Does Lintner model of dividend payout hold good? An empirical evidence from BSE SENSEX firms.

N.R. Parasuraman

SDM Institute for Management Development, Mysore

P. Janaki Ramudu

School of Business, Alliance University, Bangalore

Nusrathuunisa

School of Business, Alliance University, Bangalore

Abstract

This study primarily investigates into as to what influenced the dividends payment of BSE constituent companies for the years 2002 through as latest as 2011. The primary model used is that of Lintner (1956) with addition of relevant factors. The study tests three models including Lintner's basic model. While dividends paid is criterion variable in all the models, basic earnings and lagged dividends are predictor variables in the first model (Lintner model, 1956), cash earnings and lagged dividends in the second model and growth opportunities (depreciation and capital expenditure) in the third model are the predictor variables. The study tests the hypotheses if the dividends paid (criterion variable) depended on basic earnings, lagged dividends, cash earnings and capital expenditure. The multiple regression analysis has been performed using SPSS 15.0 version through ENTER method for every year and for all the years on an aggregate basis across the sample companies. Significance 'F' revealed that in all the three models dividends paid depended significantly (at 5% significance level) on all predictors variables. The value of multiple 'R' indicated that the models were very strong. Co-efficient of determination (R^2) also revealed that the explained portion of the relationship between criterion and predictor variables has been very high and significant enough to accept the model fit. However, standardized beta co-efficients (â) and 't' statistic revealed that basic earnings, cash earnings and lagged dividends exercised highest impact on dividends paid in most of the years during the study period. On the other hand, other predictor variables, depreciation and capital expenditure, did not have any significant impact on the dividends paid. The Durbin Watson coefficient indicated that multi co-linearity among predictor variables was strong enough to accept the validity of the model almost during the entire period of the study. Thus the results and findings of the study support the prevalence and relevance of Lintner model of dividend policy. This means that the finance manager can't afford to ignore the variables like earnings capacity and lagged dividends while framing a dividend policy.

Key Words

Dividends payout, equity earnings, lagged dividends, target ratio, adjustment factor, growth opportunity.

Introduction

Dividend policy is the most polemical topics in finance. Finance scholars have affianced in encompassing the theory to explicate why companies should pay or not pay dividends. Other investigators have originated and through empirical observation tested various models to explain dividend behavior. Some investigators have surveilled corporate managers and institutional investors to define their views about dividends. In spite of extensive deliberations and research, the actual motive for dividend payment remains a puzzle.

The dividend policy subject is like the capital structure decision. The important constituents are not difficult to distinguish; but the reciprocal action between those constituents is complicated and no promiscuous solution exists. Dividend policy is polemical, many implausible understandings are contributed for why dividend policy may be crucial and many of the claims formed about dividend policy are economically consistent.

Gordon(1959) and Lintner(1956) corroborates that the capital resulting from retained earnings are more uncertain and risky than dividends. Accordingly it is conceived that the earnings of a firm with low payout ratio will be capitalized at a higher rate than that of the earnings of a higher payout firm. They contended that dividends are preferred to capital gains due to their certainty. This dividend relevance theory is also called as 'bird in hand theory'.

The Financial experts have analysed two characteristics in corporate dividend policies: long-run payout ratio and stability of dividends. The major aspect of dividend policy of the firm is to determine the appropriate allocation of profits between dividend payments and additions to the firm's source of finance in the form of retained earnings. The important issues pertaining to firms overall dividend policy are legal, liquidity, control issues, stability of dividends, stock splits, administrative considerations and of course, cash position etc..

Many investors, both retail and institutional feel that stability of dividends has positive effect on the share price. Stable dividends tend to resolve uncertainty in the minds of investors and also have a positive utility to investors interested in current periodic income. Many companies follow target dividend payout policy, and increase dividends when they feel that increase in earnings can be maintained.

Literature review

John Lintner (1956) contends that dividends are adjusted to changes in earnings only with a lag. He studied the association between earnings and dividend behavior by conducting interviews with the employees of numerous large and well established firms of USA. Fama and Babiak (1968) examined the causal factors of dividend payments by individual firms during 1946-64 and concluded that net profits provides a better measure of dividend than either cash flows or net profit. Depreciation is also included as separate variable in the model. Baker, Farrelly and Edelman (1986) surveilled 318 New York Stock Exchange firms and concluded that the major determinants of dividend payments are predicted level of future earnings and pattern of past dividends. DeAnogelo H and DeAngelo L (1990) studied the dividend policy adjustments of 80 NYSE firms to extended financial distress as evidenced by multiple losses during 1980–1985 and resulted in dividend reductions. Pruitt and Gitman (1991) inquired financial managers of the 1000 largest U.S. firms and reported that, current and past year' profits are important factors influencing dividend payments and found risk involved also as a determinant for the firms' dividend policy. Hyun Mo Sung, Jorge L. Urrutia (1995) tested the joint implications for the intertemporal behavior of stock prices and dividends expressed in the Lintner dividend model and the present value model of stock prices. The results showed that dividends and stock prices exhibit a contemporary causal relation. Baker and Powell (2000) concluded from their survey of NYSE-listed

