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APPLICATIONS OF DIVIDEND MODEL – A SPECIAL REFERENCE WITH CHEMICAL INDUSTRY

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Abstract:

The main objective of the study to find the dividend models which suits the various chemical industry. 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. The study sample of thirty companies selected from fertilizer industry, inorganic industry and organic industry of chemical industry based on purposive sampling techniques for the 10 years period from 2006-07 to 2015-16. The required data for the study has been collected through capital line data base. In this section the various models are tested with select data to know about to what extent these models are explaining the factors that affect the dividend policy. The results are arranged in the order, namely Lintners Model, Britain Cash Flow Model, Britains Explicit Depreciation Model and Darlings Model.

Introduction:

The dividend policy means, the policy that the mangers follow in deciding the size and pattern of cash distribution to shareholders overtime. Many theoretical models developed by academicians and researchers describe the factors that the managers should consider when making dividend policy decisions[1]. 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. In this back drop it is work note that, so many authors have made an sincere attempt in an identifying the factors that affects the dividend decision to quote a few, Lintners model, Britain cash flow model, Britains explicit depreciation model and Darlings model. Though there are plenty of models available, still it is difficult to come to a conclusion about the model that totally capable of explaining the factors that affects the dividend policy. In this juncture an attempt has been made to verify to what extent the above said models are suited to the industry which are considered by this study. The following paragraph will highlights the results of the study, it means it identifies the model which suits to the chemical industry in the present context.

Review of Literature:

Lintner (1956) finds that the dividend pattern of a firm is influenced by the current year earnings and previous year dividends[2]. Darling (1957) in his research substitutes lagged profit in place of lagged dividend in the Lintner's model. And he found support for the hypothesis that dividends will tend to vary directly with current profits, with past profits, depreciation and amortization recoveries and tend to vary inversely with persistent changes in the level of sales[3]. Britain (1966) he finds and indicated that the capacity of a firm to pay dividends has been better explained in terms of cash flow as a variable, i.e., profits after taxes plus depreciation as against the Lintner's profits net of taxes, as it reflected true earnings. The arguments advanced in favour of the inclusion of cash flows have been that depreciation does not reflect capital consumption but is an accounting change and as such need to be added back[4].

Objectives of the Study:

The following objective have framed based on reviews.

- ✓ To find the variable that affects the dividend in chemical industry.
- ✓ To know the dividend model that suits to various chemical industries.

Methodology:

The sample of thirty companies had been selected from fertilizer industry, inorganic industry and organic industry of chemical industry based on purposive sampling techniques for the 10 years period from 2006-07 to 2015-16. The required data for the study has been collected through Capitaline data base. In this section the various models are tested with select data to know about to what extent these models are explaining

the factors that affect the dividend policy. The results are arranged in the order, namely Lintners Model, Britain Cash Flow Model, Britains Explicit Depreciation Model and Darlings Model.

Lintner Model (1956): $DIV_t = a + \beta_1 PATt + \beta_2 DIV_{t1} + e$

Britain's Cash Flow Model (1966): $DIV_t = a + \beta_1 CF_t + \beta_2 DIV_{t1} + e$

Britain's Explicit Depreciation Model: $DIV_t = a + \beta_1 PAT_t + \beta_2 DIV_{t1} + \beta_3 DEP_t + e$

Darling's Model (1957): $DIV_t = a + \beta_1 PAT_t + \beta_2 PAT_{t-1} + \beta_3 DEP_t + \beta_4 \Delta SAL_t + e$

Where,

DIV_t = Current year Dividend
CFt = Current year Cash Flow
DIV_{t1} = Previous year divided
PAT_t = Current year Profit after Tax
DEP_t = Current year Depreciation
ΔSAL_t = Current year changes in sales over the proceeding the two years ($\Delta SAL_t = SAL_{t0-t2}$)

The results of various dividend models for industry wise and group wise are presented in Tables 1 to 4.

Table 1: Applicability of Dividend Models: Fertilizer Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darlings Model
Intercept	1.722	-3.122	-0.275	-2.788
	-0.401	(-.0664)	(-0.057)	(-0.477)
Current Year Profit After Tax (PATt)	0.200***		0.195***	0.235***
	-6.9		-6.604	-6.269
Previous Year Profit After Tax (PATt-1)				0.061
				-1.575
Current Year Cash Flow (CFt)		0.161***		
		-6.543		
Previous Year Dividend (DIVt-1)	0.414***	0.401***	0.394***	
	-5.005	-4.598	-4.598	
Current Year Depreciation (DEPt)			0.053	0.104
			-0.9	-1.499
Changes in Sales three year (ΔSALt0-t2)				0.002
				-0.476
R2	0.725	0.715	0.728	0.691
Adjusted R2	0.719	0.708	0.718	0.674
F value	114.674	109.023	76.552	41.912
DF for models	2,87	2,87	3,86	4,75

*** Significant at 1% level,

Figures in brackets are 't' value for estimated coefficient.

