

An Empirical Investigation of Dividend Determinant with Special Reference to Indian Petrochemical & Paint Industry

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Abstract:

The present research contribution makes a thoughtful effort to explore the dynamics of dividend determinants expressively affecting the dividend policy in emerging economies like India with special reference to Indian Petrochemical & Paint Industry. The present research work makes an attempt to take a holistic view on the issue and investigate the determinant of dividend policy. Based on the scholarly work of the last six decades, six predictors have been identified along with the dividend payout as criteria variable. The study was systematically planned with the dataset of 14 years (2001-14) retrieved with CAPITALINE database. The research contribution makes a serious effort to empirically analyze and explore the relationship between the variables with the help of Multivariate Regression technique. The proposed model exposed that the explanatory power of the identified predictors is as good as 58.5%.

Keyword: Dividend Policy, Dividend Determinants, Multivariate Regression, Petrochemical & Paint Industry.

1. Introduction

Dividend policy has been a subject of great interest and enquiry among the financial practitioners over and above the last 6 decades and despite of several empirical evidence on this issue we are still struggling to reach a universally accepted explanation for, dividend ‘Puzzle’ (As described by Black, 1976). Dividend policy decisions and related issues are one of the most complex and unsolved problems in the field of Financial Economics (Brealey & Myers, 2005). The dividend is usually defined as a portion of earning available to shareholders in proportion of their ownership. Actually, it is more about the designing and formulating a payout policy in such a manner so that it fulfill the ultimate goal of value maximization. A ‘fair’ payment in this regard and the determinants of dividend payout policy are still a debatable issue. The study area is full of conflicting theoretical model and still lacking from valid empirical evidences to explain the phenomenon. Moreover, most of the existing models are focused on market conditions of developed economy whereas, it is very important to look into the issue from the perspective of

emerging market like India. The present research contribution makes an attempt to fill the absolute dearth of empirical evidences from this standpoint especially focusing to Indian Petrochemical & Paint Industry. The present study makes an attempt to explore the determinants of dividend policy in Indian Petrochemical & Paint Industry and helps to examine the factor influencing the dividend decision with special reference to Indian Paint Industry. Furthermore, it contributes to fill the absolute dearth of availability of literature available in this regard.

2. Review of Literature

Conceptual Framework & Theoretical Background:

In the last six decades, researchers enrich the study of dividend decision with dozens of theories, which we can broadly classify into three categories. On one hand, school propounding the *Relevancy Approach* of dividend (Durant, 1956), recognizes the effect of dividend on share price. On the other hand, followers of the *Irrelevance Approach* of dividend, having a contradictory viewpoint (Miller & Modigliani, 1961). Apart from these two we also have a classification of Compromising approach which recognize the effect of dividend on share price but only restricted a level. The financial researchers and practitioners cornered the *Irrelevancy Approach* based on its assumption of perfect market condition, which actually don't exist in the real world. Predating to M&M approach, the *Bird in Hand Theory*, attempt to explain that dividend does matter in imperfect condition of capital markets. The theory says that investors prefer to have cash dividend at present rather than depending only on future expectations of capital gain to shield their risk exposure (Gordon & Walter, 1963). Later in 70's the empirical evidence under the *Theory of Tax Preference* suggests that dividends are directly taxed and hence investors prefer retention of profit over its distribution as a cash dividend (Brennan, 1970; Litzenberger & Ramaswamy, 1979; Miller & Rock, 1985; Ambarish et al., 1987). Further Jansen & Meckling (1976) highlighted the *Agency Cost Theory* which constructed on conflicts between shareholders and managers due to insider ownership. In 80's Bhattacharya provides *Signaling Theory* of dividend underlined that proper dividend payout indicates the financial soundness of the firm.

Lease et al. (2000) and Fama & French (2001) provide explanation through *Life Cycle Theory* concluded that the quantum of dividend payout depends on the life cycle stage of the firm. The theory further explains that matures firms are able to pay high ratio of dividend while

younger and high growth firms are more likely to use it as retained earnings, meeting the fund requirement for future growth opportunity and growth purposes. In 2004, Baker & Wurgler comes with *Catering Theory of dividend* which suggests that firms should pay smooth dividend to give incentives to its investors.

