Determinants Of Dividend Policy In Selected Indian Industries : An Empirical Analysis

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INTRODUCTION

By Dividend policy, we mean the payout policy that the managers follow in deciding the size and pattern of cash distribution to shareholders over time. Many theoretical models developed by academicians and researchers describe the factors that the managers should consider when making dividend policy decisions. The number of factors identified as being important to be considered in making dividend decisions increased substantially over time. But still, the setting of corporate dividend policy remains a controversial issue and involves ocean deep judgment by decision makers. Also, there has been emerging consensus among the academicians and researchers that there is no single explanation of dividend and ,therefore, extensive studies are yet to be carried out to elicit factors affecting dividend payout ratio of companies. So, an attempt is made to identify the factors that might be important in determining the dividend policy decision for the managers of the Indian companies. The regression analysis technique has been adopted and analysis are carried out for each industry and each size classes to identify the factors affecting corporate dividends with the help of some known dividend models such as Lintner's Model, Brittain's Cash Flow Model, Brittain's Explicit Depreciation Model and Darling's Model.

REVIEW OF LITERATURE

A classic attempt to explain corporate dividend behaviour was made by **Lintner (1956)**[1]. After conducting interviews with the personnel of numerous large, well established firms of United States of America, Linter concluded-**(1)** That the primary determinants of changes in dividends payout were the most recent earnings and the past dividends paid, **(2)** That management focused on the change in the dividends rather than the amount, **(3)** That changes were made only when management felt secure that the new level of dividends could be maintained, **(4)** That there was propensity to move toward some target pay out ratio for most firms, but the speed of adjustment toward the level differed greatly among companies and **(5)** That investment requirements generally had little effect on dividend behaviour.

Darling (1957)[2] in his study on dividend policy holds the view that lagged dividend as an explanatory variable in Linter's model has no direct influence on the dividend decision making process. According to him, the weight assigned to it in the regression equation is a reflection of some other variables that co-vary with the lagged dividends. He, therefore, concludes that the function based on lagged dividend may be very useful for short run prediction, but lagged profit would offer better explanation of the current level of dividend. As such, he substituted lagged profit in place of lagged dividend in the Lintner's model. Darling further adds some more independent variables like depreciation and amortization recoveries and also changes in sales over the previous two years.In another study, **Brittain (1966)**[3] used the cash flow version of Lintner's model. He takes this as his starting point. The model was proposed by Lintner and obtained statistically significant results, but at the same time, he found that better results could be obtained by certain modifications and adjustments. Brittain argues that cash flow is a more appropriate measure of the company's capacity to pay dividend as it reflects more faithfully, true earnings. Further, dividend payment is considered as a charge prior to depreciation and hence, should be related to earnings gross of depreciation. Besides, as regulations and accounting practices regarding depreciation allowance keep on changing, net current earnings would fail to reflect the movement of true earnings, which is the ultimate basis of ability to pay dividend. Brittain (1966) uses this cash flow version of Lintner's model in his study entitled "Corporate Dividend Policy".

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[1]Lintner, J., "Distribution of Incomes of Corporations among Dividends, Retained Earnings, and Taxes," *American Economic Review*, May, 1956, Vol.46, PP. 97-113.

[2]Darling. P.G. "The influence of expectations and liquidity on dividend policy", *Journal of Political Economy*, June, 1957, pp. 209-224.

[3]Brittain. J.A., *Corporate Dividend Policy*, The Brookings Institution (Washington), 1966.

Fama and Babiak, (1968)[4] studied the various determinants of dividend payment by individual firms. They tried to test the validity of the Lintner's model and other known models on corporate dividend policy. Their study revealed that Lintner's model continued to explain dividend behaviour quite well and that a slightly different model with lagged earnings as well as lagged dividends did a slightly better job in that it had higher explanatory power.The work of **Purnanandam and Hanumantha Rao (1966)**[5] is a micro time series analysis of fifty companies belonging to the cotton textile industry for the period 1946-63. The Lintner model is tried for each company with and without intercept term. An analysis of the size distribution of the estimates of the short and long run dividend payout ratios and reaction coefficients is made. The Lintner model proved to be adequate in explaining the dividend behaviour.**R.P. Mahapatra and P.K. Biswasroy (2002)**[6] put forth the influence of profit after tax and cash flow on the dividend policy of the firm. They identified that dividend policy was influenced mostly by cash flow, a measure of the company's capacity to pay profit after tax was found to be less significant determinant of dividend policy. Multiple regression equation was used for determining the coefficients of different factors. In this study, they have selected 59 companies, covering four industries namely General Engineering, Cotton, Sugar and Paper for a period of 12 years (1987 to 1999) in India.**Sarma, JVM and Panda, SP (2005)**[7] studied the large public limited companies for the period 1969 to 2000. Their empirical analysis followed Lintner's model. The results showed that, among the financial variables - profits, capital structure, sales change and lagged dividend demonstrated significant results, whereas investment demand doesn't. This was because the estimates might be biased due to the presence of the lagged dependant variables as one of the explanatory variables.

