

Panel Data Study of Dividend Policy Effect on Firms' Value: Study on Manufacturing Sector of Bangladesh

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Abstract

The impact of dividend on market price of share is a controversial issue. To solve this issue in our market perspective, this study is done whether there is impact of DPR on PE or not. The panel data analysis (FE and RE model) is used to find out the impact of dividend on market price. The study is conducted on manufacturing sector and is found that the DPR has impact on PE. There is other co factors (age of the firm), which also have impact on PE. So, the findings support the relevance theory of dividend on shareholders' wealth. This finding will help the dividend decision makers and investors for taking corrective dividend decision.

Keywords: Dividend, Market price, Panel Data Analysis, EPS, PE, DPR.

Introduction

The dividend policy has significant importance in the financial decisions of the corporation. It is a guideline for financial managers, how to pay dividend to the shareholders. Net earnings are divided into two parts. One is retained earnings and the other is dividends. The retained earnings of the business may be reinvested and used for growth of the business. The dividend is distributed to the shareholders in order to meet their expectation of being made better off financially. So, the problem is to take decision that how much earnings should be given in the form of dividend payout and how much earnings should be kept as retained earnings.

In the modern and complex environment, globalization and privatization have brought deep competition in every field of activity. It is very difficult for the companies to compete in the markets of stunning nature. To cope with this competitiveness and to add value to the companies; today, the finance managers have to make critical financial decisions. The primary objective of any organization is to maximize

the wealth of shareholders. Financial manager's aim is to take a decision in such a way that shareholders receive a high contribution of dividend, which leads to increase in the price of share. Dividend policy plays a vital role for a company in financial markets and it directly affects the stock price of the company. If a company pays handsome return to its shareholders it will attract new investors to invest their money in the company and vice versa. The dividend policy causes to increase the wealth of shareholders, finance manager makes different financial decisions and dividend policy decision is one of them (Baker & Powell, 1999). Dividend decision has great impact on firm financial decision and stock price. The stock price increases when there is smooth payment of dividend exist. Investors do not prefer to purchase the shares of such type of companies, which cannot make payment regularly and of which the dividend decisions have variability because of the risk of loss associated with these variations. Simians (1995) argued that shareholders' wealth is largely influenced by the organization's dividend policy.

The dividend decisions can donate to the value of firm or not which is a controversial issue. There are mainly two schools of thoughts available in the field of finance that presented two different opinions about the

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dividend policy. One school of thought followed the opinion of Miller and Modigliani (1961) and considered dividend policy irrelevant while the second school of thought followed the point of view of Gordon (1963) and considered dividend policy relevant. Since the half century passed, the question still remains i.e. whether dividend policy is relevant or not. The impact of dividend on share price is a vital issue. If there is impact of dividend, the company should aware for dividend payment. For this reason, this study has been undertaken to analyse the relationship between dividend and market value of shares and to identify the degree of influence of dividend on market value of firm.

Prior Theoretical and Empirical Evidences

Prior Theoretical and Empirical Evidences of Foreign Context

Dividend policy is one of the most discussed topics and an essential theory of corporate finance which still has its significance. Many researchers presented numerous theories and pragmatic evidences, however, the problem is quiet unsettled and open for further debate. It is among the top ten unsettled issues in economic literature that does not have satisfactory clarification for the observed dividend behavior of the firms (Allen and Michaely, 2003; Black, 1976). Discussion of dividend policy cannot be completed without including the work of Linter (1956). Linter (1956) raised the question, which is still important, “what choices made by managers do affect the size, shape and timing of dividend payments?” After the contribution of Linter (1956), Miller & Modigliani (1961) introduced the concept of Dividend Irrelevance theory in which they explained that dividend policy does not affect the stock prices. Many researchers like Chen, Firth, & Gao (2002), Uddin & Chowdhury (2005), Denis & sobov (2008) and Adesola & Okwong (2009) provided the strong evidence in the favor of dividend irrelevance theory and did not consider its relevance to the stock prices. Gordon (1963) gave another view about the dividend policy by presenting the concept of dividend relevance theory. He said that the dividend policy affects the value of firm and market price of shares. Investors always prefer secure and current income in the form of dividends

over capital gains. Studies conducted by Travlos, Trigeorgis, & Vafeas (2001), Baker, Powell & Veit (2002), Myers & Frank (2004), Dong, Robinson & Veld (2005) and Maditinos, Sevic, Theriou, & Tsinani (2007) support dividend relevance theory. Black & Scholes (1974) found no relationship between dividend policy and stock prices. Their results further explain that dividend policy does not affect the stock prices and it depends on investors’ decision to keep either high or low yielding securities.