3. Rationalization of the Study:

Indian petrochemical & Paint Industry is the industry which is just 100 years old history, but registering a phenomenal growth of 13-15% since last 5 years. Petrochemical & paint industry has been one of the fastest growing industries of the economy. The petrochemical industry comprises about 50 segments like paints, coatings, pigments, additives, adhesives, sealants, additive for pharmaceuticals, lubricants, catalysts, fine chemicals and water treatment chemicals among others etc. which provides the foundation for manufacturing industries such as pharmaceuticals, construction, agriculture, packaging, textiles, automotive, etc. On the other hand, the paint industry can be subdivided into two broad categories as decorative and industrial paint. decorative include exterior wall paints, interior wall paints, wood finishes and enamel and ancillary products such as primers, putties etc. Decorative paints account for over 77% of the overall paint market in India. While, Industrial paint include automotive coatings, powder coatings and protective coatings. It is mainly used in automobiles, engineering and consumer durables goods. The industrial paints segment is far more technology intensive than the decorative segment. The increasing reach of media in villages has also helped paint makers, making easier for them to advertise their products in these regions.

Rising Urbanization and Advent of Environment Friendly Paints driving the market. Indian paint industry has been hugely influenced by increasing disposable incomes and growing urbanization over the years. The growth of the paint industry in India has been consistent with the GDP growth rate over the years. There is a shift in the market in terms of growing stress upon the usage of environment friendly paints. The companies have introduced various paints products which are eco-friendly and less harmful to the environment in recent years. The market has also witnessed inflow of a gamut of innovative products which serve to the changing decor styles and improving aesthetic tastes of growing urban population.

The market size of the paint industry in India is estimated at around Rs 350 bn. Industry players expect close to 16% growth in business volume and market players are expected

compounded annual growth rate of 20% in FY16. Companies have also discovered that demand for premium paints is high even in remote locations. Paint market has strong co-relation with economic indicators and industry growth. For arriving at the future market estimates factors such as GDP, IIP, Auto Sector Growth, GCF (Gross capital formation), Realty and Construction sector growth were considered

Research Methodology

Data Collection:

The data have been collected with a renowned source of CAPITALINE database and accessed through library of IIM Ahmedabad. Therefore, the dataset is quite transparent, in the context of its authenticity. The data consists the fact sheet and industry overview of Indian Petro-Chemical & Paint Industry during the period of 14 years (2001-14). Usually the life cycle of a firm completed in 5 to 7 years, whereas, 12 to 15-year period is usually recommended in case of an Industry. The study includes a time frame of 14 years fairly explains and justifies the determinant and fulfil the purpose.

Methodology

The study is meticulously planned and satisfy the basic statistical condition before applying any parametric test. Since We have one dependent variable and more than one independent variable ‘Multiple Regression Analysis’ identified as most suitable statistical technique.

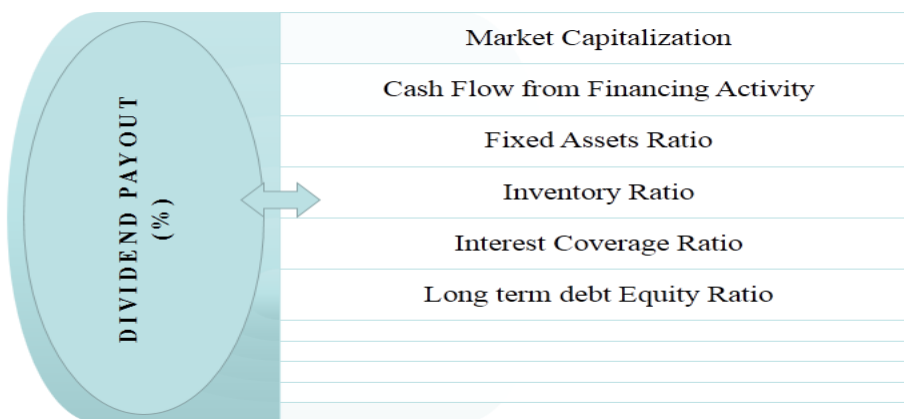


Figure 01 Dividend Payout and Independent Variable

The researcher made an attempt to develop a model using multiple regression equation. For the purpose, Dividend Payout (%) has been taken as the dependent variable (Y) and all other variable, namely Market Capitalization (x_1), Cash flow from Financing Activity (x_2), Fixed Assets Ratio (x_3), Inventory Ratio (x_4), Interest Coverage Ratio (x_5) and Long Term Debt-Equity Ratio (x_6) are taken as Independent Variable, please see figure 01.