OBJECTIVES OF THE STUDY

The objectives of the present study are as follows:

1. To evaluate the applicability of the Lintner model, a basic dividend model as well as the applicability of extended version of Lintner model in explaining the dividend policy of companies in India across industries.

2. To identify the firm specific factors determining the dividend policy.

HYPOTHESES OF THE STUDY

In the course of analysis, it has been proposed to test the following hypotheses with the help of the sample data.

1.Lintner model and the extended version of Lintner models are not explaining appropriately the dividend policy of companies in India across industries.

2.There is no impact of profitability on dividend policy of Indian companies.

3.The current year dividend policy is independent of the dividend policy of the companies in the past in India.

4.There is no significant influence of depreciation on equity dividend payment of companies in India.

SAMPLING DESIGN AND METHODOLOGY

Sampling Design : The study is explorative in nature and based on secondary data. The data for the study consists various financial statements of selected companies listed in the Bombay Stock Exchange (BSE) under Group A and B. The companies are selected using stratified sampling technique. In total, 92 companies are finally selected across cement (11), chemical & fertilizer (8), oil & gas (9), paper (9), pharmaceutical (15), shipping (9), steel (8), sugar (13) and textile (10) industries. The period of the study is for 10 years from 1997-98 to 2006-07. The data has been collected from the Stock Exchange Directories and Capitaline database.

Tools Used : In this research, several independent factors have been tested with the use of Lintner dividend model, extended version of Lintner model such as Brittain's Cash Flow Model, Brittain's Explicit Depreciation Model and Darling's Model have been used for measuring the determinants of corporate dividend policy.

These models are presented below:

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[4]Fama, E. F. and Babiak, H. "Dividend Policy: An Empirical Analysis," Journal of American Statistical Association, December, 1968, pp. 1132-1161.

[5]Purnanandam, J and Hanumantha, R.K.S., "Corporate Dividends and Target Payout Ratios in Indian Cotton Textile Industry, 1946-1963", The Journal of Industrial Economics, November,1966, Vol. xv, N0.1, pp. 38-43.

[6]Mahapatra, R.P. and Biswasroy, P.K., "Dividend Behaviour in Indian Corporate sector: An Econometric Analysis", Finance India, July, 2002, pp 80-85.

[7] Sharma, J.V.M. and Panda, S.P., " Theories and Determinants of Dividend Behaviour", The Journal of Applied Finance, January,2005, pp 5-18.

Lintner's Model:

$$DIV_t = \alpha + \beta_1 PAT_t + \beta_2 DIV_{t-1} + e$$

Brittain's Cash Flow Model:

$$DIV_t = \alpha + \beta_1 FCF_t + \beta_2 DIV_{t-1} + e$$

Brittain's Explicit Depreciation Model:

$$DIV_t = \alpha + \beta_1 PAT_t + \beta_2 DIV_{t-1} + \beta_3 DEP_t + e$$

Darling's Model:

$$DIV_t = \alpha + \beta_1 PAT_t + \beta_2 PAT_{t-1} + \beta_3 DEP_t + \beta_4 \Delta SAL_t + e$$

Where,

DIV_t	=	Equity dividend paid in the current year
DIV_{t-1}	=	Equity dividend paid in the previous year
FCFt	=	Current year Free cash flow
DEPt	=	Current year depreciation and amortization
ΔSAL_t	=	Current year change in sales over the preceding two years
e	=	error

RESULTS OF LINTNER, BRITTAIN'S CASH FLOW, BRITTAIN'S EXPLICIT DEPRECIATION AND DARLING MODELS

The results of the regression analysis based on the basic known models for industry-wise and size-wise are presented from Table 1 to 10 and discussed in detail hereunder.

