CONTENTS

CHAPTER 1

1. INTRODUCTION

The effects of stock splits are puzzling. In theory a stock split is merely an accounting change, a pure cosmetic event that leaves investors no better or worse off than they were before the split. Yet stock splits are a relatively common occurrence. In the last decade stock splits have become popular tools used by managers to adjust market prices. This implies that there must be some benefit, either real or perceived, that results from a firm splitting their stock.

It is worth mentioning that this corporate event (stock split) although in Greece has established in the last few years, it is very popular for many decades in other countries and especially in the U.S.

In perfect capital markets, splits would neither create nor destroy value. But in the real world, splits have impact. Firms do split their stocks, which they would not bother with if it were completely irrelevant. On a split announcement, there is a significantly positive abnormal return. On the split ex-date, there are a variety of negative effects as larger percent effective spreads, increased volatility, and larger commission costs. Consequently, stock splits provide an ideal testing ground for market efficiency hypotheses.

Several hypotheses have been put forward to explain the market reaction around the announcement day. The hypotheses that have received the most attention are the signalling hypothesis [Grinblatt, Masulis and Titman, Brennan and Copeland (1988), McNichols and Dravid (1990), Dhar and Goetzmann (2004), Ikenberry, Rankine, and Stice (1996)] and the liquidity hypothesis [Ikenberry,Rankine and Stice (1996), Lakonishok και Lev (1987), Conroy, Harris and Benet (1990), Jog και Zhu (2004) and Copeland (1979)], although empirical evidence for the latter is mixed. In addition, several studies find that the neglected firm hypothesis provides some explanation power as well [Christian Wulff (1999)].

Although stock splits have received excessive research in other countries, the Greek market has received little attention. This study analyzes the price effects of stock splits undertaken by firms whose stocks are traded on the Athens Stock Exchange (ASE). It also tests some hypotheses that have been advanced, in the literature, to explain the abnormal price to stock splits. This study contributes to the literature in the sense that the institutional characteristics of the Greek stock market provide a useful experimental context to study stock splits. Moreover, it provides additional insight into the relative explanation power of the existing theories.

This study is based on a sample of stock splits initiated by Greek firms between January 1st 1999 and April 30th 2006. We investigate the price reaction to Greek stock splits by applying the "market model methodology" as described in Brown and Warner (1985). Moreover, a cross- sectional analysis is presented so as to identify the factors that can explain any abnormal stock returns around split announcement.

The rest of this study is organized as follows. Section 2 describes the institutional aspects that apply to stock splits on the ASE and also a definition of stock splits is given. Section 3 describes the various hypotheses about stock splits. Section 4 reviews the literature. Section 5 presents the data of this study. Section 6 presents the methodology. In Section 7 the empirical results are discussed. In section 8 a cross-sectional analysis is presented. In Section 9 the cross-sectional results are presented. Finally, in Section 10 this study is summarized and the conclusions are drawn.

CHAPTER 2

2. INSTITUTIONAL FRAMEWORK

This chapter includes the definition of stock splits and also the institutional framework that applies to stock splits on the Athens Stock Exchange.

2.1.Definition

In a stock split the company decreases the nominal value of its stock and increases the number of the shares leaving the total capital unchanged.

In order for a company to perform a stock split, it should take into consideration the nominal value of the shares outstanding. The nominal price should not be less than 0,30 euro. It is the lower limit and it applies in all cases of stock split. Also, the nominal value of a stock must not exceed 100 euro.

2.2.Institutional settings

In Greece, the process of conducting a stock split starts with a board of directors´ proposal and a call for a shareholders' meeting through a press release, which follows within about 25 days. Within a week or less there is a board press release about the stock split proposal. When the shareholders' meeting decides the stock split, simultaneously, the board of directors must send within 20 days the necessary documents to the Athens Stock Exchange so as to approve the stock split. After the stock split's approval is published in the press and is listed in the website of the ASE, the ex-day is realized. Specifically, the ex-day is realized in the forth- working day after the approval of the insertion of the stock splits from the ASE. In the days following the ex-day, only the old shares are available for trading. At that time, the price must theoretically adjust by the split factor at the new price. The trading day usually occurs the fifth working day of the ex-day. The trading day is the day where the stocks start trading at the ASE and adjusts at the new price. Since trades on a "when-issued" basis are not allowed in the ASE, trading on the splitting stock is

limited to the existing old shares. Therefore, trading activity during this interval is artificially low compared to the market as well as to the same stock's trading volume over other periods. With the number of available shares limited, buy orders can put an upward pressure on prices on the ex-day and until the new shares are eligible for trading.

Brokerage fees for trading on the ASE are freely negotiable and levied on the market value of traded shares. Hence, increasing the number of shares through a stock split does not impact transaction costs. The same is true of other transaction charges, like transfer fees and sales tax as well as listing fees, all of which depend on market value. This cost structure also implies that trading in round or odd lots should not impact trading costs. The ASE operated as an electronic market without specialists. Market making was allowed only in 2003. Therefore, effects related to the trading activities of market participants, like the specialists and market makers, operating in the U.S. markets, are few and limited in the case of our sample of Greek stock splits.

The fact that transaction and other public trading charges are cost-neutral in the case of Greek stock splits has implication for the signaling value of stock splits. Specifically, it reduces their effectiveness to serve as signals of positive inside information. If all firms can execute stock splits with little difference in cost consequences, investors cannot distinguish reliably between good and bad firms. Nonetheless, stock splits can draw attention to the firm's performance (as suggested by Grinblatt, Masulis and Titman (1984), and thus cause a revaluation. The price adjustment can also signal the insiders' favorable expectation that the stock's recent price gains will not be reversed in the near future. It is unlikely that insiders will split the stock and cut the price if they expect a negative price drift. Thus, although the signaling effects of stock splits by Greek firms are diminished due to institutional characteristics, there is still a residual informational effect that can cause price reaction. Finally splitting the shares and adjusting the price to a lower level could attract new retail investors and thus increase the investor base and recognition, despite the fact that the small size of round lots does not seem to impose a severe budget constraint on investors.

CHAPTER 3

3. HYPOTHESES

Financial literature has advanced numerous hypotheses to explain the real, not cosmetic, effects of splits in financial markets, which, in turn, may be an incentive to managers to design a stock split. These hypotheses are not mutually exclusive and can be broadly classified into five groups.

The hypotheses most favored by researchers to explain the announcement effects around the stock splits are the signaling, the optimal trading range hypothesis (or liquidity hypothesis) and the neglected-firm hypothesis.

Signaling Hypothesis

As information between managers and investors can be asymmetric managers might use financial decisions such as stock splits to convey favorable private information to investors about the future performance of the firm. The signaling theory rests on the assumption that stock splits are costly. Grinblatt, Masulis and Titman (1984) hypothesize that firms signal information about their future earnings through their split announcement decision. Splits signal such information that it is costly for firms without favorable information to signal falsely. If a manager believes that the future share price will decrease, they may not be willing to split the stock due to the increased cost of trading a lower priced stock (Ikenberry, Rankine, and Stice (1996)).Brennan and Copeland (1988) argue that splits are costly because the fixed cost element of brokerage commissions increases the per-share trading costs of low priced costs. Moreover, the size of the split depends on the private information that managers transmit about future earnings. Signaling theory predicts that splitting firms should receive positive abnormal returns on announcement.

Optimal trading range hypothesis (liquidity hypothesis)

The optimal trading range hypothesis states that companies tend to move their share price back towards an optimal perceived trading range after the share price has risen substantially. Management might have this preference when stock prices are too high, many small and uninformed investors cannot afford to trade in round lots, thereby

affecting the liquidity of the stock. Splitting shares would improve liquidity by enlarging clientele and hence reduce the trading cost of the stock. However, empirical evidence for an improved post-split liquidity is mixed. Although Lakonishok and Lev (1987) provide some empirical evidence on the existence of an optimal trading range in the U.S. and that splits increase the number of stockholders and the number of trades, this hypothesis is in contrast to the decrease in trading activity after the split observed by Copeland (1979) and Conroy, Harris and Benet (1990). The trading range hypothesis is not likely to be a plausible explanation for splits with a small split factor.

Neglected-firm hypothesis

The neglected firm hypothesis states that if there is little known about a firm its shares trade at a discount. Thus, firms use the split to draw attention to ensure that information about the company is wider recognized than before (Christian Wulff (1999)).

Less used to explain the power of stock splits are two other hypotheses: the optimal tick size hypothesis and the self-selection hypothesis.

Optimal tick size hypothesis

Angel (1997) argues that splits are undertaken by managers with the intention of moving relative ticks to desire levels. Although that market's institutions may fix the absolute level of the tick size in a given market, the firms themselves may establish the tick size to the stock price by deciding how many shares to issue when they go public or split their stock. A decrease in the stock price after the split increases the relative tick size. A larger relative tick size may make market making more profitable as the costs of trading are reduced. Hence, brokers have an incentive to trade in the split stock, so the volatility and volume of this stock increases after the split. The empirical evidence that is consisting with positive changes in return, volatility and in volume does not reject this hypothesis.

Self-selection hypothesis

The signaling hypothesis and the trading range hypothesis have emerged as the leading explanations of stock splits. However, the signaling and trading range

hypothesis are not mutually exclusive. Self-selection hypothesis is a synthesis of those two explanations and suggests that managers use splits to move share prices into a trading range but condition their decision to split on expectations about the future performance of the firm (Ikenberry, Rankine, and Stice (1996)).

CHAPTER 4

4.LITERATURE REVIEW

Stock splits are a puzzling corporate event. While a split does not change a firm's equity value, the market tends to react to split announcements favorably. We are concerned here with the abnormal returns that occur when a split is announced. Although no entirely plausible explanation for these returns has been offered, several possibilities have been suggested. Researchers have examined not only the reasons for its occurrence, but also its effects on the market price and the liquidity of the shares. Those that examine the effect of stock splits on share prices are presented here:

Johnson (1966) attempts to develop a model that will provide a test of whether there is a significant price change associated with stock splits after controlling for fundamental factors (earnings and dividends) and for stock market trend. The data used in this study are limited to common stocks listed in the New York Stock Exchange (NYSE) that split at least 2 for 1 during 1959. One half of these 146 stocks comprise 100 per cent of the split 2: 1 or greater occurring in 1959, and the other 73 stocks are randomly selected non-split stocks used as a control. It was decided that a linear model would be developed with a least squares multiple regression analysis.
There is a significant relative price change associated with a stock split, after taking into consideration the above factors (earnings, dividend, and market trend) that were included in the model. It is concluded that there is a statistically significant (<0.05) price associated with stock splits (between $\Delta P/P$ and S) that occurred during 1959 in the NYSE. The knowledge that, on the average, a positive relationship exists between price change and splitting would appear to be useful to investors only insofar as they can predict several months in advance that a stock split will occur (8 months before and four months after). To the extent that these conclusions are valid, an implication to management is that if they intend to increase their dividends, they might also split in order to increase total market value of the common stock at that particular time. This assumes that they are in position to split their stock and it ignores any costs associated with a split.