Based on this, the multiple regression equation state as:

$$Y = \alpha + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_5x_5 + \beta_6x_6$$

Here,

‘ α ’ denotes regression constant or intercept and $\beta_1, \beta_2, \dots, \beta_6$ as a regression coefficient for x_1, x_2, \dots, x_6 respectively

Multiple Regression Analysis is the most suitable technique in such cases. But at the same time, it is important to keep a check on the basic assumption before applying this. The main assumption/ condition which needs to be satisfy are:

- Test of Normality
- Test of Heteroscedasticity
- Problem of Auto-correlation
- Problem of Multicollinearity

After satisfying above mentioned necessary conditions/assumption, the researcher applied the model. The detailed test results are discussed in *Data Analysis & Interpretation* section.

4. Data Analysis & Interpretation

The dataset has been retrieved from the reliable source of CAITALINE Database on yearly basis from Factsheet of Indian Petro Chemical & Paint Industry. The dataset comprises Industry specific information as a whole for each year. Multiple Regression analysis was performed to develop a model for predicting the effect of predictors (Long Term Debt Equity Ratio, Fixed Assets Ratio, Inventory Ratio, Cash Flow from Financing Activity, Market Capitalization, Interest Coverage Ratio) on the criteria variable (Dividend Payout).

SPSS OUTPUT: PAINT INDUSTRY

Table No. 01 Descriptive Statistics			
	Mean	Std. Deviation	N
Dividend Payout	107.4207	43.37890	14
Market Capitalization	2711.1350	2031.34805	14
Cash Flow from Financing Activity	-677.7721	753.44686	14
Fixed Assets Ratio	12.6286	3.09271	14
Inventory Ratio	77.2293	24.49377	14
Interest Coverage Ratio	-67.4214	184.31168	14
Long Term Debt Equity Ratio	10.8843	9.87851	14

The Descriptive Statistics as shown in table no. 01, indicate average trend prevailing in this Industry over the period of study (14 years, 2001-14) with respect to criteria variable as Dividend Payout and all others as Predictors. Table also contains the Standard deviation existing for the period of study for the all variables.

Table No. 02 Correlations

		Dividend Payout	Market Capitalization	Cash Flow from Financing Activity	Fixed Assets Ratio	Inventory Ratio	Interest Coverage Ratio	Long Term Debt Equity Ratio
Pearson Correlation	Dividend Payout	1.000	-.045	.164	.450	.073	.265	.163
	Market Capitalization	-.045	1.000	-.485	.091	.768	-.284	.096
	Cash Flow From Financing Activity	.164	-.485	1.000	.130	-.350	.339	-.483
	Fixed Assets Ratio	.450	.091	.130	1.000	.162	.024	-.471
	Inventory Ratio	.073	.768	-.350	.162	1.000	.059	.162
	Interest Coverage Ratio	.265	-.284	.339	.024	.059	1.000	.108
	Long Term Debt Equity Ratio	.163	.096	-.483	-.471	.162	.108	1.000
Sig. (1-Tailed)	Dividend Payout	.	.439	.288	.053	.402	.180	.289
	Market Capitalization	.439	.	.039	.379	.001	.163	.372
	Cash Flow From Financing Activity	.288	.039	.	.329	.110	.118	.040
	Fixed Assets Ratio	.053	.379	.329	.	.290	.468	.044
	Inventory Ratio	.402	.001	.110	.290	.	.421	.290
	Interest Coverage Ratio	.180	.163	.118	.468	.421	.	.356
	Long Term Debt Equity Ratio	.289	.372	.040	.044	.290	.356	.
N	Dividend Payout	14	14	14	14	14	14	14
	Market Capitalization	14	14	14	14	14	14	14
	Cash Flow From Financing Activity	14	14	14	14	14	14	14
	Fixed Assets Ratio	14	14	14	14	14	14	14
	Inventory Ratio	14	14	14	14	14	14	14
	Interest Coverage Ratio	14	14	14	14	14	14	14
	Long Term Debt Equity Ratio	14	14	14	14	14	14	14

The correlation table explains the correlation between each pair of variable. Here N concerned with dataset of 14 years referring to the period between 2001- 2014. The test and confirms that data set is not affected by the typical problem of autocorrelation among the predictors and values are acceptable. None of them is affecting each other significantly. The Test

of Autocorrelation is one of the significant tests needed to perform before applying Multiple Regression as it is a precondition of Multiple Regression Analysis. (please see Table no. 02)

Table No. 03 Model Summary^b						
Model	R	R Square	Adjusted R Square	R	Std. Error of The Estimate	Dubin-Watson
1	.815 ^a	.692	.585		41.09026	2.138
A. Predictors: (Constant), Long Term Debt Equity Ratio, Inventory Ratio, Fixed Assets Ratio, Cash Flow from Financing Activity, Interest Coverage Ratio, Market Capitalization						
B. Dependent Variable: Dividend Payout						

