

Dividend Policy and the Lintner Model

Empirical Investigation in 70 UK Companies

by Valuation & Research Specialists (VRS)



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ABSTRACT

The international bibliography includes several theories regarding the dividend puzzle, one of the essential issues examined in the context of a company's financial management. In this project we present a brief review of the bibliography on exercised dividend policy giving emphasis to the description of the Lintner model. Using historical data for the period 1980 – 2007 of earnings per share and distributed dividends of a sample of UK companies, we regressed the variables of dividends with earnings per share of the current period and the dividend of the previous period, in order to test the Lintner model. We found that the Lintner model holds for a large portion (83%) of the examined companies. Moreover, a positive correlation between the variables of dividends and the size of earnings of the current period, as well as negative correlation between changes in dividends and dividends of the previous period is confirmed.

Researcher: **VRS Research Team.**

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Abstract

The international bibliography includes several theories regarding the dividend puzzle, one of the essential issues examined in the context of a company's financial management. In this project we present a brief review of the bibliography on exercised dividend policy giving emphasis to the description of the Lintner model. Using historical data for the period 1980 – 2007 of earnings per share and distributed dividends of a sample of UK companies, we regressed the variables of dividends with earnings per share of the current period and the dividend of the previous period, in order to test the Lintner model. We found that the Lintner model holds for a large portion (83%) of the examined companies. Moreover, a positive correlation between the variables of dividends and the size of earnings of the current period, as well as negative correlation between changes in dividends and dividends of the previous period is confirmed.

1. Introduction

One of the basic issues examined in the context of a company's financial management is the applied dividend policy. Often a company aims at distributing the largest as possible dividends to its shareholders, while in other cases it wishes to invest its cash on the behalf of its shareholders, instead of paying it out. The basic dividend policy debate arises directly from the above reasons, namely if a company should pay cash to its shareholders or should that cash be reinvested in the company on their behalf. The international bibliography includes several theories regarding dividend policy. There are many arguments in favor of paying dividends, as well as many in favor of not paying out. As a result of such, dividend policy is an issue widely discussed and frequently referred to as the dividend puzzle.

The objective of this paper is a brief review of the bibliography on exercised dividend policy. Particular emphasis is given to the description of the Lintner model. As regards to the primary section of the paper, using a sample of 70 companies, we tested the degree to which the Lintner model holds.

2. Bibliography Review

Dividend policy defines the allocation of earnings between payments made to shareholders and reinvestment in the company. Retained earnings are one of the most important capital sources for the financing of a company's evolution and growth. Dividends are paid in cash.

Dividend Policy in the Case of No Taxation

A basic issue examined around dividend policy is the correlation of shareholders' assets, changing the company's objective each time, in relation to the payout ratio (dividends per share/earnings per share). The examination of the above issue requires the adoption of the assumption that we have two companies *ceteris paribus* similar except for the payout ratio.

Examining the case of no taxation requires the assumption that the two companies are, as mentioned above, similar in all aspects except for the dividend policy such follow. Specifically, they have a portfolio consisting of assets with the same risk, the same cash flows, annual earnings and they do not use debt in order to avoid any problem in the relation between capital structure and dividend policy. According to the view of Miller & Modigliani such assumptions may be expressed as follows:

$$\begin{array}{lll} \text{NOI}_1(t) & = \text{NOI}_2(t) & t = 0, 1, \dots, \infty \\ I_1(t) & = I_2(t) & t = 0, 1, \dots, \infty \\ d_1(t) & = d_2(t) & t = 0, 1, \dots, \infty \\ d_1(t) & \neq d_2(t) & t = 0 \end{array}$$

where,

NOI = net operating income,

I = investment,

d = dividend.

Net operating income is defined as the profit from the production and trade section of the company before interest and taxes. If non-repeated items do not exist in the income statement, then net operating income is equal to earnings before interest and taxes (EBIT). Moreover, we assume that investment decisions of each company are different from its dividend policies and other financial decisions. If the company avoids investments that present a positive net present value, because it wants to pay high dividends, then the value of the company will definitely be affected not by its dividend policy but from its avoidance to realize profitable investments. From the above relationships it arises that the current dividend payment is different for the two companies because $d_1(0) \neq d_2(0)$ but all future dividends will be equal.