Barclay and Smith (1995) found that high growth companies have lower dividend payouts and debt ratios than the low growth companies, which have higher dividend payouts and debt ratios. So, investors prefer higher dividend payouts and consider it less risky than capital gain. Allen & Rachim (1996) found no relationship between the dividend yield and stock market price even after studying Australian listed stocks but, it shows positive relation between stock prices and size, earnings and leverage and negative relation stock prices and payout ratio. While, Baskin (1989) examined 2344 U.S common stocks from the period of 1967 to 1986 and found a significant negative relationship between dividend yield and stock price. Another study, conducted by Ho (2002) relevant to the dividend policy in which he used the panel data approach and fixed effect regression model. Results of his study showed the positive relation between dividend policy and size of Australian firm and liquidity of Japanese firms. He found the negative relation between dividend policy and risk in case of only Japanese firms. The overall industrial effect of Australia and Japan is found to be significant. Baker, Powell & Veit (2002) provided new evidence of managers’ decision about dividend policy. They conducted a survey of managers of NASDAQ firms that were consistently paying cash dividends. Their survey result shows that managers are mostly aware of historical pattern of dividends and earnings. So, they design their dividend policies after considering it.

Pradhan (2003) also explained the effect of dividend payment and retained earnings on stock market price of the Nepalese companies. Results of his study show that dividend payment has strong relation with stock price; while, retained earning has very weak relation with stock market price. His results further explain that

Nepalese stockholders give more importance to dividend income than capital gains. Nishat & Irfan (2003) studied 160 companies listed at Karachi Stock Exchange for the period of 1981-2000. Their results were based on cross sectional regression analysis and showed that dividend yield and payout ratio is positively related to the share price volatility. Adefila, Oladipo & Adeoti (2004) studied the factors affecting the dividend policy of Nigerian firms. Results of their study show that Nigerian firms prefer regular dividend payouts that can be in accordance with the expectations of their shareholders. Their results also conclude that there is no relation between dividend payments, net earnings and stock prices. Nigerian firms pay dividends to their shareholders regardless of their level of profits for satisfaction of their shareholders. Myers & Frank (2004) conducted a study by using the data of 483 firms from Miltex Investor Database and concluded that there is a positive relationship between the price earnings ratio and dividend payout ratio. Their results further show that there is a significant positive relation between debt to equity ratio and dividend payout.

Hussainey, Mgbame, & Chijoke-Mgbame (2011) studied the impact of dividend policy on stock prices. The results of their study show the positive relation between dividend yield and stock price changes and negative relation between dividend payout ratio and stock price changes.

The academicians also engaged in finding out the facts and issues relating to dividend policy and they made different theories on this topic. According to Hayn (1995), dividend payments reduce the earning of any corporation if there are low earnings are realized, it makes the decision uneven, which enables managers to take strong decision for dividend and earning in future. Whereas, DeAngeb et al. (1992) & Charitou (2000) described the change in dividend policy make the managers informative about the cost of dividend payment. Spencer (1973) argued that dividends payout increases the investors' confidence in the company. Thus, the company can make future decisions of dividends payout on the basis of the past dividends policies. The study conducted by Farley and Baker (1989) suggests that dividends policy has a significant impact on stock prices. Dividend payout ratio is based on current and last year earnings, the changes in year wise earning and increasing rate of earnings. The past

year dividend payments have great influence on current policy (Pruitt and Gitman 1991).

Prior Theoretical and Empirical Evidences of Bangladeshi Context

Studies related to dividends impact on share price in the context of Bangladesh are mentioned below.

Uddin (2009) analyzed to identify what determines the share prices and there is a significant linear relationship between market price of stock and net asset value per share; dividend percentage; earning per share.