firms that dividend determinants are industry specific and anticipated level of future earnings is the major determinant. Aivazian *et al.* (2003) find little evidence that Book Ratio or size affects dividend policy in a significant way. Finally, for emerging market companies, they find that dividends are negatively related to the assets tangibility and also concluded that the higher ROE lead to more dividend payments. Ho (2003) presents a comparative study of dividend policies in Australia and Japan. He finds the following relationships: dividend policy is positively affected by size in Australia and by liquidity in Japan, and negatively by risk only in Japan. These results support the agency, the signalling, and the transaction cost theories of dividend policy. Omran and Pointon (2004) investigate the role of dividend policy in determining share prices, the determinants of payout ratios, and the factors that affect the stability of dividends for a sample of 94 Egyptian firms. They find that retentions are more important than dividends in firms with actively traded shares, but that accounting book value is more important than dividends and earnings for non-actively traded firms. Stephen R. Foerster and Stephen G. Sapp (2006), investigated the changes in dividend policy for Bank of Montreal, considering the relationships between dividends, prices and earnings. The results suggested that investors' perception of dividends has changed overtime, allowing management to pay smaller dividends and reinvest funds in the firm. B S Bodla, Karam Pal and Jasvir S Sura(2007) re-examined the applicability of Lintner's (1956) dividend policy in banking sector in India. The results indicate that the major determinants of current dividend are lagged dividend and the current earnings in case of both Public Sector Banks and Private Banks. I.M. Pandey and Ramesh Bhat (2007) emphasized on dividend payout behavior of firms under monetary policy restrictions in India. Their finding suggests that the restricted monetary policies have a significant influence on the dividend payout behavior of Indian firms; they cause about a 5-6 percent reduction in the payout ratios. Basil Al-Najjar, (2009) finds that the dividend policy in Jordan is influenced by factors similar to those relating to developed countries such as: leverage ratio, institutional ownership, profitability, business risk, asset structure, growth rate and firm size. The results show that the Lintner model is valid in Jordanian data, and that Jordanian firms have target payout ratios and that they adjust to their target relatively faster than firms in more developed countries. Fazli Haleem., et al., (2011) examined the perceptions of managers of dividend-paying firms listed on Karachi Stock Exchange (KSE) on factors influencing dividend policy, issues relating dividend policy and the corporate governance practices. They find strong support for the life cycle theory followed by agency theory, signaling theory and the catering theory respectively and also shows the presence of corporate governance practices in the surveyed firms.

Problem statement and purpose of the study

While we find numerous studies on the dividend payout behavior of firms in various countries across the globe, we still fail to identify very specifically as to what exact factors would drive the payout behavior in a corporate. Though we could identify a broad set of such factors, the specific factors that drive the payout decision in individual sectors, firms or any country may vary depending up on the situation. We also may not rule out the influence of age of the company and the industry and the time horizon as the determinants of dividend payout policy. Upon careful review of the literature on the subject we found very scant studies focusing on the dividend payout behavior of Indian firms. We therefore recognize the need for investigating into as to what Indian firms' dividend payout decision depended on during the last ten years period. To be specific we set the following objective and achieve the same for the study.

1. To examine the applicability of basic Lintner model as well as the extended versions and variation of this model on dividend behavior of SENSEX constituent firms.

2. To identify the influence and its extent of specific variables that drove the dividend payout behavior of SENSEX constituent firms.

Methodology of the study

Methodology of the study consists of hypotheses formulation, model development, data sampling and a brief discussion of tools of analysis.

Hypotheses

Keeping in view the implications and the factors influencing pay out decision, as revealed in literature survey, the study proposes to test the following hypotheses.

H_1: SENSEX constituent firms take dividend payout decision independent of current year's earnings position and the dividends paid in the preceding year.

H_2: SENSEX constituent firms take dividend payout decision independent of current year's cash earnings position and the dividends paid in the preceding year.

H_3: SENSEX constituent firms take dividend payout decision independent of current year's earnings position, dividends paid in the preceding year, depreciation expense in the current year and capital expenditure (CAPEX) in the current year.

H_4: Time factor does not have any impact on the dividend payout decision of SENSEX constituent firms.

Model development

Basic Lintner model and its extended versions i.e., Cash Flow Model and Segregated Cash Flow Model are used for investigating the dividend payment behavior of SENSEX constituent companies. The following are the model equations used in the study.