❁ **Regression Results For Cement Industry :** For cement industry, perusal of the Table 1 shows that all four regression models fitted significantly. The coefficient of determination adjusted for degrees of freedom (adjusted R^2) is the

Table 1: Results of Regression Showing Determinants of Dividend Policy based on Lintner's, Brittain's Cash Flow, Brittain's Explicit Depreciation and Darling's Dividend Model for Cement Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darling's Model
Intercept	0.1520	-1.2274	-2.3369**	-3.5614**
	(0.19)	-(1.66)	-(2.62)	-(2.62)
Current Year Profit After Tax (PAT_t)	0.0469***		0.0647***	0.1215***
	(4.24)		(6.03)	(8.41)
Last Year Profit After Tax (PAT_{t-1})				0.0319*
				(1.89)
Current Year Free Cash Flow (FCF_t)		0.0585***		
		(4.77)		
Last Year Dividend (DIV_{t-1})	1.0206***	0.9343***	0.7474***	
	(16.43)	(12.99)	(9.20)	
Current Year Depreciation (DEP_t)			0.1064***	0.2585***
			(4.67)	(10.02)
Change in Sales in Three Years (Δ SAL_{t0-t2})				-0.0012
				-(0.20)
R^2	0.9048	0.9086	0.9225	0.8614
Adjusted R^2	0.9028	0.9067	0.9201	0.8547
F Value	456.05***	477.12***	377.08***	128.91***
DF for Models	2, 96	2, 96	3, 95	4, 83

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.

Figures in brackets are 't' values for estimated coefficients

highest at 92.01 percent for Brittain's explicit depreciation model followed by 90.28 percent, 90.67 percent and 85.47 percent for Lintner's, Brittain's cash flow and Darling's model respectively. Therefore, Brittain's explicit depreciation model, which is the extension of Lintner's model with inclusion of current year depreciation is considered as the most appropriate model for explaining the dividend policy decision of the companies under cement industry. In the model, the estimated coefficients of all three explanatory variables, current year profit after tax (β=0.0647, t = 6.03, p < 0.01), last year dividend (β=0.7474, t = 9.20, p < 0.01) and current year depreciation (β=0.1064, t = 4.67, p < 0.01) are significant with positive sign.So, it is concluded that the last year dividend is the major factor followed by current year depreciation and current year profit after tax influencing the dividend policy decision of the companies under cement industry.

❁ **Regression Results For Chemical And Fertilizer Industry :** The results of regression analysis based on four basic known dividend models for chemical and fertilizer industry are presented in table 2.

Table 2: Results of Regression Showing Determinants of Dividend Policy based on Lintner's, Brittain's Cash Flow, Brittain's Explicit Depreciation and Darling's Dividend Model for Chemical and Fertilizer Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darling's Model
Intercept	1.1262	0.8866	1.4726	3.1979
	(1.06)	(0.75)	(1.22)	(1.55)
Current Year Profit After Tax (PAT_t)	0.0404***		0.0393***	0.1049***
	(2.98)		(2.86)	(4.96)
Last Year Profit After Tax (PAT_{t-1})				0.0909***
				(4.61)
Current Year Free Cash Flow (FCF_t)		0.0129		
		(1.02)		
Last Year Dividend (DIV_{t-1})	0.7796***	0.8476***	0.7949***	
	(13.19)	(13.90)	(12.40)	
Current Year Depreciation (DEP_t)			-0.0122	0.0655**
			-(0.63)	(2.25)
Change in Sales in Three Years (ΔSAL_{t0-t2})				-0.0019
				-(0.32)
R_2	0.8331	0.8144	0.8341	0.5717
Adjusted R_2	0.8283	0.8090	0.8268	0.5426
F Value	172.25***	151.39***	113.96***	19.68***
DF for Models	2, 69	2, 69	3, 176	4, 59

