Dividend Policy: An Empirical Analysis Of The Greek Market

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Abstract

This paper explores the corporate dividend policy in the Greek market. Assuming that managers are reluctant to make dividend changes that might have to be reversed, we test the hypothesis that corporate dividends are associated with past dividends, as well as the performance and the effective management of the firms. The net income available to stockholders and the sales are employed as dummy variables that capture the performance and the effective management of the sampling firms respectively. The estimations have been performed using panel data procedure for a sample of 149 Greek companies listed in the Athens Stock Exchange during 1996 – 2001. The empirical results support the hypothesis that companies distribute a dividend according to their performance their effective management and are not willing to change their dividend policy frequently.

1. Introduction

During the last fifty years corporate finance researchers have embark on a considerable theoretical and empirical investigation on the factors that affect the level of the dividend that a firm is willing to pay. The cause of that concern is firstly that a company's dividend decision has a direct impact on its financial mix and secondly that the magnitude of the dividend may affect the market value of the firm. At first, there is a trade-off between paying dividends and retaining the earnings within the firm. Let us assume that the management of a firm has already decided how much to invest and has chosen its debt-equity mix for financing these investments. The decision to pay a large dividend means simultaneously deciding to retain little, if any, earnings; this in turn results in a greater reliance on external equity financing. Conversely, given the firm's investment and financing decisions, a small dividend payment corresponds to high earnings retention with less need for externally generated equity funds. On the other hand there are three basic views regarding the dividend payment's effect on stock price. The first view implies that an increase in dividend payout has a positive impact on the value of the firm[1]; the second suggests that there exists a negative effect on the value of the company[2] and the third that dividend policy has no influence on the total price of the firm[3]. However, the empirical research on that field has provided conflicting results[4]. In consequence, much work remains to be done before the academic finance community is able to offer definite guidance to corporate managers.

In this paper we construct a model that formulates the dividend payout policy in the Greek market during the period 1996 – 2001. There have been only three attempts in the Greek finance literature to tackle this issue. This work comprises an improvement on the third study and is conducted from the same researchers. Moreover, this article is the first one, which examines the possible link between dividend policy and the effective management of the firm, by employing pooling techniques and Greek panel data, over a recent period.

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1 See Gordon (1963), and Lintner (1962).
2 See Lintzenberger and Ramaswamy (1979).
3 See Miller and Modigliani (1961).
4 For more information see Frankfurter and Wood, Jr. (2002), Allen and Michaely (1995), Barclay, Smith and Watts (1995), and Short, Zhang, and Keasey (2002).

The paper is organized as follows. A discussion of the empirical models and their results is provided in section 2. Section 3 describes the data and the variables used. Section 4 presents the model employed in the study. Section 5 reports the results of the empirical analysis. The paper finishes in section 6 with the conclusions.

2. Empirical Models Of Dividend Policy

In the mid-1950s, John Lintner conducted a classic series of interviews with corporate managers about their dividend policies. He started with over 600 listed firms and selected 28 for detailed investigation. The criterion to reject the 572 companies was that all of them did not accomplish simultaneously all the alternative conditions that he sets. Lintner (1956) made a number of important observations concerning the dividend policies of these companies. First, firms are primarily concerned with the stability of dividends. Second, earnings were the most important determinant of any change in dividends. Third, dividend policy was set first and other policies were then adjusted, taking dividend policy as given.

Lintner model his findings by suggesting that each firm i has a target dividend payout ratio (r_i). Then, the target dividend at time t, (D_{it}^*), would be a proportion of the real earnings of the firm i at time t, (E_{it}); that is,

$$D_{it}^* = r_i E_{it}$$

In real world the dividend, which the firm finally pays, at time t (D_{it}) differs from the target one (D_{it}^*). Thus, it appears more reasonable to model the change between the actual dividend at time t and time t-1, instead of the actual dividend at time t only. Taking the change in actual dividends into account, it is realistic and consistent with the long-run target payout ratio, to assume that the change in actual dividend at time t (D_{it} - $D_{i,t-1}$) is equal to a constant portion (α_i) plus the speed with which the actual dividend, at time t-1, has adjusted to the target dividend at time t (D_{it}^* - $D_{i,t-1}$); that is,