Ali (2011) examined the long-run equilibrium relationship and the direction of causality between stocks. He found that the DSI, in anyway, do not granger cause dividend yield; but DSI has bi-directional causal relation with market price earnings multiples and the first lag of the monthly average trading volume. On the other hand, unidirectional causality is found from DSI to the first lag of monthly average market capitalization but no causality is found from the opposite direction.

Kabir, Bhuiyan and Chowdhury (2013) attempted to identify the economic and psychological factors that impact the market price of shares of the listed pharmaceutical companies in Dhaka Stock Exchange (DSE). They found that the percentage of shares held by public, and bad news about a particular company negatively influence the market prices of shares of that particular company.

Masum (2014) analyzed to find the relation between the shares market price and the dividend policy of the banks. He found that the Model shows significant negative relation between dividend yield and stock price while, retention ratio has a negative but statistically insignificant relationship with stock market prices. He further showed that return on equity and earnings per share have statistically significant positive impact on stock price and profit after tax has a significant negative impact on stock market prices of the commercial banks of Bangladesh.

So, it is observed that the dividends policy implications on shareholders wealth carry diverse arguments from the previous researchers. One school of thought hold the notion that dividend policy does help maximizing

the shareholders' wealth, however, the other argues that there is no such impact that can be arguably supported. Very few papers are found in the context of Bangladesh, which motivates me to study the impact of dividend on share prices and to justify the relevance of dividend in financial decision making.

Research Design

Sample

The study is based on secondary data obtained from published annual reports of sample firms, monthly review of Dhaka stock exchange and website of DSE. It has taken 86 companies from manufacturing sectors as sample. The study period is 20 years from 1994 to 2013 for study.

From the population (117), it is taken 86 companies as sample through sample size determination techniques.

$$n = \frac{N}{1 + N(e)^2} \quad n = \text{Sample size, } N = \text{Population size, } e = \text{level of precision}$$

Hypothesis

H_0 : There is no association between wealth of shareholders and dividend policy.

Variables Used in Study

Dependent Variable: PE ratio

Independent Variables: Independent variables are Dividend payout ratio (DPR), Capital structure, Investment opportunity, liquidity, ownership (institution), age of the firm, size of the firm.

Model and Methods

The studies conducted by Miller and Modigliani (1961), Friend and Puckett's (1964) and Chawla and Srinivasan (1987) have influenced this paper. This theoretical statement could be framed as:

$$PE_{it} = \alpha + \beta_1 DPR_{it} + \beta_2 AGE_{it} + \beta_3 LIQ_{it} + \beta_4 SIZE_{it} + \beta_5 OWN(INSTITUTION)_{it} + \beta_6 INVESTOPP_{it} + \beta_7 CAPITAL STRUCTURE_{it} + u_{it}$$

Where,

Dependent Variable

PE ratio=Market price per share/Earnings per share

Independent Variables:

DPR (Dividend Payout Ratio) = Cash dividend per share/Earning per share*100

Firm age (AGE): Natural log of No. of years of listing on the stock exchange

LIQ (Liquidity) = Quick ratio ((Current Asset-Inventories)/Current liability)

SIZE (Size) = Log of Total Assets

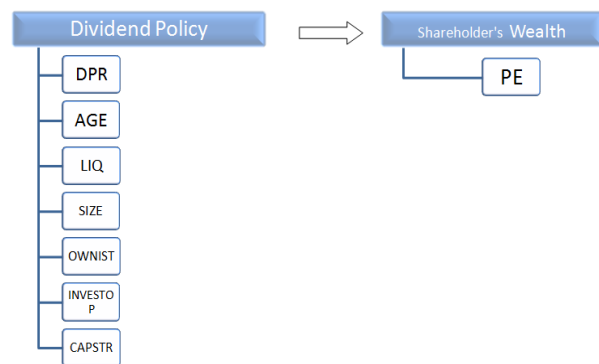
OWNIST (Institutional ownership) = No. of Share held by institution/total no. of share

INVESTOPP (Investment Opportunity)= (Net fixed asset_t-net fixed asset_{t-1})/ net fixed asset_{t-1} *100

CAPITAL STRUCTURE: Total liabilities/ Equity

Methods: In this study, the panel data approach is used to analyze the impacts of dividend policies on shareholder's wealth. Descriptive statistics and panel regression analysis (Fixed effect and random effect) are used to analyze the results.

