M.Sc. in Finance and Financial Information Systems

Market Reactions to Dividend Announcements: 
An Event Study of the Greek Stock Market

By:
Gesthimani Kariofillidou

Supervisor:  Dr. S. Athianos

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Abstract

The market reaction to dividend announcements is a matter that has drawn the attention of many researches. Theories regarding the relevancy of dividends to shareholder wealth are contradicting and provide little insight to the matter. Moreover, the numerous empirical event studies also provide dissimilar results and hence the matter is still under question. The present dissertation aimed to shed some light to the relevancy of dividends and their ability to provide information to investors about the true intrinsic value of the firm.

The Greek market, in regards to dividends, has some individual characteristics which establish it as a prime candidate in order to examine the reaction of stock prices to dividend announcements. Using data from the FTSE/ASE 20 Index for a period stretching from 2004 until 2007, standard parametric tests where applied to test the magnitude, the speed and the direction of the market’s reaction to dividend announcements. The results clearly support the signaling hypothesis that dividends convey information to the market which is incorporated into stock prices so that they reflect the true intrinsic value of the firm. Hence, the irrelevance theory as proposed by Miller and Modigliani (1961) is rejected. The sighted market movements however, indicate that the absence of taxation enables investors of the Greek stock market to employ speculative trading behavior in order to accomplish untaxed capital gains.

Keywords: Dividends, Market Reactions, Abnormal Stock Returns, Dividend Relevancy, Signaling Effect, Information Content Hypothesis.
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<td>American Stock Exchange</td>
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1. Introduction
The dividend policy of any firm is highly associated with many corporate issues (corporate structure, financing policy, corporate growth e.t.c.). Many theories have been developed throughout the years in an attempt to reconcile the selected dividend policy of the firm with the reactions of the market upon dividend announcements. Moreover, theoretical financial models have tried to capture and illustrate the reaction of the market to dividend announcements.

The main classification of the above proposed theories and models is based on how dividends are viewed in terms of their relevancy to shareholder’s wealth. In “perfect” capital markets where taxation, transaction costs and fees do not exist, according to Miller and Modigliani (1961), dividends are irrelevant and therefore they can not affect stock prices and the wealth of shareholders respectively. On the other hand, considering that the markets are “imperfect”, dividend policy plays a significant role and may affect the prices of securities. The direction of the market’s reaction to dividends however is not definite. Brennan (1970) claimed that increases in dividends lead to a decline of stock prices and shareholder wealth due to taxation issues. On the other hand, other theories claim that dividends are positively related to stock prices (Walter, 1956; Gordon 1962). This positive relationship between dividends and stock prices is attributed to the information content hypothesis. According to this hypothesis, dividends are viewed as signals from the well- informed management to the less-informed investors, in an attempt to reduce information asymmetries. Therefore, investors incorporate the new information in stock prices so that the prices reflect the true intrinsic value of the firm.

Unfortunately all the above stated theories lack strong empirical evidence. Previous literature findings indicate that each market has its own unique characteristics regarding dividends. These characteristics play a significant role in determining the reaction of investors to any announcements, not only dividends. However, even when comparing the reaction of the same market to dividend announcements, the results are not similar.

Moreover, the level of taxation imposed on dividends and in specific the difference between taxation on capital and dividend gains needs to be taken into consideration. Once again, the results of previous empirical findings are not consistent with one another. Earlier event studies provide evidence that the level of taxation does not affect shareholder wealth (Auerbach, 1979; Miller and Scholes, 1982; Black and Scholes, 1974) while other studies claim that the level of taxation is responsible for
the abnormality of stock prices (Masulis and Trueman, 1988; Brennan and Thakor, 1990; Allen et al, 2000).

From all the above, it becomes clear that, even under the assumption that investors are rational and behave in an according manner, there is no straight-forward answer as to how the market reacts upon dividend announcements. Indirectly this implies that the relevancy of dividends to shareholder wealth is still a matter under question.

The present thesis is simply an event study which aims to assess, in a quantifiable manner, the effect of dividends on the prices of securities. Indirectly, the relevancy of dividends is questioned and tested, in an attempt to shed some light to the matter.

The characteristics of the Greek market in regard to dividends differ remarkably from the characteristics of other markets (UK, US, Japan e.t.c.). First of all, the minimum height of dividends is clearly determined by governmental laws and practices, allowing no room for discreteness from the management’s point of view. Moreover, both dividend and capital gains are not taxed. This is a matter of high importance since it enables to test the reaction of the market to dividend announcements without restrictions due to taxation issues. Taking the above into consideration, it is obvious that the Greek market is an ideal candidate market in which to test and measure the direction, the speed and the magnitude of its reactions to dividend announcements.

The present dissertation applied the conventional event study methodology suggested by Brown and Warner (1985) in order to examine, using parametric tests (t-test), the reaction of the market to the event (i.e. dividend announcement). For the calculation of expected returns, the market adjusted model was considered as the most appropriate considering the characteristics of the Greek market.

The data used, were exclusively firms trading in the FTSE/ASE 20 Index of the Athens Stock Exchange due to their special characteristics which enabled the elimination of potential bias. The set period of study stretched from the year 2004 until the year 2007.

The empirical results of the present thesis clearly reject the irrelevance theory. Dividends are found to convey information to the market regarding the firm’s future prospects and hence the signaling effect is supported. Specifically, significant positive abnormal returns are sighted prior to the announcement. On the other hand, after the
event day, the prices of securities drop. The abnormal negative returns are significant for the whole event period examined after the announcement. However, the significant market movements are attributable to the absence of taxation which allows room for investor speculation strategies. Moreover, the observed reactions can also be interpreted as speculative trading techniques by investors who have inside information or have anticipated the announcement of dividends and are actually trading based on their expectations.

The remainder of the present dissertation is organised as follows. Chapters 1-5 introduce the reader to the essential literature review of previous relative event studies. In particular, chapter 1 introduces the major theories regarding the relevancy of dividends to shareholder wealth. Chapter 2 introduces the effect of taxes upon market reactions to dividend announcements (clientele effect). Chapter 3 introduces the information content hypothesis of dividends and the signaling effect. Chapter 4 analyses the rationality of investors which is considered an important parameter when testing market reactions to any event. Chapter 5 presents some of the major relative previous empirical findings. The findings of previous researches are categorised based on the origins of the data that was used in the study to enable comparison within different markets. Chapter 6 provides an analytical description of the methodology that was applied in the present dissertation. Chapter 7 presents the data used for the conduction of the present event study and explains the reasons for their selection. Chapter 8 provides the empirical findings of the present dissertation. Lastly, Chapter 9 summarises the main framework of the present event study and its findings.

2. Dividend Policy and the Value of the Firm
One of the most troublesome puzzles of corporate finance is the decision of the optimal dividend payout ratio. Deciding upon any dividend policy is a matter of high importance since it directly affects the capital structure of the firm, the corporate financing policy and indirectly other major corporate issues i.e. corporate growth. Through the last decades many theories have been developed with contradicting theses and results. The main aim of this chapter will be to address some of the most common theories regarding the dividend policy of a firm in an attempt to understand what drives firms to payout dividends, what the optimal dividend ratio is and whether the announcement of dividends affects stock prices from a theoretical approach. It is considered essential to understand the basic principles of dividend behavior in order to provide insight regarding how investors may view dividend announcements and react upon them conclusively.

Corporate earnings can either be retained or they can be returned to shareholders in different ways (dividends, share repurchase e.t.c.). Moreover, due to the different forms dividends take (cash, stock, properties), to avoid misinterpretation, the term dividends throughout this thesis will refer to normal (not special) cash dividends.

The role of the management for any firm and one of its main priorities is the maximisation of shareholder wealth. Giving this for granted, managers have to decide upon how much earnings should be reinvested in the firm and how much should be distributed out to shareholders in the form of cash dividends.

The bulk of dividend policy theories developed throughout the years can be categorised into groups according to the relevance of dividend policy to market value. The separation of the numerous theories, according to their beliefs of dividend relevancy, is illustrated in Figure (1).

The first category, the irrelevance theory, is strongly associated with the work of Miller and Modigliani (1961) who claimed that dividend policy alone can not affect the value of a firm. On the other hand, supporters of the relevance theory can be grouped into two major categories. The first group (rightists) comprises of all research that claims that investors believe dividends to be less risky than possible future capital gains and therefore prefer high dividend payouts while reacting positively to their announcement.

*Figure (1): Summary of Theories regarding the Relevancy of Dividends to Shareholders Wealth*
The second set of theoreticians (leftists) state that investors prefer low dividends due to taxation issues. Lower dividend payouts lead to higher retained earnings and therefore higher capital gains in the long run which are imposed to lower taxation. The matter of how taxation affects the selected corporate dividend policy and the market value of the firm will be presented separately latter on. Summarising, the way dividend policy affects the market value of a firm according to each theory is presented in the Figure (2).

**Figure (2): Impact of Dividends to Firm Value according to main theories**

- **Irrelevance Theory**

2.1. Irrelevance Theory

According to Modigliani and Miller (1958), the market value of the firm does not depend upon the selected corporate capital structure or, in other words, the level of debt used to finance the firm’s activities. The market value of any security, according to the same authors, is simply the earnings of the firm, before deducting any interest payments, discounted to the present, using the appropriate discount factor according to the level of risk engaged by the firm. This statement is known as Modigliani’s and Miller’s (1958) Proposition I (Figure 3).

Modigliani and Miller (1958) demonstrate that, given any selected debt to equity ratio, the value of the firm does not alter in any direction. The increase of debt for the
firm increases the shareholder’s expected returns on assets but this is offset by the simultaneous increase in the engaged risk and consequently by the increase in the appropriate rate of return investors require for the security. Once again, the total market value is not altered by the changes of the capital structure due to the increase in debt (Proposition II).

Figure (3): Value of the Firm according to Modigliani and Miller (1958)

\[
\text{Value of a Firm} = \text{Value of Equity} + \text{Value of Debt} = \frac{\text{Expected Rate of Return of Assets}}{\text{Required Rate of Return Shareholders}} \\
(\text{in equilibrium})
\]

Source: Adjusted from Modigliani, F. and M.H. Miller (1958)

Taking all the above into consideration, Miller and Modigliani (1961) linked market value of the firm to corporate dividend policy. They provided theoretical evidence that, under certain conditions and underlying assumptions, the selected dividend policy of any firm as well as the potential future dividend policy does not affect the firm’s value. Therefore it also does not affect the current price of the stock nor the total returns to investors.

The underlying assumptions of the work of Miller and Modigliani (1961) are a matter of great importance in understanding the theoretical framework in which the irrelevance theory stands. First of all, Miller and Modigliani (1961) assume that the capital markets are “perfect”. They simply imply that no individual investor has the ability to manipulate stock prices. Furthermore, all investors have access to information about the security and there are no information asymmetries (the agency theory is rejected). Moreover, the securities are not subject to fees, transaction costs or taxes neither for dividend or capital gains. Another assumption that underlies the work of Miller and Modigliani (1961) is that investors are rational. Therefore, they do not have any preference of the source of their wealth (dividend or capital gains). Lastly, they assume that the markets trade under perfect certainty. This implies that all holders of stock are sure of the firm’s goal investment policy as well as of the future
cash flows of the firm. The concept of market uncertainty is not taken into consideration. The different theories that reject the irrelevance theory have stemmed up from questioning these underlying assumptions.

Miller and Scholes (1978) provide evidence that the irrelevance theory proposed by Modigliani and Miller stands true even in a world where taxes exist. Their findings will be presented more analytically latter on in this thesis.

In practice, the above propositions imply that the stream selected to distribute cash can not affect the firm’s value and therefore stock prices due to the fact that the only determinant of firm value is the real assets of the firm.

2.2. Relevance Theory – The Leftists

The main supporter of the leftists’ theory is Brennan (1970). According to Brennan (1970), the main default of the propositions set by Miller and Modigliani (1961) was that they did not deal adequately with the imperfection of the market due to taxation issues. He attempted to fill in the gap in the literature regarding the effect that dividends have on the market value of any firm under uncertainty and the presence of taxation. Brennan (1970), was a pioneer in the field because he presented the “after-tax” Capital Asset Pricing Model (CAPM).

His findings revealed that dividend payouts do not favor investors if the “effective tax rate” is anything apart than null and therefore any increase in dividend payments leads to negative reactions to the market and a decline in market value. To justify his results, Brennan (1970) provided theoretical evidence that, when taxes are present, dividends affect the market value of the security negatively. According to his analysis, in the presence of taxes, the expected returns that investors require are positively related to the risk characteristics of the security and the selected dividend payout ratio\(^1\). This is illustrated in Figure (4).

Therefore, when keeping the risk stable at a certain level, the increase in dividend yield enhances the expected return for shareholders (required risk premium) and decreases the market value of the firm. Hence, whenever capital gains are taxed

---

\(^1\) The basic assumptions of Brennan’s model (1970) were a) easy access to borrowing and lending cash at a risk free rate b) access to short sale without restrictions and c) that the exact dividend payout ratio of the firm is known to the public.
less than dividend gains, the firm can maximise its value by reducing the dividend payout ratio through retaining cash or using it for repurchasing shares.