Lintner's Basic Model

$$D_t = á + â_1 E_{t+} â_2 CE_{t-1} + \mu \quad \text{…. Model 1}$$

Cash Flow Model

$$D_t = á + â_1 E_{t+} â_2 CE_{t-1} + \mu \quad \text{…. Model 2}$$

Segregated Cash Flow Model or explicit depreciation model

$$D_t = á + â_1 E_t + â_2 D_{t-1} + â_3 Dep_t + â_4 CAPEX_t + \mu \quad \text{…. Model 3}$$

Where, D_t = Dividend in the current year

D_{t-1}= Lagged dividend (Dividend in the previous year)

E_t = Earnings per share in the current year

CE_t = Cash Earnings per share in the current year

Dep_t = Depreciation in the year t

$CAPEX_t$ = Capital expenditure in the year t, and

μ= Standard Error term.

In Lintner Model two parameters embedded in the firm s dividend behavior, i.e. kr and (1-k) are impounded in $â_1$ and $â_2$ (regression coefficients) respectively. These parameters are as follows:

Target Payout Ratio (r)

Target payout ratio is a firm's long-run dividend-to-earnings ratio. The firm's policy is to attempt to pay out a certain percentage of earnings, but it pays a stated or pays stable dividend and adjusts it to the target as base line increases in earnings occur. The target payout ratio is computed using regression coefficients, i.e.

$$\mathbf{r = â_1 / (1-â_2)}$$

Adjustment factor (k)

It interprets the quantity $(1-â_2)$ as a safety factor that management uses to avoid increasing the dividend payment to level that cannot be maintained.

$$\mathbf{k = 1 - â_2}$$

in fact, taking Lintner's basic model (Model 1 mentioned above in this study) forward, john Britain substituted cash flows for profits and called it 'cash flow model' (model 2 mentioned above in this study) and in his second model he split cash flows into two, profits and depreciation and called it explicit depreciation model (Model 3 mentioned above in this study). Thus we base our research primarily on Lintner's basic model and its extended versions by John Britain. We also have added another independent variable, capital expenditure to model 3 in order to see if the dividend payout decision of the firms depended on new investments also. A few inputs with respect to model development have also been derived from the study conducted by Bodla and Sura (2007).

Sample and data source

The study constitutes BSE SENSEX constituent firms as the sample. The reference period for the present study is from the year 2002 to 2011, i.e., period of 10 years. Presently 30 companies have been listed on this index. However, due to information constraints the sample size differed in few years, i.e., 28 companies in 2002, 29 companies from 2003 to 2008 and 30 companies in 2009 to 2011. The list of specific companies could not be presented due to space and constraint. 'Capitaline' database maintained by Centre for Monitoring Indian Economy (CMIE) is the prime source of data for the study purpose.

Tools of analysis

In order to explain the implications of the study and to test the hypotheses, multiple regression analysis has been performed using SPSS 15.0 version through ENTER method. The model for a multiple regression takes the following form:

$$y = \acute{a} + ß_1x_1 + ß_2x_2 + ß_3x_3 + ... + \mu$$

where y is the criterion variable, á is the intercept, $\hat{a}_1$, $\hat{a}_2$….are regression co-efficients, x_1,x_2…are predictor variables, μ is the standard error.

A few discussions about the implications of the model outcome and key statistics are as follows:

Multiple R and R^2

A multiple regression allows the simultaneous testing and modeling of multiple independent variables. R^2 is a statistic that gives some information about the goodness of fit of a model. In regression, the R^2, also called coefficient of determination, is a statistical measure of how well the regression line approximates the real data points. An R^2 of 1.0 indicates that the regression line perfectly fits the data. Values of R^2 outside the range 0 to 1 can occur where it is used to measure the agreement between observed and modeled values and where the "modeled" values are not obtained by linear regression and depending on which formulation of R^2 is used. Values for R^2 can be calculated for any type of predictive model, which need not have a statistical basis.

Adjusted R^2 adjusts for the number of explanatory terms in a model. Unlike R^2, the adjusted R^2 increases only if the new term improves the model more than it would be expected by chance. The adjusted R^2 can be negative, and will always be less than or equal to R^2. Adjusted R^2 does not have the same interpretation as R^2. It is particularly useful in the feature selection stage of model building. The use of an adjusted R^2 is an attempt to take account of the phenomenon of statistical shrinkage.

Beta co-efficient

In statistics, beta coefficients are the estimates resulting from an analysis carried out on variables that have been standardized so that their variances are 1. Therefore, standardized coefficients refer to

how many standard deviations a dependent variable will change, per standard deviation increase in the predictor variable. Standardization of the coefficient is usually done to answer the question of which of the independent variables have a greater effect on the dependent variable in a multiple regression analysis, when the variables are measured in different units of measurement. A regression carried out on original (unstandardized) variables produces unstandardized coefficients. A regression carried out on standardized variables produces standardized coefficients. While both standardized and un-standardized coefficients are possible to estimate from the original variables, un-standardized betas are considered in this study as the data of all variables have been in similar terms.

