

STOCK MARKET REACTION TO DIVIDEND ANNOUNCEMENTS: EVIDENCE FROM THE GREEK STOCK MARKET

Apostolos Dasilas^{a,1} and Stergios Leventis^a

^a International Hellenic University, School of Economics and Business Administration, Thessaloniki, Greece.

Abstract

This study investigates the market reaction to cash dividend announcements for the period 2000-2004 employing data from the Athens Stock Exchange (ASE). In particular, the paper examines both the stock price and trading volume response to dividend distribution announcements. Dividend distributions in Greece demonstrate noticeable differences to those of the US, the UK and other developed markets. First, dividends in Greece are paid annually rather than quarterly or semi-annually. Second, the Greek corporate laws 2190/1920 and 148/1967 specifically designate the minimum amount for distribution from the taxed corporate profits. Third, neither tax on dividends nor on capital gains was imposed during the period under examination. Fourth, Greek listed firms are characterized by high ownership concentration where major owners are usually involved in management and therefore have less need for dividend announcements as an information source. Despite this neutralized information and tax environment, we document significant market reaction to dividend change announcements, lending support to the “information content of dividends hypothesis”.

Keywords: Dividends, signaling effects, stock prices, trading volume, Athens Stock Exchange.

JEL classification: G12; G3

¹ Corresponding address: Apostolos Dasilas, International Hellenic University, School of Economics and Business Administration, 14th klm Thessaloniki-Moudania, 57101, Thessaloniki, Greece, Tel: 0030-2310-807544, Email: tdasilas@gmail.com, a.dasilas@ihu.edu.gr

I. Introduction

The question of why companies distribute dividends when these are often taxed more heavily than capital gains has puzzled academics for several years. Miller and Modigliani (1961) were the first to conclude that dividends do not affect firm value under perfect capital markets. Instead, they argued that only the investment policy can affect corporate value. Since then, the dividend puzzle has motivated a number of researchers to investigate the impact of dividend distributions on firm value.

The first explanation behind the decision to distribute dividends is based on market imperfections due to information asymmetries. Managers are supposed to have superior information about the current and future financial position of the firm to that of investors and use the dividend to signal asymmetric information about the firm's future earnings (Daniels et al., 1997). Therefore, dividend change announcements convey valuable information to the market as a reflection of managerial expectations regarding current and future cash flows. Consequently, dividend increases (decreases) convey positive (negative) information to the market about the future prospects of firms that distribute dividends. Under this explanation, therefore, an announcement of a dividend increase (decrease) is accompanied by a rise (fall) in stock prices. The above argument is considered to be the key premise of the so-called "information content of dividends hypothesis" or the "dividend signaling hypothesis" initially proposed by Lintner (1956) and further developed by Fama et al. (1969) and Ambarish et al. (1987).

Jensen (1986) provided a second explanation for dividend distribution based on agency costs. In particular, Jensen (1986) argued that a firm with substantial free cash flows might accept negative net present value investments that promoted the objective of managers. Lang and Litzenberger (1989) deduced that if firms overinvest, an increase in the dividend amount, all else being equal, reduces the extent of the overinvestment and increases the market value of the firm,

while a decrease in the dividend brings about the opposite result. This is called the “free cash flow hypothesis” or the “overinvestment hypothesis”.

Lang and Litzenberger used Tobin’s Q^2 to distinguish between overinvestors and value-maximizing investors. According to the overinvestment hypothesis, only overinvestors (firms with Tobin’s Q less than unity) are expected to experience abnormal stock price changes following dividend change announcements. Therefore, firms with Q less than unity experience positive (negative) excess returns following dividend increase (decrease) announcements.

To date, this study is the first attempt to gauge both the stock price and trading volume reaction to dividend change announcements using data from the Greek stock market. We investigate the Greek stock market because it has significant institutional differences when compared to other capital markets. First, dividends in Greece are paid on a yearly basis determined by the Greek corporate laws 2190/1920 and 148/1967, which set a quantifiable floor for the distribution of dividends. This result deprives dividend announcements of a significant element of surprise. Second, during the examination period, there is no tax imposed on dividends or capital gains, which might render dividends and capital gains as perfect substitutes³. Financial theory has suggested that taxes may affect corporate dividend policy. In other words, the absence of tax on dividends provides an interesting setting in which to examine the information content of dividends. Third, the Greek corporate context is characterized by high ownership concentration. Principle owners usually hold managerial positions and so might not rely on dividend announcements to convey information about the future prospects of their firm. In the light of such a unique institutional environment, we expect dividend announcements to send either a weak signal or no signal to the market.

Our study contributes in several ways to the existing literature. First, we test whether a dividend change announcement has an impact on the market value of a firm that operates in a tax neutral environment. Second, we examine the incremental value relevance of dividend change

² Tobin’s Q is defined as the ratio of the market value of a firm to its replacement value (Lang and Litzenberger, 1989).

³ According to Wu (1996) taxes may affect corporate policy and blur the information content of dividends.

announcements. These offer the opportunity to assess the efficiency of the market to absorb information that is partly pre-disclosed. Third, we investigate whether value relevance is provided by a regulatory environment that deprives the market of much of the information content of dividend distributions. To examine this, we identify two groups of dividend change announcements based on the level of the distributed dividend being either higher or lower than the minimum required. This innovative approach supplements the classification of dividend change announcements which employs the classical naïve model. Fourth, we identify the factors influential to the information content of dividends in Greece. Finally, we assess the impact of dividend change announcements on the trading volume, examining whether the release of a corporate news event induces equity trading on the part of investors.