Lakonishok and Lev (1987) investigate empirically why firms split their stock or distribute stock dividends and why the market reacts favorably to these. They accept the signaling and optimal price hypotheses; they try to show a positive effect of stock split and stock dividend announcement date to abnormal return.

They used a test sample of 1,015 stock splits events covering the twenty-year period 1963-1982 and a control sample. Throughout their analysis, «month zero» was defined as the month in which the stock split was announced.

The current compares the operational performance and other characteristics of firms that have split their stock and distributed stock dividends with those of a control group of non-distributing. The main objective of the split appears to be the return of the stock price to a ¨normal¨ range in wake of the unusual growth period. In other words, the researchers came to the conclusion that stock splits are mainly aimed at restoring prices, which increased considerably during an unusual growth period, to a normal range, defined in terms of market and industry's wide price averages and firm specific prices. After the split the abnormal returns start to decrease and they disappear during the forth month after the announcement. Usually two months after the announcement is the ex-day, so all the companies will definitely have surpassed the ex-day.

However, while reversion to a ¨normal¨ price appears to be the major objective of stock splits, a signaling motive can be found of stock splits. The splitting firms exhibited a somewhat higher growth in earnings than control firms, after the split announcement. Their findings do not support the claim that stock splits improve marketability to the extent that marketability is measured by volume of trade. Their results show that splits do not appear to affect permanently the volume of trade. While not affecting volume of trade, splits might be aimed at changing the composition of shareholders.

Masulis, Grinblatt and Titman (1984) examine the impact of both stock split and stock dividend announcements following the signaling hypothesis. The sample contained the initial announcements of proposed splits and stock dividends for the years 1967-1976, and day 0 was presumed to be the date on which market becomes aware of the firm's intention to expand the number of shares. To test the significance of the

announcement return, they examined both day 0 and day 1 because the announcement often became public after the close of trading on day 0.

The data exhibit significantly positive announcement returns for the entire sample of «pure» events, which have no other announcements in the three-year day period around the announcement day, and for a sample where no cash dividends were declared in the previous three years. In general there is upward revision of the firm's value that cannot be attributed to other contemporaneous announcements.

They have also documented post-announcement large abnormal returns, particularly around the announcement (three percent) and the ex-dates of stock splits (four percent). Moreover, both announcement and ex-date returns were found to be larger for stock dividends than for stock splits. These are consistent with a cross-sectional analysis of the announcement period returns.

The prime concern of Fama, Fisher, Jensen and Roll (1969) in this paper is to examine the process by which common stock prices adjust to the information (if any) that is implicit in a stock split. They use as sample 940 stock splits that occurred on the New York Stock Exchange from January 1927 through December 1959. A split security must be listed on the Exchange for at least twelve months before and twelve months after the split. They use the method of regressions of security returns on market returns over time. Month 1 is then defined as the month immediately following the split month, while month –1 is the month preceding.

In answer to whether ¨unusual¨ behaviour exists in the rates of return on a split security in the months surrounding the split, they show that stock splits are usually preceded by a period during which the rates of return (including dividend and capital appreciation) on the securities to be split are unusually high. The period of high returns begin long before any information concerning a possible split is likely to reach the market. In this study it is shown that the highest average monthly rates of return on split occur in the few months (three or four months) preceding the split. They report that stock-splitting firms, on average experience abnormal returns of about 30% in a 2-year period prior to the stock split distribution month. Specifically, they observe significant announcement excess return of 0,68%.

By one year after the split the returns on stocks that have experienced dividend increases have resumed to their normal relationships to market returns. For stocks in the dividend decreased class the average and cumulative residuals rise in the few months before the split but then plummet in the few months following the split, when the anticipated dividend is not forthcoming. These stock splits with poor performance on the average perform poorly in each of the twelve months following the split, but their period of poorest performance is in the few months immediately after the split.

The result supports that the stock market is ¨efficient¨ since stock prices adjust rapidly to new information. The unusually high returns on splitting firms in the months immediately preceding a split reflect the market's anticipation of substantial increases in dividends.

Lamourex and Poon (1987) try to explain the documented market response to stock splits with the use of a model that does not involve signaling. They used a test sample of 217 stock splits covering the period July 1962- December 1985 using daily returns. It was used a period of 130 days was used for each announcement, beginning 250 days prior to the split announcement.

The results showed that the announcement of a large split caused a positive abnormal return. Specifically, they observe significant announcement excess return of 1,82%. The split that decreases the share price resulted in an increase in the number of transactions and the number of shares traded that increased the volatility of the prices series. Moreover, a split generally reduces liquidity, but there is no indication that the market attaches any value to this change in liquidity.

Finally, there is abnormal ex-day behavior. The size of the ex-day abnormal return is positively related to the announcement effect, but the causes of the two effects are different. While the announcement effect reflects market valuation, the ex-day effect is related to clientele shifting. They documented that the average number of stockholders increases by 34,65% in the year of a split, whereas their control sample of non- splitting firms exhibits a decline of 2,11%.

Desai and Jain (1997) provide new evidence and a detailed analysis of the long-run performance of common stock following stock split. The sample consists of 5.596

stock splits during the period 1976-1991. About 62% of the firms are listed in the NYSE and the AMEX and the remaining 38% are on the NASDAQ.

The announcement month abnormal returns are 7, 11%. However, they also find that the market does not incorporate the full effect of the stock split announcement in the month of the announcement. There is a positive drift following stock splits that is consistent with the notion that the market under reacts to firm-specific news.

Their main findings is that the announcement period abnormal returns, and more important, the 1-3 year buy-and-hold abnormal returns are positively associated with the percentage change in dividends at the time of the announcement. Furthermore, the abnormal returns are substantially larger for the firms initiating dividends with stock splits. They also find that the results are consistent with the argument that less information is available for smaller firms than for larger firms as the announcement periods as well as the long-run abnormal returns are negatively associated with the firm size.

Ikenberry, Rankine, and Stice (1996) examine 1,275 two-for-one stock splits from 1975 to 1990 on the NYSE and the ASE. They followed the Market Adjusted Return Method and their results are consistent with the self-selection hypothesis. The market reaction to split announcements was examined by five –day market adjusted returns from two days before to two days after the announcement. Specifically, they observe significant announcement excess return of 3,38%. In the short-run performance the market reaction is greater for small firms (low-to-book market firms, and firms splitting to low share prices) because less information is available to market participants about small firms. However, firms that announce two-for–one split exhibit favorable long-run performance after the announcement for all size groups.

They came to the conclusion that splits were often observed when prices had increased substantially in the past or when shares traded at relatively high levels. Splits undertaken by firm with low share prices or with negative pre-split returns were associated with positive announcement returns but negative returns in the year following the stock split. This suggested that investors interpreted these announcements as positive news, but were disappointed as post-split events unfold.

In this study Ikenberry, Rankine, and Stice find that stock split are typically used to realign share prices to a normal trading range.

Moreover, they observe significant post-split excess returns of 7.93 percent in the first year and 12,15 percent in the first three years. These excess returns follow an announcement return of 3,38 percent, indicating that the market underreacts to split announcements. The fact that the market initially underreacts to the information in a split announcement is consistent with results observed for other corporate events. Apparently, the failure of the market to fully respond to information within a short announcement period is a general result and not specific to a particular corporate event.

Jog and Zhu (2004) use thirty years of Canadian evidence to examine stock splits. In this study, they use a final sample of 740 stock splits, 155 stock dividends and 229 reverse splits during the period 1970 and 2002 in the Toronto Stock Exchange and they focus on a period around –60 months to +60 months of the «event» month where the «event» month is the month zero. Moreover, they focused on stock splits where the split ratio is at least 1.25 to 1, those with ratios less than 1.25 are classified as stock dividends. To evaluate the long-run performance they calculate the Cumulative Abnormal Returns (CAR).

Using the long-term analysis they show that stock splits occur in times of "bull" markets where the prices increase along with abnormal returns. However, during, the post-split period, the trend in abnormal returns shows no such increase indicating that most of the run –up in prices occurs during the pre-split period. It is found that that by comparing the pre-ex date price with the post ex-date adjusted price, the market seems to positively react to stock splits and stock dividend in the time period immediately around the event month. More specifically, the increase in stock price for the stock split sample in the event month is 5,53%. In the thirty-six months preceding the split, stock prices increase by 97,58%, 81,65 % in twenty-four months preceding and 48.49% in twelve months prior to the event month. The prices over the next 12, 24 and 36 months increase only by 1,24%, -2,41%, -6,1% respectively.

Jog and Zhu find that the stock splits do bring in an "optimal" price range as there is a significant increase in the volume of trading and the number of transaction in the post-

split period but their results do not indicate any information signaling since the performance of stocks in the post-event period is less than pre-event period. Moreover, they observe a permanent increase earnings per share during the post-split period and that the volume per transaction decreases considerably and that this can be explained by a possible increase in the number of individual shareholders. In addition, they find permanent changes in the P/E ratios in the two periods.

Elfakhani and Lung (2000) examine the market behavior surrounding stock split announcements in the Canadian market for the 1977-1993 period and the effect of the 2-year before compared to the 2-year after the announcement. In addition, this paper tests both the signaling role of stock splits and the trading range (liquidity) hypothesis as to explain the split event. The final sample included 82 split events, of which 27 had contaminating events such as simultaneous dividend announcements and/or earnings announcements made within 3 days of the split announcement day. This paper adopts the traditional event study approach to assess the market behavior in response to stock splits announcements. The results show that in the Canadian market, the number of transactions increases in the period following the split. The increase is however statistically insignificant. They also observe announcement excess return of 1,26%.Trading volume increases and the bid-ask spread decreases following the stock split announcement. These results show that split events are likely to enhance liquidity, thus supporting the trading range hypothesis.

