Dividend Policy and Stock Price Behaviour in Indian Corporate Sector: A panel data approach

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***Abstract*:** This paper attempts to explore the possible links between dividend policy and stock price behaviour in Indian corporate sector. A sample of 500 listed companies from BSE are examined for the years 1996-2006.Dividend policy has always been a source of controversy despite years of theoretical and empirical research both in developed countries and emerging economies. The present paper features a panel data approach to analyze the relationship between dividend-retention ratio and stock-price behaviour while controlling the variables like size and long-term debt-equity ratio of the firm. The sample is taken across six different industries namely electricity, food and beverage, mining, non-metallic, textile and service sector. The results are based on the fixed-effect model, as these perform statistically better than random effects and pooled OLS model. Results of the fixed-effect models indicate that dividend-retention ratio along with size and debt-equity ratio plays a significant role in explaining variations in stock returns. The fixed effect models show the presence of firm level effect in explaining the possible links between dividend policy and stock price behaviour of the firm. In another words it exhibits the possibility of "clientele effect" effect in case of some industries. Therefore the model helps to understand the intricacies of dividend policy and stock-return behaviour in Indian corporate sector for the same period. Although the results are not robust enough as in the case of developed markets but shades some more interesting facets to the existing corporate finance literature on dividend policy in India.

Kew Words: Dividened Policy, Stock Price, Corporate Finance, Fixed Effect Model
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1. Introduction

Dividend policy still remains an academic debate amid the clouding picture of its importance among the financial economists till today. There are few aspects of corporate financial policy where the gap between the academics and the practitioners is larger than that of the dividend policy. From Miller & Modigliani (1961)[1], 'Gordon & Linter to Fama & French (2001)[2] ,the research on the topic exhibits conflicting trends in dividend payments & firm value. The academic consensus shows that dividends really don't matter very much for the market nor is relevant, when firms pay dividend as a signal to the investors. Both corporate officials and investment analysts, still continue to insist that a firm's dividend policy matters a great deal for conveying the information to the stakeholders. One side of the argument on the basis of economic theory is, it doesn't matter or is irrelevant. But the practitioners believe it as information content to the public, which reflects seriousness of the problem that is inherent in the reaction mechanisms of the market to the dividend policy announcements. I want to foreground an explanation before the practitioners, why, in the face of all this evidence of price increase in response to dividend announcements, otherwise sensible academics believe that a firm's dividend policy really doesn't make much difference. At the same time, I'11 argue that the dividends do matter for a firm.

Dividend Policy & Share prices

The dividend policy of a firm becomes the choice of financial strategy when investment decisions are taken as given. It is also imperative to know whether the firm will go for internal or external source of financing for its investment project. There are a number of factors affecting the dividend policy decisions of a firm such as investor's preference, earnings, investment opportunities; annual vs. target capital structure, flotation costs, signaling, stability & Government policies and taxation. In the presence of asymmetric information, signaling is one of the crucial factors that influence the market. Dividends may convey information about the company, so it suggests the possibility of its influence

on the stock market. Paying large dividends reduces risk and thus influence stock price (Gordon, 1963) and is a proxy for the future earnings (Baskin, 1989)

Baskin (1989) takes a slightly different approach and examines the influence of dividend policy on stock price volatility, as opposed to that on stock returns. He advances four basic models which relate dividends to stock price risk. He terms these as the duration effect, the rate of return effect, the arbitrage pricing effect and the informational effect. The difficulty in many empirical works examining the linkage between dividend policy and stock volatility or returns lies in the setting up of adequate control over the factors that influence both. For example, the accounting system generates information on several relationships that are considered by many to be measures of risk. Baskin (1989) suggests the use of the following control variables in testing the significance of the relationship between dividend yield and price volatility are operating earnings, the size of the firm, the level of debt, the payout ratio and the level of growth. So he had tried to explain the underlying linkage between dividend policies (dividend yield and dividend payout ratio) and stock price risk in his empirical work on USA.

A number of theoretical mechanisms have been suggested that cause dividend yield and payout ratios to vary inversely with common stock volatility. As dividends can be cash dividends, stock dividends, stock splits & share repurchases, the question comes about the nature of the dividend & its impact on the share price and whether market is more volatile to high dividend yield share than normal share comes into the picture. There is a need to study the sensitivity of market to the nature of dividends. The linkage between dividends & share price should be examined by controlling other factors which are responsible for affecting the dividend policy of a firm.

Study of dividend policy and stock price in India

As Indian stock market is one of the most volatile stock market in the world. As the no of private corporations are growing day by day, & financial markets becoming more developed, there need of the study of different policy implications by corporate sector.

There are a number of studies existing on the determinants of dividends[3] behaviour in Indian context. All the studies have determined the dividend behaviour from the perspective of the factors influencing the dividend behaviour in the short run as well as in the long run[4]. But a very few literature captures the intricacies of market reaction to the dividend announcement by Indian corporate sector. The study by Reddy, Y S (2003) on dividend behavior of Indian corporate firms over the period 1990 – 2003 shows a conflicting picture of the dividend policy of firms across different industries. The study explores dividend trends for a large sample of stocks traded on the NSE and BSE, indicate that the percentage of companies paying dividends has declined from 60.5 percent in 1990 to 32.1 percent in 2003 and that only a few firms have consistently paid the same levels of dividends. Further, dividend-paying companies are more profitable, large in size and growth doesn't seem to deter Indian firms from paying higher dividends. Analysis of influence of changes in tax regime on dividend behavior shows that the tradeoff or tax-preference theory does not appear to hold true in the Indian context. This paper shows the contradictory results from the previous one. The limitations of these papers are they have taken only cash dividends for analyzing the determinant behaviour.