The model summary contains some notable information about the model. It indicates the value of R is 81.5% whereas proportion of variance in criteria variable as explained by R^2 is 69.2%. Furthermore, the adjusted R^2 value as 58.5% indicated fairly good and ensure success of the model for explaining the variance. Further the p-value signifies that model is valid and good fit for Paint/Paint Industry. It further explains that dividend payout can be explained with the help of the predictors (viz., Debt-Equity Ratio, Fixed Assets Ratio, Inventory Ratio, Cash Flow from Financing Activity, Market Capitalization and Interest Coverage Ratio;) by 58.5% and the rest of the other variable constitute the remaining 41.5%. (please see Table no. 03)

Table No. 04 Anova^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12643.608	6	2107.268	5.248	.022 ^b
	Residual	11818.865	7	1688.409		
	Total	24462.473	13			
A. Dependent Variable: Dividend Payout						
B. Predictors: (Constant), Long Term Debt Equity Ratio, Inventory Ratio, Fixed Assets Ratio, Cash Flow from Financing Activity, Interest Coverage Ratio, Market Capitalization						

The model explained in Anova table indicates the predictors explained ($f(6,7) = 5.248$, $p < 0.022$). It further confirms that model is significant. (please see Table no. 4)

The coefficient table reported by SPSS, indicates β (unstandardized coefficient) for each predictor variable. It implied the predicted increase in the value of dependent variable for 1-unit increase in the predictors while controlling all other predictors. Furthermore, the standardized

coefficient, Beta (β) gives a measures of the contribution of the variable to the model in terms of standard deviation. As here, if Long term Debt Equity Ratio is increased by 1 SD, then we can predict that dividend payout would be increased by 0.702 SD (please see Table no. 05

Table No. 05 Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-29.439	70.381		-.418	.688		
	Market Capitalization	.003	.011	.140	.283	.785	.283	3.538
	Cash Flow From Financing Activity	.023	.022	.400	1.067	.321	.490	2.039
	Fixed Assets Ratio	10.311	4.391	.735	2.348	.051	.704	1.420
	Inventory Ratio	-.234	.835	-.132	-.280	.787	.311	3.217
	Interest Coverage Ratio	.020	.077	.084	.254	.807	.637	1.570
	Long Term Debt Equity Ratio	3.081	1.621	.702	1.901	.099	.506	1.975
A. Dependent Variable: Dividend Payout								

The table further indicates the collinearity statistics. To check the *Assumption of Collinearity* we need to look at Tolerance and VIF value under the sub heading of *Collinearity Statistics* in Coefficients Table. Here also we found that VIF value is less than 10 (Myres, 1990) and Tolerance is more than 0.2 (Menard, 1995) which indicates that our data set met the assumption of Collinearity and multicollinearity was not a concern. Furthermore, a detailed collinearity diagnostics consisting the Eigen value and condition index have been reported in next table. (please see Table no. 6)

Table No. 06 Collinearity Diagnostics^a										
Model	Dimension	Eigen value	Condition Index	Variance Proportions						
				(Constant)	Market Capitalization	Cash Flow from Financing Activity	Fixed Assets Ratio	Inventory Ratio	Interest Coverage Ratio	Long Term Debt Equity Ratio
1	1	5.122	1.000	.00	.00	.01	.00	.00	.00	.01
	2	.899	2.387	.00	.00	.01	.00	.00	.52	.01
	3	.523	3.129	.00	.00	.17	.01	.00	.01	.15
	4	.270	4.352	.01	.15	.11	.00	.00	.19	.19
	5	.148	5.878	.00	.17	.67	.03	.00	.07	.27
	6	.022	15.276	.04	.43	.02	.54	.63	.05	.22
	7	.015	18.513	.94	.24	.02	.41	.36	.16	.15
A. Dependent Variable: Dividend Payout										

Table No. 07 Residuals Statistics^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	60.9767	178.6337	107.4207	31.18630	14
Residual	-41.00310	54.03942	.00000	30.15201	14
Std. Predicted Value	-1.489	2.283	.000	1.000	14
Std. Residual	-.998	1.315	.000	.734	14
A. Dependent Variable: Dividend Payout					