Dividend Policy in the Case of No Taxation

We assume once again that the company's investment policy is not affected by its dividend policy and there is no transaction costs linked to the increase of external capital. Our analysis approaches reality if we take taxation into account. Let's assume that the company's tax rate is φ_ε and the personal tax rate on income from bonds, dividends and wages is φ_π , while the tax rate on capital profit is φ_g . We also assume that the personal tax rate on income from dividends is larger than the capital profits tax rate, $\varphi_\pi > \varphi_g$, which means that owners of shares will prefer not to receive dividends. In this case, shareholders would be in a better position if the capital remained in the company or were disposed for the purchase of shares. If dividends are paid out, then shareholders in need of cash can always sell a part of their investment. In this case they pay taxes on capital profit, which are lower than the ordinary income taxes paid if dividends were received.

Signaling Theory and Dividend Policy

The effect of information included in dividend policy (signaling) is one of the most debated subjects that follow company financing. Empirically it has been defined that when dividends increase or begin to increase, prices of the respective shares

tend to rise. In contrast, when there is a decline or a non payment of dividends, prices of shares are pressured downwards. Many researchers explain that the rise in share prices following an increase in dividend prices is due to the fact that dividend increases transmit positive information, which consist the views of management executives for the future outlook on the company's results. Certain research in the bibliography, as regards to the effect of dividend signaling, has provided evidence to refute the classical signaling theory of increasing and decreasing dividends. In their work, **DeAngelo and DeAngelo**¹ believe that increases in company dividends do not constitute reliable information for future performance. **Benartzi, Michaely and Thaler**² argue that changes in the dividend policy of companies tell us usually something that has occurred, and as a result their contribution to the forecast process is minimal to nil. Even though information related to earnings is considered to be included in the dividend announcements, the earnings announcements are considered by the market as a significant event. **Griffin** examines the separate and joint effect of dividend announcements, earnings announcements and analysts' forecasts for earnings. The results show that the market reacts to both separate and joint results.

Aharony and Swary³ observed that the market reacts independently to the different dividends and earnings announcements, however they do not examine if the dividend signaling and earnings announcements are reinforcing.

Kane, Lee and Marcus⁴ examined whether the market evaluates the two announcements taking into account their consequence and they concluded that if a dividend increase is not confirmed by a near announcement of an earnings increase, then the usual increase in the company's market value is not realized. These results are indicative of the presence of "low quality" companies that try to mimic "high quality" companies through their dividend policy and whose actual type is revealed from the earnings announcement.

¹ DeAngelo Harry and Linda DeAngelo, "Dividend Policy and Financial Distress: An Empirical Investigation of Troubled NYSE Firms", *The Journal of Finance*, December 1990, pp 1415-1431.

² Benartzi Shlomo, Romi Michaely and Richard Thaler, "Do Changes in Dividends Signal the Future or the Past?", *The Journal of Finance*, July 1997, pp 1007-1034.

³ Aharony, J., and I. Swary, "Quarterly Dividend and Earnings Announcements and Stockholders Returns: An Empirical Analysis", *Journal of Finance*, vol. XXXV, No 1, March 1980, pp 1-12.

⁴ Kane, Alex, Yong Ki Lee, and Alan Marcus, "Earnings and Dividend Announcements; Is There a Corroboration Effect?", *The Journal of Finance*, vol. 39, No 4, September 1984, pp 1091-1099.

John and Williams⁵, **Miller and Rock**⁶ and **Korajczyk, Lucas and McDonald**⁷ suggest that the market's reaction to an announcement for an equity offering will be affected by the earnings or dividend announcements. Moreover, they modeled the asymmetry of the information considering that such is minimized at each earnings increase announcement and maximized during the period until the next announcement. Nevertheless, they concluded that there is a trend to issue bonds immediately after the earnings increase announcements and that the above normal profit becomes more negative in relation to the time period between the earnings increase announcement and the share capital increase announcement. The previous study was extended by **Manuel, Brooks and Schadler**⁸ to the effect of the earnings increase and dividend payment announcement on the bond loan issue and the share capital increase. The largest effect exists in the case where the share capital increase precedes the earnings increase announcement and dividend payment.

The result from the dividend policy is that some companies pay a dividend, while others don't. The shares of companies that pay dividend are held by those that protect dividends from taxes, while shares of other companies are held by those who do not relieve the shares from taxes. **Feldstein and Green**⁹ showed that the maximization of value is achieved when the company can attract both types of investors.

M. Rozeff¹⁰ suggested that the paid dividend may solve intermediation problems that are created between managers and investors. Thus the company that finances its development through self-financing, has the obligation to

⁵ John Rose and Joseph Williams, "Dividends Dilution and Taxes: A Signaling Equilibrium", *The Journal of Finance*, vol. XL, No 4, September 1985, pp 1053-1070.