The present paper is structured as follows as introduction. The subsequent section II follows the theoretical strands and section III highlights ed model for the purpose. The section IV denotes the data sources and variable construction. The section V shows empirical results and discussion. The last and final section displays the findings.

II. Theoretical Strands and Literatures study

The dividend irrelevance theory of Modigliani and Miller (1961) proposed the absence of any significant impact of the dividend policy on the value of shares because it's impact is offset exactly by other means of financing and is thus irrelevant. This theory was formulated by assuming perfect market conditions, which didn't take into account the imperfections like taxes, transaction cost or asymmetric information. Consequently, dividend policies have little impact on the market value of the firms. In a perfectly competitive market situation both the company, through its profit retention, and the

shareholders, through their dividends, might invest in the same assets, and hence, who's making the investment does not matter for the economy as a whole. However, since the capital market is neither perfect nor complete the dividend irrelevance proposition needs to be applied carefully by focusing on effects of taxes, information content, agency cost and other relevant affecting variables.

The Gordon model (1959) stock valuation model states the fair value of a stock should equal to the stock-dividend per share and the difference between the discount rate and the long-term dividend growth rate. The model assumes that the firm's dividend will grow at a constant rate and that the discount rate stays the same for ever. The theory suggests if there will be an increase in dividend rate there will be simultaneously an increase in stock value of the firm.

Fama (1998) is the advocate of modern corporate finance theory, which states that firms should be managed to create and maximize value. Here the value depicts the total price of a firm commands in the market that is the sum of the values of its equity and debt. Thus, the criteria and rules for correct financial decisions are oriented towards maximization of the total value of the firm. In theory, value maximization is appealing because it is associated with efficient allocation of resources, provided the capital market operates efficiently. That is, it rewards the most to firms that channel their resources to the best uses. Extensive empirical work on capital Market behaviour shows that the prices of corporate securities indeed respond to firms' decisions in a way that appears to be consistent with expectations about the appreciation or depreciation of value in the market. The theory emphasizes the importance of corporate financing decisions on the value of the firm in the market.

Thirumalvan & Sunita (2005) studied the impact of Share repurchases & Dividend announcements on Stock prices in the context of Indian Corporate sector during the period (2002-2004). They examined the signalling effect of Stock repurchases and Dividend announcements. The study examined abnormal returns across various repurchases level. They have taken the firms listed in the BSE Index for the purpose of

empirical investigation. The study covers the impact on stock prices five days prior and after the dividend announcement. The result exhibits the upward trend of share price movement after the dividend announcement. The crucial point of their findings is that positive signalling existed only for a day after the announcements. After which the extent of positivism of shares starts declining. Their finding shows that market reaction in the Indian context to events or announcements such as share repurchases and dividends generally fluctuate around day or two. The study can be cited as important for the present study.

Sen and Ray (2003) have explained an interesting phenomenon regarding the key determinants of stock price in India. The study is based upon the stocks comprising the BSE index over a period 1988-2000.The empirical study revealed dividend pay-out is by far the single important factor affecting stock prices. The second factor comes earning per share which has very weak impact on the share prices. So the study explored one of the crucial factor dividend pay-out ratios having impact on Indian stock price.

Black and Scholes (1974) in their study on the effects of dividend yield & dividend policy on common stock prices & returns They stated uninformed demand for dividends can result from dividend decisions which in turn derive from imperfections such as taxes, transaction costs and institutional investment constraints.

Given the above background, the study makes an attempt to examine the effect of dividends and retention earnings on the stock price behaviour in Indian corporate sector in a partial macro economic framework.

III. Proposed Derived Model

In analyzing dividend and stock price behaviour, the most important point to begin with is an objective function representing a firm's preference regarding dividend-retention mix instead of taking only dividend yield or payout ratio. Because the objective function is related to firm's main motives & there has been a shift in it's motives due to the

dominance of joint stock corporations & the associated characteristics of separation of ownership & control. This shift can be characterized from the sole motive as maximization of rate of return on capital to other set of motives such as sales maximization, expansion of business. This set of motives contributing to an increase in the market value of the firm, also, is in consonance with the managing agency system of operation, which is a characteristics of Indian companies. Moreover, the separation of ownership & control also implies a difference in the objectives & preferences between firm's management & its shareholders.

