Market Reaction to Actual Daily Share Repurchases in Greece

Angeliki Drousia, Athanasios Episcopos[*] and George N. Leledakis

Department of Accounting and Finance

Athens University of Economics and Business

Greece

Working Paper

First version: October, 2016

[*]Corresponding author. Department of Accounting and Finance, Athens University of Economics and Business, 76 Patission Str., 104 34, Athens, Greece; Tel.: +30 210 8203364; Fax: +30 210 8228816. E-mail addresses: adrousia@aueb.gr (A. Drousia), episcopos@aueb.gr (A. Episcopos), gleledak@aueb.gr (G. Leledakis). Drousia is a Post-Doctorate Researcher, Episcopos is Associate Professor and Leledakis is Assistant Professor at the Athens University of Economics and Business (AUEB). Funding by the AUEB Research Center is gratefully acknowledged. We thank the conference participants at the Hellenic Finance and Accounting Association (HFAA, 2016) and the National Financial Engineering and Banking Society (FEBS, 2016) for their helpful comments and suggestions. Any remaining errors are the authors' responsibility.

Market Reaction to Actual

Daily Share Repurchases in Greece

Abstract

The stock market reaction around the announcement date of actual share repurchases, the factors that affect the size of that reaction, and the motives behind share acquisitions are examined. A unique, hand-collected dataset is used, including public announcements of companies traded on the Athens Exchange. Consistent with the price support hypothesis, companies repurchase when their share price exhibits a declining trend, whereas the short-term market reaction is not statistically significant. Large firms and firms with low book-to-market ratio repurchase when their stock has underperformed the market. Small firms and firms with high book-to-market ratio repurchase even though their shares have not experienced abnormal declines. The market reacts more favorably to buybacks by small firms and firms with high book-to-market ratio. The main variables affecting the short-term market reaction after the announcement of actual share repurchases are the book-to-market ratio, the repurchase frequency and the CAR for the period before the announcement.

JEL Classification: G14, G15, G35

Keywords: Actual share repurchases, market reaction, firm characteristics, stated repurchase reasons, price support hypothesis

1. Introduction

Several published studies examine the motives of firms behind open-market share repurchase programs (SRPs), especially in the USA. The most popular hypothesis is that SRPs are used by companies to send a signal to the market indicating that their stock is underpriced. A partial literature includes Dann (1981), Vermaelen (1981), Bartov (1991), Dann et al. (1991), Comment and Jarrell (1991), and Lie and McConnell (1998).[1] Company executives consider stock underpricing as one of the most important factors when deciding share repurchases (Brav et al., 2005, Mitchell et al., 2001) and there is evidence that they time the SRP announcements to exploit the potential undervaluation (Ikenberry et al., 1995).

Approving an SRP does not bind the firm in any way, but it allows the firm to conduct repurchases as it deems appropriate. Separately from the signaling framework, Ikenberry and Vermaelen (1996) view these programs as options to exchange the market value of the shares with their "true" value, thereby expanding the company's opportunity set. Apparently, such options can be valuable, depending on the managers' ability to detect and exploit the mispricing opportunities.

Two basic questions that arise are, first, to what extend the managers possess the ability to discern the discrepancy between the market stock price and the stock's "true" value, and, second, whether investors perceive the firms' repurchases as a signal of undervaluation. The fact that some programs are partially completed or are not completed at all, gives rise to criticism that the signal of the program announcement is not credible (Peyer and Vermaelen, 2009). However, during the implementation of the program, the frequency and amount of repurchases entail a cost

[1] Alternative - and not necessarily mutually exclusive - motives also cited in the literature for repurchases in general are: dividend substitution (Grullon and Michaely, 2002), capital structure adjustment (Bonaimé et al., 2014, Lie, 2002), option exercise in stock option plans (Bens et al., 2003, Fenn and Liang, 2001, Kahle, 2002), agency costs of free cash-flow (Grullon and Michaely, 2004), and takeover defense (Denis, 1990).

to the mimicking firms (Akyol and Foo, 2013). In addition, there is a variety of value-adding choices available to management during the implementation phase of an SRP, such as market timing, price support and magnitude of repurchases, which would be useful to presumably better informed management (Cook et al., 2004). Market timing implies that the firm repurchases at a low price compared to the subsequent non-repurchase period. Price support implies that the firm repurchases in a contrarian fashion, thus, the stock price during the repurchases is lower than it is on prior periods but not significantly different from subsequent periods (Ginglinger and Hamon, 2007). In the same spirit of adding value to the firm's shareholders, the magnitude of repurchases enhances the strength of repurchases as signals to outside investors (Zhang, 2005).

The questions posed above are difficult to examine in the USA capital markets (Stephens and Weisbach, 1998), particularly due to the lack of timely data on actual share repurchases. Mitchell and Dharmawan (2007) report that stock buybacks in the USA do not have a standard structure, they lack typical procedures and are characterized by a relatively low degree of transparency, as they are not made public at the time they are conducted. Indeed, up to 2004, various USA studies were based either on estimates of the actual repurchases made (Stephens and Weisbach, 1998) or on questionnaires that some companies answered voluntarily (Cook et al., 2004). Beginning in 2004, companies were required to disclose the number of shares acquired each month and the average acquisition price per share. This information is released later, in the financial statements, and although such retroactive notifications increase transparency in the long run, investors are not informed immediately about the firm's most recent actions (Simkovik, 2009).

