend, DPR, and Total Asset as endogenous variables. Only selected numbers of lagged differenced variables and lagged level variables have been used as instruments for the level equation and differenced equations respectively in the system GMM estimation. On the other hand, time and industry dummy along with age are used as normal instrument variables. Time and Sectors play a significant role in explaining the variation in stock returns and an overall positive trend is found between 2005 to 2010 and particularly from 2009 to 2010 relative to 2014 and afterwards a negative trend is observed. On the other hand, in comparison to the bank sector, other sectors provided significant returns to the investors.

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These instruments are found to be jointly valid by the p-value of the estimated Hansen-J statistics. The Arellano-Bond AR(2) tests also do not provide any evidence for the presence of second-order serial correlation in first difference of the residuals which indicate that the instruments that we use in our estimations are appropriate.

**Table 5: Results from Dynamic Panel Regression Model (stock return)**

Log(stock return) <sub>it</sub>	M1	M2	M3
Log(stock return) <sub>it-1</sub>	-0.081 (0.078)	-0.024 (0.054)	-0.037 (0.054)
Log(stock return) <sub>it-2</sub>	-0.044 (0.043)	-0.053 (0.039)	-0.060 (0.038)
Stock dividend <sub>it</sub>	0.003** (0.001)	0.003** (0.002)	0.004** (0.002)
Cash dividend <sub>it</sub>	0.025** (0.010)	0.023** (0.010)	0.023** (0.010)
Log(NAV) <sub>it</sub>		0.013 (0.041)	0.021 (0.052)
Age <sub>it</sub>		0.007 (0.015)	0.006 (0.016)
Age <sup>2</sup> <sub>it</sub>		-0.000 (0.000)	-0.000 (0.000)
Log(total assets) <sub>it</sub>		-0.045*** (0.014)	-0.088** (0.037)
Public <sub>it</sub>			-0.008*** (0.003)
Director <sub>it</sub>			-0.002 (0.003)
Constant	4.982*** (0.491)	5.004*** (0.503)	5.907*** (0.596)
AR(2) p-value	.127	.633	.430
Hansen p-value	.050	.121	.136
No of instruments	129	140	139
No of firms	184	180	174
No of observations	1334	1296	1245

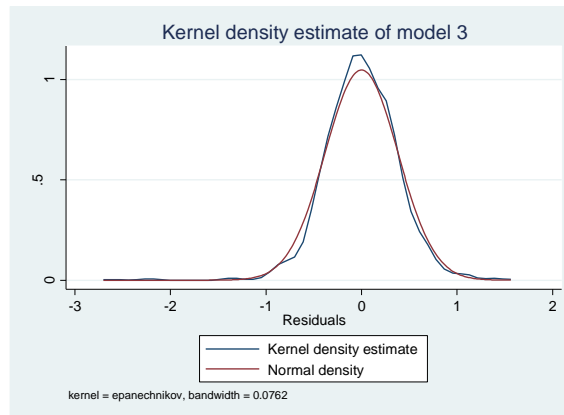
**Notes:** The model has been estimated with year and sector dummies. Standard errors in parentheses; \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10%, level respectively.

### 5.1.3 Goodness of Fit

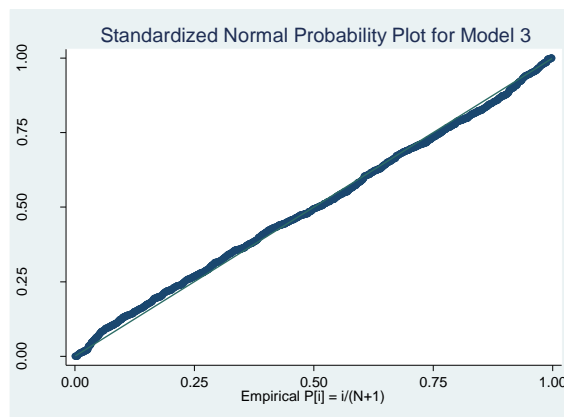
From the kernel density and standardized normal probability plot of the final model 3 in Fig 3, it is found that distribution of error terms are close to normal after log transformation of the stock return variable.