Conceptual Framework



Panel Data Analysis: Manufacturing Sector

A panel data regression differs from a regular time-series or cross-section regression in that it has a double subscript on its variables:

$$y_{it} = a + X'_{it} b + u_{it} \quad (i = 1, \dots, N; t = 1, \dots, T)$$

The i subscript denotes the cross-section dimension and t denotes the time-series dimension. Most of the panel data application utilizes a one-way error component model for the disturbances, with: $u_{it} = \alpha_i + \epsilon_{it}$.

There are several different linear models for panel data. The fundamental distinction is that between fixed-

effects and random-effects models. In the fixed-effects (FE) model, the α_i is permitted to be correlated with the regressors x_{it} , while continuing to assume that x_{it} is uncorrelated with the idiosyncratic error ε_{it} . In the random-effects (RE) model, it is assumed that α_i is purely random; a stronger assumption implying that α_i is uncorrelated with the regressors.

Descriptive Statistics

The descriptive statistics is shown in table-1 which represents the mean, standard deviation, minimum, and maximum of variables.

Table 1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
DPR	1292	50.91884	80.35464	-485.4369	985.9155
Investoppo~y	1133	15.25584	69.10146	-91.77528	988.6974
Capitalstr~e	1191	1.217675	10.78562	-160	115.6156
Liquidity	1200	1.943313	3.180107	.0018081	45.78755
Owninstitu~n	1256	15.83767	14.40954	-2	71.57
PE	1107	32.41737	57.89823	-119.64	881.73
Ageoffirm	1298	2.383588	.8109209	0	3.637586
Size	1202	6.556505	1.594046	2.288354	11.59599

Serial Correlation

Because serial correlation in linear panel-data models biases the standard errors and causes the results to be less efficient, researchers need to identify serial correlation in the idiosyncratic error term in a panel-data model. While, a number of tests for serial correlation in panel-data models have been proposed, a new test discussed by Wooldridge (2002) is very attractive because it requires relatively few assumptions and is easy to implement. Wooldridge's method uses the residuals from a regression in first-differences. Note that first differencing the data removes the individual-level effect, the term based on the time-invariant covariates and the constant.

Table 2: Wooldrige test

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(4, 865) = 2.485
Prob> F = 0.710

Null hypothesis has been accepted that there are no first order autocorrelations in the model (From the table 2).

Heteroscedasticity

The standard error component assumes that the regression disturbances are homoscedastic with the same variance across time and individuals. This may be a restrictive assumption for panels. When heteroscedasticity is present the standard errors of the estimates will be biased and I should compute robust standard errors correcting for the possible presence of heteroscedasticity.

The fixed-effects regression model estimated by *xtreg*, *fe* invokes the OLS estimator under the classical assumptions that the error process is independently and identically distributed. Also, the command *xtreg*, *fe* estimates this model assuming homoscedasticity. The most likely deviation from homoscedastic errors in the context of pooled cross-section time-series data (or panel data) is likely to be error variances specific to the cross sectional unit.

In the linear regression, the error term is assumed to be homoscedastic constant across observations. Violation of this assumption is pernicious. Estimates of standard errors for the regression coefficients are biased and the direction of the bias is not known a priori may inflate or deflate t-tests. So, the homoscedasticity assumption means that the variance of the error terms is constant for each observation. The Breusch-Pagan/ Cook-Weisberg test is used to test heteroscedasticity in this study as shown in table -3 by using STATA. A large chi-square would indicate that the heteroscedasticity is present.

Table 3: Breusch-Pagan/Cook-Weisberg test for heteroscedasticity

Breusch-Pagan/Cook-Weisberg test for heteroscedasticity
Ho: Constant variance
Variables: fitted values of PE
chi2(1) = 0.26
Prob>chi2 = 0.651

From the table 3, it is observed that the chi-square value is small, indicating heteroscedasticity is probably not a problem. Here, the chi-square value is 0.26 (p=.651) and indicates the insignificance which indicates that the errors have a constant variance (the data does not suffer from heteroscedasticity).

