

Examining Validity of Known Dividend Models in Indian Companies

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Abstract- Dividend declaration is considered as one of the key focus areas of the firm's financial policy. The core of dividend policy includes the decision like whether to distribute profits to the shareholders in the form of dividend or to retain. The dividend decision, one of the widely researched topics, yet named as dividend puzzle, has been a center of attraction for the past number of decades. The outcome of the past researches has resulted in development of number of models trying to explain the dividend behavior of the companies. Some of the well-known dividend models are: Lintner's model, Brittain's model, Watt's model and Aharony's and Swary's model. Considering the importance of the models, an attempt has been made to study their applicability in Indian conditions. This study investigates whether these models can be used to explain Indian companies' dividend payments or not. 172 companies listed with BSE with continuous dividend payments from 2004-08 have been selected in four industrial sectors: Engineering, FMCG, IT and Textiles. The study bring forth that out of all the models, Lintner's model does have a good fit in the selected Indian companies.

Keywords- Dividend; Lintner's model; Brittain,s model; Watts model; Aharony and Swary's model

1. INTRODUCTION

Dividend declaration is considered to be one of the most imperative tools for the distribution of value to the shareholders. The core of dividend policy includes the decision like whether to distribute profits to the shareholders in the form of dividend or to retain it in the form of retained earnings, the payout ratio etc. Dividend policy adopted by a firm has an inference in the practical life for all whether it is manager or the organization's stakeholders.

The dividend decision, one of the widely researched topics, yet named as dividend puzzle, has been a center of attraction for the past number of decades. The outcome of the past researches has resulted in development of number of models trying to explain the dividend behavior of the companies. Some of the well-known dividend models are: Lintner's model, Brittain's model, Watt's model and Aharony's and Swary's model. The testing of these models has extensively been undertaken in foreign researches. Considering the importance of these models, an attempt has been made to study the applicability of well-known dividend models in Indian conditions.

Lintner's Dividend Model

Lintner's model provides a good intuitive explanation of dividend payments. The essence of Lintner's dividend model is that, if a firm persisted with its target payout ratio, then the dividend payment in the ensuing year (Div1) would equal a constant proportion of earnings per share

(EPS1). If a firm adhered to its target payout ratio, it would change its dividend whenever its earnings changed. However, the managers of the companies believed that shareholders prefer a steady progression in dividends. As per Lintner (1956), the historical rate of dividend is generally considered for the determination of current dividends by many companies. In addition current earnings are invariably the starting point in considering the change in dividend policy. Thus, dividend payout is a function of net current earnings after tax and dividend paid in the previous year (lagged dividend). This can be expressed as:

$$D_t = a + b_1 P_t + b_2 D_{t-1} + u_t$$

Where,

D_t = total equity dividend in period 't'

D_{t-1} = total equity dividend in period 't-1'

P_t = net current earnings after tax in period 't'

u_t = error term

The net current earnings after tax, P_t , represent the capacity of a firm to pay dividends. Lagged dividend, indicates a possible reluctance on the part of the management to reduce the dividends already declared. The rationale of this dividend function is that firms try to achieve a certain desired pay-out norm in the long run. It is this preference for stability in the rate of dividend; that the firms make only a partial adjustment to the rate of dividend each year in response to any change in net current earnings. The rate of dividend is thus stabilized with reference to the target

level of dividends. The absolute amount of dividend in a given year is changed by a function known as speed-of-adjustment coefficient. It is the difference between the target amount and actual dividend payment. Thus, the model suggests that the dividend policy is related to a target level of dividends and to the speed of adjustment of change in dividends. Lintner's model till date is considered as widely acknowledged and suitable model to study the dividend decision even today. In the words of Myers (1984)

"John Lintner's model of how firms set dividends dates back to 1956 and it still seems to work..."