⁶ Miller Merton H. and Kevin Rock, "Dividend Policy under Asymmetric Information", *The Journal of Finance*, vol XL, No 4, September 1985, pp 1031-1051.

⁷ Korajczyk, R.A., D. Lucas and R. McDonald, "The Effect of Information Releases on the Pricing and Timing of Equity Issues: Theory and Evidence", *Review of Financial Studies*, 4, Winter 1991, pp 685-708.

⁸ Manuel Timothy, LeRoy D. Brooks and Frederick P. Schadler, "Common Stock Price Effects of Security Issues Conditioned by Current Earnings and Dividend Announcements", *Journal of Business*, 1993, vol. 66, No 4, pp 571-593.

⁹ Feldstein Martin S. and Jerry Green, "Why Do Companies Pay Dividends?", *American Economic Review*, 71 (1), pp 17-30.

¹⁰ Rozeff, M.S., "Growth Beta and Agency Costs as Determinants of Dividend Payout Ratios", *Journal of Financial Research*, 17, 1994, pp 363-3 73.

communicate with its investors only through its annual financial statements and the paid dividend.

Cornel and Shapiro¹¹ initially assumed that company managers consider that their ability to cover their claimers is apparent from the magnitude of the paid dividend. However subsequently this theory was confuted since larger dividends reduce cash equivalents used to cover claimers. Later, **Shapiro** himself made a different assumption for the relation between dividend policy and the net organization capital. Specifically he mentioned that companies that present a high level of net capital should define a dividend level that they can maintain.

Finally, **Barton, Hill and Sundaram**¹² examined the theory of claimers on the capital structure and distinguished the companies in two groups, those that present high net capital and those that present low net capital. Following, they stated that companies with high net capital tend to be more conservatively financed than the others, which use more equity. This theory can be extended also for dividend policy. Specifically, companies with a high level of net capital need more liquidity to be able to pay their claimers. Such companies are financed more conservatively using equity and maintaining a high level of liquidity in order to avoid financial trouble. However, in order to achieve high liquidity it is likely that they may reduce the paid dividend. Therefore, the company reduces its external financing and by reducing dividends is self-financing itself.

Dividend Policy from the Perspective of Management and Investors

Initially **J. Linter**¹³ studied the dividend policy issue and stresses that management of companies increase dividend yields when it considers that such will have increased to a level that may be characterized as constant, noting that dividend increases suggest an increasing shift in earnings distribution. Miller and Modigliani explicitly suggest that dividends may transmit information for future

¹¹ Cornell, B. and A.C. Shapiro, "Corporate Stakeholders and Corporate Finance", Financial Management, Sprint 1987, pp 5-14.

¹² Barton S.L., N.C. Hill and S. Sundaram, "An Empirical Test of Stakeholder Theory Predictions of Capital Structure", Financial Management, Spring 1989, pp 36-44.

¹³ John Lintner, "Distribution of Incomes of Corporations Among Dividends, Retained Earnings and Taxes", The American Economic Review, May 1956, pp 97-113.

cash flows. Other researchers, based on the definition of asymmetric information, note that changes in dividends are not just actions that occur in the context of the information process, but such constitute explicit signals for the company's future returns and that many times such constitutes the objective from the management's perspective towards its shareholders.

The announcement of changes is considered a reason that may motivate investors to react differently as regards to mobile assets, and in a way transmit valuable private-internal information to the investment community. Also, because the corporate management recognizes this effect of announcements, it may be led to an increase in company dividends. However, if companies with larger dividends are going to have high share prices, with all other factors constant, only those within the company with more positive, private information, can bring equilibrium that reveals this information publicly through larger dividends. On the contrary, those within the company with more negative, private information should prefer the payment of smaller dividends. In order to send a signal to the investment community for the valuable private information they hold, those within the company must have a motive to achieve equilibrium. Therefore, there are quite a few of issues that arise. Under which conditions is there equilibrium in signaling? In such equilibrium can dividends coexist with other signals such as the repurchase of shares or announcements of new investments? Moreover, when can dividends coexist with other signals, usually with less expensive mechanisms, for the disclosure of private information, such as the annual financial statements and the expression of opinions from financial analysts?

In 1979 **Bhattacharya**¹⁴ was the first to tackle the dividend signaling issue. Bhattacharya stated a two period model, where company managers act on returns (interest) of shares. At time "0" managers invest in an investment plan. The net present value of the investment plan is known to managers but not to investors. Also, the managers have set an investment policy. At time "1" they repay the investment plan used to pay dividends set at time "0". If the repayment

¹⁴ Bhattacharya, S., "Imperfect information, dividend policy and "The bird in the hand" fallacy", The Bell Journal of Economics, Spring 1979, pp 259-270.

is inadequate, the company must turn to external financing and is subject to transaction costs.