Multi Collinearity

The panel data analysis drops the variables which have collinearity. Besides this, collinearity problem of variables with multiple regression analysis with SPSS has been verified. The Tolerance is simply the reciprocal of VIF (Variance Inflation Factor) and is computed as: $Tolerance = 1/VIF$. The large values of VIF are unwanted and undesirable. The larger values of tolerance are indicating of lesser problem with collinearity. The theoretical maximum value of tolerance is 1.00 and minimum value of tolerance is zero. It is observed that the tolerance of the variables DPR, SIZE, AGE, INVT.OPP, LIQ, CAPST, OWNINST are 0.82, 0.81, 0.72, 0.80, 0.54, 0.61, 0.59, respectively, which are highly positive and near to 1. So, it is concluded that the variables are free from multi-collinearity.

The Hausman Test

The Hausman principle can be applied to all hypothesis testing problems, in which two different estimators are available, the first of which b^* is efficient under the null hypothesis, however inconsistent under the alternative, while the other estimator b^- is consistent under both hypotheses, possibly without attaining efficiency under any hypothesis. Hausman had the intuitive idea to construct a test statistic based on $q = b^* - b^-$. Because of the consistency of both estimators under the null, this difference will converge to zero, while it fails to converge under the alternative. Hausman suggested the statistic $m = q'(var q)^{-1} q$, where $var q = var b^- - var b^*$ follows from the known properties of both estimators under the null hypothesis and from un-correlatedness. The statistic m is distributed as χ^2 under the null hypothesis, with degrees of freedom corresponding to the dimension of b .

In the concrete case of panel models, It is known that the FE estimator is consistent in the RE model as well as in the FE model. In the FE model, it is even efficient and in the RE model, it has good asymptotic properties. By contrast, the RE–GLS estimator cannot be used in the FE model, while it is efficient by construction in the RE model. The inconsistency of the RE estimator in the FE model follows from the fact that, as $T \rightarrow \infty$, the individual fixed effects α_i are

not estimated but are viewed as realizations of random variables with mean zero. The violation of the assumption $E\alpha = 0$ for the regression model leads to an inconsistency. In Stata, the Hausman test statistic can be properly computed based upon the contrast between the RE estimator and fixed effects (FE).

Table 4: Hausman test

	---- Coefficients ----			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
DPR	.1113619	.1173229	-.0059611	.0086804
Investoppo~y	.0228262	.0221168	.0007094	.0055006
Capitalstr~e	.2020514	.1904061	.0116453	.0578876
Liquidity	.5178672	1.129106	-.6112384	.8960415
Owninstitu~n	-.3782005	-.2048128	-.1733877	.1560135
Ageoffirm	20.42063	8.826631	11.594	3.96594
Size	.560498	.8034145	-.2429165	3.432448

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg
 Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 21.49
 Prob>chi2 = 0.0031

The probability is 0.0031 (less than 0.05), so, the null hypothesis has been rejected that individual effects are random and that RE provides consistent estimates. Concluding that author have a fixed-effects model, and continued with the estimation of the model using the within estimator, the most commonly used with this type of models.

Fixed Effect Model (FE)

The FE explores the relationship between predictor and outcome variables within an entity. Each entity has its own individual characteristics that may or may not influence the predictor variables. When using FE it is assumed that something within the individual may impact or bias the predictor or outcome variables and we need to control for this. This is the rationale behind the assumption of the correlation between entity's error term and predictor variables. The FE removes the effect of those time-invariant characteristics from the predictor variables so we can assess the predictors' net effect. Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different therefore the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others.

Table 5: Fixed Effect Model

Fixed-effects (within) regression	Number of obs =	939
Group variable: Company	Number of groups =	86
R-sq: within = 0.765	Obs per group: min =	1
between = 0.266	avg =	11.3
overall = 0.595	max =	20
F(7,849) = 7.27	Prob> F =	0.0000
corr(u_i, Xb) = -0.3787		

PE	Coef. Std. Err. t P> t [95% Conf. Interval]	

DPR	.1113619 .0246447 4.52 0.000 .0629902 .1597335	
Investopportunity	.0228262 .0332137 0.69 0.492 -.0423644 .0880168	
Capitalstructure	.2020514 .1744354 1.16 0.247 -.1403238 .5444266	
Liquidity	.5178672 1.252381 0.41 0.679 -1.940259 2.975994	
Owninginstitution	-.3782005 .2107083 -1.79 0.073 -.7917708 .0353698	
Ageoffirm	20.42063 4.649984 4.39 0.000 11.29381 29.54744	
Size	.560498 3.66059 0.15 0.878 -6.624369 7.745365	
_cons	-25.2651 19.95572 -1.27 0.206 -64.43344 13.90324	

sigma_u	25.883871	
sigma_e	50.574622	
rho	.20756602 (fraction of variance due to u_i)	