*Figure (4): Dividend Impact on Market Value according to Brennan (1970)*

\[
R_j - r = \text{Required Risk Premium} \quad \text{COV}(R_j, R_m) \quad + T(\delta_j - r) \quad \text{Dividend Yield}
\]

Here:
- \( R_j \) = the rate of return for the selected security \( i \)
- \( r \) = riskless rate of interest
- \( R_m \) = the rate of return for the market
- \( \delta_j \) = the dividend yield of the security
- \( T = (T_d - T_g) / (1 - T_g) \) where \( T_d \) is tax on dividend gains
- \( T_g \) is tax on capital gains

*Source: Adjusted from Brennan (1970)*

Litzenberger and Ramaswamy (1979) tried to test the model proposed by Brennan (1970) mainly by questioning his underlying assumptions. Litzenberger and Ramaswamy (1979), therefore, tested the model under the condition that the individuals could not borrow unlimited at a risk-free rate. Their model provides evidence that shareholder returns are negatively related to both the shareholder betas and the dividend yield of the firm. For this reason, assuming that the “true” beta of the firm is stable for a specific period of time, any increase in the dividend yield will have negative impact on the expected shareholder returns. Their results provide support to the findings of Brennan (1970) but only under the assumptions that there are no restrictions to short selling and that dividends are certain and available to the public.

On the other hand, restrictions on short sales (Litzenberger and Ramaswamy, 1980) and uncertainty regarding the exact dividend payout policy (Litzenberger and Ramaswamy, 1982) may lead to opposite results. In specific, if these assumptions are questioned, the model reveals that there is a statistically significant positive relationship between the dividend yield of a firm and the returns shareholders enjoy from the equity. This relationship is proven by Litzenberger and Ramaswamy (1982) to be positive but not linear.

2.3. Relevance Theory – The Rightists
Contradicting the above theories, the main concept of the rightist’s theory was that the decision of the optimal dividend policy clearly affects the value of the firm but in a positive manner. Most of the suggested models incorporated dividends as a significant parameter for the valuation of any given security.

In a chronological order, Harkavy (1953) was the first to propose that stock prices fluctuate in alliance with dividends. Specifically, Harkavy (1953) claimed that firms that declare higher dividends experience increases in their stock prices. However, stocks, which retained a high percentage of earnings to finance their growth, experience a certain decline in their prices. It is also possible, however not certain, that these stocks in the long run, will experience enhancement of their price appreciation. Harkavy (1953) points out that, although dividends reveal a certain cash flow for shareholders, the earnings retained can not guarantee an increase in earnings power and hence a price enhancement. However, although the findings of Harkavy (1953) managed to reveal the tendency of the market, they were unable to provide a financial model in order to provide theoretical support.

The first attempt to construct a financial model was made by Graham and Dodd (1951). Their model, clearly suggested that any change in dividends per share alters the market price of the security in the same direction (Figure 5).

*Figure (5): Dividend Impact on Market Value according to Graham and Dodd (1951)*

Traditional Approach

\[
P = m \left(\frac{D + E}{3}\right)
\]

*Source: Graham, B. and D. L. Dodd (1951)*

However, the above model has some major shortcomings. The model clearly indicates that increases (decreases) in dividends lead to increases (decreases) in the P/E ratio. However, the relationship between the market price of the security (P) and the dividends per share ratio (D) is not so obvious due to the fact that earnings (E) are
also incorporated into the model as a parameter which affects market prices. Hence, there is a possibility that, despite the increase in dividend yields, a low earnings growth rate will lead to a decrease in market value. Therefore, the proposed model does not explain in a clear manner the relationship between movements of dividends and prices of securities. However it provided the basis for further investigation.

Additionally, Walter (1956) formulated a model in an attempt to shed some light to the relevancy of dividend policy. The basic principle on which his model lies upon is the comparison of the internal rate of return on shareholders (r) and the firm’s cost of capital (k). The starting point of his analysis is that the market value of any security is simply the present value of all future cash flows (dividends and capital gains). Based on a series of assumptions\(^2\), he concluded to the following model (Figure 6).

\[ P = \frac{D + (r(E-D)/k)}{k} \]

\(P=\) Market Price of the Security  
\(D=\) Dividend per Share  
\(E=\) Earnings per Share  
\(r=\) Internal Rate of Return on Investments  
\(k=\) Cost of Capital of the Firm

\[ Source: \text{Walter (1956)} \]

Figure (6): Dividend Impact on Market Value according to Walter (1956)

The model suggested by Walter (1956) provides useful insights to the relevance theory of dividends. It names three individual occasions according to the relationship between the two main parameters (r, k). If the internal rate of return (r) is greater than the average cost of capital (k) then increases in dividends lead to stock prices decline. This results from the fact that the firm has more profitable investment opportunities than the shareholders (since the returns of shareholders from dividend gains are smaller than the returns of the firm if the earnings were used for investment). In this case, the firm’s value could be maximised by providing no dividend at all. Walter

\(^2\) Walter’s (1956) model lies upon the following assumptions a) the firm’s only available source of funds is the level of earnings retained (no additional external funds can be used such as debt of the issue of new stock) b) the firm exists to infinity and c) the basic parameters (i.e. the internal rate of return and the cost of capital) do not fluctuate hence the risk and return characteristics of any security are certain.
(1956) refers to firms that experience the above (i.e. \( r > k \)) as “growth firms”. According to him, the optimal dividend ratio for growth firms is zero. All earnings should be retained by the firm.

Continuing with the above analysis, for another category of firms, mentioned as “intermediate”, the internal rate of return is smaller that the cost of capital (i.e. \( r < k \)). In this case, increases in dividends create strong positive reactions to the firm’s value. Investors face better investment opportunities than the firm and therefore the maximisation of their wealth will be achieved through paying out all earnings as dividends. Lastly, if the rate of return for any given firm is the same with the cost of capital (i.e. \( r = k \)), then dividend policy does not affect the price of the security. This is consistent with the irrelevance theory. In these cases no optimal dividend payout is suggested by Walter (1956). The market value of the firm is completely independent from the selected retention ratio that may vary from 0% to 100%.

The model of Walter (1956) clearly demonstrates the relationship between stock prices and dividend payments (Figure 7). However, the results based on the proposed model should be exercised with great care due to the limitations and assumptions of the model. For instance, no consideration is given for the business risk which may have an impact on the firm’s value and most importantly it does not incorporate the fact that firms may finance their activities through other sources as well other than retained earnings.

*Figure (7): Relationship between Stock Prices and Dividend Payments according to Walter (1956)*

\[ \text{Relationship Between Stock Prices and Dividend Payout Ratios} \]

\[ \begin{align*}
\text{r > k} & \quad \text{Negative Relationship} \\
\text{r < k} & \quad \text{Positive Relationship} \\
\text{r = k} & \quad \text{No Relationship}
\end{align*} \]

*Source: Adjusted from Walter (1956)*
Additionally, Gordon (1959) elaborated all previous knowledge and empirical findings and concluded to the fact that the price of any security is not independent from the plowback ratio. However, it was not until latter on, when he was in a position to support his findings with a sound theoretical model.

For his event study, Gordon (1962) used a dividend capitalisation approach. Specifically, the milestone of his study was that the market value of any security is simply the sum of all future dividends that rational investors expect, discounted to the present with an appropriate risk-weighted discounted factor. The assumptions he based his model on are the following. First of all the firm has no other source to finance activities apart from retained earnings. In the presence of debt however, Gordon (1962) assumes that the debt-equity ratio of the firm is stable. Exactly like Walter’s model (1956), certain parameters are considered to be stable throughout the infinite life of the firm (i.e. return on investments, the plowback ratio, the cost of capital and the growth rate of the firm). Gordon’s model (1962) assumes that the cost of capital is greater than the firm’s growth rate and that the investors are rational enough to prefer the certain cash flows from dividends than the uncertain capital gains (which are more risky). Based on the previous assumptions, the model that Gordon (1962) proposed is presented below (Figure 8).

*Figure (8):* Gordon’s (1962) Dividend Capitalisation Model

\[
P = \frac{E (1-b)}{k - b \cdot r}
\]

- \(P\) = Market Price of the Security
- \(E\) = Earnings per Share
- \(b\) = Retention Ratio
- \(r\) = Internal Rate of Return
- \(k\) = Cost of Capital of the Firm
- \(b \cdot r\) = Growth Rate in the Rate of Return on Investments

*Source:* Gordon (1962)

Based on the above model, Gordon (1962) predicts similar movements of stock prices in relation to the dividends just like Walter (1956). Namely stock prices
increase when dividends decrease and the rate of return is greater than the cost of capital ($r > k$) and vice versa. Despite the model’s weaknesses (mainly when trying to valuate firms that do not pay any dividends at all or firms that do not have a stable growth rate) it is quite helpful, due to its clarity, to understand the relationships between different firm parameters (such as $r$, $k$, $g$ and firm value).

Concluding, the different theories, regarding dividend policy, have not be able to provide a clear and simple answer regarding whether the dividend policy a firm can or can not affect the firm’s value. Each theory has its supporters and its opposers. A presentation, however, of the dividend policies would not be complete without discussing and analysing the significant role that taxation plays in the selection of the optimal dividend policy. The main theses, regarding the role of taxes, are presented in the following chapter.

3. Effect of Taxes: The “Clientele” Effect

Previous studies have raised the question whether investor reactions to dividend announcements are influenced by the level of taxes imposed on dividends. The bulk of theories regarding the matter as well as the results of empirical studies have found quite contradicting results.

One of the first attempts to unravel the puzzle was made by Miller and Modigliani (1961). According to the latter, as analysed earlier, in a perfect capital market, where no taxes exist, dividend policy would not be able to provide any value to the shareholders and therefore would be irrelevant. However, Miller and Modigliani (1961) claim that in a non-perfect market, shareholders may show some preference to dividends rather than capital gains, or vice versa according to the level of tax imposed on the gains respectively.

They suggest that differences among taxes imposed on capital and dividend gains lead to the “clientele” effect. According to the “clientele” theory, if capital taxes are lower than dividend taxes (which was the case at the time the article was written), then investors would be willing to pay less for firms with high payout ratios and vice versa. As Bhattacharyya (2007) states, the “clientele” theory simply refers to the fact that individual investors decide upon a security based on the firm’s payout policy in order to achieve the “optimum” return from dividends according to the individual tax rates.
Moreover, Brealey et al (2006) suggest that the “clientele” effect simply allows investors to choose the source of their income among capital or dividend gains. This is accomplished through the following procedure. When significant dividends are declared, investors who are taxed highly on dividends are reluctant to pay the taxes and therefore decrease their interest in these securities. These investors sell the stocks with high dividend payouts and seek to invest in stocks with lower dividend yields. On the other hand, investors who are not taxed highly on dividends are willing to possess stocks with higher dividend yields. This movement in the market gradually leads to the adjustment of stock prices to their initial levels, as Miller and Modigliani (1961) suggested. Each investor gains either from capital or dividend gains according to his individual tax preferences. The existence of taxes therefore, according to the latter, does not affect the value of the security, in alliance with their previously stated propositions, but simply alters the “clientele” of investors the firm attracts.

Similar results are provided by Miller and Scholes (1978). According to the latter, even in a world where tax-differences between dividend and capital gains exist, investors have financial instruments which offset the penalties imposed by taxes leaving the true market value of the firm unaffected. Miller and Scholes (1978) claim that when the investment policy of any firm is stable and given for granted, any change in the payout ratio will not affect the wealth of investors, provided that they react in a rational manner. This study provides support that, even with taxes present, dividend policy alone can not alter the market value of the firm in alliance with the irrelevancy theory of Miller and Modigliani (1961).

However, in a latter article, Miller and Scholes (1982) try to reconcile their irrelevance theory with the contradicting empirical findings. The latter authors test and provide evidence that, if the market reveals abnormal returns for the shareholders upon dividend announcements, due to tax differentiations, this does that not refute the irrelevance theory. Abnormal returns are created for a short period of time and are demolished in the long run. They simply believe that testing the irrelevance theory only on a short-term basis gives biased results (especially in the case of dividend announcements). Examining the returns for a longer period provides better insight on the matter.

Black and Scholes (1974) also tested and provided empirical evidence that the “clientele” theory stands true. They believe that there are three major categories of investors depending on the taxation of dividends. The first category includes large
investors i.e. firms and institutions which belong in the low tax brackets and are less likely to trade their stock. The second group comprises of all other individual investors who are more highly taxed while the third group includes investors that do not pay any taxation for dividends. Black and Scholes (1974) claim firms must adjust their dividend policy according to the preferences of their investors. However, they find no evidence that the expected shareholder returns, neither before nor after the evaluation of tax, differ among high and low dividend yield firms. This strongly implies that the market value of the firm will remain unaffected from the selected dividend policy.

Moreover, another study conducted by Elton and Gruber (1970) tried to reveal empirically through a series of tests whether the payout ratio of a firm and the different tax-brackets of investors are related in any way. Their research clearly demonstrated that the “clientele” theory is present in the financial markets. Changes in dividend payouts lead to changes in the structure of investors due to tax differentiations. Therefore, dividend policies attract specific investors, according to which dividend payout is optimum for each individual investor, just like Miller and Modigliani (1961) supported.

Latter research, regarding the impact of taxes on the optimal dividend policy and the market’s reaction to dividend announcements, has shown results contradicting to the findings of the authors mentioned above (supporters of the irrelevance theory).

Masulis and Trueman (1988) tested the optimal dividend policy under taxation. They viewed dividends as cash flows which reduce the firm’s available internal funds for investments. Masulis and Trueman (1988) claim that investors with different dividend-gain taxation view investments financed by internal funds in a dissimilar way. Their model reveals that investors who are not highly taxed for dividend gains are more willing to sacrifice investments in order to achieve a higher dividend payout. On the other hand, investors, who are highly taxed on dividends, prefer low dividend payouts so that they can gain from the positive NPV investments financed internally. Hence, the reaction to announcements (whether positive or negative) depends mainly on the level of dividend gain-taxation.