Our results suggest that the share price reaction is positive in the case of dividend increases, while dividend decreases are associated with average decreases in share prices. In the case of no dividend change announcements, we find a trivial stock price response. Moreover, the findings from the trading volume reaction during the announcement period are similar to those of stock prices. In addition, our findings provide evidence that the Greek stock market reacts efficiently (within two days) to dividend change announcements. Finally, we perform regression analysis to investigate what determines market reaction on dividend announcement days. We find that the dividend yield and the percentage dividend change are the main determinants of the abnormal share price behavior around dividend change announcements.

The remainder of the paper is organized as follows. Section 2 presents a brief literature review regarding dividend change announcements. Section 3 discusses the Greek institutional environment on dividend distributions. Section 4 describes the data, while Section 5 outlines the methodology employed. Section 6 presents the results of price and trading volume reactions to dividend change announcements. Finally, Section 7 concludes, discusses main implications and offers avenues for further research.

II. Literature Review

There is abundant literature that examines the market reaction to dividend announcements. The majority of studies have documented a positive association between announced changes in dividend policy and stock price movements. Petit (1972) was the first to demonstrate that positive (negative) changes in dividend payments induce positive (negative) abnormal returns. Watts (1973) disputed the results of Petit (1972) by testing the association between unexpected dividend changes and positive future earning changes and subsequent excessive stock returns. The results indicated that although this relationship did exist it was positive, but trivial.

Since then, a number of studies have investigated the stock price reaction to the announcement of changes in regular dividends. For example, the studies of Woolridge (1982), Bajaj and Vijh (1990), Bernheim and Wantz (1995), Dyl and Weigand (1998), Nissim and Ziv (2001) and Lie (2005) are all consistent with the dividend signaling hypothesis. The only exception is the study of Bernartzi et al. (1997) who found little empirical support for the information content of dividends. A recent study by Howatt et al. (2009) examines the information content about risk that dividend announcements convey (“risk information hypothesis”). The results provide evidence that positive changes in dividends are associated with positive future changes in mean real earnings per share (EPS). In addition, a significant increase in EPS variance is present after a dividend change⁴.

All the above mentioned studies examined US data. Evidence outside the US stock market is limited. Easton (1991) was the first who examined the effect of contemporaneous announcements of dividends and earnings on stock prices. He used a sample of Australian listed firms between July 1978 and June 1980. He found that the joint announcement of earnings and

⁴ Another strand of studies have examined the market reaction to dividend initiations and/or omissions, such as Asquith and Mullins (1983), Richardson et al. (1986), Wansley and Lane (1987), Alangar and Bathala (1999), Gorman et al. (2004) and Liu et al. (2008). All these studies provide further support for the information content of dividends. Another noticeable finding is the unanimity among the aforementioned studies regarding the asymmetrical stock price reaction to dividend initiations and omissions. Specifically, dividend omissions are considered to provoke greater market reaction than dividend initiations.

dividends had information content. Beer (1993) was the first researcher that attempted to measure the market reaction to dividend change announcements using data from a European country (Belgium). He used two samples of firms, those with regular dividend distribution and those with resumed dividend distributions after a hiatus of three years. The dividend information content was evident only for the later group. Lonie et al. (1996) analyzed the market reaction to joint earnings and dividends announcements for a sample of 620 firms listed in the UK. The empirical findings verified the interactive effect of both announcements on stock prices. However, cross-sectional regression analysis showed that earnings announcements had greater impact on stock prices than dividends. Gunasekerage and Power (2002 and 2006) re-examined the information content of dividends using data from the UK and confirmed Lonie et al.'s findings (1996). There is mixed evidence on the information content of dividend hypothesis for the Tokyo Stock Exchange. While Conroy et al. (2000) found no information content, Harada and Nguyen (2005), measuring both the short-term and long-term market reactions, found empirical support.

To the best of our knowledge, there are only two studies examining trading volume behavior around dividend announcements: Richardson et al. (1986) and Gurgul et al. (2003). Richardson et al. (1986) investigated both the trading volume and stock market reaction for a sample of 192 firms initiating a cash dividend in the US market. The authors calculated the trading volume as the number of shares traded on the announcement date over the number of shares outstanding. Then, the firm's trading volume around the announcement date is subtracted from the normal trading volume in order to calculate the abnormal trading volume. The empirical findings documented both an increase in trading volume and share price on the announcement date. Moreover, the trading volume was significantly higher in the week prior to the announcement and marginally significant in the post announcement period. Results from a cross-sectional regression reported a positive relationship between abnormal volume and the size of dividend and a negative relationship between abnormal volume and prior stock price

appreciation. This meant that a portion of abnormal volume was unrelated to the information content of dividend initiation announcements as gauged by the abnormal return.

Gurgul et al. (2003) examined stock prices and trading volume on changing dividends for firms listed on the Austrian stock market; their findings supported the dividend information content. In addition, they found that news on dividends was incorporated quickly into stock prices (evidence of the efficient market hypothesis). Similar results were reported for trading volume.