***Significant at 1% level. **Significant at 5% level.
Figures in brackets are 't' values for estimated coefficients.

For the Chemical and Fertilizer industry, all the four models are found to be significantly fit. But from the observation adjusted R square values, it is understood that explanatory power after adjusting for degrees of freedom is higher for Lintner's model (Adjusted $R^2 = 0.8283$) followed by Brittain's explicit depreciation model (Adjusted $R^2 = 0.8268$) and Brittain's cash flow model (Adjusted $R^2 = 0.8090$). The coefficient of determination after adjusting for degrees of freedom is the lowest in the case of Darling's model (Adjusted $R^2 = 0.5426$). From the examination of the estimated coefficients of the explanatory variables, it is apparent that coefficient of current year free cash flow in Brittain's cash flow model, current year depreciation in Brittain's explicit depreciation model and change in sales in three years in Darling's model are found to be insignificant. So, based on the coefficient of determination and significance of estimated coefficients, the Lintner's model is found to be the best model explaining the dividend policy decision of the companies under chemical and fertilizer industry. In the Lintner's model, both coefficients are significant with a positive sign, but the degree of unique influence by the last year dividend on dividend policy is found to be higher

when compared to that of the current year profit after tax. Hence, overall, from the above inferences, it is found that Lintner's model is the most appropriate model and between the two variables in this model, last year dividend is highly important factor for dividend policy decision of the companies belonging to the Chemical and Fertilizer industry.

❁ **Regression Results For Oil And Gas Industry :** Table 3 exhibits the results of regression revealing the determinants of dividend policy based on basic and extension of Lintner's model for companies under Oil and Gas industry. All four models are fitted significantly and the coefficient of determination adjusted for degrees of freedom (Adjusted R^2) vary between 83.01 percent by Brittain's cash flow model and 96.06 percent by Brittain's explicit depreciation model. However, variation explained by explanatory variables in Brittain's explicit depreciation model is found to be higher than that of other three models. Further, all the explanatory variables in this model are statistically significant and extent of influence of current year profit after tax is higher compared to last year dividend and current year depreciation. Hence, it is understood that Brittain's explicit depreciation model is the model of best fit for dividend policy of companies under Oil and gas industry. So, it is concluded that increase in current year profit after tax, increase in yearly dividend and decline in current year depreciation tend to influence the dividend policy for Oil and Gas industry.

Table 3: Results of Regression Showing Determinants of Dividend Policy based on Lintner's, Brittain's Cash Flow, Brittain's Explicit Depreciation and Darling's Dividend Model for Oil and Gas Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darling's Model
Intercept	-81.5611*	-31.9910	31.9647	43.4899
	-(1.99)	-(0.56)	(1.14)	(1.21)
Current Year Profit After Tax (PAT_t)	0.2051***		0.3438***	0.4187***
	(8.52)		(17.20)	(14.22)
Last Year Profit After Tax (PAT_{t-1})				0.0068
				(0.19)
Current Year Free Cash Flow (FCF_t)		0.0712***		
		(2.92)		
Last Year Dividend (DIV_{t-1})	0.5471***	1.0067***	0.2838***	
	(6.39)	(12.41)	(4.75)	
Current Year Depreciation (DEP_t)			-0.3852***	-0.5007***
			-(10.77)	-(11.38)
Change in Sales in Three Years (ΔSAL_{t0-t2})				0.0063*
				(1.95)
R^2	0.9048	0.8344	0.9621	0.9542
Adjusted R^2	0.9024	0.8301	0.9606	0.9515
F Value	370.84**	196.50***	650.71***	349.07***
DF for Models	2, 78	2, 78	3, 77	4, 67

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.
Figures in brackets are 't' values for estimated coefficients.

❁ **Regression Results For Paper Industry :** For paper industry, results of regression analysis using Lintner's and its extension models for determinants of dividend policy are shown in Table 4.

According to the results presented in the table, the fit of the all four models are found to be statistically significant with coefficient determination after adjusting for degrees of freedom (Adjusted R^2) which vary from 93.53 percent (Brittain's cash flow model), 94.54 percent (Lintner's model), 94.72 percent (Darling's model) to 95.05 percent (Brittain's explicit depreciation model). It seems that explanatory power of Brittain's explicit depreciation model is higher and beta coefficients of all three independent variables in this model are significant statistically. That is, inclusion of current year depreciation in the Lintner's model has increased the explanatory power marginally. So, Brittain's explicit depreciation model is considered as the best fitted model for explaining the dividend policy of the firms under Paper manufacturing industry. Therefore, it is concluded that last year dividend followed by current year