In alliance to the above, Brealey et al (2006) claim that taxation should be taken into consideration when determining the appropriate-optimal dividend policy for any firm. Specifically, firms should adjust their dividend policy according to the applied tax policy regarding capital and dividend gains. If dividends are highly taxed, firms
could simply lower their payout ratios as possible and provide lower dividends allowing room for capital gains. This would allow the firm to experience the higher possible total cash flow for the firm and the shareholders. This statement is a clear implication of leftist dividend theory as analysed previously.

In an attempt to explain why, despite all the above analysis, firms continue to pay dividends, even when they are taxed higher than capital gains, Allen et al (2000) develop their own theory. They claim that investors can be separated into two major categories: institutional and the individual investors. Considering the fact that institutional investors are exempted from dividend taxes, it is only rational to assume, in compliance with the “cliente effect”, that institutional investors would prefer high-dividend yield firms in comparison to individual investors who would prefer the low-dividend yield firms. However, institutional investors have the ability and the technical skills to control the firms through constant monitoring and supervision. This indirectly acts as a mechanism which motivates poor management to improve their performance. According to Allen et al (2000), firms with high proportions of institutional investors signal positive worth to the market. Therefore, it comes to no surprise that well performing firms, who do not feel threatened by institutions’ control, simply increase dividends to attract institutions as investors and signal out their real value. Concluding, Allen et al (2000) state that tax payments alone are not in a position to determine the suitable payout ratio of a firm. The optimal dividend level, according to them, is determined by the difference in taxes between individual and institutional investors.

Likewise, Brennan and Thakor (1990) tested the reaction to dividend announcements under taxation but also incorporated a different parameter. They created a model to test the preference of investors to the different forms of cash disbursements, taking into consideration the effect of taxes on actual investor gains. They state that, when the distribution of cash is small, investors prefer dividends to any other form of cash distribution. While comparing two alternatives (dividends versus share repurchases), it becomes clear that in the case of share repurchases, investors who are better informed about the future of a firm can take advantage of this information selecting the appropriate position according to each circumstance. On the other hand, dividends do not allow any arbitrage activity since they are contributed to both informed and uninformed investors and therefore are preferred even when they are taxed higher than share repurchases. This may provide an explanation of the
positive market reaction to dividend announcements (regardless of the level of taxation).

Concluding from all the above, although some theories (Miller and Modigliani, 1961; Miller and Scholes, 1978; Auerbach, 1979) claim that taxation is not in a position to alter the market value of the firm, other studies provide empirical evidence of the opposite. Therefore, it is clear that tax issues regarding dividends may play a significant role in relative event studies simply because they have the strength to influence the reaction of shareholders to dividend announcements.

4. The Information Content Hypothesis and the Signaling Effect

Having discussed the major theories regarding dividend policies, as well as the role of taxes, it is essential to refer to the ‘information content’ hypothesis of dividends, a term first introduced by Miller and Modigliani (1961). The latter used the term in an attempt to reconcile their irrelevance theory with the fact that in reality dividend announcements are accompanied with changes in stock returns.

The information content hypothesis simply states that dividends are used as devices or mechanisms to convey private unavailable information to investors about the firm’s future prospects and expectations of future growth (Aharony and Swary, 1980).

Market imperfections and stock undervaluation (meaning that securities stock prices are below the true intrinsic value) may be a result from information asymmetries (Gurgul et al., 2003). Managers are better informed than investors and therefore use dividends as a device to signal to investors the intrinsic value of the firm in regard to its future potentials.

Miller and Modigliani (1961) question the reliability of dividends as signals since they are based upon management’s discretion. They claim that dividends may by misused to manipulate the price of any security. The findings of Lintner (1956, 1961) are quite clarifying on the matter. Lintner (1961), provided evidence that managers are not willing to change their dividend policy if there is a possibility that the expected future earnings stream will not be able to support it. Hence, it is most unlikely that they would use dividends in an attempt to mislead investors. Moreover Lintner (1961) revealed that managers generally emphasise on dividend changes (not on the absolute numbers) which fluctuate in the long run according to the sustained
level of earnings. Therefore, managers try to ‘smooth’ dividends accordingly to long-term alterations of earnings.

The question that has arisen by many studies is why managers use dividends as signals (in an attempt to reduce information asymmetries) and not some other mechanism which would be less costly. Managers have other alternative ways through which they can reveal information to the public (Miller and Modigliani, 1961; Pettit, 1976) and yet they are reluctant to use them. According to Aharony and Swary (1980), managers prefer dividends because they provide less ambiguous signals. Moreover, the fact that they rely upon cash payments makes them more reliable as signals to investors.

The signalling hypothesis states that dividends are simply a mechanism through which managers reveal private information to the public (Pettit, 1976; Bhattacharya, 1979; Miller and Rock, 1985; Bernheim, 1991). Of course other theories regarding the nature of dividends have been presented. The free cash flow theory, for instance, considers dividends as mechanisms to subtract cash flows from firms when they have no positive net present value (NPV) projects to invest the surplus cash flow (Easterbrook, 1984; Jensen, 1986; Bhattacharyya, 2007).

Therefore, if dividends truly convey any information that may be useful for investors, then upon their announcement, stock prices will adjust instantaneously (Aharony and Swary, 1980; Asquith and Mullins, 1985; Ambarish et al, 1987; Bajaj and Vijh, 1995; Lonie et al, 1996; Gurgul et al. 2003). Hence, if the signalling hypothesis stands true, changes in dividends will lead to adjustments of stock prices in accordance to the new information released by the signal.

The signalling effect is consistent with the efficient market hypothesis introduced by Fama (1965). According to the efficient market hypothesis all available information is incorporated into the security’s price. When, however, new information is released, a ‘mechanism’ immediately absorbs it and adjusts the price of securities accordingly. Investors evaluate all new information and react, adjusting market prices. Therefore, testing the information content of dividends and how investors react upon dividend announcements is simply an alternative measure of the efficiency of the market.

The problem that remains unsolved is whether markets actually view dividends as signals and therefore react upon their announcements. Investor’s reactions to dividends simply link theory of dividend policy with the ‘real world’ empirical
findings. Therefore, if investors do not react to dividend announcements, hence, the market shows no abnormal activity, the irrelevance theory is supported and the signalling theory is rejected.

In alignment with the above, if dividends and price changes are positively related, then it is safe to conclude that the theory of the rightists is supported. In contradiction to the above, when dividend announcements lead to a decline in stock prices, the theory of the leftists is found to be true.

5. Rationality of Investors –“Bird in the Hand” Theory

Before presenting the major findings of previous event studies, it is important to refer to the rationality of investors which is an important parameter for the present event study. According to Miller and Modigliani (1961), investors are considered ‘rational’ meaning that they prefer an increase in their wealth, regardless of the form (dividend or capital gains) than having no change in their wealth at all. Moreover, according to the same authors investors act in markets where taxes, transaction costs and fees do not exist (in other words they act in ‘perfect’ markets) and decide upon investments with ‘perfect’ certainty. If all the above hypotheses stand true, there would be no effect from the selected dividend policy on the price of the security as well as on the total return to investors.

Event studies conducted throughout the years have in one sense questioned the significance of the above statement and tried to reveal in practice whether investors react with rationality or not to different news with puzzling and often contradicting results (Elton et al, 2004).

Gordon (1959) first introduced the “bird in the hand” theory. According to him, and in contradiction to Miller and Modigliani (1961), rational investors show some form of preference regarding the source of their wealth. The “bird in the hand” theory, suggests that investors prefer cash dividend gains to capital gains because they are more predictable and certain and hence less risky. When earnings are retained and re-invested by the firm, investors should expect to receive higher prices of stock in the future (capital gains). However, the uncertainty regarding these future potential capital gains leads investors to prefer to receive dividends in the present in order to fund their individual needs. According to the “bird in the hand theory”, firms that
payout a large proportion of their earnings would trade in higher stock prices than firms with higher retention ratios.

On the other hand, Bhattacharya (1979) argues circumstantially that, in a well informed perfect market that acts in a competitive environment, the uncertainty of investors regarding capital gains is not an adequate reason to make investors show some preference to dividend gains. Bhattacharya’s (1979) findings reject the “bird in the hand theory”. It therefore becomes clear, that once again, literature findings are not consistent with one another.

According to Heiner (1983) when examining the reaction of the market to any announcement it is inevitable that not all investors react in the same way (despite their rationality). The difference between their reactions, as Heiner (1983) claims, is due to two main elements:

a) the level of uncertainty regarding the event due to the complexity of the environment in which investors act

b) the capability of investors to incorporate and elaborate any new information

Furthermore, to test his theory, Heiner (1985) developed a behavioral model which provided evidence that the basis of investor’s rationality, which makes their actions predictable, is the uncertainty in the environment. Heiner’s findings (1985) clearly contradict the findings of Miller and Modigliani (1961).

In alliance with the above, Deshmukh et al (2008) tried to test Heiner’s (1985) model and examine the reaction of shareholders of common stocks and shareholders of preferred stock to dividend announcements. Their findings clearly verify Heiner’s (1985) statements. Specifically, their results state that both shareholders of common and preferred stocks react in the same pattern but they differ in the speed of their reaction due to the different level of uncertainty surrounding their actions and decisions. In particular, investors of preferred stock respond to the release of news more slowly because they simply have more information that needs to be elaborated before deciding upon any action (increased uncertainty). They have to determine, for example, whether the announcement of a dividend increase is a signal of future prosperity for the firm (positive news) or if it is indirectly an attempt to increase the leverage ratio of the firm and therefore transfer wealth to common shareholders from preferred shareholders who are the beneficiaries of fixed-income securities (negative news). Despite the speed of the reaction which is considered statistically insignificant,
Deshmukh et al (2008) find that all shareholders react in a positive manner to increases of dividends.

From all the above analysis, it becomes quite clear that the rationality of investors is evident. This is a major underlying assumption for all the event studies conducted (MacKinlay, 2006), some of which are presented in the following chapter.

6. Market Reactions to Dividend Announcements: Previous Empirical Findings

Having discussed the main framework regarding corporate dividend policies as well as the rationality of investors it is important to present the relevant previous event studies as well as their findings. The empirical results have been grouped into categories according to origins of the data used in the study in an attempt to enable direct comparison and to neutralise the dissimilarities between the different markets regarding the legal framework and the taxation imposed on dividends.

6.1. The US Market

The results from previous relative studies using data from the US market, do not agree upon the existence of the signaling effect and the relevancy of dividends to shareholder wealth. The major findings regarding the US market are presented in two major categories (i.e. the event studies that reject the relevancy theory and the event studies that support it).

One of the first event studies that tried to reveal whether the signalling hypothesis stands true was conducted by Watts (1973). He created a model to test the signalling effect and provided sufficient evidence that dividends convey little information about future corporate growth.

Furthermore, Black and Scholes (1974) attempted to test the irrelevance theory of Miller and Modigliani (1961). They collected the total returns of 25 portfolios of stocks trading in the New York Stock Exchange (NYSE) and classified them according to the announced dividend yield and the level of risk involved. The regression analysis applied between the two variables (dividend yields and stock returns) showed no statistically significant relationship between them. Their results clearly reject the signaling effect and support the irrelevance theory. Other previous researches have also rejected the signaling hypothesis based on their findings (Lang
and Litzenberger, 1989; Christie, 1994). Moreover, Downes and Heinkel (1982), test
the signaling hypothesis using data from firms that announce their primary public
offering of stock. Despite the fact that there is no previous record of trading behavior
and limited corporate information, dividends fail to support the signaling theory and
produce no abnormal returns.

Additionally, Fuller (2003) claims, that the reaction to dividend announcements
is dependant upon the level of information available to the market (information
asymmetry). He categorises all investors according to their available level of
information about the firm and tests the dividend signaling hypothesis. From his
results it becomes obvious that the magnitude of the reaction to dividend news is
negatively related to the level of informed investors holding the security. According to
Fuller (2003), if the majority of any firm’s equity is held by only a few informed
shareholders, then the price value of the equity is considered to be close to its true
intrinsic value. Hence, the information content hypothesis of dividends is rejected.

Contradicting the above, event studies have also provided empirical evidence
that dividends are relevant in determining the actual wealth of any shareholder. Event
studies that support the signaling effect are presented hereunder.

Firstly, Pettit (1976), based on the model of Watts (1973), questioned the
information content hypothesis and proved through the creation of his own model,
that dividends convey information to investors. He did not define, however, the exact
relationship between dividend announcements and the market’s reaction.

Additionally, Aharony and Swary (1980) tested the reaction of the US market to
quarterly dividend announcements. The use of quarterly dividend announcements was
deliberately selected in an attempt to isolate the investor’s reactions solely to
announcements of dividends. They tested the reaction of 149 firms for a period of 14
years and concluded that the market reacted positively to increases and negatively to
decreases of dividends. In the case where dividends remained constant, no abnormal
returns were observed. Aharony and Swary (1980) remark that the market reacted in
an efficient manner (i.e. stock prices where adjusted on the first day following the
announcement).

Moreover, Divecha and Morse (1983) tested a much larger sample of firms (all
firms named in the Standard & Poor’s Stock reports, apart from banks) for a smaller

3 According to Fuller (2003), “there are three major types of investors: liquidity, uniformed and
discretionary traders”.

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period of time (1977-1979) and observed that all stocks experienced abnormal returns around the announcement of dividends. Moreover, the abnormal returns of stocks fluctuate directly with the proportional change of dividends.