III. The Greek Dividend Environment

The Athens Stock Exchange (ASE) is small compared to other European stock exchanges in terms of market capitalization, number of listed firms and turnover volume. By the end of 2004, approximately 350 firms were listed. The market's total capitalization had been increasing rapidly since 1995 due to new seasoned issues of shares. The greatest increase occurred in 1999 when the total value of listed companies reached 184,000 million Euros, an increase of 195% over that of 1998 (Owusu-Ansah and Leventis, 2006). The ASE witnessed tremendous growth since 1995 and reached historical levels in September of 1999. The influx of international funds during that period was remarkable, contributing to the rise of the Athens Stock Exchange Index (ASEI) to record levels. Subsequently, there was a dramatic fall in prices that lasted until the end of March of 2003, with the majority of stocks losing more than 70% of their previous values. However, by the end of 2003 and until mid 2007, the ASE general index (ASEI) experienced a gradual upward trend following major developed capital markets such as the UK and the US.

The Greek capital market can be considered an ideal case study for examining the market reaction to dividend announcements in the sense that there are unique features that underlie the distribution of dividends. First, unlike the USA and the UK where dividends are paid on quarterly and semi-annually basis respectively, dividends in Greece are paid on a yearly basis⁵.

⁵ Very few firms (10 to 15) distribute an interim dividend during the fiscal year.

Second, information asymmetry between management and shareholders might be less dominant in Greece. Owners usually hold managerial positions and they may rely less on financial statements or dividend news for their information about a company's prospects (Tzovas, 2006). A third unique aspect of the Greek stock market is the mandatory distribution of a minimum cash dividend to shareholders. In particular, Greek firms have to pay a minimum annual cash dividend, being the higher of: (a) 6% of the stock capital (corporate law 2190/1920, art. 45) or (b) 35% of the net profits after regulatory reserves⁶. Firms have to pay out the higher of the two amounts. In the case that (a) is lower than (b) companies might distribute reduced dividends (i.e., 6% of share capital), only with the agreement of an augmented majority (65%) of the voting rights. The agreement of 80% of the voting rights is needed if no dividends are to be distributed. Finally, the Greek tax system during the period of time covered by this study did not impose any personal taxes on dividends. Corporate dividends are determined after deducting corporate taxes from net profits (Law 2065/1992). Therefore, shareholders were not subject to any taxes on dividends received, i.e., dividends were not double-taxed as in the USA⁷.

In sum, the compulsory distribution of dividends along with the high ownership concentration of Greek listed firms deprive dividend announcements of much of the element of surprise and therefore might reduce the information content of dividends. Therefore, dividend announcements might be of limited use for signalling.

IV. Data

Daily closing prices and trading volume data were obtained for all firms listed in the ASE between 1 January 2000 - 31 December 2004. The data were extracted from the ASE Dissemination Information Department. Both closing prices and trading volume data were

⁶ At least 5% of the net profits are withheld for the formation of regular reserves. This obligation ceases to exist when the amount of regular reserves reaches the 1/3 of the stock capital.

⁷ A flat tax of 10% has been imposed on dividends since 1 January 2009 trimming the cash paid to shareholders. We believe that this tax does not reduce the information content of dividends announcements. However, when the data will be available, new research should investigate whether the flat tax affected the information content of dividends announcements.

adjusted by changes in the number of shares resulting from stock splits, right issues, stock dividends, stock options, etc.

Similar to Gurgul et al. (2003), we define the announcement (event) date as the occasion of the very first official statement on dividends that can be identified in press releases, such as nationally circulated political and financial daily newspapers. Unlike mature markets, there is no official database that records corporate events, such as dividend announcements, in Greece. For that reason, we manually collected all dividend announcements by searching more than 120,000 daily financial press releases and by double-checking these dates with the ASE's website releases. Three limitations result from this. First, it is impossible to search all the Greek daily press, which results in missing data. Second, depending on the medium of publication (daily press or website) the observed announcement date can deviate by even two days from the actual announcement date. For that reason, we define as dividend announcement (event) period, the three-day⁸ period around the announcement day, namely, day -1, day 0 and day +1. Finally, our examined period is restricted to five years due to data unavailability.

A usual corporate practice in Greece is the joint announcement of annual dividends with those of earnings. Therefore, a potential occurrence of significant abnormal returns could be attributed to both corporate announcements. To distinguish between the two, we considered only dividend announcements occurring with no other corporate events (e.g. earnings announcements, stock splits, share repurchases, stock dividends and right issues) which might "contaminate" our results, within 10 days before or after the dividend announcement (-10, +10). This procedure trimmed the final sample significantly.

Furthermore, companies had to meet the following criteria to be included in the sample: (a) interim and stock dividends are not declared during the event period; (b) firms are not in the financial and utility industries; (c) price data are available for the period commencing 220 days prior to the dividend announcement date and 20 days subsequent to the dividend announcement

⁸ A similar definition has been used by Bajaj and Vijh (1990) and Lee and Yan (2003).

date; (d) trading volume data are available for the period commencing 120 days prior to the dividend announcement date and 120 days subsequent to the dividend announcement date; (e) the distribution does not represent initial dividends or resumed dividends, and (f) shares had to be actively traded⁹. We excluded firms that had no transactions for more than 100 days in the estimation period.

The above criteria resulted in a final sample that includes 231 dividend announcements consisting of 129 dividend increases, 58 dividend decreases and 44 no dividend changes. Table 1 presents some descriptive statistics for the whole sample of dividend announcements. The mean (median) market value of the sample firms is 517,082,162 (127,662,475) Euros. The mean (median) normal trading volume in the estimation period is 856,138 (222,547) Euros, the mean (median) dividend distributed is 0.21 (0.11) Euros, while the mean (median) dividend yield is 3% (2%).