$$D_{it} - D_{i,t-1} = a_i + c_i \left(D^*_{it} - D_{i,t-1} \right)$$

where c_i indicates the fraction of the difference between the target dividend (D_{it}^*) and the actual payment made in the preceding year ($D_{i,t-1}$), which the firm will intend on the average to reflect in its current year's dividend as an increase (or decrease) from the previous year's payment. The constant α_i will be zero for some firms but will generally be positive to reflect the greater reluctance to reduce than to raise dividends, and the influence of the desire of the most firms for a gradual growth in dividend payments.

Since the target dividend at time t is a proportion of the real earnings at time t, the final model is as follows:

$$D_{it} - D_{i,t-1} = a_i + c_i r_i E_{it} - c_i D_{i,t-1} \qquad (1)$$

where D_{it} is the actual dividend payment during period t, E_{it} is the earnings of the firm during period t, c_i is the "speed of adjustment coefficient" (which indicates the speed with which the actual dividend, at time t-1, has adjusted to the target dividend at time t), and r_i is the target payout ratio. This theoretical model can be estimated using the following econometric model:

$$\Delta D_{it} = a_i + \beta_1 E_{it} + \beta_2 D_{i,t-1} + \varepsilon_{it} \qquad (2)$$

where ΔD_{it} is the change in dividend from time t-1 to time t, for the firm i, β_1 represents the product c_i times r_i of the theoretical model, β_2 expresses the variable c_i of the theoretical model with negative sing (that is, $\beta_2 = - c_i$), and finally ε_{it} is the error of the model[5]. Lintner's estimation of the above model appeared fairly good, explaining 85% of the dividend changes in his sample of companies.

[5] $\beta_1 = c_i r_i \Rightarrow r_i = (\beta_1 / c_i) \Rightarrow r_i = (- \beta_1 / \beta_2)$.

Fama and Babiak (1968) undertook a more comprehensive study of the Lintner model's performance. Their starting point was the work of Lintner (1956). Their sample consists of 392 industrial firms over the period 1946 through 1964. Fama and Babiak tested the Lintner's model with their data and methodology and found that it performed well but it can be improved by introducing, as an additional explanatory variable, the earnings from the previous year without the constant term.

An alternative behavioral justification often used in the literature to derive equation (2) is the adaptive expectations model[6]. This model assumes that the dividend at time t is given by a proportion (κ_i) of the long-run expected earnings at time t (E_{it}^*) plus a disturbance term (v_{it}).

$$D_{it} = \kappa_i E_{it}^* + v_{it}$$

In addition, the model assumes that the change at t in long-run expected earnings (E_{it}^* - $E_{i,t-1}^*$), can be expressed as a proportion (λ_i) of the change between the actual earnings at time t and the expected long-run earnings at time t-1 (E_{it} - $E_{i,t-1}^*$); that is,

$$E_{it}^* - E_{i,t-1}^* = \lambda_i \left(E_{it} - E_{i,t-1}^* \right)$$

But if the successive earnings changes are independent, the optimal value of λ_i is one (full adjustment). Thus, the final theoretical model suggests that the change in dividend (D_{it} - $D_{i,t-1}$) is equal to a constant portion (α_i) plus the proportion (κ_i) of the actual earnings (E_{it}) minus λ_i times the dividend at time t-1 (note that the optimal λ is one):

$$D_{it} - D_{i,t-1} = a_i + \kappa_i E_{it} - D_{i,t-1} + v_{it}$$

However, Fama and Babiak (1968) claim that their estimations suggest that the adaptive expectations appears to be an inappropriate specification to their sample.