Table 4: Results of Regression Showing Determinants of Dividend Policy based on Lintner's, Brittain's Cash Flow, Brittain's Explicit Depreciation and Darling's Dividend Model for Paper Manufacturing Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darling's Model
Intercept	-0.0128	-0.3629	-0.2487	-0.3297
	-(0.05)	-(1.20)	-(0.92)	-(1.06)
Current Year Profit After Tax (PAT_t)	0.1505***		0.1308***	0.1174***
	(11.22)		(9.09)	(6.72)
Last Year Profit After Tax (PAT_{t-1})				0.0642***
				(3.26)
Current Year Free Cash Flow (FCF_t)		0.1075***		
		(9.69)		
Last Year Dividend (DIV_{t-1})	0.5209***	0.3983***	0.3730***	
	(9.73)	(5.53)	(5.25)	
Current Year Depreciation (DEP_t)			0.0610***	0.1244***
			(2.99)	(6.68)
Change in Sales in Three Years (ΔSAL_{t0-t2})				-0.0060***
				-(3.52)
R^2	0.9468	0.9369	0.9523	0.9502
Adjusted R^2	0.9454	0.9353	0.9505	0.9472
F Value	694.10***	579.08***	512.75***	319.26***
DF for Models	2, 78	2, 78	3, 77	4, 67

***Significant at 1% level.
Figures in brackets are 't' values for estimated coefficients.

profit after tax and current year depreciation are the predictors of the dividend policy decision of the paper industry.

❁ **Regression Results For Pharmaceutical Industry :** The regression results for pharmaceutical companies are shown in Table 5. It can be seen from table that all the four models are fitted significantly, but the adjusted R^2 value for the Darling's models is the lowest at 76.37 percent of all other models. The coefficient of determination after adjusting for degrees of freedom is of higher magnitude (Adjusted $R^2 = 0.9363$) for Brittain's cash flow model. Also, the estimated coefficients of current year free cash flow ($\beta=0.0523$, $t = 5.29$, $p < 0.01$) and last year dividend ($\beta=0.9391$, $t = 18.97$, $p < 0.01$) are statistically significant. This shows that substitution of cash flow in place of current year profit after tax has increased the explanatory power by 1.73 percent over Lintner's model. On the other hand, inclusion of current year depreciation in the Lintner's model does not improve the explanatory power (Brittain's explicit depreciation model). However, the explanatory power has decreased by 15.63 percent over Lintner's model with the inclusion of last year profit after tax, current year depreciation and change in sales in place of last year dividend (Darling's model). Therefore, Brittain's cash flow model is found to be appropriate and explanatory variables in this model, current year free cash flow and last year divided could explain maximum variance in dividend payout of companies under pharmaceutical industry.

❁ **Regression Results For Shipping Industry :** The model of the best fit among the four basic known models, which explains maximum variance in dividend policy of shipping industry, can be ascertained from the observation of the regression results presented in table 6.Perusal of the table 6 shows that 55.73 percent, 41.31 percent, 60.99 percent and 63.68 percent of the variance in dividend policy could be significantly explained by variables in Lintner's, Brittain's cash flow, Brittain's explicit depreciation and Darling's models respectively. It is identified that Darling's model determines maximum variance compared to other three models. Also, estimated coefficients of current year profit after tax ($\beta=0.3078$, $t = 4.95$, $p < 0.01$), current year depreciation ($\beta=0.4370$, $t = 3.66$, $p < 0.01$) and change in sales ($\beta=-0.0760$, $t = -2.32$, $p < 0.05$) in Darling's model are significant statistically. So, Darling's model is identified as the best

Table 5: Results of Regression Showing Determinants of Dividend Policy based on Lintner's, Brittain's Cash Flow, Brittain's Explicit Depreciation and Darling's Dividend Model for Pharmaceutical Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darling's Model
Intercept	0.0960	-0.0769	0.2636	-0.3654
	(0.16)	-(0.11)	(0.39)	-(0.27)
Current Year Profit After Tax (PAT_t)	0.0660***		0.0665***	0.1630***
	(7.29)		(7.29)	(6.43)
Last Year Profit After Tax (PAT_{t-1})				0.0049
				(0.19)
Current Year Free Cash Flow (FCF_t)		0.0523***		
		(5.29)		
Last Year Dividend (DIV_{t-1})	0.8574***	0.9391***	0.8711***	
	(17.59)	(18.97)	(15.94)	
Current Year Depreciation (DEPt)			-0.0220	0.2385***
			-(0.56)	(3.23)
Change in Sales in Three Years (ΔSAL_{t0-t2})				0.0004
				(0.05)
R^2	0.9202	0.9077	0.9204	0.7717
Adjusted R^2	0.9190	0.9363	0.9186	0.7637
F Value	761.47***	649.19***	505.10***	97.16***
DF for Models	2, 132	2, 132	3, 131	4, 115