Another study by Asquith and Mullins (1983) emphasised on those firms that declared a dividend for the first time or after a long period of no dividend payouts. The selection of this sample isolates the reaction of investors from other parameters (i.e. earnings). Their findings clearly state that the wealth of any shareholder is enhanced when dividends are announced for the first time.

Furthermore, Eades et al (1985) test the relationship of stock prices and dividend announcements in an attempt to reveal whether markets are efficient or not. They use a large sample (over 70 thousand declared dividend announcements) for a period of 19 years and try to relate dividend announcements to observed stock prices. Moreover, they incorporated in their study any potential change in the firms risk characteristics due to dividend announcements. Their results showed that markets experience statistically significant excess returns for a two-day period after the declaration of dividends, implying that the US market allows room for arbitrage activity.

Additionally, Canina (1999) examined whether the market’s reaction to dividends (which she found to be positive) reflected a permanent or a temporary modification of the earnings stream. In order to accomplish the above, she decomposed the change in prices between a short-term and a long-term change. Her results provide strong evidence that investors, with the help of the information conveyed by dividends, adjust stock prices to balance them with the permanent changes in earnings in the long run. Canina’s (1999) results are consistent with Lintner’s theory (1956) as analysed previously.

Moreover, Lippert et al (2000) examined dividend increases and observed that they were followed by price reductions. They interpreted their findings in relation to “pay-performance sensitivity” which they believe neutralises the strength of dividends as signals of information. When pay-performance sensitivity increases, dividends are considered a burden and highly irrelevant since they only increase agency costs. However, the authors claim that their results were emanated using data of large sized firms and they should not be generalised.

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4 Lippert et al (2000) use the term pay-performance sensitivity as “a measure of sensitivity of compensation to changes in shareholder wealth or as an indicator of compensation structure”.
Lastly, Best and Best (2001) tested the reaction of dividend policies in comparison to the forecasts of corporate growth and earnings. They tested the announced dividend changes according to analyst’s forecasts and the reactions they bring upon stock prices. Their data comprised of all dividend announcements in the US market from the beginning of 1977 until 1988. The results of their study are consistent with the findings of the previous event cases, supporting the positive relationship between dividends and abnormal returns. In addition, they provide evidence that the magnitude of this relationship is highly related upon the beliefs of investors about earnings prior to the announcement. Consequently, a dividend increase gives higher positive abnormal returns when the predictions of future earnings were lower than the final realisable earnings.

6.2. The UK Market

Comparing the characteristics of the UK market to those of the US market, main differences stem up from the dissimilar tax treatment of dividends and the frequency of dividend payments. Firms activating in the UK usually declare dividends twice per year. In particular, an interim dividend (usually in the middle of the fiscal year) is announced as well as a final dividend (at the end of the fiscal year). Usually, final dividends are higher than the declared interim dividends.

The magnitude of signals of interim dividends and final dividends is a matter that has drawn attention during the last decades. Several event studies have been conducted in an attempt to reveal which of the two dividends (interim or final) is considered more informative from investors. They provide, however, contradicting results. All event studies (based on UK data) agree that both dividends convey information to the public but they do not agree upon their clarity and reliability.

Laub (1976) states, that both types of dividends (interim and final) reveal information. However, interim dividends may motivate different reactions to investors according to the nature of the news revealed (good or bad). Different reactions are attributable to the fact that interim dividends enable investors to forecast future earnings while in the case of final dividends, realisable annual earnings are already known.

In alliance with the above, Acker (1999) believes the magnitude of investor’s reaction to interim or final dividends depends upon the direction of the news (positive
or negative). Therefore, when dividends are decreased (negative news) interim dividends provide stronger reactions than final dividends. However, in the case of dividend increases, the market reacts to final dividends more strongly (in terms of abnormal returns).

Moreover, Balachandran (2003) states that investors react to interim and final dividends in a similar manner since both dividends are informative. Balachandran (2003) however examined the reaction to dividend reduction comparing the case of interim dividends to final dividends. In alignment with Acker’s (1999) findings, he revealed that the market’s reactions based on interim dividends are stronger than the reactions based on final dividends. The reason that he provided, in support of his findings, was that managers are reluctant to decrease dividends especially when their dividend policy is solely based on forecasts of future earnings, just like as Lintner (1962) proposed. Therefore, decreases in interim dividends reveal the pressing necessity of firms to retain cash and simply signal potential financial problems. Investors therefore incorporate the information which is reflected into the significant decline of stock prices.

Lonie et al (1996) believe that dividends are viewed as signals of future corporate performance despite the fact that they may be influenced by other economic factors. The results of their study based on data from UK firms confirm their beliefs. Moreover, due to the fact that dividends are declared simultaneously with earnings (joint announcements), they run interaction tests in order to test the magnitude of dividend and earnings signals. The results are quite unraveling. Joint announcements are accompanied by excess market returns but it is the change in earnings that is primary responsible for the change in stock prices. Dividend signals are found to be less informative. On the other hand, Kane et al (1984) provide support that announcements of earnings and dividends should not be examined separately since the two variables are interactive at a statistically significant level.

In alignment with the above studies, Gunasekaragea and Power (2002) state that investors do not value dividend announcements alone but in comparison to earnings announcement. They also confirm the interaction effect between the two variables (earnings and dividends). However the results of their findings are not consistent with the signaling hypothesis. Positive abnormal returns after announcements of increases in dividend and earnings are eliminated in the long run. On the other hand, dividend
omissions, according to their findings, are not signals of deterioration of future performance rather than mechanisms to turn corporate performance around.

Goddard et al (2006) tested the relationship between earnings, dividends and the prices of stocks. Their research tried to reveal whether earnings determined the level of dividends (smoothing effect) or whether the opposite is true (namely, dividends determine the growth of future earnings). The study used data from 137 UK-based firms for a selected period of 1970 until 2003. Their results show that the three variables are not independent. They confirm the signaling hypothesis namely that dividends are positively related to price changes at significant levels.

6.3. The Japanese Market

In addition to all the above, the last decade emphasis has been given to studying the Japanese market’s reaction to dividend announcements due to its special characteristics. Firms in Japan activate under certain circumstances that are quite different to the legal framework of other markets. The most important difference is that firms are not obliged by law to announce dividends. Dividend announcements are voluntary and sometimes take place only one day before the ex-dividend day. Moreover, the largest proportion of stocks is held by financial institutions of other corporations rather than individuals or foreign investors who possess only 30% of stocks. This would explain why announcements are not compulsory; because financial institutions have easier access to information regarding the firm, therefore the majority of investors do not rely on dividend announcements to gain access to inside information. The information-content hypothesis of dividends should not be present in the Japanese market.

These two major characteristics influence the studies of signaling effect in Japan and create the necessity to discuss the findings of this market separately. Despite the fact that dividend announcements are not mandatory, Kato et al (1997) reveal that managers are willing to announce dividends, especially if they experience some increase. The same authors believe that the motivation of such an action is not to reverse incorrect estimates of the market, as Ajinkya and Gift (1984) claimed, or to reduce the information asymmetry between managers and investors since the majority of investors are already well informed, but simply to confirm and verify the current
status of the firm. The results of the research that took place based on data from Japanese firms are presented below.

Kato et al (1997) tested the magnitude of the market’s reaction to dividend announcements using a sample of 2,356 Japanese firms for a period of 1982 till 1991. Their findings clearly indicate that increases in payout ratios lead to positive excess returns of the market. Moreover, they claim that the Japanese market is considered quite efficient since the information released is incorporated in the stock prices within two days.

In alignment with the above findings, Fukuda (2000) tested more recent data (period of 1990 till 1994) of the Japanese market and provided evidence that the signaling hypothesis stands true. He also observed that decreases in dividends lead to stronger market reactions than increases. Moreover, Fukuda (2000) claims that although his findings are consistent with findings of other research regarding the American market, the size of the reaction of the Japanese market is considered to be smaller than the reaction of the US market. A possible explanation for this phenomenon is provided by Kato et al (2002) who claim that institutional investors (who hold over 70% of all equity) seldom trade their stock and therefore the trading activity in the market is conducted by only a small proportion of shareholders (individuals and foreign investors).

An even more recent study was conducted by Harada and Nguyen (2005). Covering a period of 1992 until 2002, a challenging decade with clear signs of deceleration for the Japanese market in comparison to the previous decade, the results confirmed the previous studies regarding the positive reaction of the market to increases in dividends even under distress conditions.

From the above analysis is becomes quite clear that even in the case of the Japanese market, where dividend announcements are not compulsory, the results do not differ from those of other market (like in the US) where dividend announcements are mandatory. Taking this into consideration, it becomes obvious that the nature of the dividend announcements (mandatory or not) does not play any important role since it does not have the magnitude to counterfeit the results.
6.4. Other Markets

Contrasting the results of the well-developed markets mentioned above (UK, US and Japan), Travlos et al (2001) examine the relationship of dividends and stock prices in an emerging market. They used data from firms trading in the Cyprus Stock Exchange Market for a period of eleven years. Their statistical tests showed a clear positive relationship between dividend increases (both cash and stock) and the security prices. Their study provides evidence that the signalling effect can also be sighted in emerging markets not only in well developed equity markets.

Moreover, Norway’ capital market has many characteristics which differentiate it from other markets. Dividends are declared only once a year (in contradiction to UK) while the dividend policy is determined by the Norwegian law. Moreover, investors do not have to pay taxes for dividends like in the UK and in the US. This market allows room for investigation whether the dividend signalling hypothesis stands true. Capstaff et al (2004) provide evidence that the Norwegian market supports the signalling hypothesis. Share prices move according to dividend changes in the case of increases and decreases. The strength and the magnitude of the markets reaction is found to relate to the size of the dividend change.

Moreover, How et al (2005) examined whether the announcement of dividends alters the information asymmetry. They based their data on Australian firms from the Australian Stock Exchange (ASX) and collected the dividend announcements during the years 1998 and 1999 for 109 enterprises. Their results support the initial hypothesis that the announcement of dividends reduces the level of information asymmetries in the market and leads to stock adjustments of prices accordingly.

Similar to the Japanese Market, the Hong Kong Market is characterised by high concentration (few shareholders own large proportions of equity) while dividends are declared one time annually and they are not taxed. Taking these features into consideration, Cheng et al (2007) test the signalling effect using data extracted from the Hong Kong Stock Exchange for a period of over fourteen years. Their results clearly support the signalling hypothesis.
6.5. The Greek market

The Greek market has many differences compared to all of the other markets discussed earlier. The main differences are associated with the legal framework that influences corporate dividend policy as well as taxation issues regarding dividend and capital gains.

Each market has its own characteristics regarding the nature of dividend announcements. Dividends in the US and in the UK are a product of management discretionary. In Japan, on the other hand, dividends are not mandatory but they are announced voluntarily by firms. On the other hand, in Norway the law determines a “ceiling” over which dividends can not be paid. It is inevitable that these differences play some vital role in the results of any event study that aims to test the impact of dividends on stock prices. Therefore, it is essential to determine the Greek legal framework in regard to dividend policy.

The minimum distribution of dividends in Greece is a matter that is clearly determined precisely by governmental laws. According to the Greek Corporate Law 2190/1920 (article No. 45) all firms are obliged to pay dividends, in the form of cash payments, equal to 6% of the total equity (Dividend A).

Latter reviews of the above law lead to Corporate Law 148/1967 which determined that minimum cash dividends should be equal to 35% of the net income after the subtraction of all mandatory reserves (Dividends B).

Finally, according to a latter Corporate Law (No. 876/1979), which is still valid up to the writing of the present thesis, firms are obliged to distribute to shareholders the greater dividend between Dividend (A) and Dividend (B). Of course the same law determines circumstances under which a different cash dividend can be paid. The above presented legal framework clearly indicates that the minimum height of the announced dividend is clearly related to the financial performance of the firm (net income) or its financial position (total equity capital).

Moreover, the Greek tax system is quite differentiated from the tax systems applied in other European Countries and in the US (where most previous empirical

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5. For example, according to Corporate Law No 876/1979, firms can distribute the smaller dividend between Dividend (A) and Dividend (B) if it is approved by an 65% majority of shareholders. Furthermore, no dividends are distributed only with the approval of an 85% majority of shareholders.
studies where conducted) and therefore it is considered essential to provide a brief description.

The Greek tax system does not engage double-taxation of dividends. Tax upon corporate earnings is paid by the firm and the declared dividend emerges from the profits after tax. Additional tax is not paid from investors when receiving corporate dividends. The same applies for capital gains, meaning shareholders are not subject to any tax for capital gains. The only tax obligation for shareholders is a fixed tax of (0.3%) on every sale of stock that takes place. Therefore, the absence of taxation upon dividends also differentiates the Greek market from other markets mentioned earlier.

Taking the above characteristics of the Greek market into consideration, a few event studies, conducted using data from the Athens Stock Exchange (ASE), attempted to shed some light as to whether the Greek market supports the signalling effect or not.

Papaioannou et al (2000) use data from all firms trading in the Athens Stock Exchange Market (ASE) and their announced dividends, from 1981 until 1994. No statistically significant abnormal returns were observed during the event period under study. Hence, their results clearly reject the signalling effect.

One the other hand, a study conducted by Lyroudi et al (2007), provided evidence of the signalling hypothesis in Greece. For their study, Lyroudi et al (2007) used data from firms listed on the ASE for a period of 1998-2004. Their results claim that, on the day of the dividend announcement, the market showed no abnormal returns. However, the market’s excess returns for day 1 until day 5 (after the event day) were statistically significant. After day 5, the market showed no abnormal returns indicating that the Greek market incorporates information conveyed by dividends slightly more slowly than other markets. Neither the less, the evidence provided by Lyroudi et al (2007) support the information content hypothesis of dividends.