Brittain's Model

Brittain (1966) suggested that cash flow (net current earnings after tax plus depreciation) is a better measure of a company's capacity to pay dividends. Dividend payment is considered a charge prior to depreciation and, hence should be related to earnings gross of depreciation. The regulation and accounting practices with respect to depreciation allowance keep on changing, thus net current earnings would fail to reflect the movement of true earnings that is the ultimate basis of ability to pay dividends. He used the cash flow version of Lintner's model in his study entitled 'Corporate Dividend Policy'. This model can be algebraically expressed as:

$$D_t = a + b_1 C_t + b_2 D_{t-1} + u_t$$

Where,

- D_t = total equity dividend in period 't'.
- C_t = cash flow in period 't'
- D_{t-1} = total equity dividend in period 't-1'.
- u_t = error term

Brittain also used depreciation, (A_t) as separate explanatory variable along with net current earnings after tax and lagged dividends. Thus, one of his regression equations was of the form:

$$D_t = a + b_1 P_t + b_2 D_{t-1} + b_3 A_t + u_t$$

Where,

- D_t = total equity dividend in period 't'.
- P_t = net current earnings after tax in period 't'
- D_{t-1} = total equity dividend in period 't-1'.
- C_t = cash flow in period 't'
- A_t = depreciation charged in period 't'
- u_t = error term

Watt's Asymmetric Information Signaling and Earnings Expectation Model

Asymmetric information models of dividend payments have generally been termed as Signaling Models. In these models, it is assumed that managers know more about the true value of the firm's stream of earnings than investors do. Managers of undervalued firms are thus eager to convey information about the quality of the firm to investors, using all the tools available to them. For these signals to be credible, they need to represent a higher cost for firms with poor earnings than to firms that actually have very optimistic earnings forecasts. Watts (1973) was the first to test directly the relationship between future changes in profitability and current and past dividend policy. The model proposed is:

$$D_t = a + b_1 D_{t-1} + b_2 E_t + b_3 E_{t-1} + e_t$$

Where,

- D_t = total equity dividend in period 't'.
- D_{t-1} = total equity dividend in period 't-1'.
- E_t = Earnings per Share in period 't'
- E_{t-1} = Earnings per Share in period 't-1'
- e_t = error term

Aharony and Swary's Dividend Expectation Model

Aharony and Swary (1980) forecasted that abnormal stock performance can be very well predicted by a simple dividend forecasting model. The model is well applicable in the situation where managers are reluctant to make changes in dividend unless they firmly believe in the firm's position. This model was assumed by them to be more successful and reliable in predicting abnormal performance as compared to Fama and Babiak (1968) model.

$$D_t = a + b_1 D_{t-1} + b_2 E_t + b_3 P_{t-1} + e_t$$

Where,

- D_t = total equity dividend in period 't'.
- D_{t-1} = total equity dividend in period 't-1'.
- E_t = Earnings per Share in period 't'
- P_{t-1} = Share Price in period 't-1'
- e_t = error term

2. REVIEW OF LITERATURE

Dividend is considered as an important facet of organisation's financing decision and has attracted the researchers all over the world to find its underlying secrets. A lot many researchers had contributed in the dividend arena.

Lintner (1956) undertook one of the classic studies on how managers in USA made dividend decisions. For

conducting the study, he constructed a model comprising of variables like size of firm, expenditure on plant and equipment, willingness to use external financing, use of stock dividends, earnings stability and ownership by control groups. A sample of 600 industrial listed companies was taken. In his study, he uncovered the fact for the first time that firms in USA maintained a target dividend payout ratio and adjusted their dividend policy to this target. The long-term sustainable investment and growth objectives determined the firms' target payout ratios. Further, he also found that firms pursued a stable dividend policy and gradually increased dividends given the target payout ratio. *Mookerjee (1992)* made an attempt to apply the Lintner model to developing countries, focusing on India. For this purpose, the data of aggregate Indian corporate sector for the time period 1949-81 was taken. The study concluded that the model applies well in Indian conditions. *Mahapatra and Sahu (1993)* analysed the determinants of dividend policy using the models developed by Lintner (1956), Darling (1957) and Brittain (1966). The sample size for the study was 90 companies covering the period 1977-78 to 1988-89. The study exposed the fact that cash flow was the major determinant followed by net earnings. Further, the study concluded that only past dividend was a major factor in influencing the dividend decision of a firm. *Lee (1996)* tried to test the existence of long-term relationship between earnings and dividend. For this purpose, the data was taken from S&P Index for the year 1871-1992 and bivariate time-series model has been used. The study concluded that earnings determine dividends. Further, the study also concluded that Lintner's model performed well when target pay-out ratio is a function of permanent earnings. *Kaur (1997)* conducted the doctoral research on determinants of corporate dividend policy in India. The sample for the study consisted of 29 companies in Chemical industry, 20 companies in Metals and Alloys, 17 companies in Electrical industry and 34 in Engineering industry, totaling 100 companies. The data was analysed using multiple linear regression model. The validity of known dividend models was also examined. The study concluded that Lintner's model is well applicable in the selected companies. *Olatundun (nd)* conducted a 882 firm-year study on a sample of 63 quoted firms in Nigeria over a wider testing period from 1984 to 1997. Dividend behavior was tested using the Lintner-Brittain model and its variants on the pooled cross sectional / time series data for the full sample of observations from 1984-1994. The models were estimated using the Ordinary Least Square (OLS) method. The result showed that there was no significant interaction between the conventional Lintner / Brittain model and dividend decisions of Nigerian firms.