On the other hand, the tests of firm-specific variables support the signaling hypothesis. In particular, the increase in future earnings per share and the increase in firm size both observed followed the split suggest the presence of a possible signaling role for split announcements confounded with increased liquidity.

Kryzanowski and Zhang (1991) try to assess whether or not abnormal returns were associated with the proposal and approval announcement dates for a sample of Canadian stock splits. The use stock splits that occurred on the Toronto Stock Exchange for the ten year period from 1978 to 1987.As has been founded by Grinblatt, Masulis and Titman, amongst others, the mean abnormal returns were positive for both types of announcements but only statistically significant for the stock-split proposal announcement dates and not for the approval date. Specifically, they observe significant announcement excess return of 0,74%.

Kryzanowski and Zhang (1992) examine the market behavior around split ex-dates for stocks listed on the Toronto Stock Exchange. In this paper are studied the behavior of abnormal returns, betas, variances and correlations between the splitting stocks and the market index around the split ex-dates for a sample of 197 Canadian stock splits for the ten year period between 1978 to 1987. The findings can be summarized as follows: First, the mean abnormal return on the ex-date is positive. Second, a statistically significant increase of approximately 19 percent in the average beta occurs after the ex-date. Third, a statistically significant increase of approximately 29 percent in the average variance occurs after the split ex-date. The increase in the variance of returns on the split ex-date is positively and significantly related to the change in the relative bid-ask spread. Fourth, the change in the average correlation coefficient after the split ex-date is not statistically significant.

Huang, Liano and Pan (2002) examine whether stock split announcements convey information content of future profitability. Their analysis focuses on a sample of splits having a low split factor (equal to or less than 0.5 which is equivalent to 3 to 2 split) because they want to minimize the impacts confounded by the trading range hypothesis. Small split factors would not effectively reduce the share price enough to a certain range. They examine 635 stock splits for NYSE, AMEX and NASDAQ firms from 1982 through 1997 and they use a regression analysis to examine whether stock split announcement convey information content of future profitability. Stock prices, number of shares outstanding, and return date are examined from one year prior to the split and five days around the announcement date. The firm's earnings are examined for a period of 5 years (year –1 through +3).

These sample firms display positive excess returns during a five-day announcement period. Specifically, they observe significant announcement excess return of 0,63%.This result implies that the market reacts to split announcements favourably. However, their results show little evidence of a positive relation between stock splits and future profitability. Their analysis show that the split announcement year has the highest earnings change and that there is a negative growth in earnings for the two years after the announcements. So, in contrast to the signaling hypothesis, these findings suggest that stock splits are negatively associated with future earnings changes after controlling for current profitability, market's expectation about future

earnings and past dividend changes. In addition, in the long run they do not find evidence of abnormal returns over the three years after the split announcement. Thus, stock splits might not be a credible signal of future earnings performance.

Wulff (1999) investigates the market reaction to stock splits using a set of German firms, using the liquidity and neglected firm hypothesis. He used the event study methodology of Brown and Warner. In an efficient market, all information should be incorporated in the stock price on the announcement, but no price reaction should be expected on the execution day.

In this study, they used a sample of 72 stock splits in Germany of Frankfurt Stock Exchange during the period 1994-1996. Abnormal returns remain positive and partly significant up to four days after the announcement. Significant positive abnormal returns are found both around the announcement and the ex-day of German stock splits. Specifically, he observes significant announcement excess return of 0,47%. An increase in return variance after the ex-day is observed as well. Also, there is a substantial increase in liquidity in German stocks. Their empirical results are best explained by the neglected firm effect. It is argued that for institutional reasons (once a company's stock is traded at the minimum par value, no further splits are possible) a signal via stock splits is very limited in Germany. The share price reaction to stock splits is much lower in Germany than usually found in the U.S.

The liquidity hypothesis often takes the form of an optimal trading range hypothesis which states that companies tend to move their share price back towards an as optimal perceived trading range after the share price has risen substantially. Furthermore, no evidence can be found that the improved liquidity after the split leads to an increase in value.

Reboredo (2003) examines the market effect of stock splits on stock price, return, volatility and trading volume around the split ex-dates for a sample of stock splits undertaken in the Spanish stock market "Bolsa de Madrid" during 1998-1999. This study takes daily information about closed price and volume for a period of 60 days before splitting and 60 days after splitting. They find that the stock price reduces significantly after the split ex-dates, even though the reduction depends on the size of the split. Likewise, the stock return is also reduced after splitting. Consequently, the

signaling hypothesis according to which splits convey positive information to markets is rejected and the wealth of shareholders is also reduced. Finally, the stock volatility and volume increase significantly after splitting although the magnitude of these changes depends on the tick size change.

Kunz (2002) analysed the impact of stock splits on the daily turnover in currency units, the relative bid-ask spread, the tick size and the short- and long-term performance of stocks listed on the Swiss stock exchange.

This study comprises 64 companies that conducted 80 splits in the period from January 1st 1992 to December 31st 2001. With respect to the short-term effects of stock splits it can be said that on average in Switzerland there where no significant excess returns to be earned. Relative bid-ask spreads and tick sizes have increased after the splits, whereas the average daily trading volume remained largely unchanged. They found that companies conduct stock splits after periods of unusual growth in share prices. The average cumulated excess return that could be earned over 100 trading before stock splits announcements is significant at the 5% level. From the announcement date the movement of the excess returns was insignificant.

Patrick Dennis (1998) following both the signaling and liquidity hypotheses, try to examine the influence of firm ownership composition on both the abnormal returns at the announcement of a stock split and liquidity changes following a stock split. They used a sample of splits that traded on the NYSE, AMEX and NASDAQ from 1 January 1990 to 31 December 1993.

They find that the proportion of institutional ownership following a split increases significantly. Conditional on the level of institutional ownership before the split, they find that the largest increase in post-split trading volume occurs in firms that have the lowest levels of institutional ownership before the split and that changes in ownership structure following a split appear to be driving the post-split volume changes. Second, turnover increase (does not change) for firms with low (high) levels of institutional ownership before the split announcement, and this increase in turnover are related to the level of institutional ownership and liquidity before the split. These firms with low institutional ownership before the split, experience the largest increase in institutional ownership and therefore the largest increase in post-split liquidity. Finally, they

examine the relation between abnormal returns and ownership following a split and find that the abnormal return is negatively related to the level of institutional ownership before the split. Their finding that the abnormal return at the announcement of a split is negatively related to the proportion of institutional ownership before the split is more consistent with the liquidity hypothesis than the signaling hypothesis.

Brennan and Copeland(1988) develop and test a model of stock splits that accounts for the abnormal returns occurred and they try to support the signaling hypothesis. The sample contained the initial announcements of proposed splits and stock dividends for the years 1967-1976 from NYSE that were used in the study of Masulis, Grinblatt and Titman (1984). Their signaling hypothesis rests on the assumption that stock splits are costly because they involve printing, legal and other administrative expenses.

They argue that the management is able to communicate its private information about the firm's prospects to investors by means of a stock splits announcement because the cost of trading depends on the stock price. The firm' s manager observes the true value of the firm's discounted future cash flows and trades off the discounted value of increased transaction costs against the benefit derived from an earlier increase in the firm's share price. Transaction costs per dollar are a decreasing function of share prices and of size firm. If a firm with good prospects, then its percent effective spread will increase temporarily. If a firm with average or bad prospects splits, then its percent effective spread will increase permanently. This cost differential allows good to signal by splitting and prevents average or bad firms from mimicking.

The signaling model is estimated using a large sample of splits and the announcement-date mean adjusted returns and explains about 27% of the split-announcement-date returns. The empirical evidence finds a +3% abnormal return on split announcement.

Copeland (1979) presents evidence for the liquidity effect of stock splits. It takes a sample of 25 companies that had a stock split at the New York Stock Exchange between January 1, 1963 and January 1, 1974. Two measures are used in this paper: the first one is changes in the proportional share volume of trading and secondly

changes in transaction costs as a percent of value traded. Results show that brokerage revenues increased by at least 7,1% following splits. Moreover, the results showed that post-split bid-ask spreads increase significantly as a percentage of the value of the stock. Taken together, these results lead to the conclusion that there is a permanent decrease in relative liquidity following the split. Also, the evidence shows that this is rather permanent effect than temporary. This directly contradicts the hypothesis that splits are motivated by a desire for more liquid markets.

By liquidity, it is meant the average cost of trading a measured by percent effective spread. Goyenko, Holden and Ukhon (2005) study the effect of stock splits on long-run liquidity. They analyze thousands of stock splits from 1962 through 2003 that occurred on the NYSE and AMEX. Their main finding is that split firms initially experience worse liquidity than control firms, but return even in 10 to 20 months and then crossover into better liquidity in 60 months. This suggests a net benefit of splitting, which supports both the trading range theory and the optimal tick size theory. Specifically, they find that for split firms their percent effective spread returns to even in 10 to 20 months, becoming statistically indistinguishable from control firms.

Dennis (2003) examines if there is any difference between post split and presplit trading activity that may be explained by liquidity, but not by signaling. To achieve this, he examines liquidity changes following two-for-one split of the Nasdaq -100 Index Tracking Stock from December 20, 1999 to June 20, 2000. Since the stock only tracks the index, there can be no signaling effect as a result of the stock split. Unlike the managers of individual firms, the managers of the trust do not have access to private information regarding the firms held in trust. Hence, signaling cannot be a motive for splitting the stock. He examines the presplit and postsplit differences in turnover, the number of trades, share volume, and the bid-ask spread. The turnover is no different after the split than before, and the relative bid-ask spread actually increases after the split. While these measures seem to indicate that the liquidity may be unchanged following the split, they potentially mask differences between small and large trades. When compared to the presplit levels, the frequency of trading, share volume, and dollar volume indicate that the index split helped traders of small lot sizes by lowering the stock price, so the liquidity of small trades seems to have

improved. Overall, the post split lower share price of the Index Tracking Stock seems to help smaller investors who like being able to trade smaller lot sizes, but the post split increased bid-ask spread hurts large traders who are not wealth constrained and whose primary trading cost is the bid-ask spread.

The most advantageous effect of a stock split is the increase in shareholder liquidity by returning stock prices to some optimal trading range. Conroy, Harris and Benet (1990) examine the effects of stock splits on bid-ask spreads for NYSE-listed companies. They examine stock splits between January 1, 1981 and April 30, 1983 with split factor 1.2 for 1 or greater. They find that percentage spread increase after splits, representing a liquidity cost to investors. This worsens the shareholder's liquidity. These spread increases, are directly affected by the decrease in share prices after a split. Their use of data also allows them to test whether changes in return variance around splits are the result of changes in the spread. They observe that the observed increase in return variability after splits is, in part the result of increases in spreads. Consequently, there is a cost for the firms when it decides to split its stocks. Such a liquidity cost may validate that stock splits are a signal of favorable information about the firm, supporting the signaling hypothesis.