Dasilas (2007), in alignment with the findings of Lyroudi et al (2007), states that the Greek market’s reaction is related to dividend announcements. Using data from firms that declared a cash dividend from 2000 until 2004, he tested the signalling hypothesis in the Greek market. He found that stock prices react positively to dividend increases, while negative abnormal returns are observed when dividends decline. When dividends remain constant, the market presents no abnormal activity.
Thus, the findings of Dasilas (2007) clearly support that dividends convey information to investors, who adjust stock prices accordingly.

Lastly, the findings of Asimakopoulos et al (2007), regarding the Greek market, are somewhat in the middle. They separate the firms of their sample into two groups. The first group consists of all the firms that pay the minimum dividend which is mandatory according to the Greek law while the second group consists of all firms that declare dividends higher than the mandatory level. Asimakopoulos et al (2007) find that the reaction of the market is different according to the level of dividend declared. Specifically, when firms declare the minimum, mandatory by law, dividend, no abnormal returns are observed. However, in contradiction to previous studies, when dividends exceed the mandatory level, stock prices decline significantly.

Summarising, the results of previous event studies, conducted with data from different countries, fail to lead to one single answer regarding the market’s reaction to dividend announcement and the dividend relevancy in shareholder wealth. The special individual characteristics of the market play a significant role in the outcomes of each event study. Hence, the environment in which the market trades is of vital importance and should be taken into consideration. But even when conducting the event study in the same country, results still are not consistent. Therefore, the study of the information content of dividends and the relevancy of dividends is still under question and requires further investigation.

7. Methodology

Event studies, according to Bodie et al (2002), are simply tools of empirical research that assess in a quantifiable manner the economic effect of any event on securities prices. All event studies are based on the assumption that investors are rational and react in an according manner (MacKinlay, 1997), as analysed in a previous chapter.

The present thesis is simply an event study which aims to reveal the impact of dividend announcements (hereafter, the event) on the firm’s value, and if any, to quantify it. The impact on the firm’s value is measured by the changes in stock prices. The present event study aims to measure a) the direction b) the speed and c) the magnitude of the effect.
The present thesis follows the conventional methodology for event studies of Brown and Warner (1985), adopted by many previous researches (Lonie et al, 1996; MacKinlay, 1997; Eaton, 1999; Papaioannou et al, 2000; Balachandran, 2003; Gurgul et al, 2003; Asimakopoulos et al, 2007; Dasilas, 2007; Lyroudi et al, 2007). However, with the adoption of this specific methodology, a few issues arise that need to be examined and clarified. These issues are discussed in the following subchapters.

7.1. Definition of the Testable Hypothesis

The present event study aims to shed some light to the contradicting results regarding the market’s reaction to dividend announcements. The special characteristics of the Greek market, discussed in a previous chapter, provide an ideal environment in which to test whether dividends provide information to investors, regarding the true intrinsic value of the firm and the firms future prospects, or not. In order words, the relevance of dividends to shareholder wealth is tested.

Summarising the above, the present event study tests the following null hypothesis:

H0: Announcements of dividends do not lead to any abnormal activity of stock prices i.e. dividends do not convey any information to the market

Acceptance of the null hypothesis (i.e. announcement of dividends results to insignificant excess returns of stock prices) would simply support the irrelevancy theory of dividends, as proposed by Miller and Modigliani (1961), and reject the information content hypothesis. On the other hand, the rejection of the null hypothesis (i.e. dividends affect significantly the distribution of returns), justifies the information content hypothesis and the relevance theory of dividends. The quantification of the impact that dividends have on shareholder wealth and the direction of the impact (positive or negative) will provide support to the rightists or the leftists theory respectively.

Indirectly, the results will provide insight to the signaling effect of dividends. If the hypothesis is found to be true, hence dividends are unable to provide any change in shareholder wealth, the signaling hypothesis is rejected. On the other hand, if the null hypothesis is rejected the signaling theory is found to be true.
7.2. Definition of the Appropriate Announcement date

Defining the appropriate date as the event day is a very important parameter for the model and should be given special consideration. The event day (day 0), meaning the day that dividends are declared, should be the day of the official announcement held by the firm’s board. Any forecasts of dividends conducted by other sources should not be taken into consideration. (Fukuda, 2000; Gurgul et al, 2003; Dasilas, 2007). The day that dividends are paid or the ex-dividend day is not considered as the event date for the present study (Asquith and Mullins, 1983; Gurgul et al, 2003).

In alliance with previous literature findings, the present event study defines the event day (hereafter, day 0) as the day which information regarding dividends is officially released to the public from the firm and not any other source (Lyroudi et al, 2007).

7.3. Selection of the Appropriate Event Windows

The selection of the appropriate event window is also a matter that requires consideration. The term “event window” or “event period” refers to the total of days prior and after the event date (in this case the announcement of dividends). During this period the event study takes place. In other words it is the time frame in which the event study is conducted and statistical conclusions are drawn from.

Determining the appropriate event window is a matter that has raised considerate amount of attention. Previous studies have presented three major types of event windows: a) the fixed length b) the ad hoc approach and c) rule based approach according to trading activity (Hillmer and Yu, 1979; Krivin et al, 2003).

If the appropriate event window is not selected, there is a possibility that the abnormal activity (due to the impact of the event) will not be captured by the study (Lev, 1989). Therefore, the results may be biased due to the inappropriate length of the event window (Krivin et al, 2003). For this specific event study, Gurgul et al (2003) suggest that the event window should not exist a period of 30 days surrounding the event date because there is a possibility that the results will be biased due to the impact of other events which are not directly related to the dividend announcement.

Relative studies of the impact of dividend announcements on stock prices have several different event windows. How et al (2005) test the hypothesis within a very
small time frame of only two hours after the announcement. The use of such a small event window which consists only on the announcement date is highly criticised as inappropriate by MacKinlay (1997).

Moreover, Bajaj and Vijh (1995) use a relatively small event window, namely only one day surrounding the event (t= -1 until t=+ 1). The same event window, consisting of totally three days, is used by Lonie et al (1996), Kato et al (1997), Canina (1999), Best (2001) and Gunasekarage and Power (2006).

On the other hand, Gurgul et al (2003) use an event window of five days. Brown and Warner (1985), propose a “event period” of five days prior to the event and five days after, namely a total of eleven days. According to McCluskey et al (2006), if the information content hypothesis is present, this particular event window should be sufficient in capturing the impact on stock prices.


Lastly, a period of 41 days is used by Divecha and Morse (1983), McCluskey et al (2006) and Asimakopoulos et al (2007), while Fukuda (2000) uses much larger event windows (almost one year). Larger event windows should be considered, according to McCluskey et al (2006), when using data from “thin” markets. Stocks that are not traded frequently may need more time in order to adjust to the news released. Hence, a bigger event window is necessary to avoid biased results due to non-synchronous trading (MacKinlay, 1997; McCluskey et al, 2006; Dasilas, 2007).

A summary of all the above is illustrated below in Figure (9).

*Figure (9):* Selection of the Appropriate Event Window

\[
\begin{align*}
  & \text{Selection of the Appropriate Event Window} \\
  & \text{t = 0} \\
  & \text{t = -x} \quad \text{Event day} \quad \text{t = +x} \\
  & \text{x = 1} \\
  & \downarrow \text{Lonie et al (1996)} \quad \text{Kato et al (1997)} \quad \text{Canina (1999)} \quad \text{Best (2001)} \\
  & \text{x = 10} \\
  & \downarrow \text{Aharony and Swary (1980)} \quad \text{Asquith and Mullins (1983)} \quad \text{Eades et al (1985)} \quad \text{Papaioannou et al (2000)} \\
  & \text{x = 20} \\
  & \downarrow \text{Divecha and Morse (1983)} \quad \text{McChusty (2006)} \quad \text{Asimakopoulos et al (2007)}
\end{align*}
\]
However, a few researches use a different approach and test the impact of dividend announcements using several event windows (Travlos et al, 2001; Balachandran, 2003; Cheng et al, 2007, Lyroudi et al, 2007). The use of several event windows rather than only one is considered by Balachandran (2003) as essential in order to avoid any impacts caused by distribution of information prior to the announcement date (potential leakage) or by “after hours” announcements.

For the present study, the use of multiple event windows was selected, in an attempt to shed more light to the matter and avoid the possible biasness caused by irrelevant events, as Balachandran (2003) proposed. However, the biggest event window, in terms of length, does not exceed 41 days surrounding the event date (20 days prior and 20 days after the event date). Specifically, the following event windows will be used (-20, +20), (-20, -1), (0, 20), (-10, +10), (-10, -1), (0, +10), (-5, +5), (-5, -1), (0, +5), (0, +1) and (0, +2).

7.4. Calculation of Abnormal Returns

Having determined how the event date is selected and the appropriate event window for the present event study, the following matter that needs to be clarified is the calculation of the abnormal returns.

According to Bodie et al (2002), abnormal returns are simply “the excess returns that shareholders receive over and about the return they would have received predicting market movements”. The above statement is illustrated in Figure (10).

*Figure (10): Calculation of Abnormal Returns of the Security (i)*

\[
AR_i = R_i + ER_i
\]

\[\begin{align*}
AR_i & = \text{Abnormal Returns of the Security (i)} \\
R_i & = \text{Actual Returns of the Security (i) that results from the Event} \\
ER_i & = \text{Expected Returns of the Security (i) if the event had not occurred}
\end{align*}\]

Therefore, for any given security (i), the abnormal return (AR\(_i\)) is the actual return (R\(_i\)) that investors observe from the market during the days of the event
window (i.e. the return that stems as a result of the event) minus the return of the stock that the investor would expect if the event had not occurred (ER). Although, for any given day (t), the actual return (R_{it}) is not under question, since it can be derived directly from the daily closing prices of the security, the expected return (ER) needs to be calculated and estimated.

7.4.1. Calculation of Actual Returns

Following the methodology of Brown and Warner (1985) all returns are examined on a daily basis. Before computing the excess returns of any stock, it is essential to calculate the actual daily returns of the stock. For a security (i) at day (t), the actual daily return (R_{it}) is simply the closing price of the stock at that day (P_{it}).

However, it is considered suitable to calculate the actual returns of the security (R_{it}) as logarithmic returns (Strong, 1992; Lonie et al, 1996; Kim and Verrecchia, 2001). Logarithmic returns are considered as more appropriate because they have the ability to relate returns of small periods to returns of larger periods (Strong, 1992). Moreover, the use of logarithmic returns enables to eliminate any potential bias due to skewness (Capstaff et al, 2004). Logarithmic returns are used by many previous relevant event studies (Balachandran, 2003; Gurgul et al, 2003; Lyroudi et al, 2007; Dasilas, 2007).

Summarising, assuming (P_{it}) is the closing price of any given stock (i) for day (t), the actual returns (R_{it}) will be calculated through the following equation:

\[ R_{it} = \log(P_{it}) - \log(P_{i,t-1}) \]

For every security included in the sample and for all of the years examined, the actual returns are calculated using the above formula.

7.4.2. Calculation of the Expected Returns

Unlike the actual returns (R_{it}), which are considered a known parameter of the model, expected results and the calculation of them is not a straight-forward process. Based on the methodology used by previous event studies, many approaches- models,
which calculate expected returns of securities \((ER_i)\), are sighted. The dominant models for calculating excess returns are:

a) the Market Model, 

b) the Market Adjusted Model

c) the Mean Adjusted Model.

According to the market model, the returns of any security that investors expect are related to the returns of the market. The market model, known also as the single index model, assumes that the expected returns \((ER_i)\) of the securities are calculated by the following formula:

\[
ER_i = \alpha_i + \beta_i \, R_m + \varepsilon_i
\]

Where, \(\alpha_i\) : is the average return of security \((i)\) in comparison the return of the average of the market  
\(\beta_i\) : measures the market risk of the security \((i)\)  
\(\varepsilon_i\) : is the random error (expected to be around zero)  
\(R_m\) : is the logarithmic return of the selected market proxy.

The underlying assumption of the market model is that the return of each security \((R_i)\) is linearly related to the return of the selected market proxy \((R_m)\).
Parameters ($\alpha$) and ($\beta$) are calculated using daily returns of the security as well as the market proxy with the Ordinary Least Squares (OLS) method (Aharony and Swary, 1980; Hagerman et al, 1984; Travlos et al, 2001; Gurgul et al, 2003). Parameter ($\alpha$) reflects that part of return that is not related to the market. On the other hand, parameter ($\beta$) reflects the component of return that is clearly related to the market. It describes the security’s level of sensitivity to market movements.

The estimation period, during which the parameters are calculated, should not include the days of the event period to avoid potential influence from the event on the parameter estimates (MacKinlay, 1997). Overlapping of the two periods (i.e. the event window and the estimation period of the parameters) should be avoided (Bajaj and Vijh, 1995; Kato et al, 1997; How et al, 2005)

Another model for the calculation of expected results, sighted in previous relevant event studies, is the market adjusted model. According to this model the expected returns of the security are considered to be the returns of the market at the given time provided that an equally weighted market index is used (Travlos et al, 2001). The market adjusted return model for a security (i) on day (t) is presented through the following equation:

$$ER_{it} = R_{mt}$$

Where, $ER_{it}$ = Expected returns of the security (i) on day (t)

$R_{mt}$ = Logarithmic Return of the market proxy on day (t)

This model is more simplified than the market model and it stands on the basis that the market portfolio, which includes all the stocks traded in the market, has the ability to “capture” the normal returns of each individual security (Travlos et al, 2001).