Ben et al. (2002) conducted a study on the determinants and dynamics of dividend policy. The study was conducted on 48 firms listed on Tunisian Stock Exchange during

1996-2002. The study was carried out with a view to find out whether the managers smooth out the dividends or not along with finding out the determinants that drives the dividend policy. In order to study the former, Lintner's model was applied and for the latter, panel regression was performed. The study demonstrated that Tunisian firms relied on both the current earnings and past dividends but the weight age was more for current earnings. *Kumar (2003)* conducted a study to explore the association between the corporate governance and the dividend payout policy for a panel of Indian corporate firms over the period 1994- 2000. The study made an attempt to explain the observed behavior with the help of well-established dividend models of Linter (1956) and Fama and Babiak (1968). The study brought out the existence of a positive association of dividends with earnings and dividends trend. *Pandey (2003)* conducted a study on corporate dividend policy and behavior of Malaysian companies. The study was conducted using financial data of 248 companies listed on the KLSE (Kuala Lumpur Stock Exchange) Main Board as at 31 December 2000. The results showed the influence of industry on payout ratios. Further, using Lintner's framework and panel regression methodology, he found evidence of less stable dividend policies being pursued by the Malaysian companies. *Anand (2004)* undertook a study to analyze the factors influencing the dividend policy decisions of corporates in India. For conducting the study, the results of 2001 survey of 81 CFOs of bt-500 companies had been used. The study concluded that most of the firms had target dividend payout ratio and dividend changes followed shift in the long-term sustainable earnings. Further, the findings on dividend policy were in agreement with Lintner's study on dividend policy and concluded that it was used as a signaling mechanism to convey information on the present and future prospects of the firm and thus affect its market value. *Benzinho et al. (2004)* made an attempt to study how the corporations that trade in the Lisbon Stock Exchange set their dividend policies in a different institutional environment and research empirically whether the corporations followed stable cash dividend policies as in developed markets where dividend smoothing is a management tendency. For this purpose, the dividend policy model of Lintner (1956) was used. The Lintner model was estimated by using panel data regressions. The empirical results showed that the Euronext Lisbon corporations followed a relatively stable cash dividend policies and the main factors that determined the dividends was the earnings of the firm in that year and the lagged dividends.

Pandey and Bhatt (2004) conducted a study on dividend behavior of Indian companies under monetary policy restrictions. The final sample of the study consisted of 571 manufacturing firms and the observations were taken from 1989-1997. The Lintner's model was used to test the

dividend stability in Indian firms. The results reflected that the Indian firms had lower target ratios and higher adjustment factors. *Sarma and Kuin (2004)* examined the corporate dividend behavior of Malaysian companies listed on Kuala Lumpur stock exchange through the application of Lintner's stock adjustment model from 1998-2001. The results of the study were found to be consistent with the Lintner's model. The empirical results showed that the main determinants of dividend policy were lagged dividends and current earnings. The study also concluded that the companies' dividend policy was guided by the twin concepts of target payout ratio and adjustment factor as enunciated by Lintner.

3. NEED AND OBJECTIVE OF THE STUDY

After a deep insight into the literature, it was found that ample research is required in the field of Dividends and the known dividend models with special emphasis on Lintner's model in Indian companies. The present paper focused on the primary objective of examining the applicability and validity of Lintner's model in Indian companies.