Koski (1998) examines the relation between the bid-ask spread and the variance of stock split returns that affects stock returns. There is some evidence that the bid-ask spread contributes partially to the increase in return volatility after splits. Variance ratio tests provide additional evidence that bid-ask spreads could not explain the significant increase in variance after splits.

Mason and Shelor (1998) support a positive relationship between institutional ownership and split behavior, controlling firm size. The data are from the Media General financial database and Compact Disclosure during the period 1988-1994. Large firms exhibit higher percentage of institutional ownership and greater stock split activity than do small firms. Institutional investors may encourage firms to approve splits to earn return increases. Alternatively, institutional investors, having the benefit of analyst information, might identify firms most likely to enact stock splits. If institutions purchase pre-split investments in these identified firms, they expect long and short-tern return increases. Split behavior increases when institutional ownership increases. The positive relationship between institutional investors and

split behavior implies that institutional investors prefer firms with stock split characteristics and stock splits. Firm managers may direct stock split behavior to pursue or avoid the ownership relations.

Dhar and Goetzmann (2004) examine the trades of individual and professional investors around stock splits find that splits bring about a significant shift in investor clientele. They study the changes in demographic characteristics of traders before and after the split announcement date as well as before and after the split ex-date, and they contrast the effect of a split upon the trading habits of professional investors to its effect upon more naïve investors. The sample that they use comes from the American market between January 1991 and November 1996. They find after a stock split there is a change in clientele. Following the announcement of a split, individual investors increase their trading of the split stocks by more than 50 percent and also increase their buying intensity. In contrast, the sample of professional traders reduces their aggregate order flow and the ratio of buy orders to sell orders. This effect causes an increase in the number of trades executed and a decrease in the average number of shares per trade. Furthermore, less sophisticated individuals comprise a larger fraction of individual investor ownership after stock splits.

They find both the price impact of trades, and the bid –ask spread decrease after a stock split, indicating improved liquidity. They also find evidence in favor of the signaling hypothesis for splits. Purchases increase after split announcements, confirming that split announcements signal favorable information about the company's future prospects. Stock co-move more with the market index after splits and become more volatile. Their cross-sectional analysis suggests that documented clientele differences are significantly related to beta shifts, volatility shifts and the post-split drift. They find that changes in beta (increases) and R^2 (increases) are associated with increases in the individual investor base and the fraction of less sophisticated investors. They also find that post-event drift is, in part, a function of clientele changes. In other words, they find that clientele shifts after splits, in part, explain the positive excess return after splits.

Amoruso and Gaver (1998) analyze changes in post-earnings announcement drift around 1,781 two-for-one or greater stock splits during the 1972 through 1996 time period from the NYSE and AMEX. They find that for the smallest firms, post

earnings announcement drift decreases significantly after a stock split. In contrast to the results for small firms, the abnormal returns for the largest firms exhibit insignificant drift in both pre- and post-split periods. The differential effect noted for small and large firms is likely attributable to the richer information environment faced by larger firms, in which the signal provided by a stock split does not constitute a significant incremental contribution. Their results do not support the transactions cost hypothesis, which predicts an increase in drift following a split that is invariant to firm size. Finally, their results suggest that stock splits provide information to investors concerning the implications of current earnings for future earnings.

Asquith, Healy and Palepu (1989) examine whether stock splits convey information about earnings. Since stock splits themselves do not directly affect a company's cash flows, the increase in a company's stock price at the time of these announcements must, assuming market efficiency, reflect the release of new information. They use as sample stock splits from NYSE or AMEX during the period 1970-1980.

Asquith, Healy and Palepu (1989) find that there are significant earnings increases in the four years before the stock split announcement. These earnings increases appear to be permanent since the earnings changes after the stock split announcement are either insignificant or positive for up to five years. Pre-split earnings increases are due to both industry and firm-specific factors. Firms that announce stock splits are in industries, which perform well. Finally, cross-sectional tests indicate that the larger the earnings change in the two years prior to the splits, the larger is the market reaction to the split announcement. There is evidence of significant earnings increases in the year of the split.

The above results document that there is earnings information conveyed by stock splits. Usually the firms split their stock after a significant increase in earnings. Before the stock splits announcement, the market expects these earnings to be temporary. The split announcement leads investors to increase their expectations that the past earnings increases are permanent. However, they do not necessarily explain manager's motives for splitting their firm's stocks.

Brennan and Hughes (1991) assume that investors trade only in stocks that they "know about" and trade through brokers who analyze those firms, which will generate

the greatest trading volume and brokerage fees. Their date was drawn from the NYSE, NASDAQ and AMEX for the years 1976-1987.

In their model a manager takes a stock split as «good» news, because it reduces the share price and increases the trading commission revenue. Investors accordingly interpret a stock split as a signal that the manager has favorable information, which explains the positive abnormal returns around split announcements.

The model also predicts an increase in the amount of information generated by analysts after the ex-date. This way account for the increase in price volatility observed after the ex-date, the wider bid-ask spread, and the increase in the number of shareholders.

Finally, they observe that the number of analysts making forecast is negatively, related to share price, and the change in analyst following is positively related to the magnitude of stock splits. This result explains the abnormal returns around stock split announcement date.

The introduction of when-issued trading provides an opportunity for traders to elect one of two markets for trades: the unsplit shares trading at one price and the when issued shares trading at the post-split price level. Angel, Brooks and Mathew (2004) provide new findings that explain the increased volatility around stock splits. For their sample period, they examine 536 NYSE firms that had stock splits between 1989 and 1992.First, they find with when-issued trading, both the when-issued shares and unsplit shares have lower volatility during the period of when-issued trading. Using a set of firms that do not have when-issued trading as a control sample, they find that volatility for the control sample remains constant across the trading period before the ex-date and increases only after the ex-date. Therefore, the introduction of when-issued trading magnifies the volatility increase at the ex-date. Finally, there is more trading activity for small-volume traders after the ex-date of the split. This increased trading by small volume traders is long-term change but begins with the availability of the lower price level shares. For firms with when-issued trading, small –volume traders enter the market before the ex-date. For firms without when issued trading, small volume traders enter the market after the ex-date.

McNichols and Dravid (1990) try to assess the empirical validity of the explanation of the "trading range hypothesis" for the positive market response documented at stock dividend and split announcements. Also, their study provides further evidence on the signaling hypothesis by testing whether stock splits convey information about future earnings, and by testing whether the split factor itself is the signal. In the signaling equilibrium that results, the more favorable the manager's information about the value of the firm, the greater the split factor. Managers not in possession of favorable information about their firm's shares are unwilling to split 'falsely' because they will incur higher expected transaction costs if they do, reducing the value of the firm that they retain. The sample is comprised of stock splits from the NYSE and AMEX from 1976-1983.Maureen McNichols and Ajay Dravid conduct tests that managers signal their private information through split factor choice. The first one examines whether managers use their private information about future earnings in choosing their split factor. They find that there are closely correlated. The second test examines the association between announcement returns and their measure of the split factor signal (holding pre-split price, and firm size constant). They find a strong statistical association between announcement returns and split factor signals, which suggests that investors' inferences about firm value do correspond to firm's split factor choices. Thirdly, they find a significant relation between excess announcement returns and one-year – ahead earnings forecast error, suggesting that announcement period returns can be explained by management's private information about future earnings. Their results strongly support the "trading range hypothesis".

In Table 1 we summarize the most significant results of the above literature review containing the Author, the period under examination, the market and the influence of stock splits on the price of stocks.

Table 1

This table presents a summary of the most significant results containing the Author, the period under examination, the market and the influence of stock splits on the price of stocks.

AUTHORS	PERIOD	MARKET	RESULT
Johnson (1966)	1959	NYSE	positive abnormal returns
Fama, Fisher, Jensen and Roll (1969)	1927-1959	NYSE	positive abnormal returns(0,68%)
Lakonishok and Lev (1987)	1962-1985	NYSE-AMEX-NASDAQ	positive abnormal returns
Lamourex and Poon (1987)	1962-1985	NYSE-AMEX	positive abnormal returns(1,82%)
Masulis, Grinblatt and Titman (1984)	1967-1976	NYSE	positive abnormal returns(3%)
Brennan and Copeland (1988)	1967-1976	NYSE	positive abnormal returns(3%)
Jog and Zhu (2004)	1970-2002	TORONTO STOCK EXCHANGE	positive abnormal returns(5,53%)
Ikenberry, Rankine, and Stice (1996)	1975-1990	NYSE-ASE	positive abnormal returns(3,38%)
Brennan and Hughes (1991)	1976-1987	NYSE-AMEX-NASDAQ	positive abnormal returns
Desai and Jain (1997)	1976-1991	NYSE-AMEX-NASDAQ	positive abnormal returns(7,11%)
Elfakhani and Lung (2000)	1977-1993	TORONTO STOCK EXCHANGE	positive abnormal returns(1,26%)
Kryzanowski and Zhang (1991)	1978-1987	TORONTO STOCK EXCHANGE	positive abnormal returns(0,74%)
Huang, Liano and Pan (2002)	1982-1997	NYSE-AMEX-NASDAQ	positive abnormal returns(0,63%)
Kunz (2002)	1992-2001	SWISS STOCK EXCHANGE	statistically insignificant abnormal returns
Wulff (1999)	1994-1996	FRANKFURT STOCK EXCHANGE	positive abnormal returns(0,47%)
Reboredo (2003)	1998-1999	BOLSA DE MADRID	statistically insignificant abnormal returns

CHAPTER 5

5. DATA

The sample consists of stock splits that occurred on ASE from January 1,1999 to April 30, 2006. We examine the sample in three groups. The first sample includes every stock split that occurred between January 1,1999 and April 30, 2006 (total sample). This sample consists of 45 stock splits, from which one case is excluded due to lack of data that precludes us from investigating, leaving a final sample of 44 stock splits.

The second sample (pure sample) excludes stock splits if there are other corporate decisions in the board of directors' call for a general shareholders meeting. Specifically, the purity of the sample depends on the absence of other contaminating announcements on trading days 0, 1 and 2 in the event time. The pure sample consists of 31 cases.