***Significant at 1% level.

Figures in brackets are 't' values for estimated coefficients.

Table 6: Results of Regression Showing Determinants of Dividend Policy based on Lintner's, Brittain's Cash Flow, Brittain's Explicit Depreciation and Darling's Dividend Model for Shipping Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darling's Model
Intercept	2.6130	2.3854	-5.9651	-5.9386
	(0.49)	(0.36)	-(1.07)	-(0.99)
Current Year Profit After Tax (PAT_t)	0.3254***		0.2394***	0.3078***
	(6.10)		(4.26)	(4.95)
Last Year Profit After Tax (PAT_{t-1})				-0.3230**
				-(2.22)
Current Year Free Cash Flow (FCF_t)		0.1507**		
		(2.98)		
Last Year Dividend (DIV_{t-1})	-0.3537*	0.1279	-0.3506**	
	-(1.93)	(0.64)	-(2.03)	
Current Year Depreciation (DEP_t)			0.2529***	0.4370***
			(3.39)	(3.66)
Change in Sales in Three Years (ΔSAL_{t0-t2})				-0.0760**
				-(2.32)
R^2	0.5683	0.4277	0.6245	0.6572
Adjusted R^2	0.5573	0.4131	0.6099	0.6368
F Value	51.35***	29.15***	42.69***	32.12***
DF for Models	2, 78	2, 78	3, 77	4, 67

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.

Figures in brackets are 't' values for estimated coefficients.

model for explaining the dividend behaviour of shipping companies. Based on the selected model, it is found that increase in current year profit after tax and increase in the current year depreciation tend to have a positive influence even though there has been a decline in the current year change in sales on dividend policy of shipping companies.

❁ **Regression Results For Steel Industry :** It is well apparent from Table 7, in which regression results for steel companies are presented, that the coefficient of variation adjusted for degrees of freedom for Darling's model is the highest (Adjusted $R^2 = 0.8107$) for companies under steel industry. Following this, Brittain's explicit depreciation model and Lintner's model explain 76.09 percent and 71.22 percent of variation (adjusted for degrees of freedom) in the dividend decision process. It is further apparent from the observation of estimated coefficients across the models that, only in Darling's model, all the coefficients are found to be significant statistically as has been in the case of companies under shipping industry. In view of this, it is concluded based on Darling's model that the current year profit after tax, last year profit after tax and current year depreciation have positive influence while change in current year sales relative to year before previous year has negative influence on dividend policy of steel companies.

Table 7: Results of Regression Showing Determinants of Dividend Policy based on Lintner's, Brittain's Cash Flow, Brittain's Explicit Depreciation and Darling's Dividend Model for Steel Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darling's Model
Intercept	18.7838*	-6.7849	-2.6657	1.1259
	(1.79)	-(0.61)	-(0.24)	(0.10)
Current Year Profit After Tax (PAT_t)	0.1416***		0.1369***	0.1505***
	(13.31)		(14.01)	(6.01)
Last Year Profit After Tax (PAT_{t-1})				0.0885***
				(3.24)
Current Year Free Cash Flow (FCF_t)		0.1455***		
		(12.48)		
Last Year Dividend (DIV_{t-1})	0.1061	-0.2225	-0.1609	
	(0.35)	-(0.70)	-(0.57)	
Current Year Depreciation (DEP_t)			0.1097***	0.2340***
			(3.88)	(5.25)
Change in Sales in Three Years (ΔSAL_{t0-t2})				-0.0338**
				-(2.36)
R^2	0.7203	0.6939	0.7710	0.8227
Adjusted R^2	0.7122	0.6851	0.7609	0.8107
F Value	88.84***	78.22***	76.31***	68.46***
DF for Models	2, 69	2, 69	3, 68	4, 59

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.
Figures in brackets are 't' values for estimated coefficients.