From the shareholders side, their preferences depend upon mainly their income level & the degree of understanding of corporate stock –dealings & associated tax implications. Nevertheless, the behaviour of the shareholders may be generalized as that they prefer stable dividend rates & that the effect of taxes is only on the preference of the shareholders as the shareholders, who belong to the richer classes prefer low dividends and high retained earnings. The opposite is applicable in the case of middle income group of shareholders. On the other hand, the management behaviour can be relatively & conceptually distinguished between a 'passive' & an 'active' type[5]. The motives of passive management are similar to those of the shareholders & it efforts to ensure stable dividend. But firm also requires sufficient profit retentions to satisfy the firm's long-term needs such as investment demand & liquidity needs etc. But the 'active' management aims at increasing the market value of the firm & the market price of shares as well. So while its credibility requires to emphasize on the shareholders preference, it's general tendency would be to reduce dividends on the basis of different excuses like high tax rates on distributions, 'tax shelter' benefits. Given the vast diversity of stockholders, it is not surprising that, over time, stockholders tend to invest in firm's whose dividend policies match their preferences. Stockholders in high tax brackets who do not need the cash flow from dividend payments tend to invest in those companies which either pay low or no dividends. By contrast, stock holders with low tax bracket will invest in companies with high dividends. This clustering of stock-holders in companies with dividend policies that match their preferences is called as clientele effect. So it suggests that firms get the investors they deserve since the dividend policy of a firm attracts

investors who like it. Second, it means that firms will have a difficult time changing an established dividend policy, even if it makes complete sense to do so.

However in practice, it is reasonably assumed that managements are neither extremely 'passive' nor extremely 'active' and shareholders are neither rich nor badly dependent or dividend income alone but contain all the elements in different combinations. Thus, let's consider a typical firm having a map of dividend preference curves, each indicating a specific level of utility obtained by alternative combinations of dividends & retentions. So the dividend preference function can be noted as:

$$U = f(Dn, R) \qquad (3.1)$$

Where, Dn and R are the dividend and retention net of all taxes at all levels. The utility level can be seen as monotonically related to the motives of the management with respect to the shareholders preference. The shape of the utility curves might be a result of a process of accounting for their relative performances & the factors influencing such preferences as well. The second step is to represent the hypothesis that dividends affect stock prices or market value of the firm. The utility function can be represented as the function for optimizing the market value of the firm. The market value of the firm can be represented as

$$\text{Market value of the Firm} = f\left(\textit{Net profit}, \frac{\textit{Dividends}}{\text{Re}\textit{tained earnings}}\right) \qquad (3.2)$$

The market value of the firm here is basically represented on the basis of Accounting Earning Analysis. Here the Net profit is derived from the current investment of the firm. The higher the net profit the higher will be the stock price. The market value of the firm also depends upon the ratio of Dividends to Retained Earnings because the profit is basically segregated into either dividend or retained earnings. If clientele effect is not present in the firm then higher dividends will lead to higher value of the share price whereas if the investors are rich then they will prefer lower dividend to retention. The

return on equity entirely depends on the net worth[6] of a company. Equity return of a company depends upon dividends and retained earnings. If a company is going for dividends then the retained earning will be less, leading the firm to go for either new-equity issues or External financing. If the flotation cost[7] is high, the company will go for external financing which will be costlier for the firm than internal financing through equity. So the firm has to maximize the dividend to retained earnings ratio for any new investment aimed at firm's growth. We can represent it through the following function;

$$P_t = f\left(Y, \frac{D}{R}\right) \qquad (3.3)$$

Where Y represents the net profit of the firm

$\frac{D}{R}$ represents ratio of dividends to retention earning of the firm. The ratio of dividends to retained earnings acts as a proxy for future cash flow of the firm and share price, P_t, acts as the proxy for the absolute market value of the firm.

While calculating the stock return on an equity share, we are basically interested to calculate the change in current price with respect it's price in the previous period. So the equation (3.3) can be represented as

$$\left(\frac{P_t}{P_0}\right) = f\left(\frac{Y}{P_0}, \frac{D}{R}\right), \qquad (3.4)$$

The eqn (3.4) represents the change with respect to base price. We have assumed a Cobb-Douglas type of function represented as the following

$$\left(\frac{P_t}{P_0}\right) = A\left(\frac{Y}{P_0}\right)^{\beta_1}\left(\frac{D}{R}\right)^{\beta_2} e^{u_i} \qquad (3.5)$$

The equation (3.5) can be expressed alternatively as

$$\ln\left(\frac{P_t}{P_0}\right) = \ln A + \beta_1 \ln\left(\frac{Y}{P_0}\right) + \beta_2 \ln\left(\frac{D}{R}\right) + u_i \qquad (3.6)$$

We can write the above equation as

$$\ln V_{it} = \alpha_i + \beta_1 \ln\left(\frac{Y}{P_0}\right) + \beta_2 \ln\left(\frac{D}{R}\right) + u_{it} \qquad (3.7)$$

Where $\ln A = \alpha$ i = 1… N

t = 1… T,

There may be potential links between size and volatility of stock returns of the firm. The size of the firm also exhibits crucial link between size and volatility. Small firms are likely to be less diversified in their activities and subject less investor's scrutiny for the firm. But research is still confined to large listed companies. The Information on the stocks of smaller listed companies could conceivably be less informed and illiquid in nature. These firms are subject to greater price volatility as a result of above posed factors. So a control variable, long-run debt equity ratio is being added .When asymmetric information comes into the picture, there is also likely to be a link between borrowing & dividend policy. Baskin (1989) suggests that firms with a dispersed body of shareholders may be more disposed towards using dividend policy as a signaling device. The dividend policy may also be a function of size and there is a need to introduce size as a control variable. There is also a need of introducing control variables, which will reflect the corporate leverage. The earlier models have been aimed at capturing the effect of stock price and dividends but very few of them have tried to include the control variables such as debt-equity ratio and size of the firm. So in the present study, the focus is to fill-up the limitations of the previous studies by using context-specific Panel-Data models including the control variables like leverage ratio and size of the firm. Through panel data estimation we can observe firm effect[8] and time effect throughout the sample period. So now the eqn (3.7) can be stated as

$$\ln V_{it} = \alpha_i + \beta_1 \ln\left(\frac{Y}{P_0}\right) + \beta_2 \ln\left(\frac{D}{R}\right) + \beta_3(SZ) + \beta_4\left(\frac{D}{E}\right) + \mu_i + \varepsilon_{it} \qquad (3.8)$$