The third sample includes stock splits that occurred between January 1,2000 and April 30, 2006. In this sample we examine the daily stock price returns for a period that the stock market started falling. The third sample consists of 28 stock splits.

The price reaction tests are performed in relation to day 0 (day 0 is the day that the first public announcement was made). Announcement dates of the stock splits were collected from the Greek daily press. Daily prices of the stocks and the market index as well as the trading volume were extracted from DataStream. Split factors and all other accounting information were extracted from various publications (Yearbooks and Annual Statistical Bulletins of the A.S.E.).

Table 2 presents the annual distribution of stock splits (total and pure sample) between January 1,1999 and April 30, 2006. We can observe that after 1999 stock splits were quite few in number and also in 2005 such an event never took place.

Table 2

Annual distribution of stock splits (total and pure sample) of firms on the Athens Stock Exchange and distribution of stock splits by split factor

Period 1999-2006

Number of splits			Split factor	Percent (%)	
Year	Total Sample	Pure Sample			
1999	16	13	>5 for1	2,22%	0%
2000	4	3	4 for 1	4,44%	6,45%
2001	3	3	3 for 1	6,67%	6,45%
2002	6	3	15 for 10	6,67%	9,68%
2003	5	4	6 for 10	2,22%	0,00%
2004	8	3	5 for 10	2,22%	0,00%
2005	0	0	1 for 10	2,22%	0,00%
2006	3	2	1 for 2	4,44%	3,23%
Total	45	31	2 for 1	13,33%	19,35%
			<2 for 1	55,56%	54,84%
				100,00%	100,00%

CHAPTER 6

6. METHODOLOGY

The methodology that we will follow is an "Event Study Methodology" by Warner & Brown (1985). Event studies focus on the impact of particular types of firm-specific events on the prices of the affected firms' securities. A simple methodology based on the market model performs well in the case of stock splits. The major concern in the event studied methodologies is to assess the extent to which security price performance around the time of the event has been abnormal, that is the extent to which security returns were different from those which would have been appropriate.
In an efficient market, to observe the impact of stock splits on the prices of the affected firms we must observe the changes that occurred on the price the day of the announcement and not after that particular date. Consequently, this paper examines the changes on the prices of the stocks around the announcement date. Our interest is traced on the announcements in the daily press of the invitation for a shareholder's meeting setting as an issue the stock split.

To examine the effect that has the stock split on the price of the stock, it is necessary to compare the real returns. Consequently, so as to estimate the 'real' or the 'expected' E (R_{it}) returns there are basically three methods of calculating this predicted return. These are the mean-adjusted return method, the market model method, and the market adjusted return method. For most cases the three methods yield similar results. In our case we are using the market method as our main methodology, in order to calculate the abnormal return of every stock, which is the actual return for that day for the firm minus the predicted return. In the appendix, we shall show and the results of the market adjusted return method, which shows similar results.

The excess return e_{it} of the stock i in day t is symbolized as follows:

$$AR_t = R_{it} - E(R_{it})$$

In our research we will use the market model methodology to observe whether abnormal returns exist around the announcement of a stock split.

Statistically we will examine these two hypotheses:

- H_0 : $AR_t = 0$
- H_1 : $AR_t \neq 0$

Where:

AR_t is the abnormal return of the sample during the announcement date of the stock split.

H_0 is the zero hypothesis.

H_1 is the alternative hypothesis

After explaining the market model, we shall analyze the two other models that yield similar results (mean-adjusted return model and market adjusted returns model).

The market model

The market model assumes that the returns of the stocks are caused from the following procedure:

$$R_{it} = a_i + \beta_t R_{mt} + e_{it}$$

Where:

i= 1, ….., N

t= 1, ….., M

R_{it} = is the actual return of stock i in day t

R_{mt} = is the return of the stock market portfolio in day t

$$\beta_i = \frac{Cov(R_{it,} R_{mt})}{Var(R_{mt})}$$

The coefficient β of the stock i is a measure that shows how sensitive is the stock on the changes of the market.

$$a_i = E(R_{it}) - \beta_i E(R_{mt})$$

Coefficients a_i and β_i are OLS estimates from the market model regression. Denoting the event time as day 0, regression coefficients are estimated over a period of 151 days, from day -200 to day -50.

e_{it} = calculative error of the stock i in day t that has normal distribution and its mean is equal to zero. Also, its variance is constant through time.

Using the coefficients a_i and β_i the equation becomes as follows:

$$AR_t = R_{it} - \left[a_i + \beta_t R_{mt}\right] \qquad \textbf{(1)}$$

In the above equation $\left[a_i + \beta_t R_{mt}\right]$ is the ¨normal¨ return of the stock i in day t and the AR_t is the ¨excess¨ return of the stock i in day t.

The subtraction $\left[a_i + \beta_t R_{mt}\right]$ from the R_{it} cancels out the possible effects of the changes that occurred on the market. However, it does not eliminate the possible changes that are caused from other events that were irrelevant with the announcement of stock split.

Next we estimate the Average Abnormal Returns $\overline{AR_t}$ of every stock for a period of –49 to +10 as follows:

$$\overline{AR_t} = AAR_t = \frac{\sum_{i=1}^{N} AR_t}{N} \qquad \textbf{(2)}$$

Where:

N is the number of stock splits in the sample the specific day.

t = -49, -49, -48,-47….., 0, ……+10

In this way it is canceled out the possible effect of other firm facts that were irrelevant with the announcement of stock split at the same time period and for N stock splits of our sample.

Finally, we estimate the Cumulative Average Abnormal Returns for the periods CAAR (-10,0), CAAR (-5,0), CAAR (-1,0) and CAAR (-1, +1). The announcement day is the day 0.

$$CAAR(t_1, t_2) = \sum_{t=t_1}^{t_2} \overline{AR_t} \qquad \textbf{(3)}$$

Where:

t_1 is the first day of the period that the cumulative average abnormal return is calculated

t_2 is the last day.

For example:

$$CAAR(-10,0) = \sum_{t_1=-10}^{0} \overline{AR_t}$$

Mean-adjusted return model

In this method the mean of the real returns of the stock i, $(\overline{R_j})$, for the 150 days that comes to an end 50 days before the announcement date, is used for the calculation of the expected return of the stock i. In this case the excess return is calculated as follows:

$$AR_t = R_{it} - \overline{R_j} \qquad \textbf{(4)}$$

$$\overline{R_j} = \frac{\sum_{-200}^{-51} R_{it}}{150}$$

Then, by using the excess returns we calculate the average abnormal returns $\overline{AR_t}$ and cumulative average abnormal returns CAAR (t_1, t_2) for the sample of the N stocks according to the types (2) and (3).

Market adjusted returns model

In this model that we will use, the excess return of the stock i is measured by the difference between the stock's return and the corresponding return of the stock market portfolio (R_{mt}) in day t. So, the abnormal return for a given security in any period time *t* is defined as the difference between its actual return and that of the market portfolio. So, the next step is to calculate a predicted return R_{mt} for each day in the event period of each firm

$$AR_t = R_{it} - R_{mt} \qquad \textbf{(5)}$$

Where:

R_{it} is the actual return of stock i in day t

R_{mt} is the actual return of stock market portfolio at the day t and is considered to be the expected return of the stock. The index that is being used for the stock market portfolio return is the Athens Stock Exchange.

Then, by using the excess returns we calculate the average abnormal returns $\overline{AR_t}$ and cumulative average abnormal returns CAAR (t_1, t_2) for the sample of the N stocks according to the types (2) and (3).

Significance test (t-statistics)

In order to see whether the Average Abnormal Returns and Cumulative Average Abnormal Returns are equal to zero, we will make a statistical control with the help of "t-statistics".

$$t\,(AAR) = \frac{\overline{AR_t}}{S(\overline{AR_t})} \qquad \textbf{(6)}$$

$$t\,(CAAR) = \frac{CAAR_t}{\sqrt{T} * S(\overline{AR})_t} \qquad \textbf{(7)}$$

Where:

$S(\overline{AR_t})$ is the standard deviation of average abnormal return portfolio during the estimation period. The defining period contains 151 days from period t = -200 to t = -50 in relation with the announcement day t = 0

$T = t_2 - t_1 + 1$ days

t_1 is the first day of the period that the cumulative abnormal return is calculated

t_2 is the last day.

For our sample we will use the market model.

CHAPTER 7

7. EMPIRICAL RESULTS

In this chapter we analyze the empirical results using the market model methodology by Warner & Brown (1985).

We compute the daily abnormal returns (ARs) and the cumulative abnormal returns (CARs) for the portfolio of all splitting stocks of all samples that occurred after the stock market started falling from 20 days before to 10 days after the event day (day 0). The price reaction is estimated by applying, respectively, the market model and we present as a second methodology the market adjusted model in the appendix. The results of the event study concerning the announcement date are presented in Table 3, 4 and 5.

In each Table, Column 1 presents the event period and Column 2 shows the number (N) of stock splits. Column 3 presents the daily average abnormal returns, whereas Column 4 the percentage of positive AARs. Column 5 presents the t-statistic. In the last four rows of the tables we have calculated the cumulative average abnormal returns for the intervals (-10,0), (-5,0), (-1,0) and (-1,+1) as well as the t-statistics for these intervals so as to assess the overall value implication of stock splits.

Table 3 presents daily average abnormal returns of the total sample and cumulative average abnormal returns for specific intervals. In the overall sample we observe an insignificant price run-up in the days prior to the split announcement. The average abnormal returns are in day -1 -0,95% and day 0 -0,33%, which are statistically insignificant (t = -1,59 and t = -0,55 respectively). However, on day +6 after the announcement we observe negative average abnormal return (-1,73%) statistical significant (t = -2,88). The cumulative average daily returns by day -10 to day 0 is 0,9%, a percentage insignificant. The positive cumulative return in the interval -10 to day 0 shows evidence of a positive drift before the announcement day. Moreover, the cumulative average abnormal returns for specific intervals are CAAR (-5,0) = -0,33, CAAR (-1,0) = -1,28 and CAAR (-1,+1) = -1,57 statistically insignificant at conventional levels (t-statistics -0,22, -1,52 and -1,5 respectively)

We also investigate and present the average trading volume of the overall sample in Diagram 1 in order to examine the daily trading activity of splitting stocks. The period we investigate is 30 days before the event day (day 0) to 30 days after the announcement date (day 0).