Moreover, the market adjusted model is considered to be a modification of the market model in the case where parameter ($\alpha_i$) is zero and parameter ($\beta_i$) is considered to be equal to 1, meaning that the risk of any security is equal to the risk of the market (Asimakopoulos et al, 2007). The error variable, as mentioned earlier, tends to zero, or is statistically insignificant. Hence it is not incorporated in the model.

On the other hand, the use of the mean adjusted model is not frequently sighted in previous literature findings. The mean adjusted model assumes that the expected returns of any stock can be detected through the observation of the market since they
are simply the mean average returns of the security for a period of days before the event day. The mean market model is derived from the following equation:

$$ER_i = \bar{R}_i,$$

where $\bar{R}_i$ is the average return of the security (i) for the estimation period.

Similar to the market model, as discussed earlier, the estimation period should not overlap the event window to avoid possible biasness of results. The major flaw of the mean adjusted model is that it assumes that investors are in a position to forecast their expected returns, based on average past prices. This assumption clearly contradicts the weak form of market efficiency, proposed by Fama (1965). According to the latter, all previous information of past prices is already incorporated in the current stock price. Stock prices follow a random walk and therefore, they cannot be predicted or forecasted based on past performance.

For the calculation of expected returns, as it becomes clear from the above, the first two proposed models seem to dominate in the previous literature findings. Moreover, many studies have tried to test the null hypothesis using simultaneously both models. Indirectly, they simply test which model is more capable of capturing the potential excepted returns and abnormal returns conclusively in order to reject or support the testable hypothesis.

The findings clearly indicate that the estimates of excess returns do not differ significantly when using the various models, provided that the models are applied upon the same data and for the same event window. (Papaioannou et al, 2000; Travlos et al, 2001; Dasilas, 2007; Lyroudi et al, 2007). Of course, each model has its own strengths and weaknesses. Therefore, no model seems to rule out the other. However, for the needs of the present study the market adjusted model was used.

The selection of the market adjusted model was decided mainly due to the main limitations and potential weaknesses of the market model that may cause biasness to the results.

The main weakness of the market model is associated with the calculation of the parameters. According to Scholes and Williams (1977) parameter ($\beta$) of the market model is related to the trading volume of the security. Therefore, in the case of non-synchronous trading the estimates of parameter ($\beta$) may be biased and therefore lead to biased results (Dimson, 1979; Brown and Warner, 1985; Capstaff et al, 2004). The
problem is enhanced when using daily prices, which is the case for the present study (Aharony and Swary, 1980). Moreover, the biasness created by non-synchronous trading is also attributable to the selection of the appropriate market proxy. Brown and Warner (1985) provide an example to illustrate the above. They state that stocks trading in the New York Stock Exchange (NYSE) tend to have higher trading frequencies than those in the American Stock Exchange (AMEX) and therefore tend to have higher values for parameter ($\beta$). However, according to the same authors, this phenomenon does not affect any test conducted for abnormal performance directly but indirectly.

In regard to the market model, apart from parameter ($\beta$), Gurgul et al (2003) claim that the estimation of the correct error term is also a potential source of bias. Specifically, they claim that, due to the negative bias of the error term ($\varepsilon$), there is a possibility that it will influence positively the results of the statistical tests. MacKinlay (1997) and Eaton (1999) also provided evidence of the above especially when the parameters are calculated using lengthy estimation periods. Moreover, Dimson and Marsh (1986) claim that the market model is not suitable for calculating expected returns for large event windows. Lastly, Brown and Warner (1985) claim that the market model is considered to be quite sensitive to the size of the sample.

From all the above analysis it becomes clear that the use of the market adjusted model is the most appropriate for the present thesis, in an attempt to eliminate the sources of bias mentioned above which stem from the use of the market model.

Concluding, the ASE Composite Index was selected as the market proxy. The expected returns are calculated for each firm included in the sample and for every year of the set period of study. Having calculated the expected returns of all firms, the abnormal returns are also estimated by simply subtracting the actual returns from the expected.

7.5. Test Statistics under the null hypothesis

According to almost all previous event studies, the null hypothesis is tested using standard parametric tests. The student’s t-test is the most common parametric test used for relative event studies (Aharony and Swary, 1980; Asquith and Mullins, 1983; Divecha and Morse, 1983; Kato et al, 1997; Canina, 1999; Best and Best, 2001; Travlos et al, 2001; Balachandran, 2003; Capstaff et al, 2004, How et al, 2005;
Gunasekarage and Power, 2006; Dasilas 2007; Lyroudi et al, 2007). Other non-parametric tests are sighted in event studies (Bajaj and Vijh, 1995; Best and Best, 2001; Bernhardt et al, 2005; How et al, 2005) but they are mainly used as supplementary tests to confirm the results subtracted from the t-test. Moreover, according to Brown and Warner (1985), the t-test is preferred when the size of the sample is small (less than 30).

One of the main assumptions of the t-test is that the observations examined are normally distributed and independent (Gardner, 1975). In reality, the distributions of daily returns are considered to be non-normal. However, Brown and Warner (1985), provide evidence, in alliance with the Central Limit Theorem that the non-normality of daily returns distributions do not affect the results of the present event study due to the normality of distributions of daily mean excess results. According to the latter, the “cross sectional mean abnormal returns tend to normality”, as the sample size increases. Gurgul et al (2003) as well as Dasilas (2007) claim that the distributions of average abnormal returns are normal. Therefore, the assumption, the t-test is based on, is not interrupted.

Hence, in order to test the null hypothesis, meaning that the announcement of dividends does not create any excess returns to stock prices, the t-test is the most suitable parametric test. It simply examines the null hypothesis and tests whether the distribution of the sample differs statistically from the normal distribution in terms of means. In order to accomplish the test, it is necessary to calculate the average (mean) and the standard deviation of the returns created by the sample during the event window.

The t-test is simply a ratio that examines the mean of the population to its standard deviation. Specifically, for the needs of the present event study, the following formula is used:

\[
t = \frac{\overline{AR}_t - \bar{0}}{\sigma(\overline{AR}_t) / \sqrt{N}}
\]

(1)

Where  
\(\overline{AR}_t\): the mean average daily abnormal returns  
\(\sigma (\overline{AR}_t)\): the standard deviation of average daily abnormal returns  
\(N\): the size of the sample
Furthermore, the t-test will be applied for the Cumulative Abnormal Returns of all event windows. Equation (1) simply is transformed to the following formula:

\[ t = \frac{\text{CAR}_{(t_a, t_b)} - 0}{\sigma(\text{CAR}_{(t_a, t_b)}) / \sqrt{N}} \]  

(2)

Where, \( \text{CAR}_{(t_a, t_b)} \) : Cumulative Abnormal Returns from \( t=a \) until \( t=b \)

\( \sigma(\text{CAR}_{(t_a, t_b)}) \) : Variance of Cumulative Abnormal Returns for the same event window (day \( t=a \) until \( t=b \))

Formulas (1) and (2) introduce some terms that need to be explained thoroughly to avoid misinterpretation. After the calculation of the abnormal returns (\( \text{AR}_i \)) of each security \( i \) included in the sample, it is important to calculate the daily average excess returns (\( \bar{\text{AR}}_t \)) across the whole sample (consisting of \( N \) firms). Through the following equation, the excess returns are simply aggregated across the total firms included in the selected sample:

\[ \bar{\text{AR}}_t = \frac{\sum_{i=1}^{N} \text{AR}_i}{N} \]  

(3)

Given that \( \sigma^2_{it} \) is the variance of the security \( i \) on day \( t \), the variance\(^6\) of the average abnormal returns \( (\sigma^2(\bar{\text{AR}}_t)) \) for each day \( t \) is calculated through the following equation:

\[ \sigma^2(\bar{\text{AR}}_t) = \frac{1}{N^2} \sum_{t=1}^{N} \sigma^2_{it} \]  

(4)

For the needs of the present event study, it is also necessary to calculate the Cumulative Abnormal Returns (CAR) of the sample throughout the various event windows that were selected. The calculation of CAR will enable to identify the “total-

\(^6\) Although the t-test requires the calculation of the standard deviation, only the calculation of variance is provided above. This, however, does not cause a problem, given that the standard deviation of any variable is simply the square root of its variance.
firm specific stock movement” for each examined event window, in which it is assumed that investors are reacting to the event and the release of new information (Bodie et al, 2002). The calculation of Cumulative Abnormal Returns (CAR) is simply an aggregation of the average abnormal returns over the event window. For each event window, stretching from day \( (t_a) \) to day \( (t_b) \), the Cumulative Abnormal Returns (CAR \( (t_a, t_b) \)) are calculated with the following formulae:

\[
\text{CAR}_{(t_a, t_b)} = \sum_{t=t_a}^{t_b} \overline{\text{AR}}_t
\]  

(5)

Respectively, for the calculation of the \( t \)-statistic test, the variance of the Cumulative Abnormal Returns \( (\sigma^2 \text{CAR}_{(t_a, t_b)}) \) for each window needs to be calculated. For the event window \( (t_a, t_b) \), the variance is computed through the following equation.

\[
\sigma^2 (\text{CAR}_{(t_a, t_b)}) = \sum_{t=t_a}^{t_b} \sigma^2 (\overline{\text{AR}}_t)
\]

(6)

Needless to say, that for the case of Cumulative Abnormal Returns, the variance is calculated for each event window separately. Moreover, the \( t \)-test is also performed separately for every individual event window.

This chapter discussed the methodology that will be applied for the needs of the present event study. The testable hypothesis was determined as the null hypothesis (i.e. that dividends do not affect stock prices). Moreover, this chapter provided insight as to how the actual event day is decided and why the use of multiple event windows is appropriate for controlling possible leakage of information prior to the event day. Furthermore, the present chapter provided formulas for calculating actual returns, excess returns (based on the all available models) as well as abnormal returns. The market adjusted model was selected as the most appropriate model to calculate excess returns. Lastly, the standard parametric test that will be used in the present event study was presented thoroughly.
8. Data Selection

The data used to conduct the present thesis, the reasons of their selection as well as other important issues are presented thoroughly in the present chapter in order to complete the research design.

The set period of study stretches from 01-01-2004 until 31-12-2007. The sample of the present study consists exclusively of firms that trade in the FTSE/ASE 20 Index in the Athens Stock Exchange (ASE). The selection of the FTSE/ASE 20 Index, which consists of the 20 largest firms in terms of capitalisation and liquidity, was considered as the most appropriate due to the following reasons.

First of all, the Greek market is considered to be a small market (in terms of the number of trading stocks), with low capitalisation rates and trading volume. However, the firms included in the FTSE/ASE 20 Index are the twenty firms with the highest capitalisation rates (blue chips) and have the highest trading volume according to the official announcement of the ASE in the year 2007. Therefore in order to avoid problems due to non-synchronous trading, the FTSE/ASE 20 Index seems to be the most appropriate.

Moreover, the Greek market is considered to be highly “concentrated” meaning that corporate equity is held by a few investors. But, if the majority of stocks of any firm is held by only a few investors, it is inevitable that these investors have better access to information about the firm regarding its current status as well as future growth and perspectives (Cheng et al, 2007). Therefore, according to Fuller (2003), the information content hypothesis of dividends is not present for highly concentrated firms simply because investors do not rely upon dividends in order to gain access to corporate information. Therefore, to overcome the possibility of including such firms that may lead to biased results, the data used in the present event study was subtracted exclusively from the FTSE/ASE 20 Index which does not consist of highly concentrated firms.

Furthermore, previous literature findings provide evidence that the size of the firms included in the sample plays a significant role in relative event studies. Bamber (1986) states that the findings differ when comparing studies conducted on small and large firms due to the difference in the level of information available to the public. This is mainly due to the fact that larger firms are monitored more closely and that there are plenty of streams from which an investor can subtract information from.
Taking the above statement into consideration it is only rational to assume that the market’s reaction to dividends would be greater in the case of small firms where sources of information are limited. However, Yu and Wu (2001) claim that stock prices of larger firms tend to react with greater speed and more accuracy than firms of smaller size mainly due to lower information acquisition costs. To exclude the possibility of biased results due to differences in the size of the selected data, the FTSE/ASE 20 Index is selected in order to test the null hypothesis on firms of the same size-class.

Taking all the above into consideration, it was decided that the sample of the present study would consist exclusively of firms that trade in the FTSE/ASE 20 Index. However, the firms included in the final sample, following the research design of Balachandran (2003) and Dasilas (2007), had to meet the following criteria:

a) during the selected event window (extending 20 days prior and 20 days after the announcement) only one dividend was declared (i.e. no special dividends were declared)
b) the firms did not change their accounting periods during the period of study
c) data for stock prices were available for all of the period of study

Applying the criteria to all the firms listed in the FTSE/ASE 20 Index, two firms were excluded from the final sample due to inconsistency to the above mentioned criteria. Therefore the final sample consists of 18 firms which fully meet the above criteria.

Closing stock prices of the firms included in the sample as well as closing prices of the index that was used as a market proxy (the ASE Composite Index) for the period of 01-01-2004 until 31-12-2007 were obtained from the Dissemination Information Department of the Athens Stock Exchange.

Lastly, defining the official announcement day of dividends is not an easy task for the Greek market. As discussed previously, the event date should be the day of the official announcement to the public made by the board. In Greece however, the first official announcement can be found in an electronic form from the ASE web site. The release of the announcement in the press lags behind. Lyroudi et al (2007) believe press releases are announced one day after the electronic release. On the other hand Dasilas (2007) provides evidence that dividend announcements may appear in the press up to three days later. Therefore, for the present event study, day 0 (the event
day) is defined as the first official announcement, that is the day that dividends are declared and presented electronically by the ASE website.