HYPOTHESIS

In order to empirically verify the above objectives the following null hypothesis was framed and tested:

Mookerjee (1992) in the study concluded that Lintner's model, a well-known dividend model, fits into Indian conditions. The results were further supported by the study of Mahapatra and Sahu (1993). Kaur (1997) has also examined the validity of some known dividend models like Lintner's model, Pettit model, Watts's model, Charest model and Aharony and Swary's model and has concluded that Lintner's model is the best among all the models and fits very well in Indian conditions. Besides these, the validity of Lintner's model has been made in context of foreign countries. On the basis of findings of the previous studies, the hypothesis has been framed.

H₀: Number of studies has been conducted on Lintner's dividend model and its applicability. However, the validity of the said model varies with the scope in various studies. Thus, in order to examine the validity, the null hypothesis has been framed that *Known Dividend Models do not fit into Indian conditions.*

4. DATA BASE AND METHODOLOGY

Data Base

This paper focuses on the applicability and validity of well-known dividend models: Lintner's, Brittain's, Watt's and Aharony and Swary's, in Indian companies. For this purpose, the study was carried out on secondary data of

172 companies in Engineering, FMCG, IT and Textiles industry, listed on Bombay Stock Exchange. The data has been collected from Prowess database. The companies have been selected on the basis of the following criteria:

- i. The companies must be listed with Bombay Stock Exchange.
- ii. The companies must have paid dividend from 2004-08.

Statistical Tools & Techniques

The present study had been analyzed using Multiple Regression Analysis. Multiple Regression analysis was used to test the validity of known dividend models in Indian industries under study. The variance inflation factor (VIF) was used to assess the multi-collinearity. Threshold values of tolerance above .10 (Hair et al., 1998) and VIF scores of less than 10 suggest minimal multi-collinearity and stability of the parameter estimates (Neter et al., 1985; Dielman, 1991). For carrying out the analysis, SPSS software has been meticulously used.

5. ANALYSIS AND INTERPRETATIONS

The validity of known dividend models in India has also been studied on grouped data basis where different models have been applied to grouped data of different industries for all the four years, that is, 2005-08.

A) Year 2005

The variance inflation factor (VIF) scores, as shown in Table 1 and the VIF ranged between 1.038 and 5.181.

The regression results of various models for the year 2005 are presented in table 2. The table shows that in 2005, only Lintner's model significantly explained the dividend decision of the companies under study. Further analysis of the regression coefficients indicates that values of R^2 (coefficient of multiple determination), R^2 (adjusted coefficient of determination) and F value of the coefficients, all signified the influence of explanatory variables on the dependent variable DPS_t in all the 4 years under study.

The values of R^2 and R^2 remained higher than 0.8 for all the three models. The t-values of regression coefficients of two explanatory variables in Lintner's model, P_t and D_{t-1} were significant at 10% and 1% level of significance respectively. However, another well-known model of dividend, Brittain's model, deemed to be inapplicable in Indian companies as only one explanatory variable D_{t-1} was significant at 1% level. In case of Watt's model, it offered only partial explanation for the dividend decision of Indian companies as only two explanatory variables viz. D_{t-1} and E_t were significant at 10% and 1% level of significance respectively. The t-value of the third explanatory variable of Watt's model, E_{t-1} , showed insignificant results. Similar

was the case with Aharony and Swary's model of dividend as in this case also significant influence was exerted by two explanatory variables D_{t-1} and E_t that were significant at 10% and 1% level of significance. The third variable P_{t-1} showed insignificant results. It can, thus, be concluded that of all the models, Lintner's model showed best validity in explaining the dividend decision of Indian companies in terms of dividend per share in the year 2005 while other three models were only partially applicable.

B) Year 2006

The variance inflation factor (VIF) scores, as shown in Table 3 ranged between 1.002 and 6.412. The regression results of various models for the year 2006 are presented in table 4. The table shows that in 2006, only Lintner's and Watt's model significantly explained the dividend decision of the companies under study. The analysis of the regression coefficients indicates that values of R^2 (coefficient of multiple determination), R^2 (adjusted coefficient of determination) and F value of the coefficients were moderately significant. The t-values of regression coefficients of two explanatory variables in Lintner's model, P_t and D_{t-1} were significant at 1% level of significance. Another well-known model of dividend, Brittain's model, deemed to be inapplicable in Indian companies as only one explanatory variable D_{t-1} was significant at 1% level. In case of Watt's model, it offered best explanation for the dividend decision of Indian companies as all the three explanatory variables viz. D_{t-1} , E_t and E_{t-1} were significant at 1% level of significance respectively. In case of Aharony and Swary's model of dividend, significant influence was exerted by only one explanatory variable E_t that was significant at 1% level of significance. The other two variables D_{t-1} and P_{t-1} showed insignificant results. It can, thus, be concluded that of all the models, Lintner's model and Watt's model showed best validity in explaining the dividend decision of Indian companies in terms of dividend per share in the year 2006 while Brittain's model was only partially applicable and Aharony and Swary's model was inapplicable in Indian companies.