There are only three studies conducted for the Greek market. Patsouratis (1989) investigated empirically the Greek corporate dividend behavior employing analysis of covariance. The basis of this research is the classic work of Brittain (1964). His sample consists of 25 firms and covers the period 1974 – 1983. Joannos and Filippas (1997) examined the dividend policy of 34 firms listed in the Athens Stock Exchange during the period 1972 – 1988. Their empirical results lead to the general conclusion that Lintner's model best describes the dividend policy of the Greek firms. Current profits constitute the most important variable that tends to influence the change in dividends while the previous period dividends tend to also significantly influence the change in the dividend policy of the firms.

Vasiliou and Eriotis (2003) test the model of Lintner and suggest two different versions that improve the original model introduced by Lintner. In their first version of the Lintner's model, they consider as dependent variable the change in dividend between time t and time t-1 and as independent variables the change in the earnings of the firm between time t and t-1 and the change in dividend between time t-1 and t-2:

$$\Delta D_{it} = a_i + \beta_1 \Delta E_{it} + \beta_2 \Delta D_{i,t-1} + \varepsilon_{it} \qquad (3)$$

where D_{it} is the dividend of the firm i at time t, E_{it} is the net income of the firm i available to stockholders at time t, ΔD_{it} (= D_{it} - $D_{i,t-1}$) is the change between the dividend at time t and time t-1, for the firm i, ΔE_{it} (= E_{it} - $E_{i,t-1}$) the change in the net income available to stockholders, at time t and time t-1, and ε_{it} is the error at time t.

[6] For a discussion, see Brittain (1966), pp. 27-31.

The next empirical model that they test considers the same variables, dependent and independent, but this time without the changes between time t and t-1:

$$D_{it} = a_i + \beta_1 E_{it} + \beta_2 D_{i,t-1} + \varepsilon_{it} \qquad (4)$$

The findings of Vasiliou and Eriotis (2003) suggest that the Greek firms follow a discrete dividend policy. That is, the dividend payout of a firm depends upon the firm's long-run target dividend which is adjusted according to the net earnings of the firm.

3. Data And Variables

Our empirical investigation about the determinants of dividend payout uses a sample of firms listed in the Athens Stock Exchange (ASE) market during the period 1996 – 2001. All the companies that included in the sample fulfill two basic criteria. First, all of the firms were listed in the market in 1995. This criterion was imposed to ensure that dividend policy was not distorted by the effects of a recent official listing. Second, none of the sample firms was expelled from the market during the period examined. The sample was further reduced to 149 firms, as a result of missing data. This number of firms corresponds to 63% of the listed companies on the Athens Stock Exchange in 1996.

In order to examine empirically the dividend models discussed in the previous section, the key variables of interest are measures of dividends (D), earnings (E), and sales (S). These variables were derived from data collected from the financial database of the Athens Stock Exchange. Dividends ($D_{i,t}$) are calculated as the total amount of dividends of the firm i at time t, and earnings ($E_{i,t}$) as the net income available to stockholders for the firm i at time t.

Our sample consists of 149 firms in 5 year period (because of the employed change in the variables). That is a panel of data with 715 observations, as for some companies some data were missing. For the model which we consider the variables in lags the total panel includes 596 observations.

4. The Model

The use of panel data models is a powerful research instrument, because it combines the cross-sectional data with time-series data, and provides results that could not be estimated and studied if we use only time-series or cross-section data. A general model for panel data that allows the researcher to estimate panel data with great flexibility and formulate the differences in the behavior of the cross-section elements is theoretically as follows[7]:

$$y_{it} = x'_{it}\beta + z'_{it}a + \varepsilon_{it}$$

where y_{it} = is the dependent variable, x_i = is the matrix with the independent variables, and z_i = is a matrix which contains a constant term and a set of individual or group specific variables, which may be observed or unobserved. This model is a classical regression model. If the matrix z_i can be observed, for all individuals, then the least square method gives efficient and consistent estimators.