In his model, the company's management as "insiders" can distribute dividends to shareholders through taxed dividends or a share repurchase that is favorably taxed. In equilibrium, the management that has more favorable insider information regarding the present value of the company distributes larger dividends, with all other factors constant. The dividend of each company maximizes shareholders' wealth, given the insider information regarding the company's present value and the decisions by people outside the company to sell their shares for personal reasons. External users of information evaluate, given the observed dividends, each company rationally and following they pay the correct price for the share of each company in perfect competitive capital markets. This way, companies with larger dividends are valued higher in equilibrium, with all other factors constant.

The classical theory in relation to using dividend yields as a mean for provision of information, was reviewed by the recent study of **DeAngelo and DeAngelo**¹⁵ who studied the content of information included in the decisions by management executives regarding dividend policy for 145 companies listed on the NYSE (New York Stock Exchange) and whose annual profitability is decreasing, following nine or more consecutive increasing years. Using multiple models was to parameterize the data, they reached the conclusion that dividends tend not to be reliable information signals. **Benartzi, Michaely and Thaler**¹⁶ studies both the profitability and the dividend yields of companies listed on the NYSE and AMEX stock exchanges, and reached the conclusion that changes in the level of dividends include information on future performance of the companies' profitability, but to a very small extent.

The empirical research shows that while there is a strong proceeding and parallel connection between earnings and changes in dividends, the forecasting value of

¹⁵ Harry DeAngelo and Linda DeAngelo, "Dividend Policy and Financial Distress: An Empirical Investigation of Troubled NYSE Firms", *The Journal of Finance*, December 1990, pp 1415-1431.

¹⁶ Shlomo Benartzi, Romi Michaely and Richard Thaler, "Do changes in Dividends Signal the Future or the Past?", *The Journal of Finance*, July 1997, pp 1007-1034.

the change in dividends seems to be minimal. Only the case of decreasing dividend yields signifies an increase in the companies' future profitability. There is some evidence that developing companies have less possibility to face a significant reduction in profitability from companies whose dividend yield – policy remains stable despite their earnings increase. The researchers reach the conclusion that changes in dividend yields do not signify anything future rather than something that has already occurred. If there is any information in the content of dividends during the announcement date, such holds because the simultaneous change in profitability is permanent and not momentary.

The empirical results that arise from the aforementioned studies are in line with the theory that changes in payments of dividends include relevant information with the future profitability condition of the company. Particularly between dividends and earnings, the phenomenon of the time lag (as regards to earnings) is observed and is due to the fact that executives realize the negative signal that will be sent to the market in case of a future decrease of dividends. This fact constitutes a deterring factor for an increase in dividends, with the fear that the possible inability increases to maintain such at the same high levels in the future. Unexpected changes in dividends have significant effects at the moment of the announcement because investors realize the reluctance of executives to change (increase) the dividend, leading to such a change being interpreted as an information event.

Finally, **De Angelo, De Angelo and Skinner**¹⁷ and **Healy and Palepu**¹⁸ with their research, created a feeling of uncertainty as regards to the information that decreases of dividends are transmitted to the market. Specifically, both such studies present evidence that on average prove that increases in earnings are following by decreases in dividends.

¹⁷ Harry DeAngelo, Linda DeAngelo and Douglas J. Skinner, "Reversal of Fortune: Dividend signaling and the disappearance of sustained earnings growth", *Journal of Financial Economics*, 1996, pp. 341-371. Harry DeAngelo, Linda DeAngelo and Douglas J. Skinner, "Special Dividends and the Evolution of Dividend Signalling", *Journal of Financial Economics*, 2000, pp. 309-354. Harry DeAngelo, Linda DeAngelo and Douglas J. Skinner, "Are Dividends disappearing? Dividend Concentration and the consolidation of earnings", *Journal of Financial Economics*, 2003.

¹⁸ Paul M. Healy and Krishna G. Palepu, "Earnings Information Conveyed by Dividend Initiations and Omissions", *Journal of Financial Economics*, 1988, pp. 149-175.

3. The Lintner Model

According to Lintner (1956), the objective of companies is to distribute a constant optimal percentage (r_i) of distributed earnings (Long run target payout ratio).