Where V = value of the firm

SZ = Ln (Total Assets)

μ_i = firm specific component

ε_{it} = disturbance term

IV. Analytical Framework

We have already discussed the proposed model to be tested here to analyze the impact of dividends on stock returns. So in this section we will analyze the methodological issues over our proposed derived model. Simultaneously we will discuss other options available for the analysis. We will first analyze the results of different industry and then aggregate data over all the industry.

The proposed model is here is

$$\text{Ln } V_{it} = \alpha_i + \beta_1 \ln\left(\frac{Y}{P_0}\right) + \beta_2 \ln\left(\frac{D}{R}\right) + \beta_3(SZ) + \beta_4\left(\frac{D}{E}\right) + \mu_i + \varepsilon_{it} \quad 4.1$$

Where SZ = Ln (Total Assets)

μ_i = Firm specific component

ε_{it} = Disturbance term

Here the null Hypothesis is dividend or D/R ratio affects stock return i.e. $H_{0:}$ D/R affects V_{it} .

We will test the results of the classical linear regression model and other tests. Then we will proceed to see if Panel data models improve the estimation. So we will propose different models before proceeding to fixed effect model. We will define four basic models to be tested before proceeding towards final estimation.

1. $y_{it} = \alpha + \varepsilon it$ **(**No group effect or xs)

2. $y_{it} = \alpha_i + \varepsilon it$ (Group dummies only)

3. $y_{it} = \alpha + \beta' X_{it} + \varepsilon it$ (Repressors only)

4. $y_{it} = \alpha_i + \beta' X_{it} + \varepsilon it$ (Xs and group effects)

Model 1 on 2: H_0: (no group effects on the mean of y)

Model 1 on 3; H_0: (no fit in the regression of y on xs)

Model 1 on 4; H_0: (no group effects or fit in regression)

Model 2 on 4; H0: (group effects but no fit in regression)

Model 3 on 4; H0: (fit in regression but no group effects)

We have tested the data set for applying the panel data models with the above five different hypothesis. The LR, F and LM Test along with the Hausman Specification test favors the use of fixed effect models for Food and Beverage, Mining Industry and Non-metallic Industry whereas the diagnostic tests rejects the use of fixed effect models for Other services, Textile industry, and Mining industry. The Aggregate data is also not satisfying the qualifying criterion for applying Fixed effect models.

V. Data Sources and Sample Design

The study mainly relies on the Prowess database of the CMIE (centre for monitoring on Indian economy) in India in order to mitigate the above noted objectives. Since the present study aims at exploring the dividend and stock return volatility with the assumptions of "semi strong efficiency" in the stock market a sample of 500 companies from "A1" and "B1" group of shares is selected for the empirical analysis. All of them are spread across six different industries namely Electricity, Food and Beverage, Mining, Non-metallic, Textile and Service Sector. The first filtering criterion for selecting the stocks is their consistency with the dividend payment history for the study period 1996-2006. The second filtering criterion used for the selection is that the market-capitalization of these companies should be more than ten crores. The third filtering criterion is that the scrip must be traded continuously without any interruption during the above mentioned period.

However, the study has conceptualized the dependent variable (i.e. market value of the firm) and the explanatory variables such as size of the firm, dividends to retain earning ratio, and debt to equity ratio. The stock return is considered as proxy for the market value of the firm (dependent variable) and for other subsequent variable, Ln (total assets of the firm) have taken as a proxy.

Sock Return: Market value of the firm which is the dependent variable of our interest is being represented by Stock Return .This can be calculated by taking closing share prices of each company. Stock returns should be calculated using the log return of the closing price of the stock, where the Closing price is defined as the last trade price of the stock.
V_{it} = ln (Pt/Pt-1).

$\frac{Net\ profit}{Average book\ value of\ equity}$ Here the net profit is taken as the profit after taxes. Profit after taxes is calculated as the difference between the profit before taxes and tax for the year. PBIT or Profit before interest and taxes is generally calculated as the sum of operating profit and non-operating surplus/ deficit. This represents a measure of profit which is not influence by financial leverage and the tax factor. Hence, it is pre-eminently suitable for inter-firm comparison. Hence it is assumed that higher Net profit of a firm leads to higher share prices as opposed to stock returns. It is denoted as $\frac{Y}{P_0}$ in the study.

$\frac{Dividend}{\text{Re}tained\ earnings}\left(\frac{D}{R}\right)$ This can be calculated by adding together all the annual cash dividends paid to common shareholders & then dividing this summation by the total no of outstanding equity shares in each year. The average of all available years will be used. Retained earnings is calculated as the difference between profit before taxes and dividends and dividend by the total no of outstanding equity shares each year .Like Earnings, dividends act as proxy for the future profitability .Therefore this ratio is expected to have positive relationship with the stock return.