In Diagram 1, we observe that the average trading volume of the overall sample (44 stock splits) rises dramatically in the pre-announcement period and falls on the post-announcement period. This is consistent with evidence from the U.S. stock splits. Actually the interval -2 to -1 is a period of unusual high trading activity. Examination of daily trading activity of splitting stocks reveals that the average turnover volume rises from around 203 in the nine days prior to the announcement date to an average of 506 on day -2, which suggests unusual trading activity. The existence of unusual trading activity 2 days before the announcement date may be a result of a possible leakage of information to the investors before the announcement day, which most likely drives investors to sell their stocks because they believe that the price may fall.

Diagram 1

Average trading volume of the overall sample of stock splits (N = 44) for the event period -30, +30 days relative to the announcement day (t = 0).

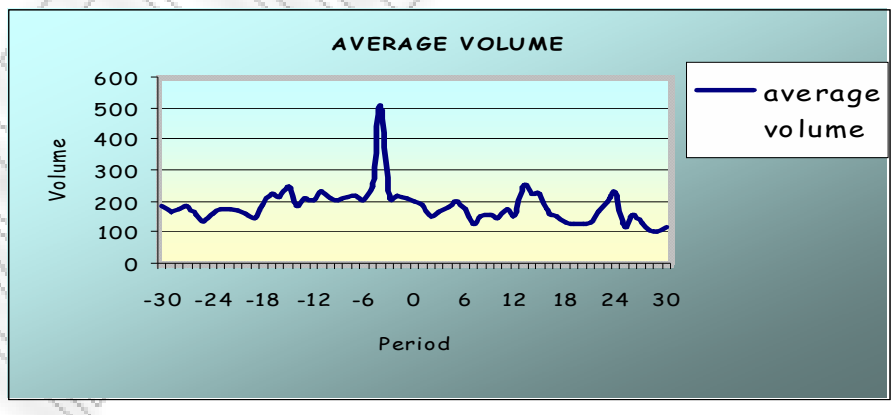

Table 3

Event days, number of observations (N), daily average abnormal returns (AAR), percentage of positive AARs, t-statisitcs (t[AAR]) for the daily AARs, cumulative average abnormal returns for the intervals (-10,0), (-5,0), (-1,0) and (-1,+1) relative to the announcement day, day 0.Day 0 is the day of the earliest press release about the stock split decision. Abnormal returns are calculated using the **market model**. Sample firms are listed on the Athens Stock Exchange. (N = 44)

Period 1999 to 2006

Event day	N	AAR	Percentage of positive AARs	t[AAR]
-20	43	0,0070	50,00	1,17
-19	42	0,0070	47,73	1,17
-18	42	0,0036	52,27	0,60
-17	43	0,0037	40,91	0,62
-16	43	-0,0005	50,00	-0,08
-15	42	0,0052	56,82	0,86
-14	40	0,0059	40,91	0,99
-13	41	0,0010	54,55	0,17
-12	44	-0,0032	36,36	-0,53
-11	42	0,0003	40,91	0,06
-10	43	-0,0028	38,64	-0,47
-9	43	-0,0001	47,73	-0,02
-8	42	0,0073	47,73	1,22
-7	41	0,0054	47,73	0,91
-6	44	0,0025	45,45	0,41
-5	43	-0,0014	38,64	-0,24
-4	40	0,0004	40,91	0,07
-3	44	0,0087	59,09	1,46
-2	43	0,0018	52,27	0,31
-1	40	-0,0095	40,91	-1,59
0	**43**	**-0,0033**	**47,73**	**-0,55**
1	43	-0,0029	43,18	-0,48
2	42	-0,0048	38,64	-0,80
3	42	0,0071	54,55	1,18
4	42	0,0028	52,27	0,47
5	43	-0,0003	43,18	-0,05
6	42	-0,0173	15,91	-2,88**
7	43	0,0007	45,45	0,12
8	43	-0,0005	50,00	-0,09
9	41	0,0052	40,91	0,87
10	42	-0,0049	40,91	-0,82

Event periods	CAAR	t[CAAR]
(-10,0)	0,0090	0,4535
(-5,0)	-0,0033	-0,2245
(-1,0)	-0,0128	-1,5182
(-1,+1)	-0,0157	-1,5155

**Significant at the 0.05 level

Table 4

Event days, number of observations (N), daily average abnormal returns (AAR), percentage of positive AARs, t-statisitcs (t[AAR]) for the daily AARs, cumulative average abnormal returns for the intervals (-10,0), (-5,0), (-1,0) and (-1,+1) relative to the announcement day, day 0.Day 0 is the day of the earliest press release about the stock split decision. Abnormal returns are calculated using the **market model**. Sample firms are listed on the Athens Stock Exchange. This table contains information of **pure sample** (firms that exclusively announced a stock split). (N = 31)

Period 1999 to 2006

Event day	N	AAR	Percentage of positive AARs	t[AAR]
-20	30	0,0069	45,16	0,82
-19	30	0,0130	58,06	1,56
-18	29	0,0054	51,61	0,65
-17	30	0,0013	38,71	0,16
-16	30	-0,0029	48,39	-0,35
-15	30	0,0055	58,06	0,66
-14	28	0,0063	38,71	0,75
-13	30	-0,0014	48,39	-0,17
-12	31	-0,0079	29,03	-0,95
-11	30	-0,0012	38,71	-0,15
-10	30	-0,0057	35,48	-0,68
-9	31	-0,0057	38,71	-0,68
-8	29	0,0093	51,61	1,12
-7	30	0,0055	51,61	0,66
-6	31	0,0012	38,71	0,14
-5	30	-0,0029	41,94	-0,35
-4	29	-0,0017	45,16	-0,20
-3	31	0,0094	64,52	1,13
-2	30	-0,0004	48,39	-0,05
-1	29	-0,0133	38,71	-1,59
0	**31**	**-0,0085**	**38,71**	**-1,02**
1	30	-0,0052	35,48	-0,62
2	29	-0,0070	41,94	-0,83
3	29	0,0135	67,74	1,62
4	29	0,0034	51,61	0,41
5	31	-0,0018	48,39	-0,22
6	30	-0,0210	16,13	-2,51**
7	30	-0,0022	32,26	-0,27
8	30	0,0010	48,39	0,12
9	29	0,0051	38,71	0,61
10	29	-0,0024	48,39	-0,29

Event periods	CAAR	t[CAAR]
(-10,0)	-0,0127	-0,4603
(-5,0)	-0,0174	-0,8496
(-1,0)	-0,0218	-1,8437*
(-1,+1)	-0,0270	-1,8653*

*Significant at the 0.10 level

**Significant at the 0.05 level

Table 5

Event days, number of observations (N), daily average abnormal returns (AAR), percentage of positive AARs, t-statisitcs (t[AAR]) for the daily AARs, cumulative average abnormal returns for the intervals (-10,0), (-5,0), (-1,0) and (-1,+1) relative to the announcement day, day 0.Day 0 is the day of the earliest press release about the stock split decision. Abnormal returns are calculated using the **market model**. Sample firms are listed on the Athens Stock Exchange. (N = 28)

Period 2000 to 2006

Event day	N	AAR	Percentage of positive AARs	t[AAR]
-20	27	0,0101	57,14	1,65
-19	26	-0,0005	39,29	-0,08
-18	26	0,0030	53,57	0,49
-17	28	0,0050	35,71	0,82
-16	27	-0,0009	50,00	-0,15
-15	27	0,0060	60,71	0,98
-14	24	-0,0024	32,14	-0,40
-13	25	-0,0049	50,00	-0,79
-12	28	-0,0031	32,14	-0,50
-11	27	-0,0050	39,29	-0,81
-10	27	-0,0036	39,29	-0,59
-9	27	-0,0044	46,43	-0,72
-8	27	0,0022	39,29	0,36
-7	27	0,0039	50,00	0,63
-6	28	-0,0026	39,29	-0,43
-5	28	-0,0108	32,14	-1,76
-4	25	-0,0049	28,57	-0,80
-3	28	0,0084	57,14	1,38
-2	28	-0,0023	46,43	-0,38
-1	25	-0,0108	35,71	-1,76
0	**27**	**-0,0018**	**53,57**	**-0,29**
1	27	-0,0048	39,29	-0,79
2	27	-0,0029	39,29	-0,47
3	27	0,0041	50,00	0,66
4	27	-0,0023	42,86	-0,37
5	27	0,0018	42,86	0,30
6	26	-0,0155	14,29	-2,52**
7	28	-0,0009	53,57	-0,14
8	28	-0,0052	50,00	-0,85
9	26	0,0010	35,71	0,16
10	26	-0,0142	25,00	-2,31**

Event periods	CAAR	t[CAAR]
(-10,0)	-0,0269	-1,3207
(-5,0)	-0,0222	-1,4795
(-1,0)	-0,0126	-1,4541
(-1,+1)	-0,0174	-1,6409

**Significant at the 0.05 level

Table 4 reports the daily average abnormal returns of the 'pure' sample and the cumulative average abnormal returns for specific intervals. The announcement of a pure stock split (N = 31) reveals average abnormal return for day 0 of -0,85%, which is not statistically significant (t = -1,02) at the 0,10 level of significance. Also, we find negative average abnormal return of 2,10% on day +6, which was statistically significant (t = -2,51) at the 0,05 level of significance. The cumulative average abnormal returns over the extended window are (-10,0) and (-5,0) are -1,27% and 1,74% respectively, which are statistically insignificant. However, over the windows day -1 to day 0 and day -1 to day +1 the sample realizes statistical significant negative cumulative average abnormal returns of about -2,18% and -2,70% respectively. Hence, we can observe that on average the announcement of a stock split had a negative influence on the price of the stocks.

Table 5 reports the market reaction around 20 days before and 10 days after the announcement day for stock splits that occurred during the period January 1st 2000-April 30th 2006 (N = 28). The post-announcement day average abnormal returns include few statistically significant as well as negative average abnormal returns (e.g. on day 6 and 10) at the 0,05 level of significance. The average abnormal return is negative (-0,18%) and statistically insignificant (t = -0,29) on the announcement date. A negative abnormal return is also computed in day -1, which is also statistically insignificant (t = -1,76). The cumulative average abnormal returns (CAAR) for the main intervals are -2,69%, -2,22%, -1,26% and -1,74% statistically insignificant (t-statistics -1,32, -1,47, -1,45 and -1,64 respectively).