Therefore, if this optimal ratio is constant for each year t , the following will hold:

$$D^*_{it} = r_i E_{it} \quad (1)$$

where D^*_{it} is the optimal level of dividends distributed and E_{it} are the earnings of company i in period t .

Despite the wish of companies to change their dividends from $D_{i, t-1}$ to D^*_{it} very few companies (or almost none) are those that actually change their dividends by that amount.

Indeed it is more realistic to adopt the assumption that real changes of dividends are a percentage of the desired changes:

$$D_{it} - D_{it-1} = a_i + c_i (D^*_{it} - D_{i,t-1}) \quad (2)$$

where c_i is the 'speed of adjustment'.

The price of c_i ranges from zero to one ($0 < c_i < 1$).

Replacing the relationship 1 in 2 the following is derived:

$$D_{it} - D_{it-1} = a_i + c_i r_i E_{it} - c_i D_{i, t-1} \quad (3)$$

and finally:

$$\Delta D_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 D_{i, t-1} + u_{it} \quad (4)$$

where: $\beta_1 = c_i r_i$ and (4.1)

$$\beta_2 = -c_i \tag{4.2}$$

Equation (4) leads to indications that there is positive correlation between dividend changes and the size of earnings of the present period, as well as negative correlation between dividend changes and dividends of the previous period. The reason for this is simple: The larger the earnings of the present period the larger the corresponding changes in dividends. However, at the same time the larger the dividends of the previous period, the smaller the forthcoming changes in dividends.

The calculation of the long-run target payout ratio results from the estimation of model (4) and the combination of relations 4.1 and 4.2 as follows:

$$r_i = -\frac{\beta_1}{\beta_2} \tag{5}$$

After examining 600 known companies in the USA, Lintner selected 28 companies for a subsequent detailed analysis. These companies were not selected as a sample based on which statistical conclusions will be inferred. The basic criterion for the selection was that the companies cover alternative conditions. The analysis of the 28 companies referred to years 1947-1953, namely a total of 196 observations.

The basic theoretical observations that emerged both from the analysis of the companies and from interviews with their senior executives (presidents, financial vice-presidents, treasurers, directors etc) were the following four:

1. The primary variable in defining dividend policy was changes in the existing payout ratio and not the level of the present or future payout ratio.
2. The majority of senior executives believed that most shareholders prefer a relatively stable dividend yield, while the market sets a premium on such stability or on a progressive increase. Therefore, the managements of companies try to

avoid significant increases in the payout ratio, which could be reversed in a short time period.

3. The most important variable that defines the quantity of changes in dividends were the current net earnings of the company.

4. The optimal payout ratios range from 20% to 80%. The most common payout ratio was 50%, while the majority of the remaining companies had the objective to distribute 40-60% of their earnings.

Taking into account the above observations, Lintner proposed the estimation of the known partial adjustment model. This model exhibited a very satisfactory behavior, while on average it interpreted 85% of changes in dividends of the 28 companies examined.

Lintner tested the specification, reliability and the stability of the model through time, with very encouraging results. The equations that were used for the pre 2nd world war behavior of companies provided satisfactory estimations for the post war behavior. The comparison was made with a simple, naïve model which adopts the assumption that dividends of the next year will be the same with the corresponding dividends of the present year.

The Study of Fama - Babiak (1968)

The most important econometric effort in the area of dividend policy was the study by Fama-Babiak. The innovation and significant contribution of the above authors can be found mainly in their methodological approach. The authors used a sample of companies, where with a series of simulations and forecasts were led to methodological proposals.

Fama-Babiak selected 392 important companies for analysis, from a total of 900 large industrial companies for a period of 19 years (1946-1964).

The basic reference point of the authors is the partial adjustment model proposed by Lintner.

The issues examined in the study were the following:

1. The empirical testing of alternative models that describe the behavior of companies' dividend policy.
2. The estimation problems of the regression coefficients of alternative Models.
3. The statistical properties of alternative models through experimental Monte-Carlo approaches.
4. The testing of forecasting ability of alternative models used in the analysis.

The conclusions of the study that emerged from the regressions, simulations and tests of forecasting abilities of the models, led to uniform results.

The Lintner model, which as known includes the constant parameter, the earnings E_t , and the dividends with a time lag D_{t-1} as explanatory variables, had a very good adjustment compared to other models.

However, Fama and Babiak argue that the omission of the constant and the introduction of the variable of earnings with a time lag E_{t-1} lead to a small improvement in the forecasting power of the model. It is of course important to note that the model suggested by authors Fama-Babiak did not emerge from some economic theory but is an ad hoc approach.