Long term debt (Debt to Equity ratio) is calculated as the sum of each company's debentures, mortgages & loans with a maturity greater than one year to total equity is to be calculated. The average over all the years will be used.

Size of the Firm (SIZE) The variable size should be constructed in such a way that it will reflect the value of the firm in real terms. Here the natural log of Total assets is being used as a proxy for size.

VI. Empirical Estimation and Results Discussion

The basic principles of fixed-effect model have already been discussed in the previous section. So in this section we attempt to estimate our proposed model. In this section we present the results in two sections. We present first the results of those industries that how the applicability of fixed effect models by our previous section of hypothesis testing. And those industries that don't satisfy our criterion in another sections (table 4.9).Here we test the other models and the significance of our target variables.

The results from the regression analysis are discussed in two sub-sections. The first section is the result of the Table 8, which exclusively covers the regression result of one-way fixed effect model for Electricity, Food and Beverage and Non-Metallic Industry. The other section of the result from the Table 9,covers the regression from the other three industries that did not satisfy the filtering criterion of hypothesis for fixed effect model. These industries are other services, Textile and Mining. In the last section we discuss about the results of aggregate data.

Electricity Industry:-

As we have already discussed in the previous chapter, we have taken one-way fixed effect model. The result for the electricity industry can be summarized as follows. Before estimating the final model, we have tested different combination of variables. The estimation of one way fixed firm effects multivariate regressions illustrate that controlling for the underlying time-invariant heterogeneity of firms has significant effect on results. The coefficient for PAT/P_0 is 9.32 which is significant at 5% level of significance. It explains 9.32% variation in the model. The variable D/R is also exhibiting positive relationship with stock-returns. It implies higher the dividend paid

to the investor higher will be the return in the long-run. The co-efficient for D/R is 2.48 which is significant at 1% level. This implies validity of the model through the dividends and retention. The coefficient of leverage ratio or D/E ratio is -1.89% which is significant at 10% level. The negative sign of the coefficient implies the negative relationship between the stock return and D/E. As the leverage ratio will be higher then it will have a negative impact on the stock-return. The coefficient for another variable size is .96 which is coming insignificant at any level of confidence. The standard error is also coming very high at 12.54. The R^2 for the model is 0.44, which is explaining 44% variation for variation in the dependent variable stock-return. The p value of F-test is significant at 1% level. The computed F-tests (Fixed firm effect versus pooled OLS) of the null hypothesis that all coefficients are jointly equal to zero are rejected. The one-way fixed effect model explains the relationship more clearly as it explains more than 50% level of variation of firm-specific component in the model. So the over all explanatory power of the model is high in the Electricity Industry.

Food and Beverage Industry:-

The computed F-test results favors the use of the fixed-effect model over the Pooled OLS is justifiable over the test of OLS vs. Fixed effect model. The Hausman statistics is also high suggesting the use of the fixed effect model over the random effect model. Before estimating the model with variables D/R, PAT/P_0, D/E and SZ with Stock return, we have tried with different combination of independent variables with the stock-return. The Current model gave the high R^2 and low standard errors. The coefficients for the variables D/R, PAT/P_0, D/E and SZ are 3.05, 11.09,-1.41, .68 respectively. Here the variables D/R and PAT/P_0 are significant at 1% and 5% level of significance. The coefficients for the control variable which is included to control the heteroscedasticity is significant for size of the firm which explains 68% variations in the stock-return is and the coefficient for the debt-equity ratio is -1.41. The most important result is that the dividend retention ratio is positive and explains 11.09% variation in stock return. The R^2 is 0.36, explaining 36% variation in the dependent

variable i.e. Stock return. The F-test for Pooled OLS Vs Fixed effect turns out to be significant and the null-hypothesis that all the co-efficients are zero is rejected here.

Non-metallic industry:-

The coefficients for the variables D/R, PAT/P_0, D/E and SZ are .024, 10.58,0 -.88 and 30.5 respectively. The variables are significant at 5%, 1%, and 10 %(Sz.) level of significance in T-test for testing the null-hypothesis that the means of the co-efficients are zero. The sign of the D/R remains positive here. It explains positive relationship with the stock-return. So the D/R ratio explains 11.98% variation in the stock-return behaviour of the firms. It supports the null-hypothesis that D/R affects the stock prices. Another important observation is that the coefficient of size of the firm is 30.5, which is quite high in comparison to the other industry. The variables are insignificant in other models like pooled OLS, so the F-test rejected the hypothesis that all co-efficients are jointly equal to zero. The R^2 is coming with improved performance of 0.46%, which is high in comparison with other two industries. After all Non-metallic industry is showing robust result with the expected sign as proposed in methodology.

Results from the Table 9:-

We have presented another analysis for other services, Textile Industry and Mining industry because these industries are not satisfying the criterion for the fixed effect model. So the next best alternative is to test it with pooled OLS and Random effect model. We have done comparison with these three models for these industries.