Unfortunately, Greece does not provide any official database from which the announcements dates of dividends could be obtained. Therefore, the event days for the selected firms were found through the process of hand picking. Official announcements for each year and each firm separately were found from the official data base of the ASE through screening.

9. Empirical Results

The previous chapters analysed thoroughly the methodology that was followed for the conduction of the present event study as well as the data selection process. The present chapter presents the main empirical results. However, before presenting the findings of the present event study, it is important to determine the levels of significance used for the needs of the statistical tests. This will enable better understanding of the results. Three levels of significance were decided. Namely, a significance level of 10% (for t-statistics outcomes between 1.66 and 1.95), a significance level of 5% (for t-statistics outcomes between 1.96 and 2.55) and finally a significance level of 1% (for t-statistics outcomes equal and higher than 2.56). These levels were used as a criterion to reject or support the null hypothesis under question.

Table (1), presented hereunder, summarises the average abnormal returns for the entire sample for all the years starting from the year 2004 until the year 2007 and for the whole event window (-20, +20). It also summarises the abnormal returns of the sample for all the years simultaneously.

From the observation of the mean abnormal returns for all the examined years (2004-2007), it is obvious that the market enjoys strong, statistically significant returns throughout the whole event window. Specifically, 15 days prior to the event day (i.e. day t= -15), a strong positive market reaction (+0.494%) is observed which is statistically significant at a 1% significance level. Moreover, on day t= -5, a positive reaction of (+0. 376%) is sighted, which is significant at a 5% significance level. However, on the actual event day (t=0), the abnormal returns of the sample are insignificant. This does not imply that the null hypothesis is supported. It is necessary to examine the days following the event day before reaching to any conclusions.
Table (1)

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</tr>
<tr>
<td>-8</td>
<td>0.145</td>
</tr>
<tr>
<td>-7</td>
<td>0.300</td>
</tr>
<tr>
<td>-6</td>
<td>0.265</td>
</tr>
<tr>
<td>-5</td>
<td>0.376**</td>
</tr>
<tr>
<td>-4</td>
<td>0.074</td>
</tr>
<tr>
<td>-3</td>
<td>0.069</td>
</tr>
<tr>
<td>-2</td>
<td>0.312</td>
</tr>
<tr>
<td>-1</td>
<td>0.024</td>
</tr>
<tr>
<td>0</td>
<td>0.123</td>
</tr>
<tr>
<td>1</td>
<td>-0.551**</td>
</tr>
<tr>
<td>2</td>
<td>-0.798***</td>
</tr>
<tr>
<td>3</td>
<td>-0.386*</td>
</tr>
<tr>
<td>4</td>
<td>0.119</td>
</tr>
<tr>
<td>5</td>
<td>0.100</td>
</tr>
<tr>
<td>6</td>
<td>-0.110</td>
</tr>
<tr>
<td>7</td>
<td>-0.159</td>
</tr>
<tr>
<td>8</td>
<td>-0.153</td>
</tr>
<tr>
<td>9</td>
<td>-0.043</td>
</tr>
<tr>
<td>10</td>
<td>0.125</td>
</tr>
<tr>
<td>11</td>
<td>0.153</td>
</tr>
<tr>
<td>12</td>
<td>0.008</td>
</tr>
<tr>
<td>13</td>
<td>0.112</td>
</tr>
<tr>
<td>14</td>
<td>-0.006</td>
</tr>
<tr>
<td>15</td>
<td>-0.196</td>
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<tr>
<td>16</td>
<td>-0.009</td>
</tr>
<tr>
<td>17</td>
<td>0.136</td>
</tr>
<tr>
<td>18</td>
<td>0.315</td>
</tr>
<tr>
<td>19</td>
<td>0.026</td>
</tr>
<tr>
<td>20</td>
<td>-0.116</td>
</tr>
</tbody>
</table>

| t-Statistic | 1.11 | -0.176 | 2.12 | -0.207 | -0.436 | 0.96 | 0.690** | -0.414 | 0.135 | 0.266 | -0.403 | -0.429 | -1.23 | 0.319 | 1.48 | 0.290 | 1.65 | -0.043 | -0.11 | 0.159 | 0.073 | 0.22 | 0.145 | 0.32 | 0.387 | 0.79 | 0.643** | 2.27 | 0.032 | 0.11 |
| AR%          | 0.84 | -0.38 | 0.81 | -0.28 | -1.36 | 0.26 | 0.690** | -1.19 | 0.36 | 0.86 | 1.16 | -0.303 | -0.73 | 0.150 | 0.27 | 0.66 | 0.36 | -0.303 | -0.11 | 0.362 | 0.92 | 0.362 | 0.76 | 0.198 | 0.63 |

Note: This table shows the abnormal returns (ARs) for the sample firms for 41 days around the dividend announcement date (t=0). * indicates a significant difference from zero at the 10% level, ** indicates a significant difference from zero at the 5% level and *** indicates a significant difference from zero at the 1% level.
In fact, on the day following the announcement (t= +1) the market reacts upon the news released but in a negative direction. Significant negative abnormal returns are observed for days (t=+1), (t=+2) and (t=+3). Specifically, on the first day after the event (i.e. t=+1), the market faces a return of (-0.551%) which is significant at a 5% significance level. On the second day (t=+2), the observed returns are (-0.798%) which are significant at a 1% significance level. Finally, on the third day after the announcement (i.e. t= +3), investors enjoy a negative return of (-0.386%), which is also significant but at a 10% significance level. Throughout the rest of the event window (from t= +4 until t= +20) all abnormal returns are statistically insignificant.

Overall, it is clear that although the market, prior to the event, relishes high positive returns, after the announcement of the event (in this case the announcement of dividends), the abnormal returns decline radically (Graph 1). The negative abnormal returns are statistically significant for the first three days after the release of the new information. The impact of the information is fully adjusted, in terms of returns, within the first three days. Moreover, in order to provide better insight to the matter, the results are also presented for each year separately.

*Graph (1): Abnormal Returns (%) for the years 2004-2007*

During the year 2004, the abnormal returns, calculated using the market adjusted model, seem to experience a similar pattern as described above. To illustrate their movement, Graph (2) presents the abnormal returns for the first year examined (2004).
Throughout the prior-announcement days (-20, -1) the market experiences positive returns which are enhanced as the event day approaches. Specifically, on day \((t= -17)\) and on day \((t= -6)\) the abnormal returns were \((+0.68\%)\) and \((+0.79\%)\) respectively which are significant at a 5% significance level. However, on the event day \((t=0)\), the abnormal returns observed were insignificant.

*Graph (2): Abnormal Returns (%) for the year 2004*

On the other hand, the day following the announcement (which is actually the day that the news is released to the vast public through the press, as analysed earlier) the abnormal returns decline by \((-1.284\%)\), which is statistically significant at a 1% significance level. The negative slope continues for a few more days while stock prices start to bounce back to their prior level only after the fifth day \((t=+5)\).

Moreover, for the year 2005, Graph (3) provides evidence of a similar pattern in abnormal returns during the event window. Throughout all of the days prior to the event, the stock returns fluctuate at insignificant levels. However, on day \((t= -15)\) and on day \((t= -3)\) significant abnormal returns are observed at a 5% and 1% significance level respectively.

Moreover, during the post-announcement period, the abnormal returns of stock prices continue to fluctuate but the peaks of the graph indicate negative reactions. The results of the t-test confirm the negative slope. In particular, on day \((t= +1)\), day \((t= +8)\) and day \((t= +11)\), the abnormal returns are \((-1.139\%), (-0.843\%)\) and \((-0.789\%)\) respectively. These returns are all statistically significant at a 5% significance level.
After the twelfth day, following the release of information, the market returns to its prior condition, namely the abnormal returns fluctuate through time but at insignificant levels.

*Graph (3): Abnormal Returns (%) for the year 2005*

Contradicting with the above, year 2006 does not appear to have many significant abnormal returns (Graph 4). During the prior to the event period (i.e. $t=-20$ until $t=-1$) only one significant positive abnormal return (0.907%) is sighted on day ($t=-5$). Almost the same abnormal return but in the opposite direction (namely negative) is sighted on day ($t=+2$). All other days included in the event window appear to have insignificant excess returns.

*Graph (4): Abnormal Returns (%) for the year 2006*
Lastly, for the year 2007 (Graph 5), it seems that, during the period from \((t=-20)\) until \((t=-1)\), the market gradually manages to reduce the negative abnormal returns (statistically significant on day \(t=-8\) and \(t=-5\)) and turn them around to statistically positive. On day \((t=-2)\), the returns are significant \((0.643\%)\) at a 5% significance level. The announcement however of dividends leads to an almost immediate decline in abnormal returns. Moreover, 2 days after the announcement, the abnormal returns are significantly negative \((-1.495\%)\) at a 1% significance level.

*Graph (5): Abnormal Returns (%) for the year 2007*

The positive trend, regarding the abnormal returns, during the prior to the event period gives way to a negative trend which is accompanied with strong negative abnormal returns.

The same trend, as described above, is also supported from the t-test of the Cumulative Abnormal Returns of the sample through the various selected event windows. Table (2) provides the results from the statistic parametric test of the Cumulative Abnormal Returns for all years separately as well as for the whole set period of study simultaneously.

The same table enables the better understanding of the market’s reaction to the release of new information under different timeframes (event windows). For the whole event period \((-20, +20)\), the observed cumulative returns are found to be negative but insignificant.
Moreover, all event windows that consists solely of days prior to the event day, namely the event windows of (−20, −1), (−5, −1) and the event window (−10, −1), experience strong positive CAR’s equal to (1.722%), (0.855%) and (1.383%) respectively. On the other hand, all event windows that include days exclusively after the announcement day, experience strong negative cumulative abnormal returns. Specifically, during the event window (0, +20), the market is confronted with a negative CAR of (−2.757%) which indicates a significant difference than zero at a 1% significance level. Furthermore, during the event windows of (0, +2), (0, +5) and (0, +10), statistically significant negative CAR’s at a 1% significance level are also sighted (i.e. (−1.226%), (−1.632%) and (−1.972%) respectively).

Table (2)

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR (-20+20)</td>
<td>-1.035</td>
<td>-0.66</td>
<td>0.941</td>
<td>0.35</td>
<td>0.243</td>
</tr>
<tr>
<td>CAR (-20-1)</td>
<td>1.722</td>
<td>1.56</td>
<td>2.848</td>
<td>1.50</td>
<td>0.605</td>
</tr>
<tr>
<td>CAR (0+20)</td>
<td>-2.757***</td>
<td>-2.44</td>
<td>-1.907</td>
<td>-0.98</td>
<td>-0.362</td>
</tr>
<tr>
<td>CAR (-10+10)</td>
<td>-0.589</td>
<td>-0.52</td>
<td>0.647</td>
<td>0.33</td>
<td>-0.771</td>
</tr>
<tr>
<td>CAR (-10-1)</td>
<td>1.383*</td>
<td>1.78</td>
<td>1.907</td>
<td>1.42</td>
<td>0.710</td>
</tr>
<tr>
<td>CAR (0+10)</td>
<td>-1.972***</td>
<td>-2.41</td>
<td>-1.259</td>
<td>-0.89</td>
<td>-1.481</td>
</tr>
<tr>
<td>CAR (-5+5)</td>
<td>-0.777</td>
<td>-0.95</td>
<td>-2.279</td>
<td>-1.62</td>
<td>0.720</td>
</tr>
<tr>
<td>CAR (-5-1)</td>
<td>0.855</td>
<td>1.55</td>
<td>-0.195</td>
<td>-0.21</td>
<td>1.343</td>
</tr>
<tr>
<td>CAR (0+5)</td>
<td>-1.632***</td>
<td>-2.71</td>
<td>-2.084**</td>
<td>-2.00</td>
<td>-0.623</td>
</tr>
<tr>
<td>CAR (0+1)</td>
<td>-0.428</td>
<td>-1.23</td>
<td>-0.878</td>
<td>-1.46</td>
<td>-0.828</td>
</tr>
<tr>
<td>CAR (0+2)</td>
<td>-1.226***</td>
<td>-2.87</td>
<td>-1.276*</td>
<td>-1.73</td>
<td>-1.152</td>
</tr>
</tbody>
</table>

Note: This table shows the Cumulative Abnormal Returns (CARs %) for the various event windows around the event day. * indicates a significant difference from zero at the 10% level, ** indicates a significant difference from zero at the 5% level and *** indicates a significant difference from zero at the 1% level.

The results of the present study seem to contradict the findings of previous relevant event studies. The findings of the present thesis differ mainly on the fact that significant positive abnormal returns are sighted prior to the event, while after the event day, the t-test outcomes distinguish significant negative abnormal returns.

However, without regarding the stock price fluctuation prior to the event day, the announcement of dividends creates negative abnormal returns, statistically significant at a 1% significance level. Similar reactions of the market were sighted by Brennan (1970) and Litzenberger and Ramaswamy (1979) who argued that dividend payments lead to a decrease in shareholder wealth due to tax issues (leftists theory).
However, considering that both capital and dividend gains are not taxed in Greece, the findings of the present study could not be considered consistent with the findings of the above mentioned authors. Moreover, the sighted positive abnormal returns, prior to the announcement of the event, do not relate to the theory of the leftists and can not be interpreted by it.

On the other hand, the statistical significant cumulative abnormal results sighted during the different event windows clearly reject the null hypothesis and therefore it can be clearly stated that the irrelevance theory, as suggested by Miller and Modigliani (1961) is also not supported by the present event study.