❁ **Regression Results For Sugar Industry :** For sugar industry, it seems from the regression results depicted in Table 8 that the coefficient of determination of Linter's model, Brittain's cash flow model and Brittain's explicit depreciation model adjusted for degrees of freedom is almost at same level at 85.56 percent, 84.53 percent and 85.50 percent respectively. From the result, it is identified that explanatory power of Darling's model is the lowest of all. Therefore, Darling's model is not considered for further interpretation. As all the known models except Darling's model have almost same explanatory power, all those three models can be considered appropriate for explaining the dividend policy of sugar companies. At the same time, the beta coefficient of current year depreciation in Brittain's explicit depreciation model is found to be insignificant statistically. Because of this, the explanatory variables in Lintner's and Brittains' cash flow models, namely, current year profit after tax, current year free cash flow and last year dividend are identified as determinants of dividend policy decision of companies under sugar industry.

❁ **Regression Results For Textile Industry :** Table 9 presents the results of regression exhibiting the variables that have relationship with dividend policy of textile companies. Though all four models are fitted significantly at 1 percent

Table 8: Results of Regression Showing Determinants of Dividend Policy based on Lintner's, Brittain's Cash Flow, Brittain's Explicit Depreciation and Darling's Dividend Model for Sugar Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darling's Model
Intercept	-0.0657	-0.3261	-0.2011	-0.2895
	-(0.29)	-(1.36)	-(0.67)	-(0.54)
Current Year Profit After Tax (PAT_t)	0.0390***		0.0385***	0.0572***
	(5.16)		(5.06)	(3.96)
Last Year Profit After Tax (PAT_{t-1})				0.0745***
				(3.57)
Current Year Free Cash Flow (FCF_t)		0.0312***		
		(4.15)		
Last Year Dividend (DIV_{t-1})	1.0650***	1.0863***	1.0379***	
	(17.72)	(17.09)	(14.47)	
Current Year Depreciation (DEPt)			0.0170	0.2007***
			(0.70)	(5.55)
Change in Sales in Three Years (ΔSAL_{t0-t2})				-0.0051**
				-(2.20)
R^2	0.8581	0.8479	0.8587	0.6540
Adjusted R^2	0.8556	0.8453	0.8550	0.6400
F Value	344.76***	317.88***	228.96***	46.78***
DF for Models	2, 114	2, 114	3, 113	4, 99

***Significant at 1% level. **Significant at 5% level.

Figures in brackets are 't' values for estimated coefficients.

level of significance, coefficient of determination adjusted for degrees of freedom is below 50 percent for all models. The coefficient of determination adjusted for degrees of freedom is the lowest at 21.90 percent (Adjusted $R^2 = 0.2190$) for Darling's model, whereas, it is highest and almost with the same magnitude for Lintner's (Adjusted $R^2 = 0.4754$) and Brittain's explicit depreciation (Adjusted $R^2 = 0.4765$) models. There has been decrease in the adjusted R square value for Brittain's cash flow model, in which current year free cash flow in included in the place of current year profit after tax (Adjusted $R^2 = 0.3777$). Hence, both Lintner's and Brittain's explicit depreciation model better explain variation in dividend policy of textile companies. However, inclusion of current year depreciation (Brittain's explicit depreciation model) in addition to variables in the Lintner's models does not make any difference and estimated coefficient of this variable is also not significant statistically. Therefore, Lintner's model is found to be inappropriate for explaining the dividend policy of textile companies. In the Lintner's model, strength of unique relationship of last year dividend ($\beta=0.4870$, $t = 6.27$, $p < 0.01$) is much higher than that of current year profit after tax ($\beta=0.0597$, $t = 4.91$, $p < 0.01$). Therefore, it may be concluded that last year dividend followed by current year profit after tax is the best predictor of dividend policy of textile companies.

❁ **Results Of Empirical Analysis For The Total Sample** : For all selected companies across all industries under study, an examination of the regression results presented in Table 10 reveals that the fit of all the four models are significant statistically and coefficient of determination adjusted for degrees of freedom is 89.73 percent, 84.54 percent, 91.23 percent and 86.57 percent by Lintner's, Brittain's cash flow, Brittain's explicit depreciation and Darling's models respectively.