[Insert Table 1 here]

V. Methodology

The methodology employed is the standard event study methodology. First, we use the naïve model to define the dividend change. The naïve model¹⁰ assumes that the dividend process is a martingale, that is, the current dividend is expected to be equal to the previous dividend and the expected dividend change is equal to zero (Gurgul et al., 2003).

$$E[\Delta D_{i,t}] = E[D_{i,t}] - D_{i,t-1} = 0 \quad (1)$$

where $E[\Delta D_{i,t}]$ denotes the expected change in the dividend payout of firms i for year t , $E[D_{i,t}]$ stands for the expected dividend payout of firm i for year t , and $D_{i,t-1}$ is firm i 's dividend payout last year. A dividend announcement is considered a positive event if $D_{i,t} > E[\Delta D_{i,t}]$, neutral if

⁹ It is well known that the thin trading problem can result in biased estimates of the market model parameters (Brown and Warner, 1985).

¹⁰ Woolridge (1982), Asquith and Mullins (1983), Impson (1997), Howe and Shen (1998), Alangar and Bathala (1999), Fuller (2003) and Gurgul et al. (2003) are among the researchers that used the naïve model to define dividend changes.

$D_{i,t} = E[\Delta D_{i,t}]$ and negative event if $D_{i,t} < E[\Delta D_{i,t}]$ where $D_{i,t}$ denotes the announced dividend of company i for year t .

Second, considering the unique Greek stock market setting where a minimum dividend amount is mandated, we re-define unexpected dividend changes to be the difference between the announced dividend and the minimum required by regulation¹¹. We define the announced dividend that is higher (lower) than the minimum mandated by law as “dividend above the minimum required” (“dividend below the minimum required”). A dividend less than the minimum required can be distributed when firms intend to finance new investment projects with internal funds. The examination of the market reaction to dividend change announcements, as identified by the pertinent regulation, offers an ad hoc mechanism to examine the marginal information content of dividend announcements.

If the information content of dividends hypothesis is valid, in the event period ($t = -1, 0, +1$) abnormal returns should be significantly different from zero (McClusky et al., 2006). The hypothesis predicts that stocks with dividend increases should, on average, earn positive abnormal returns, while stocks with dividend decreases should, on average, earn negative abnormal returns. Finally, stocks with constant dividend (no dividend change) should, on average, earn normal returns (zero abnormal returns). Considering the unique information environment of Greece, we expect that dividend change announcements will send only a weak signal to the market.

We calculate daily stock returns for the 41-day event period as:

$$R_{i,t} = \ln(P_{i,t}) - \ln(P_{i,t-1}) \quad (2)$$

where $R_{i,t}$ is the actual return on share i on day t , $P_{i,t}$ is the price of share i on day t and $P_{i,t-1}$ is the price of share i on day $t-1$. For each day of the event window, we compute the abnormal

¹¹ We have estimated the regulatory dividend based on the information obtained from corporate financial statements and relevant regulation as explained in the third section of the current paper.

return as the difference between the actual ex-post return and the security's normal return that would be expected in the absence of the event, according to the following equation:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (3)$$

where $AR_{i,t}$ is the abnormal return on share i on day t and $E(R_{i,t})$ is the expected return on share i on day t . To estimate the expected return, for each event, we employ the market model where the parameters α and β are estimated by the OLS regression using 200 daily returns data prior to the event window (-220, -21):

$$E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} + e_{i,t} \quad (4)$$

where $R_{m,t}$ is the return on the market portfolio on day t proxied by the ASE general Index (ASEI), $e_{i,t}$ is the random error term and α_i and β_i are the market model parameters.

The daily abnormal returns are then averaged across portfolio of firms which increase, decrease or do not alter their dividend level as follows:

$$AR_{p,t} = \frac{\sum_{i=1}^N AR_{i,t}}{N} \quad (5)$$

where $AR_{p,t}$ is the actually weighted average portfolio abnormal return for dividend-increasing firms, dividend-decreasing firms and for no-dividend-change firms.

We also examine the trading volume reaction to dividend change announcements. The examination of the trading volume around dividend change announcements clarifies whether the information released by dividend announcements provokes buying or selling pressure on stocks traded.

We estimate the abnormal trading volume (AV_{it}) of share i on day t as the difference between trading volume (V_{it}) and the expected trading volume for that date ($E(V_{it})$), divided by the standard deviation of trading volumes in the estimation period¹² (σ_i):

$$AV_{it} = \frac{V_{it} - E(V_{it})}{\sigma_i} \quad (6)$$

where $E(V_{it})$ and σ_i are the mean and standard deviation in daily trading volume for firm i in the estimation window ($t = -120$ to -21 and $t = +21$ to $+120$).

VI. Empirical Results

Abnormal returns are calculated using the market model¹³. Table 2 displays abnormal returns around the dividend announcement day¹⁴. The results show a positive stock price reaction on the dividend announcement day (day 0) of 0.374%, statistically significant at the 10% level ($t = 1.69$). The cumulative abnormal return (CAR) on days -1 and 0 is 0.694%, statistically significant at the 10% level (1.81%). Therefore, the null hypothesis of insignificant (zero) share price response to dividend announcements is rejected. This result is quite surprising in the light of the limited information that we expected Greek listed firms to send to the market by announcing dividend distributions. However, our results are in line with those found in the US and other developed markets (e.g., Asquith and Mullins, 1983; Gurgul et al., 2003; McClusky et al., 2006).