't' Statistic

The "t'' statistic is computed by dividing the estimated value of the parameter by its standard error. This statistic is a measure of the likelihood that the actual value of the parameter is not zero. The larger the absolute value of t, it is less likely that the actual value of the parameter could be zero.

Standard error

The standard error is the standard deviation of the sampling distribution of a statistic. The term may also be used to refer to an estimate of that standard deviation, derived from a particular sample used to compute the estimate.

The standard error of the mean is the standard deviation of those sample means over all possible samples drawn from the population. Secondly, the standard error of the mean can refer to an estimate of that standard deviation, computed from the sample of data being analyzed at the time.

Sig. F or 'p' value

The "F value'' statistics test the overall significance of the regression model. Specifically, it tests the null hypothesis that all of the regression coefficients are equal to zero. This tests the full model against a model with no variables and with the estimate of the dependent variable being the mean of the values of the dependent variable. The F value is the ratio of the mean regression sum of squares divided by the mean error sum of squares. Its value will range from zero to an arbitrarily large number.

Durbin-Watson statistic

The "Durbin-Watson test for autocorrelation'' is a statistic that indicates the likelihood that the deviation (error) values for the regression have a first-order auto regression component. The regression models assume that the error deviations are uncorrelated. The Durbin Watson's coefficient indicates if there existed autocorrelation among the error terms of models. From the view point of model justification, there should not be auto correlation among the error terms. A Watson's coefficient closer to 2 indicates that there is no auto correlation and any deviation this value implies that there is auto correlation.

Analysis and interpretation of results

The analysis has been carried in the order of model 1, model 2 and model 3. While SPSS output gave many figures, only the most important statistical outcomes are taken into account and have summarized in the tables accordingly.

Table 1 : Summary details of regression model between dividends payout, the dependent variable and earnings and lagged dividends as the independent variables (Model 1)

Year	á	R	R^2	Adj. R	Std. Error(μ)	R^2 Change	Sig. F
2002	1.44	0.92	0.85	0.84	6.94	0.85	0.0001
2003	3.76	0.82	0.67	0.64	4.39	0.67	0.0001
2004	4.09	0.80	0.64	0.61	14.62	0.64	0.0001
2005	7.70	0.90	0.80	0.79	5.09	0.80	0.00
2006	-2.38	0.88	0.77	0.75	18.17	0.77	0.00
2007	-4.22	0.90	0.82	0.80	19.30	0.82	0.00
2008	-15.54	0.93	0.86	0.85	19.19	0.86	0.00
2009	-9.36	0.97	0.94	0.93	12.71	0.94	0.00
2010	7.77	0.79	0.62	0.59	13.36	0.62	0.00
2011	8.34	0.78	0.60	0.57	14.08	0.60	0.00

Table 1(a) : Beta coefficients and't' values of independent variables (earnings and lagged dividends) and Durbin Watson' coefficient of in model 1

Year	Earnings (E_t)		Lagged Dividends (D_{t-1})		Durbin Watson
	$\hat{a}_1$	t-value	B_2	t-value	
2002	0.178*	-9.01	0.07	-0.95	1.43
2003	0.118*	-3.96	0.313*	-3.35	1.44
2004	0.203*	-3.15	0.402*	-4.47	1.19
2005	0.09*	-5.03	0.437*	-7.8	1.97
2006	0.389*	-4.82	0.298*	-3.97	1.64
2007	0.387*	-6.01	0.16	-1.96	1.60
2008	0.626*	-7.36	0.11	-1.53	1.35
2009	0.476*	-12.52	0.04	-0.84	1.79
2010	0.17	-2.16	0.392*	-4.16	1.21
2011	0.18	-2.22	0.392*	-4.07	1.50

*Significant at 5% level.

Table 1 contains the details pertaining to regression models, through ENTER method that reveal if the dividend decision of the firm depended significantly on earnings and lagged dividend together. Significance F (also called 'p' value) in all the years was below 0.05 and hence we understand that dividend decision of the firms depended significantly on earnings and lagged dividends. Based up on this observation, we reject null hypothesis, $\mathbf{H_1}$ and prove that dividend decision of BSE SENSEX firms did consider earnings and lagged dividends into consideration while deciding on their payout ratio in every year. Multiple 'R' in the table reveals that the correlation between dividends payout ratio as the dependent variable and earnings and lagged dividends as the independent variables is high in almost all the years. 'R^2' is also reveals that the portion of the relationship explained is found to be high except for the years like 2011, 2010 and 2004. Table 1(a) captures un-standardized beta co-efficients, 't' values of independent variables, earnings and lagged dividends and Durbin Watson's coefficient of the model 1. The influence of earnings on dividend payout ratio was not significant in the years 2010 and 2011 while it was significant in the rest of the years. The 't' statistic of the earnings beta co-efficient reveals that the impact of earnings on dividend payout ratio was highest in year 2009 followed by 2002 and 2008 and 2007. On the other hand the beta co-efficeints of lagged dividends was significant only in the years 2003, 2004, 2005, 2006, 2010 and 2011. In the rest of the years lagged dividends could explain any significant impact on the dividend payout ratio of the firms. However, the 't' statistic of beta co-efficients of lagged dividends reveals that its impact was no so high in any year unlike that of earnings. It is also worth noting that the Durbin Watson's coefficient was closer to 2 only in the years 2005 and 2009. This in turn indicates that there was auto correlation among the error terms of the models in the rest of years. This means that the results obtained through the regression models in these years was erroneous and hence may not relied up on to conclude concretely that earnings and lagged dividends influenced the payout decision. Thus based on the outcome of the model, we conclude that though we reject null hypothesis, $\mathbf{H_1}$ the other statistics, 't' and Durbin Watson, indicate that the impact of earnings and lagged dividends on payout decision is not so strong in many years.