The pooled regression considers that z_i contains only a constant term. In this case the ordinary least square method provides an efficient and consistent estimate for the β and the α coefficients. If z_i is unobserved and correlated with the independent variables then the least squares estimator of β is biased and inconsistent, as a consequence of an omitted variable. The fixed effects method takes those problems into account and gives an unbiased and consistent estimator of β and α. If the unobserved individual effects can be formulated, and under the assumption that these observations are uncorrelated with the independent variables, the econometric model can be estimated by the random effects method.

[7] For more information see Greene (2003).

The hypothesis that will be tested in this paper is that each year dividend depends upon the total performance of the firm, the effective management and the dividend pattern that the firm followed in the past. In our view, the firm does not wish to change dramatically the value of the dividend that usually pays. Given the last year dividend, the firm adjusts this year dividend in order to accomplice a long-run target dividend payout. In consequence, (D_{it}) is associated with the variable ($D_{i,t-1}$). The net income available to stockholders (E_{it}), and the sales (S_{it}) are employed as dummy variables that capture the impact of the performance and the effective management on the dividend, respectively. Thus, we empirically estimate three versions of the theoretical model.

The first model associates the change in dividend with the performance of the firm, the effective management, and the dividend that the firm distributed last year; that is,

$$\Delta D_{it} = a_i + \beta_1 E_{it} + \beta_2 S_{it} + \beta_3 D_{i,t-1} + \varepsilon_{it} \qquad (5)$$

where, E_{it} is the net income available to stockholders, for the firm i at time t, S_{it} is the total sales of the firm i at time t, D_{it} is the dividend of the firm i at time t, ΔD_{it} (= D_{it} - $D_{i,t-1}$) is the change in dividend of the firm i at time t, and e_{it} is the error term of the model.

The analysis of Vasiliou and Eriotis (2003) suggests that the model can be improved by the following two ways:

$$\Delta D_{it} = a_i + \beta_1 \Delta E_{it} + \beta_2 \Delta D_{i,t-1} + \beta_3 \Delta S_{it} + \varepsilon_{it} \qquad (6)$$

and

$$D_{it} = a_i + \beta_1 E_{it} + \beta_2 S_{it} + \beta_3 D_{i,t-1} + \varepsilon_{it} \qquad (7)$$

where $\Delta E_{it} = E_{it} - E_{i,t-1}$, $\Delta D_{it} = D_{it} - D_{i,t-1}$, and $\Delta S_{it} = S_{it} - S_{i,t-1}$.

5. Empirical Results

Tables 1 - 6 present the estimations of the econometric models (5), (6), and (7), respectively. At first, we estimate the equations (5) - (7) employing the total model. In order to improve the performance of these estimations we also consider the fixed effects and the random effects model. As in Vasiliou and Eriotis (2003), the random effects model did not provide us with any significant results. That happens because the random effects model considers that the individual effects of each firm can be observed and formulated, an assumption that does not hold for our sample. The estimates with the fixed effects model proved to be the appropriate one.

The results from the first model [equation (5)] for the Greek market, during the five-year period (total observations 715) with the total and the random effects models are presented in the tables 1 and 2, respectively.

Table 1

Model	$\Delta D_{it} = a_i + \beta_1 E_{it} + \beta_2 S_{it} + \beta_3 D_{i,t-1} + \varepsilon_{it}$			
Method	**Total (GLS, cross section weights)**			
	Coefficient	**t – Stat.**	**Prob. (t – Stat.)**	**Stand. Error**
Constant	-196696.3	-7.6688	0.0000	25648.78
E	0.0872	14.8214	0.0000	0.0059
S	0.01065	11.4901	0.0000	0.0009
D_{t-1}	-0.3187	-13.3195	0.0000	0.0239
R^2	0.3332			
R^2 adj.	0.3304			
F – Stat.	118.42			
S.E.	10,326,465			

GLS: Generalized Least Square
S.E. Square Error of the regression.