Best Suited Models: Fertilizer Industry:

The table 1 reveals that, the models Lintner and Britain's Explicit Depreciation Models are significant in explaining the factors that affects the dividend policy. The coefficient of determination adjusted for degree of freedom (adjusted R2) is the highest at 71.90 per cent for Lintners model followed by 71.8 per cent, 70.8 per cent and 67.4 per cent for Brittain's Explicit Depreciation model, Brittain's Cashflow Model and Darlings model respectively. Therefore, Lintners Model, which is Britains Cash flow Model with is considered as the most appropriate model for explaining the dividend policy decision of the companies under fertilizer industry. In the model the estimated coefficient of three variables, current year profit after tax ($\beta = 0.200$, $t = 6.900$, $p < 0.01$) and previous year dividend ($\beta = 0.414$, $t = 5.005$, $p < 0.01$) current year cashflow ($\beta = 0.161$, $t = 6.543$, $p < 0.01$) are significant with positive sign. So it is concluded that the last year dividend is the major factor followed by current year profit after tax, previous year dividend and current year cashflow influencing the dividend policy decision of the companies in fertilizer industry.

Best Suited Models: Inorganic Industry:

The table 2 reveals that, the two models such as Lintner and Brittain's explicit depreciation models are found to hold good in explaining the factors that influence the dividend policy. The coefficient of determination adjusted for degree of freedom (adjusted R2) is the highest at 44.5 per cent for Lintners Model followed by 43.9 per cent, 43.4 per cent and 42 per cent for Brittain's Explicit Depreciation Model, Brittain's Cashflow model and Darlings Models respectively. Therefore, Lintners model policy is considered as the most appropriate model for explaining the dividend policy decision of the companies in Inorganic industry. In the model the estimated coefficient of three variables, current year profit after tax ($\beta = 0.3.88$ $t = 4.505$, $p <$ 0.01) and previous year dividend ($\beta = 0.290$, $t = 2.870$, $p < 0.01$) and current year cash flow tax ($\beta = 0.316$, $t = 4.683$, $p < 0.01$) are significant with positive sign. So it is concluded that the last year dividend is the major factor followed

by current year profit after tax, previous year dividend and current year cashflow influencing the dividend policy decision of the companies in inorganic industry.

Table 2: Applicability of Models: Inorganic Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darlings Model
Intercept	-0.43	-0.491	-0.4	-0.966
	(-1.222)	(-1.350)	(-1.087)	(-1.336)
Current year profit after tax (PATt)	0.079***		0.082***	0.091**
	-4.743		-4.102	-2.384
Previous year profit after tax (PATt-1)				0.128**
				-2.558
Current year cash flow (CFt)		0.062***		
		-4.497		
Previous year Dividend (DIVt-1)	0.917***	0.896***	0.927***	
	-17.71	-15.709	-15.203	
Current year depreciation (DEPt)			-0.018	0.421***
			(-0.300)	-2.942
Changes in sales three year (ΔSALt0-t2)				-0.01
				(-1.639)
R2	0.913	0.911	0.913	0.739
Adjusted R2	0.911	0.909	0.91	0.725
F value	455.953	445.57	300.821	53.116
DF for models	2,87	2,87	3,86	4,75

*** Significant at 1% level, ** significant at 5% level, * significant at 10% level

Best Suited Models: Organic Industry:

The result of regression analysis which identifies the determinants of dividend policy based on Lintners, Brittain's Cash flow, Brittain's Explicit Depreciation and Darlings model for organic industry are presented in the table 3. It reveals that, the two models such as Lintner and Brittain's Cashflow models are explaining the variables that affect dividend policy. The coefficient of determination adjusted for degree of freedom (adjusted R2) is the highest at 91.1 per cent for Lintners Model followed by 91.0 per cent, 90.9 per cent and 72.5per cent for Brittain's explicit depreciation model, Brittain's cashflow model and Darlings models respectively. Therefore, Lintners model, which is the extent of Britains Cash flow model, is considered as the most appropriate model in explaining the dividend policy decision of the companies under organic industry. In the model the estimated coefficient of three variables, current year profit after tax ($\beta = 0.079$ $t = 4.743$, $p < 0.01$) and previous year dividend ($\beta = 0.894$, $t = 15.709$, $p < 0.01$) and current year cash flow tax ($\beta = 0.062$, $t = 4.497$, $p < 0.01$) are significant with positive sign. So it is concluded that the last year dividend is the major factor followed by current year profit after tax, previous year dividend and current year cashflow influencing the dividend policy decision of the companies in organic industry.