Table 2 : Summary details of regression model between dividends payout, the dependent variable and cash earnings and lagged dividends as the independent variables (Model 2)

Year	á	R	R^2	Adj. R^2	Std. Error(µ)	R^2 hange	Sig. F
2002	1.77	0.92	0.85	0.84	6.76	0.85	0.00
2003	3.88	0.81	0.65	0.63	4.41	0.65	0.00
2004	2.72	0.81	0.65	0.62	14.12	0.65	0.00
2005	7.57	0.89	0.79	0.78	5.12	0.79	0.00
2006	2.39	0.83	0.69	0.67	20.73	0.69	0.00
2007	1.54	0.84	0.71	0.69	23.62	0.71	0.00
2008	-13.55	0.89	0.79	0.78	22.63	0.79	0.00
2009	-11.57	0.95	0.90	0.89	15.73	0.9	0.00
2010	8.34	0.78	0.61	0.58	13.57	0.61	0.00
2011	8.4	0.77	0.60	0.57	14.17	0.6	0.00

Table 2(a) : Beta coefficients and 't' values of independent variables (cash earnings and lagged dividends) and Durbin Watson' coefficient of in model 2

Year	Cash Earnings (CE_t)		Lagged Dividends (D_{t-1})		Durbin Watson
	$\hat{a}_1$	t-value	B_2	t-value	
2002	0.121*	-9.21	0.04	-0.54	1.99
2003	0.089*	-3.82	0.345*	-3.88	1.64
2004	0.19*	-3.4	0.391*	-4.47	1.33
2005	0.077*	-4.89	0.53*	-8.13	2.13
2006	0.51*	-3.31	0.365*	-4.47	1.5
2007	0.345*	-3.82	0.82*	-3.11	1.41
2008	0.52*	-5.55	0.18	-2.15	1.29
2009	0.448*	-9.62	0.07	-1.16	1.72
2010	0.14	-1.93	0.071*	-4.45	1.16
2011	0.15	-2.12	0.403*	-4.22	1.48

*Significant at 5% level.

The summary details pertaining to model 2 are portrayed in table 2. The Sig. F of the model is found to be less than 0.05 in all and hence we reject null hypothesis, $\mathbf{H_2}$ and prove that dividend decision of BSE SENSEX firms depended on the cash earnings and lagged dividends together in every year. Multiple 'R' indicates that the correlation between payout ratio and cash earnings and lagged dividends was high in all the years. The 'R^2' reveals that the variation in dividend payout ratio was strongly explained by the independent factors cash earnings and lagged dividends in majority of the years. The model was not so strong only in the years 2010 and 2011 since 'R^2' was relatively low when compared to that of the rest of the years. Table 2(a) contains un-standardized beta coefficients and 't' statistics of independent variables cash earnings and lagged dividends in model 2. As in the case of earnings in model1, coefficient of cash earnings in model 2 was not significant in the years 2010 and 2011 indicating that the dividend payout decision did not significantly depend on this factor in these two years. On the other hand the beta coefficient of lagged dividends in model 2 was not significant in the years 2002, 2008 and 2009 respectively. Thus but for a few years, cash earnings and lagged dividends could exercise the impact on the dividend payout decision of the firms in almost all the years. The 't' statistic of the two beta coefficients in also reveal that the extent of the influence of cash earnings and lagged dividends was not very high during the study period. With these observations we have, the Durbin Watson's in

table 2 indicates that there was auto correlation among the error terms of models during the study period except in the years 2002 and 2005 in which this coefficient was close to 2. This means that the model has not been justified in most of the years though we reject H_2.