The results from the Total model imply that the model explains the 33.32% of the changes in dividend from year to year. The F-Statistic proves the validity of the estimated model. In addition, all the coefficients are statistically significant in level of confidence 95%. On the other hand, the fixed effects model gave the following results:

Table 2

Model	$\Delta D_{it} = a_i + \beta_1 E_{it} + \beta_2 S_{it} + \beta_3 D_{i,t-1} + \varepsilon_{it}$			
Method	**Fixed Effects (cross section weights)**			
	Coefficient	**t – Stat.**	**Prob. (t – Stat.)**	**Stand. Error**
Constant	-	-	-	-
E	0.1333	17.376	0.0000	0.0077
S	0.0289	13.68	0.0000	0.0021
D_{t-1}	-0.8163	-27.26	0.0000	0.0299
R^2	0.6863			
R^2 adj.	0.6042			
F – Stat.	619.07			
S.E.	9,154,634			

GLS: Generalized Least Square
S.E. Square Error of the regression.

The results from the fixed effects model improve our last estimation. This means that, there are individual or group effects, which cannot formulated, but must be taken into account. The improved estimation explains the 68.6% of the changes in dividend from year to year. The F – Statistic proves the higher validity of this model compared to the last one. In addition, all the coefficients are statistically significant in level of confidence 95%.

The decision to change the dividend depends positively on the effective management and the performance of the firm and negatively on the dividend that the firm distributed a year before. As the firm improves its performance and its management, it increases the dividend that it pays and vice versa. The negative sing in the dividend at time t-1 reveals the intention of the firm to stabilise the dividend that distributes. If an increase had occurred in last year's dividend payment which implies that an increase might had appeared in last year's dividend change, then a decrease in this year dividend change should be expected, in order to "smooth" dividends.

Tables (3) and (4) present the empirical results from the model (6). Because we had to estimate all the variables in changes as well as a variable in one lag (ΔD_{t-1}), the total number of observations decreased to 596.

Table 3

Model	$\Delta D_{it} = a_i + \beta_1 \Delta E_{it} + \beta_2 \Delta S_{it} + \beta_3 \Delta D_{i,t-1} + \varepsilon_{it}$			
Method	**Total (GLS, cross section weights)**			
	Coefficient	**t – Stat.**	**Prob. (t – Stat.)**	**Stand. Error**
Constant	88,759.10	2.96	0.0032	2,9626
ΔE	0.1270	15.19	0.0000	0.0084
ΔS	0.0280	9.41	0.0000	0.0030
D_{t-1}	-0.1625	-4.86	0.0000	0.0334
R^2	0.4049			
R^2 adj.	0.4019			
F – Stat.	134.29			
S.E.	9,771,148			

GLS: Generalized Least Square
S.E. Square Error of the regression.

Table 4

Model	$\Delta D_{it} = a_i + \beta_1 \Delta E_{it} + \beta_2 \Delta S_{it} + \beta_3 \Delta D_{i,t-1} + \varepsilon_{it}$			
Method	**Fixed Effects (GLS, cross section weights)**			
	Coefficient	**t – Stat.**	**Prob. (t – Stat.)**	**Stand. Error**
Constant	-	-	-	-
ΔE	0.1020	14.40	0.0000	0.0070
ΔS	0.0219	10.72	0.0000	0.0020
ΔD_{t-1}	-0.4058	-10.74	0.0000	0.0377
R^2	0.6352			
R^2 adj.	0.5112			
F – Stat.	386.69			
S.E.	13,033,461			

GLS: Generalized Least Square
S.E. Square Error of the regression.

The results from the Total model indicate that our model (6) explains the 40.5% of the changes in dividend. The F – Statistic proves the significance of the estimated model. In addition, all the coefficients are statistically significant at 95% level of confidence. The estimation of the model without the constant term provides less satisfactory results with adjusted R^2 around 38%.

The estimation with the fixed effects model improved our results. The explanatory power of the fixed effects model increased from 40.5% to 63.5%. In both models, the sings of all the estimated coefficients remained the same. The decision to change the dividend at time t is positively related with the change in the performance of the firm as well as the change in the effective management and negatively with the change in dividend of the previous year. As in the previous estimation of the model [equation (5)], the negative sing in the coefficient of the (ΔD_t) reflects the adjustment of the firm's dividend in the long-run target dividend. The expected positive sign in the coefficients of (ΔE_t) and (ΔS_t) confirmed by the data, which express the intention of the firm to adjust the dividend according to its overall performance.