Table 3: Applicability of Models: Organic Industry

Explanatory Variables	Lintner's Model	Brittain's Cash Flow Model	Brittain's Explicit Depreciation Model	Darlings Model
Intercept	-0.651	-0.844	-0.54	-1
	(-0.883)	(-1.083)	(-0.668)	(-1.071)
Current Year Profit After Tax (PAT_t)	0.374***		0.388***	0.327**
	-4.9		-4.505	-2.62
Previous Year Profit After Tax (PAT_{t-1})				0.300**
				-2.309
Current Year Cashflow (CF_t)		0.316***		
		-4.683		
Previous year Dividend (DIV_{t-1})	0.271***	0.290***	0.271***	
	-2.686	-2.87	-2.665	
Current Year Depreciation (DEP_t)			-0.114	-0.212
			(-0.344)	(-0.549)
Changes in Sales three year (ΔSAL_{t0-t2})				-0.016
				(-0.548)
R^2	0.457	0.447	0.458	0.449
Adjusted R^2	0.445	0.434	0.439	0.42
F value	36.68	35.173	24.245	15.289

DF for models	2,87	2,87	3,86	4,75

*** Significant at 1% level, ** significant at 5% level
Figures in brackets are 't' value for estimated coefficient.

Table 4: Applicability of Models: Overall Industry

Explanatory Variables	Lintner's Model	Brittain's Cash flow Model	Brittain's Explicit Depreciation Model	Darlings Model
Intercept	0.276	-0.783	-0.21	-0.67
	-0.226	(-0.617)	(-0.167)	-0.451
Current year profit after tax (PATt)	0.201***		0.193***	0.231***
	-12.539		-11.54	-10.807
Previous year profit after tax (PATt-1)				0.064***
				-2.876
Current year cash flow (CFt)		0.154***		
		-11.916		
Previous year Dividend (DIVt-1)	0.427***	0.408***	0.403***	
	-9.101	-8.185	-8.254	
Current year depreciation (DEPt)			0.052*	0.092**
			-1.657	-2.513
Changes in sales three year (ΔSALt0-t2)				0.002
				-0.669
R2	0.789	0.781	0.791	0.76
Adjusted R2	0.787	0.779	0.789	0.756
F value	498.86	476.176	335.664	185.736
DF for models	2,267	2,267	3,266	4,235

*** Significant at 1% level, ** significant at 5% level, * significant at 10% level
Figures in brackets are 't' value for estimated coefficient.

Best Models: Overall Industry:

The result of regression showing the determinants of dividend policy based on Lintners, Brittain's Cash flow, Brittain's Explicit Depreciation and Darlings model for overall industry are presented in the table 4. It reveals that, the three models such as Lintners, Britains Cashflow and Brittain's Explicit Depreciation Models are more significant in explaining the factors which affects the dividend policy. The coefficient of determination adjusted for degree of freedom (adjusted R^2) is the highest at 78.9 per cent for Brittain's explicit depreciation model followed by 78.7 per cent, 77.9 per cent and 75.6 per cent for Lintners model, Brittain's cashflow model and Darlings models respectively. Therefore, Lintners Model, Britains Cash flow Model and Brittain's Explicit Depreciation Model is considered as the most appropriate model for explaining the dividend policy decision of the companies under overall three industries. In the model the estimated coefficient of Four variables, current year profit after tax ($\beta = 0.201, t = 12.539, p < 0.01$), previous year dividend ($\beta = 0.429$, $t = 9.101$, $p < 0.01$) , current year cash flow tax ($\beta = 0.154, t = 11.916, p < 0.01$) , current year depreciation ($\beta = 0.052$, $t = 1.657$, $p < 0.10$) are significant with positive sign. So it is concluded that the last year dividend is the major factor followed by current year profit after tax, previous year dividend, Current year cashflow and Current year depreciation are influencing the dividend policy decision of the companies in all industries.

Conclusion:

Based on the empirical analysis of financial data of select companies, it is found that the Lintners model and Brittain's Cashflow model are the most appropriate models that are capable of explaining the factors that affects the dividends irrespective of industry classification. It is further concluded from the result that, the current year profit after tax, previous year dividend and current year Cashflow are found to be the basic determinants that affect the dividend policy of select Indian chemical industry.

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