Looking at the speed of the share price adjustment to the new information emanating from dividend announcements, we observe that there is no lagging response to dividend announcements. In particular, the CAR of days -5 to -1 do not provide any evidence of price adjustment before the dividend announcement event. On the other hand, looking at the post-

¹²Landsman and Maydew (2002) and Alves and Dos Santos (2008) followed similar approach for estimating abnormal trading volume around earnings announcements.

¹³ Abnormal returns were also calculated employing the market-adjusted and raw returns model as a sensitivity test. The results are qualitatively similar.

¹⁴ For economy reasons, we report condensed tables that present results from -5 to +5 days.

announcement period (CAR of +1 to +5 days), we do not observe any sluggish market reaction. These results suggest that the Greek stock market responds quickly and efficiently to the corporate news contained in dividend announcements. Results are similar to those of Petit (1972) and McClusky et al. (2006).

Next, we investigate the stock price reaction to different types of dividend change announcements. The results reported in Table 2 refer to the sample of dividend-changing firms using the naive model. Looking at the market model results, the mean abnormal return for the sample of dividend-increasing firms is 0.480% on day 0, statistically significant at the 10% level ($t = 1.98$), and 0.659% on day -1, statistically significant at the 1% level ($t = 2.71$). On day +1, the mean abnormal return is positive (0.033%) and statistically insignificant at any conventional level. The CAR for the three days around the event day (days, -1, 0, +1) show a share price reaction of 1.172%, statistically significant at the 1% level ($t = 2.78$). These results corroborate the findings of earlier studies that dividend increases are associated with positive share price reaction.

Table 2 also reports the stock price response to the sample of firms that announce dividend decreases. The market seems to consider dividend reductions as bad news. Specifically, on day -1, the abnormal return is -0.368% which is statistically significant at the 10% level ($t = -1.71$). The negative share price reaction is consistent with the notion that a dividend cut conveys negative information to the public resulting in stock price drop. Once again, the market reacts quickly and efficiently to the news released. No significant reaction occurs before or after the announcement day.

Finally, we examine the share price response to those firms which did not alter their dividend payment. As expected, these firms do not provide additional news to the market and, therefore, experience insignificant market reactions on all days of the event window. In particular, the mean abnormal return is 0.034%, 0.427% and 0.165% on days 0, -1 and +1, respectively. This empirical finding is in line with prior studies.

[Insert Table 2 here]

Due to the unique characteristic of the Greek stock market where a minimum cash dividend should be distributed, we re-examine the market reaction to dividend announcements by splitting the whole sample in firms paying out a dividend above the minimum required and those paying out below the minimum required. Similar to dividend increase announcements as determined by the naive model, we find that firms paying out a dividend higher than the minimum required experience a positive and statistically significant share price response. Specifically, the average abnormal return is 0.510%, 0.527% and 0.518% on days -2, -1, and 0 respectively. The CAR of three days around the event date is 1.150%, statistically significant at the 1% level ($t=2.75$). Comparing this reaction with that of dividend increases calculated by the naïve model, we observe the former is greater in magnitude (1.150% vs. 0.694%) and more significant than the latter. Moreover, in the case of the share price reaction to dividend increases higher than the statutory minimum, it begins one day earlier (on day -2 the mean abnormal return is 0.485%, statistically significant at the 5% level). In the remaining post- and pre-announcement period the market reaction does not display any significance. This finding corroborates our earlier finding that the Greek stock market responds quickly and efficiently to the news contained in dividend announcements.

Table 3 also documents the share price response to dividend announcements below the minimum required. Surprisingly, there is no clear direction of the market response. Specifically, the average abnormal return is equal to -0.129%, 0.049% and -0.268% on days -1, 0 and +1, respectively, none of these are statistically significant at any conventional levels. These results are not completely in line with those found in Table 2 (dividend decreases using the naïve model). A possible explanation is the different way of identifying dividend “decreases” using the decrees of corporate laws 2190/1920 and 148/1967 and the naïve model. Depending on the earnings level and the stock capital, the minimum amount for distribution is not necessarily less than the previous year’s distribution. Therefore, an announced dividend below the minimum

required can be higher than the previous year's distribution (dividend decrease using the naïve model). In addition, decoding the signal from the dividend change announcements using the decrees of corporate laws 2190/1290 and 148/1967 requires specialized knowledge of corporate law on the part of shareholders. As a result, a dividend payment below the minimum required may not be necessarily regarded as a bad signal from the majority of investors.

In sum, our results show that even in a relatively neutral information environment dividend change announcements emit useful signals to the market. Hence, a dividend increase conveys positive information to the market, a dividend decrease conveys negative information to the market and no dividend change communicates no significant information to the market. In addition, our results suggest that stock prices absorb the release of corporate news quickly and efficiently.

[Insert Table 3 here]

Apart from the stock price behavior, we also examine trading volume reaction to dividend change announcements. Table 4 displays the results from the trading volume behavior around dividend announcements. Similar to the stock price reaction, we find a positive abnormal trading volume reaction on days 0 and +1 of 6.32% and 3.67%, respectively. However, the abnormal trading volume is not statistically significant at any conventional level. The lack of significant changes in the trading volume could be attributed to the high proportions of stock held by insiders (e.g., family and close groups) and to the limited float that characterizes the majority of Greek listed firms.