The regression of the model with all the variables, dependent and independent, in values [i.e. equation (7)] is presented in the following two tables (5 and 6).

Table 5

Model	$D_{i,t} = \alpha_i + \beta_1 E_{it} + \beta_2 S_{it} + \beta_3 D_{i,t-1} + \varepsilon_{it}$			
Method	**Total Model (PLS)**			
	Coefficient	**t – Stat.**	**Prob. (t – Stat.)**	**Stand. Error**
Constant	-602,874.1	-1.27	0.2040	474,180.4
E	0.1056	11.97	0.0000	0.0088
S	0.0199	10.48	0.0000	0.0019
$\mathbf{D_{t-1}}$	0.6197	28.19	0.0000	0.0220
$\mathbf{R^2}$	0.9011			
$\mathbf{R^2}$ **adj.**	0.9007			
F – Stat.	2,159.57			
S.E.	12,132,278			

PLS: Pooled Least Square
S.E. Square Error of the regression.

The results from the Total model indicate that this version of the model has the greater explanatory power among the three with R^2 equals to 90.09%. The high F – Statistic proves the validity of the model. In addition, all the coefficients are statistically significant in level of confidence 95%.

Table 6

Model	$D_{it} = \alpha_i + \beta_1 E_{it} + \beta_2 S + \beta_3 D_{i,t-1} + \varepsilon_{it}$			
Method	**Fixed Effects (cross section weights)**			
	Coefficient	**t – Stat.**	**Prob. (t – Stat.)**	**Stand. Error**
Constant	-	-	-	-
E	0.1333	17.37	0.0000	0.0077
S	0.0289	13.68	0.0000	0.0021
$\mathbf{D_{t-1}}$	0.1836	6.13	0.0000	0.0299
$\mathbf{R^2}$	0.9550			
$\mathbf{R^2}$ **adj.**	0.9433			
F – Stat.	6,016.20			
S.E.	9,157,131			

GLS: Generalized Least Square
S.E. Square Error of the regression.

The results from the fixed effects model improved, as we were expected, the explanatory power from 90% to 95.5% and the F – Statistic appears even better. In addition, all the coefficients are statistically significant in level of confidence 95%.

In both estimations, with the total and the fixed effects models, all the sings of the independent variables remained positive. The positive effect from the performance and the effective management of the firm indicate that the firm adjusts the dividend accordingly. As the performance and the effective management of the firm improve, the dividend increases as well. On the other hand the positive sign in dividend supports the hypothesis that firms are not willing to change their dividend policy from year to year. An increase in last year's dividend appears to have a positive impact on this year's dividend. The above tables seem to provide evidence that the Greek firms follow a discrete dividend policy. Their dividend payout depends upon their long-run target dividend which is adjusted according to their earnings and their sales.

6. Conclusions

The examination of the factors that affect the dividend policy of a firm has always been one of the major topics in the corporate finance research. In this paper we consider a model that associates the corporate dividend policy with a long-run target dividend, which is adjusted according to the performance and the effective management of the firm. The empirical results of the model explain the 95.5% of the distributed dividend of the sampling firms from the Greek market during 1996 – 2001. In addition our results reveal that the firms have no intension to change their dividend policy frequently. This final result is consistent with the Lintner's empirical evidence where the managers appear to believe that the market puts a premium on firms with stable dividend payout policy.

7. Suggestions For Future Research

This paper confirms that corporate dividends are associated with past dividends, as well as the net income available to stockholders and the sales of the firms. Several interesting extensions of this work are possible. First, the dividend yield could be used as a depended variable, instead of the total corporate dividends. In addition, one could test whether there is a link between dividend policy and corporate leverage. 🕮

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Notes