For the estimation and testing of models that express dividend policy of companies, net earnings constitute the best measure for earnings. This variable is preferred to alternative variable such as cash flows or net earnings plus depreciation, which could possibly be included in the model as alternative variables.

Finally, in all models examined, the problem of autocorrelation of the stochastic term seemed not to consist of a serious problem.

4. Empirical Examination of the Lintner Model

i) Descriptive statistics

To examine the Lintner model, data for the period 1980-2007 are used for the companies presented in table 4.1.

In table 4.2 we present the average distributed dividend (%) per company. We must note that the number of observations differs from company to company due to the lack of available data for some companies. We observe that the largest average dividend is held by the company Camellia (37.14) and the smallest by the company Baillie Giff.Japan (0.02).

Table 4.1: The Companies of the Sample

THE COMPANIES	
AVIVA	CANDOVER INVS.
BABCOCK INTL.	CAPITA GROUP
BAE SYSTEMS	CAPITAL & REGIONAL
BAILLIE GIFF.JAPAN	CARE UK
BALFOUR BEATTY	CASTINGS
BANKERS INV.TRUST	CATTLES
BARCLAYS	CHARLES STANLEY GROUP
BARR (AG)	CHARTER
BARRATT DEVELOPMENTS	CHEMRING GROUP
BBA AVIATION	CHLORIDE GROUP
BELLWAY	CHRYSALIS GROUP
BERKELEY GP.HDG.UNITS	CITY OF LONDON IT.
BESPAK	CLARKE (T)
BG GROUP	CLARKSON
BLACKS LEISURE	CLINTON CARDS
BODYCOTE INTL.	CLOSE BROTHERS GROUP
BP	COBHAM
BPP HOLDINGS	COOKSON GROUP
BRAMMER	CORPORATE SVS.GP.
BRITISH AIRWAYS	COSTAIN GROUP
BRITISH AMERICAN TOBACCO	CRANSWICK
BRITISH ASSETS	CRESTON
BRITISH EMPIRE SECS.	CRODA INTERNATIONAL
BRITISH LAND	DAEJAN HOLDINGS
BRITISH POLYTHENE INDS.	DAILY MAIL 'A'
BRIXTON	DAVIS SERVICE GROUP
BROWN (N) GROUP	DE LA RUE
BRUNNER INV.TST.	DELTA
BSS GROUP	DERWENT LONDON
BT GROUP	DEVELOPMENT SECS.
BUNZL	DIAGEO
CABLE & WIRELESS	DOMESTIC & GENERAL GP.
CADBURY SCHWEPPE	DOMINO PRINTING SCIENCES
CALEDONIA INVESTMENTS	DSG INTERNATIONAL
CAMELLIA	DUNEDIN ENTERPRISE

Table 4.2: Calculation of Average per Company

COMPANY	AVERAGE
CAMELLIA	37.14
COOKSON GROUP	32.37
COSTAIN GROUP	32.10
DAEJAN HOLDINGS	29.63
DEVELOPMENT SECS.	24.77
AVIVA	21.76
CANDOVER INVS.	16.02
BRITISH AMERICAN TOBACCO	15.12
CALEDONIA INVESTMENTS	14.51
DE LA RUE	13.08
DIAGEO	12.83
DOMESTIC & GENERAL GP.	11.73
BRITISH POLYTHENE INDS.	11.28
BRAMMER	11.24
BALFOUR BEATTY	10.68
CLOSE BROTHERS GROUP	10.60
CHARTER	10.60
BESPAK	10.58
BARR (AG)	10.51
BARRATT DEVELOPMENTS	10.14
BELLWAY	9.49
BT GROUP	9.38
CLARKSON	9.20
DELTA	8.85
CRODA INTERNATIONAL	8.84
BP	8.84
BARCLAYS	8.31
BRITISH AIRWAYS	8.24
DAVIS SERVICE GROUP	7.83
DUNEDIN ENTERPRISE	7.40
BPP HOLDINGS	7.12
BRITISH LAND	7.04
CADBURY SCHWEPPE	6.62
BRIXTON	6.62
BLACKS LEISURE	6.60
CRANSWICK	6.58
BBA AVIATION	6.21
DERWENT LONDON	6.12