Table 3 : Summary details of regression model between dividends payout, the dependent variable and earnings, lagged dividends,depreciation and capital expenditure as the independent variables (Model 3)

Year	á	R	R^2	Adj. R^2	Std. Error(μ)	R^2 Change	Sig. F
2002	2.12	0.93	0.87	0.85	6.76	0.87	0.00
2003	2.96	0.84	0.70	0.65	4.35	0.70	0.00
2004	4.04	0.80	0.64	0.58	15.21	0.64	0.00
2005	7.15	0.90	0.81	0.77	5.23	0.81	0.00
2006	-1.01	0.89	0.78	0.75	18.39	0.78	0.00
2007	-1.51	0.91	0.83	0.80	19.36	0.83	0.00
2008	-11.6	0.96	0.92	0.90	15.06	0.92	0.00
2009	-5.3	0.98	0.96	0.95	10.30	0.96	0.00
2010	6.79	0.79	0.63	0.57	13.64	0.63	0.00
2011	7.53	0.79	0.62	0.56	14.38	0.62	0.00

Table 3(a) : Beta coefficients and't' values of independent variables (earnings, lagged dividends, depreciation and capital expenditure) and Durbin Watson' coefficient of model 3

Year	Earnings (E_t)		Lagged Dividends (D_{t-1})		Depreciation (Dep_t)		Capital Expenditure ($CAPEX_t$)		Durbin Watson
	$\hat{a}_1$	t-value	$\hat{a}_2$	t-value	$\hat{a}_3$	t-value	$\hat{a}_4$	t-value	
2002	0.151*	-6.25	0.14	-1.64	0.00	-0.85	0.00	-0.15	1.50
2003	0.117*	-3.74	0.349*	-3.34	0.00	-1.44	0.00	-0.32	1.56
2004	0.21	-3	0.401*	-4.28	0.00	-0.02	0.00	-0.18	1.19
2005	0.091*	-4.89	0.449*	-7.38	0.00	-0.74	0.00	-0.19	2.03
2006	0.404*	-4.85	0.288*	-3.77	0.00	-0.81	0.00	-1.09	1.69
2007	0.394*	-6.06	0.15	-1.83	-0.01	-1.23	0.00	-1.01	1.63
2008	0.708*	-10.15	0.06	-0.96	0.012*	-4.07	0.00	-2.85	1.47
2009	0.495*	-15.78	0.02	-0.57	0.007*	-3.52	0.00	-3.31	2.02
2010	0.22	-2.22	0.373*	-3.72	0.00	-0.64	0.00	-0.95	1.23
2011	0.22	-2.35	0.375*	-3.66	0.00	-0.61	0.00	-0.93	1.51

*Significant at 5% level.

The summary details of regression model 3 that we developed in the study are captured in table 3. These details pertain to understand as to how dividend payout decision of sample firms got influenced by four independent variables called earnings, lagged dividends, depreciation and capital expenditure respectively. As in the case of models 1 and 2, Sig. F of the model 3 is also less than 0.05 in all the years and hence we reject the null hypothesis, H_4 and conclude that the dividend payout decision of the sample firms depended on independent variables. This in other words means that earnings, lagged dividends, depreciation and capital expenditure did have influence on dividend payout decision of SENSEX constituent firms. 'R^2' statistic reveals that the model fit was strong enough to conclude that the explained portion of the relationship was higher in almost all the years barring 2004, 2010 and 2011. This indicates that using all four independent variables (earnings, lagged dividends, depreciation and capital expenditure) to understand as to how the dividend payout is much strong. However when we observe the beta coefficients and 't' statistics of these four independent variables, mentioned in table 3(a), we realize that depreciation and capital expenditure could not influence the payout decision almost during the entire period of study. While earnings also did not have significant impact the payout decision in the years 2004, 2010 and 2011, lagged dividends did not have significant impact in four years 2002, 2007, 2008 and 2009. A keen observation into the 't' statistic of coefficients of these variables reveals that the extent of effect, of course wherever significant, was on the lower side. The Durbin Watson's coefficient was closer to 2 only in the years 2005, 2006 and 2007. This means that there was autocorrelation among the error terms of the models in the rest of the years hinting the models being not fully justified. On an overall basis, as model 3 suggests, we understand that two independent variables, earnings and lagged dividends, only significant and explainable influence on dividend payout decision of SENSEX firms.

Table 4 : Target Ratios and Adjustment Factors of model 1, model 2 and model 3

Year	Target Payout Ratio $r=\hat{a}_1/(1-\hat{a}_2)$			Adjustment Factor $k=1-\hat{a}_2$		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
2002	0.19	0.13	0.18	0.93	0.96	0.86
2003	0.17	0.14	0.18	0.69	0.66	0.65
2004	0.34	0.31	0.34	0.60	0.61	0.60
2005	0.16	0.14	0.17	0.56	0.55	0.55
2006	0.55	0.40	0.57	0.70	0.64	0.71
2007	0.46	0.34	0.46	0.84	0.72	0.85
2008	0.70	0.63	0.75	0.89	0.82	0.94
2009	0.50	0.48	0.51	0.96	0.93	0.98
2010	0.28	0.15	0.34	0.61	0.93	0.63
2011	0.30	0.25	0.36	0.61	0.60	0.63
Average	0.37	0.30	0.39	0.74	0.74	0.74
Variance	0.03	0.02	0.03	0.02	0.02	0.02
S.D	0.16	0.15	0.17	0.14	0.14	0.14
't' Value	6.36	5.47	6.38	15.44	14.98	15.11