Looking at the trading volume reaction for the sample of dividend-increasing firms we find a positive abnormal trading volume on days 0 and +1 of 19.02% and 6.78%, respectively. Moreover, the abnormal trading volume on day 0 is statistically significant at the 10% level ($t=1.81$). These results are similar to prior research supporting the positive information transmittance of dividend increase announcements. On the other hand, the announcement of dividend reductions sends a bad signal to the market spurring significant negative trading volume

reaction on days -1 and 0 of -29.75% and -35.58%, respectively, again similar to prior research. In fact, the negative trading volume reaction implies that investors trade less than usual because dividend cuts are considered by the market as the forerunner of the future financial firm deterioration which discourages investors from buying shares. Finally, the group of firms that pay out constant dividends send a neutral signal to the market. Similar to stock price behavior, the trading volume response to no-dividend change announcements is negative, although the volume reaction is statistically not significant during the whole estimation period.

[Insert Table 4 here]

To get a better insight about which variables influence the price reaction to dividend announcements, we perform four cross-sectional regressions¹⁵ for (i) the whole sample of dividend announcements, (ii) the sample of dividend increases, (iii) the sample of dividend decreases and (iv) the sample of no-dividend change announcements. We regress the cumulative abnormal returns on the event period ($CAR_{i,-1+1}$) against a number of independent variables such as systematic risk (BETA), dividend yield (DY), size (SIZE), average (normal) volume (NV), percentage change in dividend ($\% \Delta D$), pre-announcement abnormal trading volume (PREAV) and a dividend dummy variable (DDUMMY). The choice of explanatory variables is based on the idiosyncrasies of the Greek stock market and prior research (see Wansley et al., 1991; Impson, 1997; Lee and Yan, 2003; Fuller, 2003 and McClusky, 2006). The model is reported as follows:

$$CAR_{i,-1+1} = a_0 + a_1 * BETA_i + a_2 * DY_i + a_3 * SIZE_i + a_4 * NV_i + a_5 * \% \Delta D_i + a_6 * PREAV_i + a_7 * DDUMMY_i + b * YEARS_i + u_i \quad (7)$$

where BETA is the systematic risk estimated using data in the pre-event (estimation) period. DY is the dividend yield estimated as the ratio of the annual dividend over the price one day prior to the dividend announcement. SIZE refers to the firm size as measured by the logarithmic market capitalization one day prior to the dividend announcement day. NV is the logarithmic normal

¹⁵ We also included dummy variables to capture possible year effects. None of the year-dummy variables was statistically significant.

volume in the estimation period. $\% \Delta D$ is the percentage change in the dividend from year to year. $PREAV$ is the abnormal trading volume as a percentage of the average trading volume during the pre-announcement period. $DDUMMY$ is a variable to indicate if the firm's dividend payment is below or above the minimum. Year dummies have been included ($YEARS$) to control for year effects.

Table 5 presents the results from all regressions. Panel A displays the regression for the whole sample of dividend announcements. The coefficient of dividend yield (DY) is positive and statistically significantly at the 10% level ($t = 1.93$) suggesting that the dividend yield is the main driver of abnormal returns on dividend announcement dates. This result is similar to Wansley et al. (1991) and Lee and Yan (2003). Another variable that has a statistically significant impact on abnormal returns is that of the dividend dummy variable ($DDUMMY$), implying that the distribution of a dividend above or below the minimum required contains information content and provokes excess returns. The implication of this result is that the decrees of corporate laws 2190/1290 and 148/1967 offer a valuable tool in the hands of management to determine the dividend policy of their firms. The remaining variables have insignificant explanatory power.

Panel B of Table 5 presents the results for the sample of firms announcing a dividend increase. Dividend yield still has a positive and significant effect on abnormal returns ($t = 1.82$). This result implies the higher the dividend yield, the more attractive the share to investors. Moreover, the coefficient of $SIZE$ displays a negative sign, lending support for the “small size effect” where small firms earn higher abnormal returns than large firms. This result is in line with Fuller (2003). Regarding the sample of dividend decrease announcements (Panel C), it appears that dividend change ($\Delta D \%$) explains relevant variations. The smaller the current dividend when compared to last year's, the greater the share price drop. The CAR of three days surrounding the no-dividend-change announcement is not statistically significant (Table 2). This means that none of the control variables could have explanatory power for this group of firms. The results from Panel D (Table 5) confirms our expectations.

[Insert Table 5 here]

The above empirical findings show that dividend change announcements have a clear impact on the market value of Greek listed firms that operate in a tax-neutralized environment. Moreover, the impact of dividend change announcements contains incremental value relevance dependent on the dividend change sign. Hence, even in a less informatory environment, dividend change announcements continue to send significant signals to the market. Looking at the factors behind this finding, we observe that the dividend yield and the dividend change percentage play the most significant role in explaining abnormal returns on dividend announcement dates.

VII. Conclusions

This paper examines the stock market and trading volume reactions to dividend change announcements for a sample of firms listed in the Athens Stock Exchange. While not the first study to analyze stock price reaction to dividend change announcements, our study is a first attempt to investigate both share-price and trading-volume behavior in an institutional environment characterized by the trimmed component of dividend news. In addition to the classical naïve model, our study uses a new approach, adjusted to the idiosyncrasies of the Greek corporate environment, to identify dividend change announcements. Our results indicate that there is a statistically significant market reaction on the dividend announcement day. In line with the tenor of prior literature, we find support for the dividend signaling hypothesis. Hence, dividend increases induce a significant positive stock price reaction, whereas dividend decreases bring about a significant negative stock price reaction. Constant dividends leave stock prices unaltered. In addition, we report evidence that the market incorporates dividend news in an efficient manner.