Other Services Industry:-

If we compare the results of the fixed effect model and Random effect model here, then some interesting picture emerges. The co-efficients for the fixed firm effect model for the variables D/R, PAT/P_0, D/E and SZ are coming 6.37, .33,-10.54, 2.61 respectively. Among the co-efficients D/R and D/E are significant at 10% level of

significance. D/R is surprisingly significant with a positive sign according to our prior expectation. We then compare the R^2 value of two models, which is very low i.e. 0.09 for fixed firm effect model and 0.11 for the random effect model. Although R^2 turns out to be very low the variable D/R and D/E ratio is exhibiting correct sign as per the hypothesis is concerned. The F-test for comparing the coefficients are equal to zero or not is becoming insignificant for the variables. This can be observed through the p-value which comes out 0.9870. This is not significant at 1%, 5%and 10% level of significance. In the Random effect model the Coeff for the variables D/R, PAT/P_0, D/E and SZ are 4.69, 0.53,-8.09 and 13.96 respectively. The R^2 improves by two points to 0.11 the target variable D/R ratio remain insignificant in the model. May be the cause for insignificant variables and low explanatory power of the model is due to improper specification which is affected by the industry characteristics. The firms in the Services industry generally went for less dividends and more retention in the study period. These are high growth firms which require more flow of money for the projects. So the investors got return through the capital gains here.

Textile Industry:-

If we observe the Coeff for the variables D/R, PAT/P_0, D/E and SZ, the values are 5.28, .10, -1.73,5.95 and for the Random effect model the values are coming out 4.83,.17,-1.30 and 0.87 respectively. The results show some unexpected outcomes in the model. The signs of the Coeff are as per prior expectation but D/E ratio is out significant at 5% level in fixed firm effect model and other variables are remaining highly insignificant with R^2, 0.04 .In the Random effect model, the target variable D/R is significant at 5% level and PAT/P_0, D/E ratio are significant at 10%, 1% level of significance respectively. The R^2 for the random effect model has improved to 0.13%. When we compare the result between two models, random effect model turns out to be more robust than the fixed effect model.

Mining Industry:-

The values of the co-efficients for the variable D/R, PAT/P_0, D/E and SZ, are 17.07, 14.75,-13.77, 4.09 and for the Random effect model the co-efficients are 16.01, 10.08,-6.63 and 1.66 respectively. In fixed effect model three Coeff. of PAT/P_0, D/R and D/E ratio remain significant at 5%, 1%, and 10% respectively. The R^2 for the fixed firm effect model remains at 0.10 and for the random effect model it is 0.14. We cannot judge the models by the R^2 only because we have to check out the significance of the variables. So given these conditions, the fixed effect model is more appropriate in the Mining industry.

Aggregate Industry Data:-

As we have examined above the different industry wise data, only three Electricity, Food and Beverage and Non-metallic satisfy the tests for use of the fixed firm effect model whereas other three industries namely Textile, Mining and Other services do not satisfy the test criterion in favour of fixed effect model. Aggregate industry data doesn't shows any robustness for using fixed-effect model over other possible models such as pooled OLS and Random Effect model. The results from fixed-effect models is having leverage over the random effect model results .The aggregate data of whole industries is affected by those industries, which are not satisfying the criterion for fixed effect model. The overall explanatory power of the Aggregate industry data are affected the fluctuations in other industries as the data set is characterized by different industry. So when we run the regression of one-way fixed effect model, the R^2 is also exhibiting very low at 0.12 only. The value of the Coeff of the variables D/R, PAT/P_0, D/E and SZ are coming out 3.10, .34,-.60, -.15 respectively. If we observe the sign of the variables D/R, D/E and PAT/P_0 remains as per prior expectation. Among the Coeff of variables, PAT/P_0 and D/E come out significant at 1% and 5% level of significance. Whereas if we compare the result with random effect model, we will find that no variables are significant and the R^2 turns out to be very low at 0.08

only. The p-value of F-test is also coming very high at 0.76, which is well above the 0.01and 0.05 level of significance.

The use of the fixed effect model in aggregate data explained the variation of the independent variables more clearly than Random effect model and Pooled OLS model.

VII. Conclusion

We have tried to explore the relationship of dividends and stock return by using a simple Specification of stock return as a function of net profit and dividend-retention ratio with two control variable such as size & debt-equity ratio of the firm. There was an attempt to test different structural tests before proceeding towards the final estimation through panel-data modeling. The exclusive tests of different model allow us to go for the use of panel-data modeling. As we have given six different industry classifications for the study, we have tested the proposed model for each industry separately with different combination of variables. The results display statistical significance and linearity when the industry classifications are given. The regression on aggregate data remains in significant. .However, the direction of relationship between the dependent variable is as per prior expectation. In other words dividend retention ratio is positively related with the stock-returns. In case of aggregate data which consists of all firms above from industry classifications, the regression lacks statistical significance, the null hypothesis that there is no relationship between the dependent variable and independent variable cannot be rejected.

When the fixed firm effect regression is applied on sample firms of classified industry category-wise, we observe some industry specific peculiarities. Firms of Electricity, Food and beverage and Non-Metallic Product show some robustness in the results of the

regression. The signs of the coefficient and their value remain significant in the analysis. Other three industries, textile, mining and other services are exhibiting insignificant coefficients values and very low R^2. This conflicting trend of these variables is also visible when we have tried Pooled OLS and Random effect model. When we relax the industry classification and with the same data set and variables, fixed effect model shows the regression is significant at 0.05 level of significance as the p value of getting a higher or equal value than calculated f-value is 0.0497, which is we can reject the null hypothesis that all coefficients are equal to zero. . Another important result is the sign of the leverage ratio and the coefficient remain as per prior expectation. The negative sign of the debt-equity ratio implies the negative relationship between the stock-return and debt-equity ratio. As the firm will go for more debt, then its value is going to be affected by stock-return. Size of the firm remains consistently positive but in many cases it turns out to be insignificant. So we can not generalize about the variable size. So we can conclude that dividends have impact on the stock-return in Indian corporate sector, which is industry specific. The study explores that the dividend paying companies are large, profitable and growth rate of the firm does not seems to dissuade the dividend payment. Although the regression is not showing high R^2 but Net profit and Dividend and Retention Ratio remains significant in other services, mining and Textile industries.