Target ratios and adjustment factors of all the three models during the study period are mentioned in table 4. Both the ratios in case of all the models are different in the years due to the fact that the coefficients of earnings and lagged dividends varied according to the model fit. As we know target payout ratio indicates firms' policy with respect to payment of earnings in form of dividends to the shareholders. While this does ratio does not reveal rupee amount of dividends, it simply mentions as to what portion of earnings are proposed to be paid out as the dividends to the shareholders and therefore this is the major limitation of target ratio. A close look into the table, we find that there is no much variation in the target ratios of all the three models in every year. However we find high volatility in the target ratios across the years. It varied between the lowest of 16% in the year 2005 and the highest of 70% in 2008 in case of model. In case of model 2, it varied between lowest of 13% in the year 2002 and the highest of 63% in 2008. And in case of model 3 it varied between the lowest of 17% in the year 2005 and the highest of 57% in 2006. This scenario reveals that SENSEX firms did not follow any specific pattern in having target payout ratio. The adjustment factor reveals the firms' being aggressive or conservative (Prasanna Chandra, 2011) in distribution of earnings to the shareholders as the dividends. While higher factor indicates aggressive payout policy, lower factor reveals conservative policy. As we see in table 4, the adjustment factor in case of all the three models is almost same in every year but for minor differences. Year wise adjustment factor (2002 through 2011) is relatively on the higher side in almost all the years with an exception in the year 2005. It is also worth noting that average adjustment ratio of all the three models is equal i.e. 74%. This indicates that SENSEX firms were relatively aggressive in getting dividends payment adjusted towards target payout ratio.

Table 5 : ANOVA details of Dividend Payout Ratio of sample firms

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3548485.913	9	394276.213	1.347	.212
Within Groups	82519175.682	282	292621.190		
Total	86067661.595	291			

The summary details of ANOVA for dividend payout ratio of sample firms across the years 2002 through 2011 have captured in table 5. As the Sig. F is greater than 0.05, we accept null hypothesis, $\mathbf{H_4}$ and conclude that dividend payout ratio of SENSEX firms did not vary significantly during the study period. To be precise, this implies that the time factor did not have any impact on the way the firms decided the payout ratio.

Conclusion

In this paper we tried to test empirically as to how SENSEX firms went about dividend payout decision. While there are many studies on the topic we feel that the research on dividend policies of the firms in any country is topic to be discussed and debated continuously. Having taken Lintner's model basic model and its extended versions by John Britain, we tested four hypotheses to find if the payout decision of SENSEX firms depended on the factors like earnings cash earnings, lagged dividends, depreciation and capital expenditure. At the outset the study revealed that dividend payout decision of the firms depended on almost all the factors mentioned earlier. However,

the study revealed that the payout decision did not significantly depend on capital expenditure of the firms. From this, we understand that the growth factor was not a constraint for the firms while paying dividends. The ANOVA for payout ratio of the firms also revealed that, the time factor did not have anything to do the dividend decision. Therefore, in way we prove that Lintner's model holds good to a larger extend in case of SENSEX firms. This study, we hope, is of great significance to the managers, investors and other stakeholders in terms of providing necessary inputs about the payout behavior of the firms. We sincerely believe that the study has made its own contribution and enhanced the value towards body of knowledge pertaining to dividend decisions and policies.

References

Aivazian, V., Booth, l., Cleary, S. (2003), "Do emerging market firms follow different dividend policies from US firms?", Journal of Financial Research, Vol. 26 No.3, pp.371-87.

B S Bodla, Karam Pal and Jasvir S Sura(2007) "Examining Application of Lintner's Dividend Model in Indian Banking Industry", The ICFAI Journal of Bank Management, Vol. VI, No. 4, pp. 40-59.

Baker,H.Kent,and Garry E.Powell.,(2000) ,"Determinants of corporate dividend policy: a survey of NYSE firms" , Financial Practice and education 9, pp29-40.

Basil Al-Najjar, (2009) "Dividend behaviour and smoothing new evidence from Jordanian panel data", Studies in Economics and Finance, Vol. 26 Iss: 3, pp.182 – 197

DeAnogelo H and DeAngelo L (1990), "Dividend Policy and Financial Distress: An Empirical Investigation of Troubled NYSE Firms", Journal of Finance, Vol. 45, pp. 1415-1431.