Moreover, the trading volume behavior displays positive reaction to dividend change announcements. As with stock prices, the trading volume moves in the same direction as the dividend change signals. We perform regression analysis to investigate the determinants of

abnormal share price behavior around dividend change announcements. Similar to previous studies, the dividend yield and the percentage dividend change seem to reveal significant explanatory power.

Overall, our results are consistent with those found in the USA, the UK and other developed markets. Our results are interesting due to a number of idiosyncrasies in the research setting, most notably in the way that Greek firms distribute dividends to shareholders. Specifically, because of the requirements of the corporate laws 2190/1920 and 147/1967 which mandate a minimum amount for distribution, a significant portion of the dividend surprise vanishes. However, our results show that dividend change announcements still convey valuable information to shareholders.

Our empirical findings have practical implications for both investors and policy makers. In particular, potential investors can exploit significant abnormal returns trading around dividend announcement dates. In particular, the daily abnormal return on the announcement day is at least 0.374% and can exceed 0.5% in the case of dividend increases announcements. Moreover, the lure of the Greek stock market is also magnified by the absence of taxes on dividends and capital gains during the examined period. Furthermore, during recent years the ASE has displayed fast growth offering considerable capital gains to investors while at the same time it has adopted an adequate regulatory framework that secures transparency and efficiency.

Future research should be directed to the investigation of long-term performance of those Greek firms announcing a dividend change. The imposition of a flat tax since 1 January 2009 calls for new research in the area. Additionally, the examination of stock return volatility would usefully complement the work presented here. Finally, the relationship between ownership concentration and the market reaction to dividend change announcements merits new empirical investigation.

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Table 1. Descriptive Statistics for the Whole Sample of Dividend Announcements

	Number of shares	Market value in €	Normal volume in €	Abnormal volume in €	Abnormal volume %	Dividend in €	Dividend yield	P/E	P/BV	Beta
Mean	52210032	517,082,162	856,138	49,136	0.08	0.21	0.03	17.96	3.16	1.07
Median	21630000	127,662,475	222,547	-23,376	-0.28	0.11	0.02	12.60	1.80	1.09
St. deviation	88231373	1411,042,859	2,309,711	1,974,733	1.56	0.32	0.04	16.56	5.22	0.36
Max	512500000	13,589,301,205	23,934,059	21,706,194	11.85	2.60	0.56	107.20	49.00	2.70
Min	1002280	7,043,640	5,404	-8,366,677	-0.98	0.01	0.00	2.80	0.30	0.01
Q1	12866360	46,878,175	81,307	-189,623	-0.65	0.06	0.01	9.20	1.30	0.80
Q3	46209600	375,314,174	648,057	12,706	0.14	0.21	0.04	19.40	2.90	1.31

Table 2. Average Daily Abnormal Returns for the Event Window around Dividend Announcements using the Naïve model

Panel A. Abnormal returns around dividend announcement days

Days	N=231		N=129		N=58		N=44	
	ARs %	t-Statistic	ARs %	t-Statistic	ARs %	t-Statistic	ARs %	t-Statistic
-5	-0.358	-1.62	-0.355	-1.46	-0.136	-0.34	-0.548	-1.20
-4	-0.366	-1.65	-0.422*	-1.74	-0.395	-0.98	0.014	0.03
-3	-0.295	-1.33	-0.241	-0.99	-0.449	-1.11	-0.096	-0.21
-2	0.317	1.43	0.200	0.82	0.657	1.62	0.191	0.42
-1	0.297	1.34	0.659***	2.71	-0.368*	-1.71	0.034	0.07
0	0.374*	1.69	0.480**	1.98	-0.058	-0.14	0.427	0.93
1	0.022	0.10	0.033	0.14	-0.064	-0.16	0.165	0.36
2	0.216	0.99	0.365	1.50	0.012	0.03	0.299	0.65
3	-0.012	-0.55	-0.145	-0.60	0.209	0.52	-0.225	-0.49
4	0.156	0.71	-0.033	-0.14	0.335	0.83	0.742	1.62
5	0.276	1.25	0.242	1.00	0.242	0.60	0.419	0.92

Panel B. Cumulative abnormal returns around dividend announcement days

Days	CARs %	t-Statistic	CARs %	t-Statistic	CARs %	t-Statistic	CARs %	t-Statistic
CAR (-5, +5)	0.519	0.71	0.782	0.97	-0.015	-0.01	1.421	0.93
CAR (-5, -1)	-0.406	-0.82	-0.159	-0.29	-0.691	-0.76	-0.405	-0.40
CAR (+1, +5)	0.550	1.11	0.462	0.85	0.734	0.81	1.400	1.37
CAR (-1, +1)	0.694*	1.81	1.172***	2.78	-0.490	-0.70	0.626	0.79
CAR (-1, 0)	0.672**	2.14	1.139***	3.31	-0.426	-0.74	0.461	0.71
CAR (0, +1)	0.396	1.26	0.513	1.49	-0.122	-0.21	0.592	0.91

Note: This table shows the abnormal returns (ARs) for the sample firms for 11 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.