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Appendix

Electricity Industry

(Table 1)

Models	R^2	H_0	LR-Test Chi-squ.	p-value	F-test F-Val.	p-value	LM-Test vs.Model-3	Haus.Spec. Fix vs. Ran.
1.Constant term only	0.0000	M 1 on 2	114.3	0.001	52.06	0.000	Chi 2 (1)	36.21
2. Group effects only	0.4245	M 1 on 3	123.4	0.000	113.5	0.002	1.52	p value> chi 2 =0.000
3. X-variables only	0.2135	M 1 on 4	156.6	0.000	121.9	0.010	p > chi 2 (1) 0.2183	
4. X & group effect	0.63	M 2 on 4	141.5	0.100	128.6	0.000		
5. Fit in Reg. but no Group effect.	0.24	M 3 on 4	129.5	0.000	134.7	0.100		

Note: - Large values of Hausman statistics argue in favour of the fixed effect model over the random effect model.

2. Large values of the LM statistics argue in favour of the one factor model (either Fixed or Random depends upon further Hausman Specification test) against the classical regression with no group effects.

3. A large value of the LM-statistics in the presence of a small Hausman statistics argues in favour of the random effect models.

4. If $p < 0.10$, then the test is significant at 90% confidence level, if $p< 0.05$, then the test is significant at 95% level of confidence. If $p< 0.01$, then the test is significant at 99% level of confidence.

5. The p-value of the LR test will be set to 1 if it is determined that your estimate is close enough to zero to be, in effect, zero for purposes of significance. Otherwise, the p-value displayed is set to one-half of the probability that a chi-square with 1 degree of freedom is greater than the calculated LR test statistic.

Food and Beverage Industry
(Table 2)

Models	R^2	H_0	LR-Test Chi-squ.	p-value	F-test F-Val.	p-value	LM-Test vs.Model-3	Haus.Spec. Fix vs. Ran.
1.Constant term only	0.000	M 1 on 2	113.4	0.000	112.9	0.000	Chi 2(1)	34.21
2. Group effects only	0.32	M 1 on 3	134.2	0.000	132.5	0.000	2.53	
3. X-variables only	0.41	M 1 on 4	103.5	0.000	126.5	0.004	p > chi 2(1)	p> chi 2=0.000
4. X & group effect	0.53	M 2 on 4	142.8	0.000	176.5	0.001	0.3831	
5. Fit in Reg. but no Group effect.	0.24	M 3 on 4	121.7	0.002	183.5	0.000		

Mining Industry
(Table 3)

Models	R^2	H_0	LR-Test Chi-squ.	p-value	F-test F-Val.	p-value	LM-Test vs.Model-3	Haus.Spec. Fix vs. Ran.
1.Constant term only	0.00	M 1 on 2	116.070	0.000	52.084	0.000	Chi 2(1)	Chi 2 (1)
2. Group effects only	0.21	M 1 on 3	150.894	0.001	170.23	0.000	1.21	2.02
3. X-variables only	0.32	M 1 on 4	161.23	0.003	232.419	0.000	p > chi 2(1)	p> chi2 (1)
4. X & group effect	0.42	M 2 on 4	277.186	0.005	186.03	0.001	0.2721	0.7318
5. Fit in Reg. but no Group effect.	0.15	M 3 on 4	172.5	0.000	58.78	0.000		

Non-Metallic Industry
(Table 4)

Models	R^2	H_0	LR-Test Chi-squ.	p-value	F-test F-Val.	p-value	LM-Test vs.Model-3	Haus.Spec. Fix vs. Ran.
1.Constant term only	0.00	M 1 on 2	119.070	0.000	21.00	0.000	chi2(1) = 3.92	chi2(3) = 1.23
2. Group effects only	0.21	M 1 on 3	154.894	0.000	31.01	0.000	Prob > chi2 = 0.0477	Prob>chi2 = 0.0013
3. X-variables only	0.13	M 1 on 4	165.23	0.000	12.02	0.064		
4. X & group effect	0.25	M 2 on 4	267.186	0.000	49.64	0.000		
5. Fit in Reg. but no Group effect.	0.31	M 3 on 4	172.05	0.214	64.57	0.741		

Other services Industry
(Table 5)

Models	R^2	H_0	LR-Test Chi-squ.	p-value	F-test F-Val.	p-value	LM-Test vs.Model-3	Haus.Spec. Fix vs. Ran.
1.Constant term only	0.01	M 1 on 2	109.70	0.060	11.00	0.087	chi2(1) = 0.30	chi2(4) = 1.39
2. Group effects only	0.24	M 1 on 3	164.89	0.000	41.01	0.001	Prob > chi2 = 0.5812	Prob>chi2 = 0.8460
3. X-variables only	0.14	M 1 on 4	175.23	0.000	52.02	0.020		
4. X & group effect	0.33	M 2 on 4	217.19	0.000	79.64	0.000		
5. Fit in Reg. but no Group effect.		M 3 on 4	162.05	0.000	95.4	0.000		