It seems that explanatory variables in the Brittain's explicit depreciation model could explain maximum variation in the dividend policy decision of all selected companies followed by Lintner's model. But additional variance explained by Brittain's explicit depreciation model with current year depreciation in addition to current year profit after tax and last year dividend is just 1.5 percent. However, the estimated coefficient for additional variable, current year depreciation is found to be significant, leading to the consideration of Brittain's explicit depreciation model as appropriate for explaining dividend policy of Indian companies. On the whole, it is summed up that paying dividend

Table 9: Results of Regression Showing Determinants of Dividend Policy based on Lintner's, Brittain's Cash Flow, Brittain's Explicit Depreciation and Darling's Dividend Model for Textile Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darling's Model
Intercept	0.1536	0.0872	0.2844*	0.5373***
	(1.57)	(0.62)	(1.84)	(2.69)
Current Year Profit After Tax (PAT_t)	0.0597***		0.0628***	0.0671***
	(4.91)		(5.03)	(3.22)
Last Year Profit After Tax (PAT_{t-1})				0.0163
				(0.71)
Current Year Free Cash Flow (FCF_t)		0.0268**		
		(2.58)		
Last Year Dividend (DIV_{t-1})	0.4870***	0.5449***	0.4883***	
	(6.27)	(6.55)	(6.29)	
Current Year Depreciation (DEP_t)			-0.0207	-0.0165
			-(1.09)	-(0.65)
Change in Sales in Three Years (ΔSAL_{t0-t2})				0.0011
				(0.39)
R^2	0.4872	0.3917	0.4942	0.2585
Adjusted R^2	0.4754	0.3777	0.4765	0.2190
F Value	41.33***	28.01***	28.01***	6.54***
DF for Models	2, 87	2, 87	3, 86	4, 75

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.

Figures in brackets are 't' values for estimated coefficients.

Table 10: Results of Regression Showing Determinants of Dividend Policy based on Lintner's, Brittain's Cash Flow, Brittain's Explicit Depreciation and Darling's Dividend Model for All Companies

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darling's Model
Intercept	-7.2144**	-4.8090	0.1633	2.2087
	-(2.32)	-(1.25)	(0.06)	(0.54)
Current Year Profit After Tax (PAT_t)	0.1665***		0.2142***	0.3010***
	(28.12)		(32.93)	(25.26)
Last Year Profit After Tax (PAT_{t-1})				0.0567***
				(3.87)
Current Year Free Cash Flow (FCF_t)		0.0759***		
		(12.89)		
Last Year Dividend (DIV_{t-1})	0.6045***	0.9536***	0.5582***	
	(25.16)	(40.82)	(24.85)	
Current Year Depreciation (DEP_t)			-0.1720***	-0.2282***
			-(13.56)	-(11.63)
Change in Sales in Three Years (ΔSAL_{t0-t2})				0.0002
				(0.13)
R^2	0.8975	0.8457	0.9126	0.8663
Adjusted R^2	0.8973	0.8454	0.9123	0.8657
F Value	4677.10***	2925.90***	3712.90***	1533.70***
DF for Models	2, 1068	2, 1068	3, 1067	4, 947

***Significant at 1% level. **Significant at 5% level.

Figures in brackets are 't' values for estimated coefficients.

to shareholders is positively decided by the Indian companies based on last year dividend, current year profit after tax when there has been significant decline in current year depreciation.

CONCLUSION

Based on the empirical analysis of the financial data of selected companies, it is found that the Lintner's model and the extension of Lintner's model with inclusion of depreciation (Brittain's explicit depreciation) best describes the dividend policy of the companies across most of the industries. It is further concluded from the application of basic and extended dividend model that current year profit after tax and dividend paid in the past in addition to current year depreciation are found to be the basic determinants of the dividend policy of Indian companies. This leads to the conclusion that paying dividend to the shareholders is decided based on the status of profitability and depreciation in the current year as well as the dividend policy in the past. The above inferences disproved the null hypotheses which read as follows:

i) There is no impact of profitability on dividend policy of Indian companies,

ii) The current year dividend policy is independent of the dividend policy of the companies in the past in India and

iii) There is no significant influence of depreciation on equity dividend payment of companies in India.

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