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BUNZL	6.03
CABLE & WIRELESS	6.03
CHEMRING GROUP	5.72
BAE SYSTEMS	5.34
BABCOCK INTL.	5.33
BG GROUP	5.18
CITY OF LONDON IT.	4.89
BRUNNER INV.TST.	4.86
DAILY MAIL 'A'	4.60
CAPITAL & REGIONAL	4.48
CATTLES	4.27
CRESTON	4.20
BANKERS INV.TRUST	4.02
BERKELEY GP.HDG.UNITS	3.78
CASTINGS	3.68
BRITISH ASSETS	3.63
CARE UK	3.41
BSS GROUP	3.40
CLARKE (T)	2.87
DSG INTERNATIONAL	2.63
BROWN (N) GROUP	2.62
BODYCOTE INTL.	2.51
DOMINO PRINTING SCIENCES	2.43
CORPORATE SVS.GP.	2.33
CAPITA GROUP	1.78
CHARLES STANLEY GROUP	1.53
CLINTON CARDS	1.32
BRITISH EMPIRE SECS.	1.13
COBHAM	1.11
CHLORIDE GROUP	1.08
CHRYSALIS GROUP	0.95
BAILLIE GIFF.JAPAN	0.02

In table 4.3 we have the average distributed dividend of all companies per year. The largest average dividend is observed in year 1980 (3.56) and the smallest in year 2007 (15.37). Moreover, we see that in the '80s there is a larger positive percentage change in dividends (1986, 1984, 1989). While at the beginning of the '90s we observe the largest percentage change in dividends.

Table 4.3: Calculation of Average per Year

YEAR	AVERAGE	DIVIDEND CHANGE (%)
1980	3.56	
1981	3.81	7.10%
1982	3.71	-2.79%
1983	3.75	1.30%
1984	4.62	23.09%
1985	4.45	-3.76%
1986	6.15	38.31%
1987	6.19	0.68%
1988	6.84	10.50%
1989	7.85	14.77%
1990	9.07	15.54%
1991	9.19	1.24%
1992	7.98	-13.18%
1993	6.50	-18.50%
1994	6.74	3.65%
1995	7.17	6.46%
1996	7.79	8.56%
1997	8.78	12.73%
1998	9.14	4.17%
1999	9.55	4.45%
2000	10.71	12.18%
2001	11.86	10.66%
2002	11.92	0.51%
2003	11.35	-4.73%
2004	11.70	3.01%
2005	12.45	6.48%
2006	13.65	9.63%
2007	15.37	12.59%

ii) Testing of the Lintner model

Using historical data (1980-2007) for annual earnings per share of the companies in the sample, we performed regressions to test the Lintner model. Specifically for each company we regress the variables of the dividend with earnings per share of the current period and the dividend of the previous period. We note that the

number of observations differs from company to company. The regression had the following form:

$$\Delta D_t = a_0 + a_1 E_t + a_2 D_{t-1}$$

If the Lintner model holds, we expect to find:

$$a_0 = 0$$

$$a_1 > 0$$

$$a_2 < 0$$

$$a_2 > a_1$$

Appendix A includes the results of the regressions for all companies in the sample. According to the results, the following hold:

- In table 4.4 we have classified the companies in two categories. In those for which the Lintner model holds and those for which it doesn't. Specifically in 58 out of 70 companies we found that the model holds. Namely the former represent the high percentage of 83%.

Table 4.4: Number of Companies the Lintner Model Does or Does Not Hold For.

THE LINTNER MODEL HOLDS	THE LINTNER MODEL DOES NOT HOLD
AVIVA	BANKERS INV.TRUST
BABCKOK	BARCLAYS
BAE SYSTEMS	BPP HOLDINGS
BAILLIE GIFF.JAPAN	BRITISH EMPIRE SECS
BALFOUR BEATTY	CHARLES STANLEY GROUP
BARR (AG)	CITY OF LONDON IT
BARRATT DEV.	CLARKE
BBA AVIATION	COBHAM
BELLWAY	DAEJAN HOLDINGS
BERKELEY GP.HDG.UNITS	DIAGEO
BESPAK	DOMINO PRINTING SCIENCES
BG GROUP	DSG INTERNATIONAL
BLACKS LEISURE	
BODYCOTE INTL	
BP	
BRAMMER	
BRITISH AIRWAYS	
BRITISH AMERICAN TOBACCO	
BRITISH ASSETS	
BRITISH LAND	
BRITISH POLYTHENE	
BRIXTON	
BROWN N GROUP	
BRUNNER INV.TST	
BSS GROUP	
BT GROUP	
BUNZL	
CABLE&WIRELESS	
CADBURY SCHWEPPEES	
CALEDONIA INV	
CANELLIA	
CANDOVER INVS	
CAPITA GROUP	
CAPITAL®IONAL	
CARE UK	
CASTINGS	
CATTLES	