Textile Industry

(Table 6)

Models	R^2	H_0	LR-Test Chi-squ.	p-value	F-test F-Val.	p-value	LM-Test vs.Model-3	Haus.Spec. Fix vs. Ran.
1.Constant term only	0.03	M 1 on 2	139.070	0.000	71.00	0.000		= 3.50
2. Group effects only	0.14	M 1 on 3	124.894	0.000	44.00	0.000	chi2(1) = 7.75 Prob > chi2 = 0.0054	Prob>chi2 = 0.4774
3. X-variables only	0.21	M 1 on 4	195.23	0.000	22.02	0.000		
4. X & group effect	0.43	M 2 on 4	167.186	0.000	69.67	0.000		
5. Fit in Reg. but no Group effect.		M 3 on 4	152.05	0.000	96.8	0.001		

Aggregate Data
(Table 7)

Models	R^2	H_0	LR-Test Chi-squ.	p-value	F-test F-Val.	p-value	LM-Test vs.Model-3	Haus.Spec. Fix vs. Ran.
1.Constant term only	0.02	M 1 on 2	169.70	0.000	31.01	0.000		chi2(4) = 1.28
2. Group effects only	0.11	M 1 on 3	184.94	0.000	51.01	0.000	chi2(1) = 0.01 Prob > chi2 = 0.9425	Prob>chi2 = 0.8649
3. X-variables only	0.21	M 1 on 4	145.23	0.000	62.42	0.000		
4. X & group effect	0.24	M 2 on 4	257.186	0.000	89.84	0.000		
5. Fit in Reg. but no Group effect.		M 3 on 4	172.95					

Table 8

Results of Fixed-effect model

Industry	Variables	Fixed effect model			
		Coeff.	S.E	R^2	F.V
Electricity Industry	PAT/P_0	9.32**	5.84	0.44	F(4,56)=11.49
	D/R	12.48*	.0794		P>F= 0.000
	D/E	-1.89***	4.38		
	Size	.96	12.54		
Food & Beverage	PAT/P_0	3.05*	1.63	0.36	F(4,256)
	D/R	11.97**	.18		= 1.26
	D/E	-1.41*	0.71		0.001
	Size	.68	1.79		
Non-Metallic	PAT/P_0	.024**	.04	0.46	F(4,232)
	D/R	10.58*	1.74		= 12.21
	D/E	-.88	2.72		Prob > F = 0.0000
	Size	30.5**	4.70		

Note:-1. Fixed effect model has no constant term.

2. *, **, *** represents 10%, 5% and 1% level of significance respectively

Table 9

Comparison of results of fixed effect model and Random effect model.

Industry	Variables	F.E			R.E		
		C.F	R^2	F	C.F	R^2	W
Other services	PAT/P_0	6.37 (12.52)	0.09	F (4,182) = 0.08 p>F = 0.9870	4.69 (9.81)	0.11	W chi2(4 =2.86 p>chi 0.5819
	D/R	0.33*** (.443)			0.053 (.426)		
	D/E	-10.54*** (24.56)			-8.09*** (16.69)		
	Size	2.61 (15.52)			13.96** (8.43)		
Textile	PAT/P_0	5.28 (1.83)	0.04	F (24,244) =0.33 p>F =0.990	4.83*** (1.51)	0.13	Wald Chi 2(4)=10.36 p>chi 2=0.0348
	D/R	0.10 (.704)			.172** (.667)		
	D/E	-1.73** (1.28)			-1.30* (1.066)		
	Size	5.95 (2.73)			.87 (.459)		
Mining	PAT/P_0	17.07** (10.57)	0.10	F (4,46) =2.00 p>F =0.1097	16.01** (8.67)	0.14	Wald Chi 2 (4) =6.35 p>chi 2 = 0.1747
	D/R	14.75* (27.90)			10.08*** (22.26)		
	D/E	-13.77*** (10.79)			-6.63 (7.39)		
	Size	4.09 (5.80)			1.66 (4.91)		
Aggregate Data	PAT/P_0	3.10* (.095)	0.12	F (124,1232) = 16.49 p>F 0.76057	-.011 (.0945)	0.08	Wald Chi 2 (4) = 2.31 p> chi2 0.8745
	D/R	.34 (.10)			.31 (.1051)		
	D/E	-.60** (1.89)			-1.06 (1.40)		
	Size	-.15			1.55 (1.037)		

Note:- *, **, *** represents 10%, 5% and 1% level of significance respectively

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[3] The term 'dividends', is defined inclusively under the Income Tax Acts, 1922 and 1961. The definition of Dividends includes distributions from accumulated profits wheather capitalised or not, which reduces the assets of a company or in the form of

debentures issue, distributions on liquidation or in the form of loan or advances to the extent such distributions are attributable to to accumulated profits. The definition for certain companies of closely held category, the definition is more inclusive

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[6] Net worth of a company refers to the difference between Total assets and Total debt of a company.

[7] It refers to the cost of new-equity issues to be borne by the company, under the condition of imperfect market.

[8] Firm effect refers to the effect of factors affecting the behaviour of an individual firm, if it is constant overtime. The time effect refers to the economic condition of particular time point : it varies over time.