The Greek market is considered a “thin” market. This implies that the market may need more time to absorb information than other liquid markets. Therefore, this may explain why no significant abnormal returns, at any level of significance were sighted on day (0), unlike other relative studies (Balachandran, 2003; Gurgul et al, 2003; Capstaff et al, 2004). On the other hand, the fact that dividends are announced to the public electronically on the event day and through the press on day (t= +1) it may be considered that the majority of investors are informed about the announcement on day (t=+1). Therefore, it is not surprising that on day (t=0) no significant abnormal returns are sighted while on day (t=+1) the abnormal returns are significant at a 1% significance level.

Moreover, as mentioned earlier, previous event studies have provided evidence that the reaction of stock prices to the announcement of dividends appears to be a short- time effect. Stock prices increases (or decreases which is the case according to the present findings) are only temporary (Miller and Scholes, 1982; Brown et al, 1988; Lonie et al, 1996; Balachandran, 2003). The rationality of investors, analysed in a previous chapter, motivates them to overcome the uncertainty of the announcements and this is reflected from the “rebouncing” of stock prices to the initial level before the actual announcement (Brown et al, 1988). The findings of the present study do not support the above. In particular, the market experiences negative CAR’s throughout the event window of (0, +20) which are statistically different than zero on a 1% significance level. However, this does not imply that the rationality of investors is under question.

On the contrary, the present findings provide evidence of the rationality of investors. The legal framework in Greek allows no room for discretion when it comes to dividends. Dividends are announced around the time of the announcement of the
financial statements of the firm for the previous fiscal year. The height of the dividends is also determined according to law. Under these circumstances it may be assumed that investors have the ability to “forecast” the actual dividend they would receive long before the actual announcement. Moreover, the fact that the present study used data from firms in the FTSE/ASE 20 Index, which consists of “mature” firms, encourages this possibility. According to Grullon et al (2002), mature companies, face smaller investment opportunities in comparison to growth companies, hence they are more likely to have higher dividend payout ratios. Taking all the above into consideration, it is most likely that investors create an expectation regarding the height of dividends prior to their announcement.

Considering that investors have formed expectations about dividends well in advance and that they are able to trade upon their expectations, the findings of the present study can be interpreted as speculation movements. Trading activity based on expectations, according to Tirole (1982), justifies the rationality of investors. Therefore, the findings of the present study do not refute the theory of investor rationality.

Taking all the above into consideration, the market movements according to the findings of the present study can be explained as an attempt of investors to trade based on their expectations. Therefore, the abnormal positive returns during the period before the announcement indicates that investors are buying stock which they simply sell back around the actual dividend announcement in order to enjoy untaxed capital gains. This would explain the significant negative abnormal returns after the announcement day. Mahr (2007) states that market movements, like the ones described above are clearly speculative since investors intend to gain from the difference in stock prices (capital gains). Gunasekarage and Power (2006), also sighted such movements in the market which could be considered as speculative. However, they only found this to be true only in the case where both dividends and earnings were increased. Gunasekarage and Power (2006) interpret these movements as signals that “the market may have been anticipating the announcements well in advance”.

Moreover, it is possible that investors may be trading upon actual information (not only on their expectations). Potential leakage of information may also be a possible explanation for the sighted statistically positive cumulative abnormal returns
during the event window (-10, -1). In other words, it may be possible that investors are reacting in such a manner, based on “inside” information about the firm.

It is important, however, to discuss the present findings in association with previous studies that were conducted using data from Greek listed companies and therefore eliminate the possibility of other parameters (such as tax issues, the discretion of dividend announcements, the legal framework e.t.c.) from influencing the comparison.

However, even when comparing the results with previous studies based on data from Greek firms, only a few similarities can be sighted. The findings of the present study show that markets react upon announcements. This clearly conflicts the findings of Papaioannou et al (2000), who supported the null hypothesis. On the other hand, the present findings partly confirm the findings of Asimakopoulous et al (2007) who also found negative abnormal returns after the announcement day, but only in the case where the declared dividends were higher than expected (regardless of dividend increases or decreases compared to the dividends of the previous year). The present study did not take into account the actual height of the dividend in comparison to the mandatory by law dividend and therefore the results can not be wholly compared. Lastly, the present thesis in alliance with the findings of Dasilas (2007) and Lyroudi et al (2007), supports the signaling effect. However, the sighted direction of the reaction differs from the direction of abnormal returns that Dasilas (2007) and Lyroudi et al (2007) sighted. The comparison of the above studies is illustrated in Figure (11).
**Figure (11):** Summary of Relative Event Studies based on data from the Greek Stock Market

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Set period of study</th>
<th>Model used to calculate expected Returns</th>
<th>Event Window Used</th>
<th>Findings</th>
<th>Signalling Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asimakopoulos et al (2007)</td>
<td>2000 - 2004</td>
<td>Market Adjusted Model</td>
<td>41 days</td>
<td>Insignificant returns</td>
<td>Insignificant returns</td>
</tr>
<tr>
<td>Dasilas (2007)</td>
<td>2000 - 2004</td>
<td>Both Market Model and Market Adjusted Model</td>
<td>41 days</td>
<td>Insignificant returns</td>
<td>Abnormal Returns (statistically significant at a 10% significance level)</td>
</tr>
<tr>
<td>Lyroudi et al (2007)</td>
<td>1998- 2004</td>
<td>Both Market Model and Market Adjusted Model</td>
<td>Multiple Event Windows</td>
<td>Abnormal Returns (statistically significant at a 10% significance level)</td>
<td>Abnormal Returns (statistically significant at a 1% significance level)</td>
</tr>
<tr>
<td>Present Thesis (2008)</td>
<td>2004 -2007</td>
<td>Market Adjusted Model</td>
<td>Multiple Event Windows</td>
<td>Abnormal Returns (statistically significant at a 10% significance level)</td>
<td>Insignificant returns</td>
</tr>
</tbody>
</table>
9.1. Possible Sources of Bias

However, the presentation of the empirical findings would not be complete without mentioning some issues that may have contributed to the above presented outcomes. First of all, the data used in the model were not “clean” but “contaminated”. This simply implies that other events unrelated to the dividend announcement may have taken place during the event window and influenced the abnormal returns. Examples of unrelated events are the announcement of a merger, or an acquisition, a possible stock split, share repurchases the issue of new equity or debt e.t.c. The relationship between announcements and the reaction of stock prices has puzzled many previous researches (Fama et al, 1969; Eddy and Saunders, 1980; Kim and Verrecchia, 1991).

Moreover there is a possibility that during the event window other unexpected and unrelated events may have occurred and influenced the market proxy which was used to calculate the expected returns. Such events may be for example, changes in macroeconomic factors. However, the firms included in the sample were not screened out according as to whether other unrelated events occurred during the event period. Therefore, it is likely, that other announcements may have affected the results of the present study.

In alliance with the above, in Greece it is a common practice to release information about the earnings for the previous fiscal year approximately at the same time that dividends are announced. This joint- announcement is a parameter that many previous event studies incorporated in their analysis (Gunasekarage and Power, 2002; Balachandran, 2003; How et al, 2005; Goddard et al 2006; Dasilas, 2007, Lyroudi et al, 2007) while other studies tried to isolate it (Aharony and Swary, 1980; Asquith and Mullins, 1983; Papaioannou et al, 2000; Capstaff et al, 2004; Asimakopoulos et al, 2007).

Furthermore, since it is a common practice to release announcements regarding dividends and earnings simultaneously or around the same period, there is a possibility that the observed abnormality in returns may have been influenced by dividends as well as earnings. Gurgul et al (2003) claim it is almost impossible to isolate the effect of dividend announcements from earnings announcements. Therefore, in the presence of abnormality in stock prices, “one can not be certain that this abnormality is solely caused by announced dividends changes”.

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Additionally, Dasilas (2007) claims separating the effect of earnings and dividends announcements is not an easy task and therefore earnings and dividends should be viewed as “joint signals”. After all, the height of earnings, according to the Greek law, determines the height of dividends and therefore dividends and earnings are closely related. Furthermore, as mentioned in an earlier chapter, previous researches have also provided evidence that the two announcements (i.e. from dividends and earnings) should not be examined separately since the two variables are interactive at a statistically significant level (Kane et al, 1984; Lonie et al, 1996; Gunasekaragea and Power, 2002).

Summarising from all the above, the findings of the present study should be examined under the condition that they may have been affected by other events. Some events are considered unrelated to the dividend announcement (i.e. the issue of new equity) while others are clearly related (i.e. announcement of earnings). The first type of events (unrelated) could be eliminated through a screening process while the second type of events (related) can not be distracted due to the fact that they are highly related to the actual dividend announcement. This is supported by many previous researches, which provide proof that earnings and dividends announcements should be viewed as joint signals and not independently.

10. Conclusions

Dividend policy is one of the most troublesome issues of corporate finance and is a matter that until today puzzles most researches. The different theories that have been presented can be categorised into two major groups: a) the irrelevance theory and b) the relevance theory. According to the irrelevance theory, dividends alone should not lead to any market reactions while the relevance theory claims that the announcement of dividends is responsible for the abnormality of stock prices surrounding the event. However, these theories are based upon assumptions which sometimes are not met in the “real word”. This may explain why so many differences are sighted between the proposed theoretical models and the empirical findings.

However, even when reviewing solely the empirical findings, the results are contradicting. The differences between relative event studies stem up mainly from the interpretation of dividends. The irrelevance theory does not regard dividends as signals of the future prospects of the firm. On the other hand, however, the relevance
theory implies that dividends are signals which investors interpret and react upon (signaling effect). Therefore, any abnormality in stock prices after the announcement of dividends is simply the adjustment of stock prices to the information revealed to the public (information content hypothesis).

Moreover, the reaction of investors to dividend announcements is strongly associated with the characteristics of the market. Another major determinant of market reactions to dividend announcements is the existence of taxes. The presence of taxation upon dividend and capital gains, may lead to different reactions in stock prices. This is a matter that has drawn attention of many previous researches and has lead once again to very dissimilar results, even when comparing the reactions of the same market.

The main aim of the present dissertation was to conduct an event study in order to test the reactions of the Greek stock market to the announcement of dividends and shed some light to the relevancy of dividends to shareholder wealth. In regard to dividends, the characteristics of the Greek market differ from other markets (i.e. UK, US, Japan). In particular, governmental laws, determine the minimum height of dividends. Therefore dividends are not subject to the discreteness of the firm’s managers. Moreover, the absence of taxation upon dividends and capital gains allows room for investigating the matter without tax- restrictions and limitations.

The conventional methodology of event studies, applied by Brown and Walner (1985), was used for the needs of the present thesis. Due to the fact that the Greek market is considered to be “thin” in terms of trading volume and in order to avoid possible bias from non- synchronous trading, the selected sample included exclusively firms that trade in the FTSE/ASE 20 Index for the set period of 2004 until 2007. Moreover, for the calculation of all expected returns, the market adjusted model was applied using the Athens Composite Index as the market proxy.

A standard parametric statistic test (t- test) was applied, in alliance with previous relative event studies. The results clearly indicate that the Greek market, during the whole event window ( 20 days prior and 20 days after the announcement) experiences statistically significant abnormal results. The results clearly reject the irrelevance theory of dividends. However, in contradiction to the findings of previous relative event studies, the direction of stock price reactions is found to be positive (statistically significant at a 1% significance level) for the event window (-10, -1) and negative (statistically significant at a 10% significance level) for the event window ( +1, 10).
On the actual announcement day (which is the day that dividends are officially announced electronically through the website of the Athens Stock Exchange) the returns are found to be insignificant.

The positive significant abnormal returns (prior to the announcement to the event) may be an indication that the market has been anticipating the announcement of dividends before they are actually released to the public or that there was a leakage of information. On the other hand, after the announcement of the event, stock prices decline rapidly. The same pattern is observed for all the years of the set period of study and can be characterised as speculative movements of the market. Investors trade upon their expectations (or even inside information) in order to accomplish higher capital gains. Assuming the rationality of investors (i.e. that they do not show any preferences regarding the source of their wealth), the absence of taxes in the Greek market allows room for investors to employ such speculative trading strategies.

Comparing the results of the present dissertation with the findings of previous event studies that used data from the Greek market, very few similarities can be sighted. The present dissertation, rejects the null hypothesis (i.e. that the announcement of dividends does not create any abnormal returns) unlike the findings of Papaioannou et al (2000) and Asimakopoulos et al (2007) who clearly support the irrelevance theory. On the other hand, Dasilas (2007) sighted abnormality in stock prices and claimed that the announcements of dividends convey information to the market. Although the present findings also support the information content hypothesis, the direction of the sighted abnormal returns especially before the announcement of dividends (i.e. positive) differs from the findings of Dasilas (2007) who found no abnormal activity before the event day.

However, the present dissertation would not be complete without referring to some of its limitations. The main limitation of the present event study is that, during the selection of the appropriate sample, the firms were not screened in order to rule out the possibility of other non-related events from influencing the results. Moreover, due the fact that in Greece dividends are announced simultaneously with earnings (joint signals), there is a possibility that the observed abnormality in stock prices is not solely attributed to dividend announcements. However, previous research has reached to the conclusion that the effects of earnings and of dividends should be examined simultaneously due to the fact that earnings and dividends are interrelated (Kane et al, 1984; Lonie et al, 1996; Gunasekaragea and Power, 2002). Despite the
potential limitations and weakness, the findings of the present dissertation confirm the findings of previous relative event studies that supported the relevance theory of dividends as well as the signaling effect of dividends.
11. References


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