CHARTER
CHEMRING GROUP
CHLORIDE GROUP
CHRYSALIS GROUP
CLARKSON
CLINTON CARDS
CLOSE BROTHERS GROUP
COOKSON GROUP
CORPORATE SVS GR
COSTAIN GROUP
CRANSWICK
CRESTON
CRODA INTERNATIONAL
DAILY MAIL A
DAVIS SERVICE GROUP
DE LA RUE
DELTA
DERWENT LONDON
DEVELOPMENT SECS
DOMESTIC&GENERAL GR
DUNEDIN ENTERPRISE

Table 4.5

COMPANIES	Et	Dt-1
AVIVA	-	√
BABCOCK INTL.	√	√
BAE SYSTEMS	√	√
BAILLIE GIFF.JAPAN	√	√
BALFOUR BEATTY	√	√
BANKERS INV.TRUST	√	√
BARCLAYS	√	-
BARR (AG)	√	√
BARRATT DEVELOPMENTS	√	√
BBA AVIATION	√	√
BELLWAY	√	√
BERKELEY GP.HDG.UNITS	-	-
BESPAK	√	√
BG GROUP	-	√
BLACKS LEISURE	√	√
BODYCOTE INTL.	√	√
BP	√	√
BPP HOLDINGS	√	-
BRAMMER	√	√
BRITISH AIRWAYS	-	-
BRITISH AMERICAN TOBACCO	-	-
BRITISH ASSETS	√	√
BRITISH EMPIRE SECS.	√	-
BRITISH LAND	-	-
BRITISH POLYTHENE INDS	√	√
BRIXTON	√	√
BROWN (N) GROUP	√	√
BRUNNER INV.TST.	√	√
BSS GROUP	√	√
BT GROUP	√	√
BUNZL	√	√
CABLE & WIRELESS	√	√
CADBURY SCHWEPPE	-	-
CALEDONIA INVESTMENTS	-	-
CAMELLIA	-	-
CANDOVER INVS.	-	-
CAPITA GROUP	√	-
CAPITAL & REGIONAL	-	√

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CARE UK	√	√
CASTINGS	√	√
CATTLES	√	-
CHARLES STANLEY GROUP	√	-
CHARTER	-	-
CHEMRING GROUP	√	√
CHLORIDE GROUP	√	√
CHRYSALIS GROUP	√	√
CITY OF LONDON IT.	√	√
CLARKE (T)	√	-
CLARKSON	√	-
CLINTON CARDS	√	√
CLOSE BROTHERS GROUP	√	√
COBHAM	-	-
COOKSON GROUP	√	√
CORPORATE SVS.GP.	√	√
COSTAIN GROUP	√	√
CRANSWICK	√	√
CRESTON	√	√
CRODA INTERNATIONAL	√	√
DAEJAN HOLDINGS	-	-
DAILY MAIL 'A'	√	-
DAVIS SERVICE GROUP	√	√
DE LA RUE	√	√
DELTA	√	√
DERWENT LONDON	-	√
DEVELOPMENT SECS.	√	√
DIAGEO	-	-
DOMESTIC & GENERAL GP.	√	√
DOMINO PRINTING SCIENCES	√	-
DSG INTERNATIONAL	√	-
DUNEDIN ENTERPRISE	√	√

- Moreover, according to table 4.5 we observe that from the companies where the Lintner model holds, both coefficients that correspond to the variables **Et** and **Dt-1** are statistically significant for 41 companies. On the other hand, from the companies where the Lintner model does not hold, both the coefficients that correspond to variables **Et** and **Dt-1** are statistically significant for only two.

5. Conclusions

In the present paper, we examined the dividend puzzle. Initially we stated several basic conceptual issues linked to dividend policy. Following we examined the theories of dividend policy both in the case of no taxation and in the case of taxation. Moreover, we referred to the signaling theory in the context of dividend policy and also to several empirical studies regarding the relation between dividends and share value.

Particular reference was made to the Lintner model. In order to test the validity of the aforementioned model, we selected a sample of 70 companies from the United Kingdom. Using historical data for the period 1980 – 2007 of earnings per share and distributed dividends of the companies, we regressed the variables of dividends with earnings per share of the current period and the dividend of the previous period. The results of the regressions showed that the Lintner model holds for a large portion (83%) of the examined companies. Therefore, it is confirmed that there is a positive correlation between the variables of dividends and the size of earnings of the current period, as well as negative correlation between changes in dividends and dividends of the previous period.

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NOTES

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