Unlike the evidence from the U.S. stock splits and in line with the market efficiency hypothesis, we find no evidence of a price reaction around the stock split announcement. Over the interval 20 days before the announcement to the day of the announcement (t = 0), the portfolios of splitting stocks do not realize significant positive average abnormal returns. The insignificant of positive average abnormal returns implies that stock splits of Greek firms do not convey strong information about valuation consequences as shown by U.S. stock splits. The statistically insignificant price reaction reveals a diminished signalling value of Greek stock splits that may be a result of the institutional characteristics of the Greek market.

In the appendix we present results using the market-adjusted return method. In accordance with the market model, the market-adjusted returns method shows that stock splits are not associated with a significant price reaction on day 0 and -1.

CHAPTER 8

8. CROSS-SECTIONAL ANALYSIS

To examine the cross-sectional variation in price reactions to announcements, a linear regression is estimated, where firm characteristics and prior information available to investors at the time of the event are available as independent variables. We initially perform a cross- sectional analysis of the average abnormal returns for the pure sample of 31 companies and afterwards for the total sample of 43 companies (one stock was excluded) that announced stock split during the period January 1999 –April 2006 so as to inquire further into potential causes. This analysis helps identify factors that can explain the appearance of any abnormal stock returns around split announcements. The cross- sectional analysis is estimated by estimating the regression:

$$CAAR\ (-1,0) = a_0 + a_1 SPFAC + a_2 DUM + a_3 VOL + a_4 CAP + e$$

Where:

CAAR (-1,0)	is the two days cumulative average abnormal stock return for sample firms.
SPFAC	is the ratio of the number of new to old shares that firms distributed to the investors when splitting their shares.
DUM	is a dummy variable distinguishing the regular from the irregular General Shareholder´s Meeting of the firms(regular =0 and irregular=1) .
VOL	is the average daily percentage change of volume of trade of the sample firms during the estimation period –49 to +10.
CAP	is each firm's capitalization, which points out the firm's size. (< €1.800.000=1, € 1.800.000- € 9.500.0000=2, > €10.000.000=3)
e	is an error term with the usual OLS properties.

CHAPTER 9

9. CROSS-SECTIONAL RESULTS

In this regression the dependent variable is the cumulated return over the period -1 to day 0. The explanatory variables are the SPFAC, DUM, VOL and CAP. The lack of data from Greek firms limits the examination to these four variables.

In Chapter 7 we have presented that the cumulative average abnormal return of the pure sample for the interval –1 to 0 was negative and statistically significant.

Coefficient estimates for the regression of the pure sample are shown in Table 6, where all the results of the regression are presented after subtracting the dummy variable of regular/ irregular General's Shareholders Meeting.

Table 6

$$CAAR\ (-1,0) = a_0 + a_1 SPFAC + a_2 VOL + a_3\ CAP + e$$

Dependent Variable: CAAR
Method: Least Squares
Sample: 1 31
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SPFAC	**0.005208**	0.014609	**0.356518**	0.7242
VOL	**-0.002641**	0.005199	**-0.508079**	0.6155
CAP	**4.74E-10**	3.04E-10	**1.560145**	0.1304
C	**-0.040695**	0.027427	**-1.483770**	0.1495

R-squared	0.091893	Mean dependent var	-0.023822
Adjusted R-squared	-0.009008	S.D. dependent var	0.069531
S.E. of regression	0.069843	Akaike info criterion	-2.365214
Sum squared resid	0.131708	Schwarz criterion	-2.180184
Log likelihood	40.66082	F-statistic	0.910729
Durbin-Watson stat	2.214595	Prob(F-statistic)	0.448843

In Table 6 a cross-sectional analysis is performed for the pure sample. All coefficients are positive (SPFAC and CAP) except the coefficient VOL. The results show that all variables have a statistically insignificant relationship with the cumulative average abnormal returns around the announcement day. Only the 9,18% of the variation in the dependent variable is explained in this regression, percentage quite small.

Table 7

$$CAAR\ (-1,0) = a_0 + a_1SPFAC + a_2DUM + a_3VOL + a_4CAP + e$$

Dependent Variable: CAAR
Method: Least Squares
Sample: 1 43
Included observations: 43

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SPFAC	**-0.001214**	0.007823	**-0.155176**	0.8775
DUM	**-0.043362**	0.022035	**-1.967925**	0.0564
VOL	**0.000742**	0.003632	**0.204195**	0.8393
CAP	**0.024366**	0.012173	**2.001674**	0.0525
C	**-0.029716**	0.028938	**-1.026871**	0.3110

R-squared	0.151240	Mean dependent var	-0.014379
Adjusted R-squared	0.061897	S.D. dependent var	0.062854
S.E. of regression	0.060878	Akaike info criterion	-2.650950
Sum squared resid	0.140832	Schwarz criterion	-2.446159
Log likelihood	61.99542	F-statistic	1.692795

Table 7 reports the results of the total sample from the regression of cumulative average abnormal returns (based on the market model) around the announcement day. In this table the announcement results are significantly related to certain independent variables. Specifically, the coefficient estimates of VOL and CAP are positive and statistical significant, whereas those of SPFAC and DUM are statistically insignificant at the 0,10 level of significance. The regression shows that partially the cumulative average abnormal return of stock splits can be explained by the independent variables CAP and DUM. In this regression the R-Squared is 15,12%, percentage very small. The R-squared statistic in the regression measures the success of the regression in predicting the values of the dependent variable within the sample. In standard settings, may be interpreted as the fraction of the variance of the dependent variable explained by the independent variables. The statistic will equal one if the regression fits perfectly, and zero if it fits no better than the simple mean of the dependent variable.

Seeing these results we subtracted coefficient estimates, in order to see if this will alter our results.

Table 8 presents the results of a regression that did not include the variable of the split factor for the 43 firms that decided a stock split during the period January 1st 1999-

April 30th 2006. The results are the same with the ones of the first regression in Table 7. This means that in this regression the Dummy Variable as well as the CAP Variable play an important role in the appearance of abnormal returns because they appear to be statistical significant at the 0,05 level of significance. The regression explains 15,07% of the variation in the dependent variable, a percentage nearly the same with that of the original regression. The coefficient of DUM is negative, whereas those of CAP and VOL are positive.

Table 8

$$CAAR\ (-1,0) = a_0 + a_1\ DUM + a_2\ VOL + a_3\ CAP + e$$

Dependent Variable: CAAR
Method: Least Squares
Sample: 1 43
Included observations: 43

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DUM	**-0.043833**	0.021550	**-2.033999**	0.0488
VOL	**0.001044**	0.003027	**0.344727**	0.7322
CAP	**0.024432**	0.012012	**2.034005**	0.0488
C	**-0.031309**	0.026715	**-1.171979**	0.2483
R-squared	0.150702	Mean dependent var		-0.014379
Adjusted R-squared	0.085371	S.D. dependent var		0.062854
S.E. of regression	0.060111	Akaike info criterion		-2.696828
Sum squared resid	0.140922	Schwarz criterion		-2.532995
Log likelihood	61.98180	F-statistic		2.306757
Durbin-Watson stat	1.777737	Prob(F-statistic)		0.091649

In Table 9, we have removed the average daily percentage change of volume of trade (VOL) of the 43 firms. In this regression we can see that the coefficient CAP and also the coefficient DUM are statistical significant. None of the other coefficients are statistically significant. This regression explains the 15,03% of the variation in the dependent variable, a percentage similar to this of the original regression. The coefficient estimates of SPFAC and DUM are negative, whereas the coefficient estimate of CAP is positive.

Table 9

$$CAAR\ (-1,0) = a_0 + a_1SPFAC + a_2DUM + a_3CAP + e$$

Dependent Variable: CAAR
Method: Least Squares
Sample: 1 43
Included observations: 43

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SPFAC	**-0.002070**	0.006523	**-0.317367**	0.7527
DUM	**-0.042065**	0.020837	**-2.018732**	0.0504
CAP	**0.023760**	0.011659	**2.037836**	0.0484
C	**-0.028339**	0.027794	**-1.019611**	0.3142

R-squared	0.150308	Mean dependent var	-0.014379
Adjusted R-squared	0.084948	S.D. dependent var	0.062854
S.E. of regression	0.060125	Akaike info criterion	-2.696365
Sum squared resid	0.140987	Schwarz criterion	-2.532532
Log likelihood	61.97184	F-statistic	2.299669
Durbin-Watson stat	1.776926	Prob(F-statistic)	0.092388

In Table 10 a regression is calculated that does not include the dummy variable of regular/ irregular General's Shareholders Meeting of the 43 firms (total sample). All three coefficients are negative (SPFAC and VOL) except the coefficient CAP. The results show that all variables have a statistically insignificant relationship with the cumulative average abnormal returns around the announcement day. Only the 6,47% of the variation in the dependent variable is explained in this regression, percentage very small.

Table 10

$$CAAR\ (-1,0) = a_0 + a_1SPFAC + a_2VOL + a_3CAP + e$$

Dependent Variable: CAAR
Method: Least Squares
Sample: 1 43
Included observations: 43

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SPFAC	**-0.003333**	0.008029	**-0.415070**	0.6804
VOL	**-0.001320**	0.003603	**-0.366362**	0.7161
CAP	**0.018369**	0.012211	**1.504217**	0.1406
C	**-0.046334**	0.028680	**-1.615581**	0.1142

R-squared	0.064739	Mean dependent var	-0.014379
Adjusted R-squared	-0.007204	S.D. dependent var	0.062854
S.E. of regression	0.063080	Akaike info criterion	-2.600413
Sum squared resid	0.155185	Schwarz criterion	-2.436580
Log likelihood	59.90887	F-statistic	0.899867
Durbin-Watson stat	1.857365	Prob(F-statistic)	0.449968

In Table 11, after removing the variable CAP, there is no statistically significant relationship between the variables (SPFAC, VOL, CAP) and the cumulative average abnormal returns for the interval -1 0. The coefficients SPFAC and VOL are negative whereas the coefficient CAP is positive. The regression explains the 6,17% of the variation in the dependent variable, a percentage much smaller than the original one.