Charts

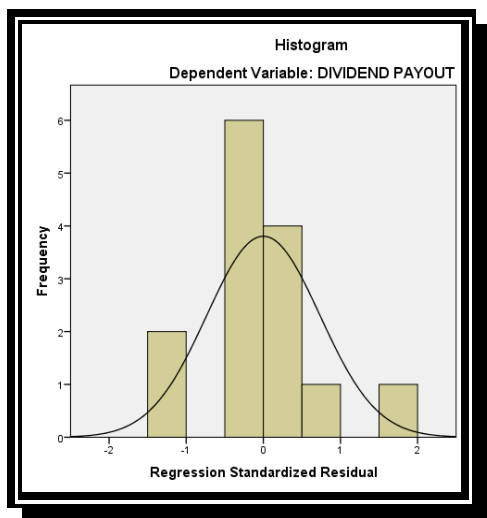


Figure 02 Normality Distribution Industry

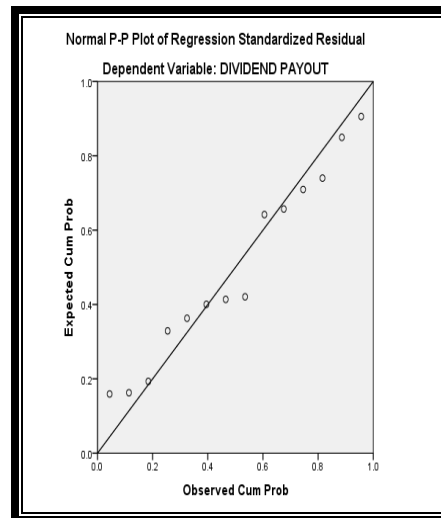


Figure 03 Normal P-P Plot Paint

The above figure no. 02 depicted the standard bell shape indicating the normality of the data. Furthermore, figure no. 03, graph is produced by normal probability plot options. Here, we found that the points are reasonably close to the straight line.

Statistical Criteria and Inference-

The results of standard residual show that data set of Petro-Chemical & Paint Industry contained no outlier as *Standard Residual* Minimum value is above -3.29 and Maximum value is below than 3.29. To check the *Assumption of Collinearity* we need to look at Tolerance and VIF value under the sub heading of *Collinearity Statistics* in Coefficients Table. Here also we found that VIF value is less than 10 (Myres, 1990) and Tolerance is more than 0.2 (Menard, 1995) which indicates that our data set met the assumption of Collinearity and multicollinearity was not a concern. Further, we conducted *Test of Independence Error*, which is again one of the important assumption of Multiple Regression which test whether residual terms are uncorrelated or not. For this purpose, we are referring the *Model Summary* table and **Durbin-Watson Value**. The Value of Durbin-Watson can be anywhere between 0 and 4 however value near to 2 is most appropriate in order to meet the assumption of independent errors. Here again we found that the data set met the assumption of independent error. Furthermore, the statistical test performed to

check the assumption of *Normal Distribution, Homoscedasticity and Linearity* and figure 02 & 03 confirms the same. So, it can be concluded that the it satisfying all the important assumption required for performing Multiple Regression.

Multiple Regression analysis was performed to develop a model for predicting the effect of Independent (PredictoPr) Variables (Long Term Debt Equity Ratio, Fixed Assets Ratio, Inventory Ratio, Cash Flow from Financing Activity, Market Capitalization, Interest Coverage Ratio) on the Criteria/Dependent Variable (Dividend Payout). The analysis and statistical procedures reveal the R value is 0.815, R Square value is 0.69 and Adjusted R Square value is 0.585 which confirms that the model explain the dependent variable at least of 58.5%. Further the p-value signifies that model is valid and good fit for Petro-Chemical/Paint Industry. It further explains that dividend payout can be explained with the help of the said Independent variable (viz., Debt-Equity Ratio, Fixed Assets Ratio, Inventory Ratio, Cash Flow from Financing Activity, Market Capitalization and Interest Coverage Ratio;) by 58.5% and the rest of the other variable constitute the remaining 41.5%.

5. Conclusion

The research work makes a noteworthy attempt to reveal the dynamics and determinant of dividend payout policies with special reference to Indian Petro-Chemical & Paint Industry. The study reveals that dividend policy of a firm by at large depends upon 6 variables viz. Long Term Debt Equity Ratio, Fixed Assets Ratio, Inventory Ratio, Cash Flow from Financing Activity, Market Capitalization and Interest Coverage Ratio, especially in the case of Indian Petro-Chemical & Paint Industry of India. The explanatory power of the model is quite good and hence, provides a good basis for future research in this area. The model may derive different results unlike to the Indian Petro-Chemical & Paint industry of India due to the inherent characteristics of the industry itself.

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