Eugene F. Fama and Harvey Babiak (1968), "Dividend Policy: An Empirical Analysis", Journal of the American Statistical Association, Vol.63, No. 324, pp. 1132-1161.

Fazli Haleem, Ijaz-Ur-Rehman, Attiya Y. Javid, "The Dividend Policy in Manufacturing Sector of Pakistan: The Perception of Corporate Managers", Journal of Economics and Behavioral Studies,Vol. 3, No. 1, pp. 63-75.

Gordon, Myron J. (1959). "Dividends, Earnings and Stock Prices". Review of Economics and Statistics (The MIT Press) 41 (2): 99–105.

Ho, H. (2003), "Dividend policies in Australia and Japan", *International Advances in Economic Research*, Vol. 9 No.2, pp.91-100.

Hyun Mo Sung, Jorge L. Urrutia (1995), "Long- term and short- term causal relations between dividends and stock prices: a test of Lintner's dividend model and the present value model of stock prices", The Journal of Financial Research, Vol.XVIII, No. 2, pp. 171-188.

I.M. Pandey and Ramesh Bhat, "Dividend behaviour of Indian companies under monetary policy restrictions" Managerial Finance Volume: 33 Issue: 1.

Linter, J (1956), "Distributions of incomes of corporations among dividends, retained earnings and taxes", American economic Review, 46(1), pp. 97-113.

Miller, M.H. and Modigliani, F. (1961), ''Dividend policy, growth, and the valuation of shares'',Journal of Business, Vol. 34, pp. 411-33.

Omran, M., Pointon, J. (2004), "Dividend policy, trading characteristics and share prices: empirical evidence from Egyptian firms", *International*

Journal of Theoretical and Applied Finance, Vol. 7 No.2, pp.121-33.

Pruitt, S.W. and Gitman, L.W (1991), The interactions between the investment, financing, and dividend decisions of major US firms, Financial review, Vol.26 No.33, pp.409-30.

Stephen R. Foerster and Stephen G. Sapp(2006), The Changing Role of Dividends: A Firm-level Study from the Nineteenth to the Twenty-First Century", The Canadian Journal of Economics , Vol 39, No.4, pp.1316-1344.

Prasanna Chandra (2011), Financial Management, Theory and Practice, Eigth Edition, Tata McGraw Hill Education Private Ltd. P.547.

Authors' Profile

Dr. N. R. Parasuraman is presently the Director of SDM Institttue For Management Development, Mysore and has 30 years of experience in diverse areas of finance. He was the Company Secretary of Federal Bank for 5 years. *LLB, Fellow member of Institute of Company Secretaries of India, Fellow member of the Cost and Management Accounting Institute, Ph.D* He has worked as Finance Manager of KEK group of Companies, Trivandrum and as a Securities Analyst for JOINDRE CAPITAL SERVICES, Mumbai. He has been in full-time academics for the last fourteen years. His special areas of teaching and research are Strategy, Financial Derivatives and Multinational Finance. He has authored a book titled 'FUNDAMENTALS OF FINANCIAL DERIVATIVES' published by Wiley India Limited, which is very popular among the teachers and students of Derivatives, and has gone into a second edition. He is also currently an Adjunct Faculty at the Indian Institute of Management, Kozhikode. He has published 30 papers and concept articles in various journals. He can be contacted at nrparasuraman@sdmimd.ac.in

Prof. P Janaki Ramudu is a doctorate in finance, a post-graduate in Management and a graduate in Commerce from Sri Venkateswara University, Tirupati. He is currently associated with School of Business, Alliance University, Bangalore as a Professor of Finance. Dr. Ramudu has twenty two years of experience in teaching, research and administration in the field of Management Education. He is the life member of AIMA, NHRDN, Research Development Association (RDA), ISTD and Consultancy Development Cell (CDC). He also served as the secretary of NHRDN-Hosur Chapter for a period of three years and rendered yeomen services to the same. He conducts Management / Executive Development Programmes for various organizations. He published a lot more research papers in leading journals like Finance India, South Asian Journal of Management, Journal of Decisions and Mathematical Sciences, to quote a few. His area of research interest is Corporate Finance. Prof.Ramudu can be reached at:
pjanakiramudu@yahoo.co.in and
janakiramudu.p@alliance.edu.in

Ms. Nusrathuunisa is a Post-graduate in Commerce from Bangalore University , Post Graduate in Management and Master of Philosophy from Madurai Kamaraj University and a graduate in Mangement from Bangalore University, . She is currently associated with School of Business, Alliance University, Bangalore as a Teaching Assistant in the Area of Finance. Nusrath has seven years of experience in teaching and research in the field of Management Education. She has participated in various conferences both national and international and also recently started publishing articles in journals of repute. Her area of research interest is Accounting & Corporate Finance. Ms. Nusrath can be reached at:
nusrathun@yahoo.com or
nusrathunnisa.i@alliance.edu.in