Table 11

$$CAAR\ (-1,0) = a_0 + a_1 SPFAC + a_2 DUM + a_3 VOL + e$$

Dependent Variable: CAAR
Method: Least Squares
Sample: 1 43
Included observations: 43

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SPFAC	**-0.001766**	0.008114	**-0.217663**	0.8288
DUM	**-0.032320**	0.022140	**-1.459820**	0.1523
VOL	**-0.001031**	0.003655	**-0.282129**	0.7793
C	**0.011349**	0.021181	**0.535825**	0.5951

R-squared	0.061747	Mean dependent var	-0.014379
Adjusted R-squared	-0.010426	S.D. dependent var	0.062854
S.E. of regression	0.063181	Akaike info criterion	-2.597218
Sum squared resid	0.155682	Schwarz criterion	-2.433386
Log likelihood	59.84020	F-statistic	0.855537
Durbin-Watson stat	1.866191	Prob(F-statistic)	0.472218

Concluding, from the above results we can extract that the coefficient CAP is always positive and the coefficient DUM is always negative and both are statistically significant in some tables (Tables 7, 8, 9) of the total sample, which means that each firm's capitalization (CAP) as well as the variable that distinguishes whether it was a pure stock split or not can partially explain any appearance of abnormal returns around split announcements. For the pure sample the results show that all variables have a statistically insignificant relationship with the cumulative average abnormal returns around the announcement day.

CHAPTER 10

10. CONCLUSION

The finance theory predicts that stock splits have no effect on the market behaviour around split announcements. Splits would only have the effect of reducing share prices according to the split factor. Although stock splits seem to be purely a cosmetic event, there exists ample empirical evidence especially from the U.S. and other markets [e.g.Grinblatt, Masulis and Titman (1984), Lamourex and Poon (1987), Ikenberry, Rankine and Stice (1996)] that stock splits are associated with positive abnormal returns on the announcement day.

This study analyses the price effects of stock splits undertaken by firms whose stock is traded on the Athens Stock Exchange (ASE) during the period January 1,1999 - April 30, 2006. We examine the sample in three groups. The price reaction in this study is estimated by applying the market model as our main methodology and the market adjusted model as a secondary and it is presented in the appendix, for the purpose of comparing the results.

This analysis used daily stock price returns to examine the valuation effect of split announcements. The returns on various days around the announcement are compared with the average daily return for a subsequent benchmark period of 30 days (-20,+10). To test significance of the announcement return, we examine day 0 and day -1. Both our methodologies show the same results for the announcement returns, as we examine day 0 and day -1.

Unlike the case of the U.S. stock splits, we find no evidence of positive price reaction around the split announcement time. In all samples, the abnormal returns around the announcement date were statistically insignificant, meaning that the market did not react to the announcement of the stock split. Further analysis reveals that this price announcement reaction may be explained by the fact that the stock splits of Greek firms have weak signaling content, because of the characteristics of the institutional framework.

In addition, a cross- sectional analysis for the pure sample of 31 stock splits was performed during the period January 1999-April 2006, in order to investigate whether coefficient estimates, affect the dependent variable. Specifically, in the cross sectional analysis we used a regression, where the dependent variable was the two-day cumulative average abnormal return (-1,0) and the coefficients were the split factor, each firm's capitalization and the average daily percentage change of volume of trade. The results showed that the relationship between CAAR and the above variables is statistically insignificant. All independent variables used in the regression model provide no explanation to what is leading to the AR during the announcement event period.

In this study, our results give no support to the trading range hypothesis (liquidity hypothesis), since the performance of stocks is quite poor in the pre-event period. However, we observed that managers might decide to split their stock in order to draw attention to ensure that information about the company is wider recognized than before.

Concluding, the goal of this study was to make the notion of stock splits more understandable and to present its effects to the value of the firm with the help of previous papers. Specifically, we examined the reaction of stock prices to stock splits in Greece during the period January 1,1999 - April 30, 2006, and we presented that no significant abnormal returns were found in all three samples. These results coincide with the results of previous studied such as Reboredo (2003) and Kunz (2002).

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APPENDIX

Table 12

Event days, number of observations (N), daily average abnormal returns (AAR), percentage of positive AARs, t-statisitcs (t[AAR]) for the daily AARs, cumulative average abnormal returns for the intervals (-10,0), (-5,0), (-1,0) and (-1,+1) relative to the announcement day, day 0.Day 0 is the day of the earliest press release about the stock split decision. Abnormal returns are calculated using the **market-adjusted return model**. Sample firms are listed on the Athens Stock Exchange. (N = 44)

Period 1999 to 2006

Event day	N	AAR	Percentage of positive AARs	t[AAR]
-20	43	0,0122	56,82	1,95*
-19	42	0,0108	59,09	1,73
-18	42	0,0113	54,55	1,81*
-17	43	0,0081	50,00	1,30
-16	43	0,0065	54,55	1,04
-15	42	0,0048	52,27	0,77
-14	40	0,0112	47,73	1,79
-13	41	0,0034	43,18	0,54
-12	44	-0,0029	45,45	-0,47
-11	42	0,0018	47,73	0,29
-10	43	-0,0007	40,91	-0,10
-9	43	0,0053	59,09	0,85
-8	42	0,0120	59,09	1,92*
-7	41	0,0085	56,82	1,36
-6	44	0,0055	47,73	0,88
-5	43	0,0016	47,73	0,26
-4	40	0,0043	50,00	0,68
-3	44	0,0114	61,36	1,82*
-2	43	0,0048	54,55	0,76
-1	40	-0,0039	47,73	-0,63
0	**43**	**-0,0009**	**54,55**	**-0,15**
1	43	0,0000	54,55	-0,01
2	42	-0,0013	34,09	-0,20
3	42	0,0104	61,36	1,66
4	42	0,0063	59,09	1,00
5	43	-0,0015	47,73	-0,24
6	42	-0,0132	27,27	-2,10*
7	43	0,0047	54,55	0,75
8	43	0,0015	47,73	0,23
9	41	0,0093	54,55	1,48
10	42	-0,0016	40,91	-0,26

Event periods	CAAR	t[CAAR]
(-10,0)	0,0479	2,3094**
(-5,0)	0,0172	1,1225
(-1,0)	-0,0049	-0,5492
(-1,+1)	-0,0049	-0,4527

*Significant at the 0.10 level

**Significant at the 0.05 level

Table 13

Event days, number of observations (N), daily average abnormal returns (AAR), percentage of positive AARs, t-statisitcs (t[AAR]) for the daily AARs, cumulative average abnormal returns for the intervals (-10,0), (-5,0), (-1,0) and (-1,+1) relative to the announcement day, day 0.Day 0 is the day of the earliest press release about the stock split decision. Abnormal returns are calculated using the **market -adjusted return model**. Sample firms are listed on the Athens Stock Exchange. This table contains information of **pure sample** (firms that exclusively announced a stock split). (N = 31)

Period 1999 to 2006

Event day	N	AAR	Percentage of positive AARs	t[AAR]
-20	30	0,0145	0,58	1,71
-19	30	0,0175	0,71	2,05*
-18	29	0,0167	0,55	1,96*
-17	30	0,0095	0,55	1,11
-16	30	0,0065	0,45	0,77
-15	30	0,0066	0,55	0,78
-14	28	0,0150	0,52	1,76
-13	30	0,0019	0,39	0,23
-12	31	-0,0072	0,45	-0,84
-11	30	0,0009	0,42	0,11
-10	30	-0,0019	0,42	-0,22
-9	31	0,0015	0,55	0,18
-8	29	0,0167	0,61	1,96*
-7	30	0,0108	0,68	1,27
-6	31	0,0069	0,48	0,81
-5	30	0,0032	0,55	0,37
-4	29	0,0040	0,58	0,47
-3	31	0,0136	0,68	1,60
-2	30	0,0049	0,55	0,58
-1	29	-0,0050	0,52	-0,59
0	**31**	**-0,0041**	**0,52**	**-0,48**
1	30	0,0002	0,52	0,02
2	29	-0,0004	0,39	-0,05
3	29	0,0186	0,71	2,18*
4	29	0,0087	0,61	1,02
5	31	-0,0037	0,45	-0,43
6	30	-0,0153	0,26	-1,80
7	30	0,0044	0,52	0,51
8	30	0,0046	0,48	0,54
9	29	0,0114	0,58	1,34
10	29	0,0025	0,52	0,29

Event periods	CAAR	t[CAAR]
(-10,0)	0,0507	1,7952
(-5,0)	0,0166	0,7976
(-1,0)	-0,0091	-0,7549
(-1,+1)	-0,0089	-0,6020

*Significant at the 0.10 level

Table 14

Event days, number of observations (N), daily average abnormal returns (AAR), percentage of positive AARs, t-statisitcs (t[AAR]) for the daily AARs, cumulative average abnormal returns for the intervals (-10,0), (-5,0), (-1,0) and (-1,+1) relative to the announcement day, day 0.Day 0 is the day of the earliest press release about the stock split decision. Abnormal returns are calculated using the **market-adjusted return model**. Sample firms are listed on the Athens Stock Exchange. (N = 28)

Period 2000 to 2006

Event day	N	AAR	Percentage of positive AARs	t[AAR]
-20	27	0,0135	0,64	2,07*
-19	26	0,0013	0,54	0,20
-18	26	0,0097	0,57	1,49
-17	28	0,0075	0,46	1,16
-16	27	0,0043	0,54	0,67
-15	27	0,0053	0,57	0,82
-14	24	0,0034	0,43	0,53
-13	25	-0,0047	0,36	-0,73
-12	28	-0,0064	0,46	-0,99
-11	27	-0,0045	0,50	-0,70
-10	27	-0,0027	0,43	-0,42
-9	27	0,0005	0,61	0,07
-8	27	0,0064	0,50	0,99
-7	27	0,0054	0,57	0,84
-6	28	-0,0008	0,39	-0,13
-5	28	-0,0086	0,43	-1,33
-4	25	-0,0009	0,43	-0,14
-3	28	0,0082	0,57	1,26
-2	28	-0,0012	0,46	-0,18
-1	25	-0,0075	0,36	-1,15
0	**27**	**-0,0015**	**0,57**	**-0,23**
1	27	-0,0024	0,50	-0,37
2	27	-0,0016	0,32	-0,24
3	27	0,0054	0,61	0,83
4	27	0,0002	0,54	0,03
5	27	-0,0013	0,50	-0,20
6	26	-0,0119	0,29	-1,83*
7	28	0,0006	0,61	0,09
8	28	-0,0054	0,43	-0,83
9	26	0,0027	0,50	0,42
10	26	-0,0130	0,21	-2,00*

Event periods	CAAR	t[CAAR]
(-10,0)	-0,0028	-0,1284
(-5,0)	-0,0115	-0,7232
(-1,0)	-0,0090	-0,9764
(-1,+1)	-0,0114	-1,0131

*Significant at the 0.10 level