Figure 3: Kernel Density Estimation and Standardized Normal Probability Plot for model 3

a)



b)



## 5.2 Price Earnings Ratio (PE) as Proxy for Market Value

### 5.2.1 Testing Serial Correlation and Heteroscedasticity

Wooldridge Test is conducted to test for serial correlation in the panel data and it is found that the data suffers from the serial correlation problem.

**H5o:** No first-order autocorrelation

$F(1,171) = 72.5$

P-Value = 0.000

Modified Wald Test is also conducted for group-wise heteroscedasticity and the result suggests that constant variance does not exist across panels. So heteroscedasticity exists. Although, with unbalanced panel and large number of firms this is expected.

**H6o:** No presence of Heteroscedasticity

Chi-square (187) =  $9.7e+32$

P-Value = 0.000



5.2.2 Unit Root Test Panel Data

To ascertain whether the Price Earnings Ratio depends on its past value, Unit Root test is conducted for Price Earning Data. The results in table 6 suggest that the Price Earnings Ratio is auto correlated with its past value up to lag order 2.

Table 6: Result from Fisher Type Unit Root Test

		Lag order=3		Lag order=2		Lag order=1	
		Test Statistic	P-Value	Test Statistic	P-Value	Test Statistic	P-Value
Inverse squared(334)	chi-P	454.05	0.000	350.81	0.184	683.19	0.000
Inverse normal	Z	-2.33	0.000	2.20	0.986	-4.34	0.000
Inverse logit t(549)	L*	-6.70	0.000	-0.57	0.283	-9.99	0.000
Modified inv. chi-squared	Pm	7.69	0.000	0.890	0.186	13.16	0.000

The result of the dynamic Regression Model in table 7 has determined that PE is influenced by its past values up to one lag. Stock and cash dividend have significant positive impact on the Price Earnings Ratio similar to the stock return model rejecting the null hypothesis, whereas Total Asset has a negative impact on the Price Earnings Ratio. The study considered NAV, Stock Dividend, DPR, and Total Asset as endogenous variables and similar kinds of instruments have been used here as in case of the stock return model. Time and Industry Dummy along with Age are used as instrument variables. Both AR (2) and Hansen J statistics results are in favor of the instruments validity. Price Earnings Ratio of other sectors significantly varies in comparison to the Bank Sector. In comparison to 2014, Price Earnings Ratios are significantly higher in 2009 to 2011 and lower in 2005 to 2006.

**Table 7: Results from Dynamic panel regression model (price earnings ratio)**

Log(P/E) <sub>it</sub>	M4	M5	M6
Log(P/E) <sub>it-1</sub>	0.347*** (0.060)	0.437*** (0.059)	0.420*** (0.056)
Log(P/E) <sub>it-2</sub>	-0.012 (0.047)	-0.011 (0.052)	-0.010 (0.051)
Stock dividend <sub>it</sub>	0.001 (0.003)	0.003*** (0.001)	0.003*** (0.001)
Cash dividend <sub>it</sub>	0.124** (0.049)	0.135*** (0.051)	0.129** (0.053)
Log(NAV) <sub>it</sub>		-0.139** (0.068)	-0.150 (0.092)
Age <sub>it</sub>		0.005 (0.024)	-0.004 (0.026)
Age <sup>2</sup> <sub>it</sub>		-0.000 (0.000)	0.000 (0.000)
Log(total assets) <sub>it</sub>		-0.041 (0.027)	-0.055 (0.054)
Public <sub>it</sub>			0.008 (0.005)
Director <sub>it</sub>			0.009* (0.005)
Constant	1.474*** (0.190)	1.997*** (0.551)	1.666*** (0.644)
AR(2) p-value	.264	.461	.452
Hansen p-value	.196	.524	.609
No of instruments	100	183	182
No of firms	182	179	173
No of observations	1273	1252	1205