Table 3. Average Daily Abnormal Returns for the Event Window around Dividend Announcements using the minimum required by law

Panel A. Abnormal returns around dividend announcement days

Days	Higher than minimum required N=157		Lower than minimum required N=74	
	ARs %	t-Statistic	ARs %	t-Statistic
-5	-0.348	-1.44	-0.355	-1.03
-4	-0.159	-0.66	-0.763**	-2.21
-3	-0.260	-1.07	-0.309	-0.89
-2	0.510**	2.11	-0.087	-0.25
-1	0.527**	2.18	-0.129	-0.37
0	0.518**	2.14	0.049	0.14
1	0.105	0.44	-0.268	-0.78
2	0.423	1.64	-0.133	-0.38
3	-0.029	-0.12	-0.214	-0.62
4	0.217	0.90	0.080	0.23
5	0.247	1.02	0.346	1.00

Panel B. Cumulative abnormal returns around dividend announcement days

Days	CARs %	t-Statistic	CARs %	t-Statistic
CAR (-5, +5)	1.751**	2.18	-1.782	-1.56
CAR (-5, -1)	0.270	0.50	-1.642**	-2.13
CAR (+1, +5)	0.963*	1.78	-0.189	-0.24
CAR (-1, +1)	1.150***	2.75	-0.348	-0.58
CAR (-1, 0)	1.045***	3.06	-0.080	-0.16
CAR (0, +1)	0.623*	1.82	-0.219	-0.45

Note: This table shows the abnormal returns (ARs) for the sample firms for 11 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.

Table 4. Average Daily Abnormal Trading Volume for the Event Window around Dividend Announcements

DAYS	N=231		N=129		N=58		N=44	
	Full sample		Dividend increases		Dividend decreases		Constant dividend	
	% AVs	t-Statistic	% AVs	t-Statistic	% AVs	t-Statistic	% AVs	t-Statistic
-5	-17.10	-1.43	-37.24**	-2.47	35.96	1.42	-25.85	-0.84
-4	-39.72***	-3.41	-48.14***	-3.19	-11.77	-0.67	-43.88*	-1.72
-3	-26.74***	-2.68	-34.50***	-3.01	-22.55	-0.95	-5.55	-0.41
-2	-31.61***	-3.22	-31.53***	-2.80	-28.48	-1.53	-44.42	-1.62
-1	-9.67	-0.78	-23.31*	-1.81	-29.75*	1.74	-30.88	-1.31
0	6.32	0.52	19.02*	1.81	-35.58*	-1.90	-14.58	-0.55
1	3.67	0.37	6.78	0.34	-8.48	-0.33	-36.39	-1.27
2	-6.78	-0.62	-2.16	-0.13	-10.23	-0.59	-38.61	-1.45
3	-18.84**	-1.92	-15.82	-1.27	-16.10	-1.58	-45.65	-1.56
4	-19.62*	-1.99	-23.45*	-1.77	-23.83	-1.64	7.25	0.14
5	-10.29	-0.83	-13.29	-0.81	1.29	0.10	-32.11	-0.95

Note: This table shows the abnormal trading volume (%AV) for the sample firms for 11 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.

Table 5. Regression Analysis of Abnormal Returns on Dividend Announcement Dates

Panel A. Full sample of dividend announcements										
c	BETA	DY	SIZE	NV	$\Delta D\%$	PREAV	DDUMMY	N	Adj R	F
0.034	-0.008	0.080*	-0.003	0.002	0.001	0.003	0.012*	231	0.065	3.20
(0.49)	(-0.63)	(1.93)	(-0.46)	(0.33)	(0.33)	(0.88)	(1.67)			
Panel B. Sample of dividend increase announcements										
0.095	-0.001	0.119*	-0.009*	0.006	-0.005	-0.002	0.013	128	0.049	1.92
(1.46)	(-0.12)	(1.82)	(1.68)	(1.38)	(-0.90)	(-0.73)	(1.44)			
Panel C. Sample of dividend decrease announcements										
0.105	-0.042	-0.098	-0.003	-0.002	-0.037**	0.018	0.017	58	0.162	2.38
(0.67)	(-1.41)	(-0.98)	(-0.23)	(-0.26)	(-2.23)	(1.23)	(1.02)			
Panel D. Sample of constant dividend announcements										
0.001	-0.006	0.434	-0.001	0.003	-0.016	0.015	-0.017	44	0.089	1.90
(0.01)	(-0.34)	(0.44)	(-0.08)	(0.27)	(-1.10)	(0.89)	(-0.48)			

Note: This table represents the results obtained from regressing cumulative abnormal returns of three days around dividend announcements ($CAR_{1,+1}$). BETA is the systematic risk estimated using data in the pre-event (estimation) period. DY is the dividend yield estimated as the ratio of dividend for the year over the price one day prior to dividend announcement. SIZE refers to the size in which the company is placed according to logarithmic market capitalization one day prior to the announcement day. NV is the logarithmic normal volume in the estimation period. $\Delta D\%$ is the percentage change between the current and the previous dividend. PREAV is the abnormal trading volume as a percentage of the average trading volume during the pre-announcement period. DDUMMY is a variable to indicate if the firms' dividend payment is below or above the minimum. The significance of the White heteroscedasticity consistent t-test of each variable is in parentheses. No autocorrelation was detected for any of the regressions presented. * 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.