Coefficient of Multiple Determinations (R²):

The summary of the model is shown in table 5. The R² shows the amount of variance of PE of explained by DPR, SIZE, AGE, INVT.OPP, LIQ, CAPST, (OWNINST). The value of R² of the model is .765(within) which indicates that the independent variables explain 76.5% of the dependent variable (PE). This represents satisfactory result for interpreting the model.

Significant of the Model: F-Test

The table 5 represents the significance of the model through the F-test. It tests whether R² is different from zero. The F value of model is 7.27(p=0.00) which is statistically significant. It is interpreted that the model significantly improves the ability to predict the outcome variable (dependent variable).The F-statistics of the model is significant at 5 percent level of significant indicating that the model provides significant explanation of variation in the market price of nonfinancial sector.

Significant of the Variables/Model Parameter:

The result of the model parameter is shown in table 5. The coefficient indicates the individual contribution of each predictor to the model. The coefficient values tell about the relationship between PE and each predictor. If the value is positive, it indicates that there is a positive relationship between the predictor and the

outcome whereas a negative co-efficient represents a negative relationship. The coefficient values also tell us to what degree each predictor affects the outcome if the effects of all other predictors are held constant. The beta values have an associated standard errors indicating to what extent these value would vary across different sample and these standard error are used to determine whether or not the beta values differ significantly from zero. In the model, the Coefficient values of DPR, AGE are .1113, 20.42 respectively which are positive in nature. It infers that the DPR, AGE of the firm have positive impact on the PE.

The t test associated with coefficient value is significant then that predictor is making a significant contribution to the model (if the value is less than 0.05). The smaller the value of significance, p value (the larger the value of t) is the greater the contribution of that predictor (independent variable). From the table 5, it is observed that the t value of DPR, AGE are 4.52(p=.000), 4.39(p=.000) respectively which are significant at 5 percent level of significant. The p values of the independent variables DPR, AGE are less than .05 which also indicates the significance of the variables. So, finally it is concluded that among the independent variables-DPR, AGE have positive impact on the PE. This result supports the findings of Grdon (1963), Ho (2002), Gul and others(2012).

Model: $PE_{it} = -25.26 + 0.11DPR_{it} + 20.42AGE_{it} + .517LIQ_{it} + .56SIZE_{it} - .37OWN(INSTITUTION)_{it} + 0.022INVESTOPP_{it} + 0.202CAPITALSTRUCTURE_{it} + u_{it}$

Summary of Findings and Recommendations

The DPR, AGE of the firm have positive impact on the PE. The t value of DPR, AGE are 4.52(p=.000), 4.39(p=.000) respectively which are significant at 5 percent level of significant. The dividend payout ratio is derived from formula of Gordon growth model as one of the direct determinant factors to P/E ratios. When the dividend payout ratio is high, the expected returns investors gained will be correspondingly high, which will further lead investors make a high measure of stock values, the companies' P/E ratios will then rise. Conversely, the P/E ratios will decline. Therefore, it is supposed that there is a positive correlation between dividend payout ratios and companies' P/E

ratios. The DPR has positive impact on the PE ($t=4.52$), which indicates that the dividend has the impact on the market price of firms.

This result infers the relevance theory of dividend policy which is supported by many other researchers, findings like Myers and Frank (2002), Friend and Puckett (1964), John and Williams (1985), Richardson and Thompson (1986). These findings will help the dividend decision maker for taking corrective dividend decision. The companies should follow continuous dividend policy practices with a view to boosting investor morale as well as keeping stock market as safe harbor for investment and financing sector.

Conclusion

The impact of dividend on market price of share is a controversial issue. To solve this issue in our market perspective, this study is done whether there is impact of DPR on PE or not. Findings support the relevance theory of dividend on shareholder wealth. The study is conducted separately on manufacturing sector and has found that the DPR has impact on PE. There are other co factors such as age, capital structure, which have also impact on PE (market price share/ Earnings per share). These findings will help the dividend decision maker for taking corrective dividend decision.

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