C) Year 2007

The variance inflation factor (VIF) scores, as shown in Table 5 ranged between 1.033 and 2.358. The regression results of various models for the year 2007 are presented in table 6. The table shows that in 2007, only Lintner's model significantly explained the dividend decision of the companies under study. Further analysis of the regression coefficients indicates that values of R^2 (coefficient of multiple determination), R^2 (adjusted coefficient of determination) and F value of the coefficients were moderately significant. The t-values of regression coefficients of two explanatory variables in Lintner's model, P_t and D_{t-1} were significant at 5% and 1% level of

significance respectively. Another well-known model of dividend, Brittain's model, deemed to be inapplicable in Indian companies as only one explanatory variable D_{t-1} was significant at 1% level. In case of Watt's model, it offered best explanation for the dividend decision of Indian companies as two explanatory variables viz. D_{t-1} and E_t were significant at 5% and 10% level of significance respectively while in case of third variable E_{t-1} , the results were insignificant. In case of Aharony and Swary's model of dividend, significant influence was exerted by only one explanatory variable D_{t-1} and E_t that were significant at 1% and 10% level of significance. The other variable P_{t-1} showed insignificant results. It can, thus, be concluded that of all the models, Lintner's model showed best validity in explaining the dividend decision of Indian companies in terms of dividend per share in the year 2007 while Brittain's model, Watt's model and Aharony and Swary's model were partially applicable in Indian companies.

D) Year 2008

The variance inflation factor (VIF) scores, as shown in Table 7 ranged between 1.002 and 1.560. The regression results of various models for the year 2008 are presented in table 6.40. The table shows that in 2008, Lintner's model, Brittain's model and Aharony and Swary's model significantly explained the dividend decision of the companies under study. The analysis of the regression coefficients indicates that values of R^2 (coefficient of multiple determination), R^2 (adjusted coefficient of determination) and F value of the coefficients were moderately significant. The t-values of regression coefficients of two explanatory variables in Lintner's model, P_t and D_{t-1} were significant at 1% level of significance. Another well-known model of dividend, Brittain's model, deemed to be applicable in Indian companies as the explanatory variables C_t and D_{t-1} were significant at 10% and 1% level respectively. In case of Watt's model, it offered best explanation for the dividend decision of Indian companies as the two explanatory variables viz. D_{t-1} and E_t were significant at 1% while in case of third variable E_{t-1} , the results were insignificant.

In case of Aharony and Swary's model of dividend, significant influence was exerted by all the three explanatory variables D_{t-1} , E_t that were significant at 1% level of significance and P_{t-1} that was significant at 10% level of significance. It can, thus, be concluded that of all the models, Lintner's model, Brittain's model and Aharony and Swary's showed best validity in explaining the dividend decision of Indian companies in terms of dividend per share in the year 2008 while Brittain's model was partially applicable in Indian companies.

6. CONCLUSION

Due to lack of research on validity of dividend models in India, an attempt to test the same in Indian industries has

been made in this chapter. The analysis brings forth the fact that Lintner's model of dividend is the best among all the models analysed in this chapter. The dividend behavior of Indian industries under study has well been explained by Lintner's model for the study period 2004-08. The model states that dividend is governed by two financial variables viz. current earnings and lagged dividends. The same holds true for all the industries under study. The other three models, viz. Brittain's model, Watt's model and Aharony and Swary's model do not offer satisfactory explanation of dividend behavior of Indian industries in all the four years under study. Further, it was revealed that lagged dividend is considered more important and influential for determining the dividend followed by current earnings. Cash flow and share prices have little influence on the dividend decision of the companies during the period under study.

It can further be concluded that applicability of these models differ on time and industry basis. And out of all the four models considered under study, only Lintner's model of dividend has emerged as best model having applicability in Indian industries for the time period under study.

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