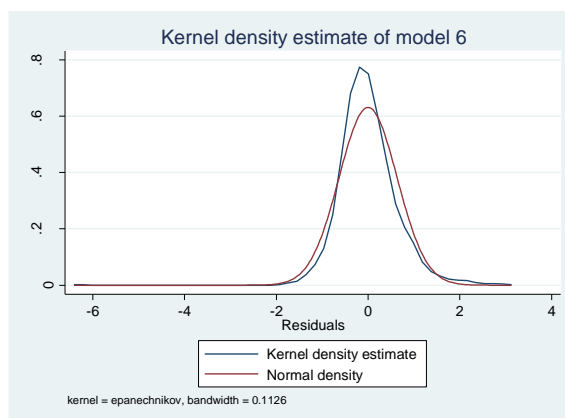
**Notes:** The model has been estimated with year and sector dummies. Standard errors in parentheses; \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10%, level respectively.

### 5.2.3 Goodness of Fit

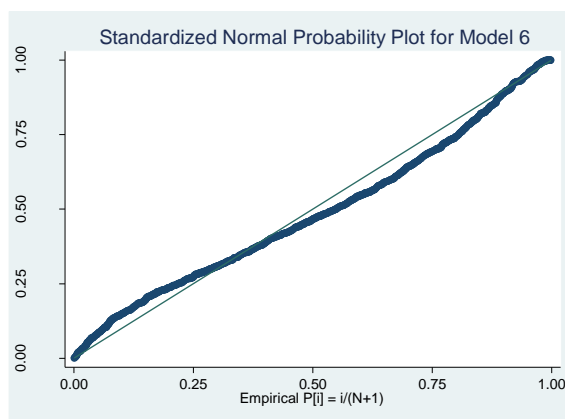
From the Kernel Density and standardized normal probability plot in Fig 4, it is found that distribution of error terms is very close to normal in case of the final model 6 involving P/E ratio.

Figure 4: Kernel Density Estimation and Standardized Normal Probability Plot for model 6

a)



b)



## 6. Conclusions

The capital market of Bangladesh is growing. Even though corporate financing is still bank based, increasing adoption of corporate culture and a stable middle class will change the scenario in coming decades. This paper discusses the impact of dividend policy on the market value of a company in the context of Bangladesh. The impact on the Stock return and P/E in general, and across the selected economic sectors, is measured by using the dynamic panel model for thirteen years from 2003 to 2015 to assess the differences in impact across the 17 sectors of the companies. This study significantly contributes in dividend policy decisions by elaborating the dynamic roll of payout on market value in the context of the Chittagong Stock Market which has not been previously undertaken and therefore, attempts to show new insights for policy makers to improve the performance of Chittagong stock exchange to be specific. The dynamic model controlling for endogeneity and heterogeneity in a developing country setting with a reasonably large panel data is to us the major contribution of this study to the contemporary literature. The analysis finds that cash and stock dividend, both have positive impact on market value. The study first discusses the Irrelevant Theory proposed by Miller and Modigliani (1961), which refers to the absence of a relationship between dividend policy and market value. In this context, the researcher believes that the reason why the results of the study are in disagreement with

the theory is mainly due to two important points. Firstly, the assumptions of the theory regarding the conditions for an efficient market are almost impossible to achieve in practice. Secondly, it is uncertain that the Bangladeshi market is 100% efficient; also the differences in the nature of the corporate activity means the companies have different working conditions not related to the presence of efficient financial markets. The impact of these conditions on the dividend policy will influence the market value of the company as well. In all models of the study it is observed that payout has a statistically significant positive correlation with Price Earnings Ratio as well as Stock Return. Since the Chittagong market is still in the developing stages, age and size of the companies are the biggest concerns for the shareholders. The Shareholding Pattern has an insignificant relation with Price Earnings Ratio even though it has got insignificant relation with Stock Return. It proves lack of awareness of the shareholders towards price movements. This profit driven motive has an impact on the value of the firm. Consequently this influences the management decisions along with the market value. Therefore, to adopt dividend policy that might maximize the shareholder's wealth, management should forecast the value maximizing current dividend policy and implement the same. From the point of view of investors they should understand the dividend policy and its impact on share price to make the investment portfolio safe and sound. In future, this study may be extended in a cross country setting including companies listed in all South Asian stock exchanges to see how the level of financial development and economic liberalization may affect their payout mechanisms.

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