Brockman and Chung (2001) suggest that questions such as the market timing of repurchases and the effect of those repurchases to the liquidity of the firm can have convincing

answers only in an environment where the repurchase date, the number of shares and the average repurchase price can be determined accurately. Some markets other than those of the USA, such as Australia, Canada and Hong Kong, have a different and more transparent repurchase framework in which companies are required to disclose the share repurchases made within a day. Studies that use daily data find, among other things, that the companies buy their own shares when the share prices are on a declining path, that the managers are capable to time the markets, and that firms acquire their shares at a price lower than the average investor does (Brockman and Chung, 2001, Zhang, 2005, McNally et al., 2006, Akyol and Foo, 2013).

The present study uses a unique database, with hand-collected data from the Greek stock market, covering the period from August 2005 to December 2010. During the period in question, companies were required to disclose publicly their daily transactions on share repurchases immediately, in no case exceeding seven trading days. The Greek legal framework provides the required transaction transparency and its capital market a rich data volume (7,619 announcements of share repurchases are observed during the period under examination). This enables us to draw more reliable conclusions about the repurchase activity on the part of firms and about the reaction on the part of investors, hence the study's contribution to the rather thin, albeit much needed, non-USA actual-repurchases literature.

The questions addressed initially are, first, when companies choose to implement their approved SRPs, and second, how investors react when they are notified about company actions such as actual repurchases.

Next, we investigate how some company characteristics (size and book-to-market ratio) and some company choices (frequency and size of repurchases), as well as the preceding mandatory company announcement stating the reason for approving an SRP affect the behavior

of companies and investors. It is observed that companies whose stock is more likely to be underpriced acquire their own shares without a preceding decline in stock prices, and the reaction of investors is positive. The results are consistent with the hypothesis of signaling undervaluation. The rest of the companies acquire shares after periods in which the stock price exhibits a declining trend. After the acquisition of the shares, the stock price exhibits signs of stabilization in the short run, a fact that is in line with the hypothesis of stock price support. In addition, the stated reason for approving SRPs seems to play some role in the final market reaction. The findings of the present study are, to a great degree, in agreement with the results of other market studies, such as Zhang (2005) for Hong Kong, Ginglinger and Hamon (2007) for France, and Akyol and Foo (2013) for Australia.

The rest of the paper is organized as follows. The theoretical framework and the hypotheses to be tested are presented in the next section. Section 3 describes the data and the methodology. The empirical results are shown in Section 4, and Section 5 concludes the paper.

2. Theoretical background and development of hypotheses

2.1. The market timing hypothesis

Market timing, or managerial timing ability, is a term that refers to the issuance of new shares by a company when its stock price is at high levels and the acquisition of own shares when the stock price is at low levels. The purpose of these company actions is to exploit the current stock price fluctuations for the benefit of the long-term investors. An obvious precondition is that the market should not be characterized by strong form efficiency (Baker and Wurgler, 2002).

A fundamental question related to stock buybacks is to what extend the executives use their private information to proceed with stock repurchases (Barclay and Smith, 1988).

Brockman and Chung (2001) use daily data from the Hong Kong stock market and find that executives possess a market timing ability which depends on the market conditions and the special characteristics of the firm.

Using monthly data from Japan, Ishikawa and Takahashi (2011) find that firms acquire their own shares if their stock price has followed a declining trend during the previous month, and that the stock returns of firms actually repurchasing shares exceeds the market return during the ensuing months. The results support the notion that company executives do possess the private information and/or the ability to detect when the capital market has been driven by mispricing.

The market timing hypothesis implies that the market price of the stock will be lower during the dates of conducting share repurchases in comparison to the subsequent days (Ginglinger and Hamon, 2007). The recent study by De Cesari et al. (2012) for the USA finds that indeed the companies seem to possess the ability to time the market and succeed in acquiring their own shares at a relatively low price. In addition, they find that during the month before the share acquisitions, the stock price follows a declining trend, a negative abnormal return is observed, whereas after the repurchase, a positive abnormal return is observed. The studies of Ben-Rephael et al. (2014) and Dittmar and Field (2015) find results consistent with the market timing hypothesis.

***Hypothesis 1**: Negative abnormal returns are observed before the stock repurchases in the open market and positive abnormal returns are observed after the stock repurchases.*

2.2. The price support hypothesis

According to the price support hypothesis, share repurchases are conducted by a company in order to thwart a declining trend in the stock price. The main difference with the market timing hypothesis is that, a stabilization of stock prices is expected after the share repurchase, whereas in the case of the market timing hypothesis, a positive abnormal return is expected.

Ginglinger and Hamon (2007) study the French market and find that companies proceed to stock buybacks following periods of declining stock prices, but they do not observe a significant price increase after the repurchase. The results are consistent with the price support hypothesis. Similar results are found by Cook et al. (2004) for the shares that are traded at the New York Stock Exchange.

Hypothesis 2: *Negative abnormal returns are observed in the period before a stock repurchase occurs and no abnormal returns are observed during the period after the repurchase.*

2.3. Company characteristics and stock repurchases

Several studies find that companies with different characteristics exhibit different behavior regarding share repurchase activities and the market reaction is also different.

Ikenberry et al. (1995) examine announcements of SRPs (irrespective of whether the shares were eventually bought back) which are published in the *Wall Street Journal* from January 1980 until December 1990. They find that companies with a high book-to-market ratio (for which the signaling undervaluation hypothesis is more likely to hold), the long-term buy-and-hold abnormal return in a three-year horizon reaches 45.3% compared to similar companies which did not conduct any repurchases. Companies with a low book-to-market ratio exhibit a zero long-run abnormal return. In the short-run, the market reaction is more favorable to SRP

announcements by companies of smaller size. The results of Ikenberry et al. (2000) for Canada based on data from 1989 to 1997 are similar.

Cook et al. (2004) use voluntarily disclosed daily data via the questionnaire method from two stock markets, NYSE and NASDAQ, to find that the larger companies proceed to buybacks after periods in which the stock price exhibits a downward trend, whereas for the smaller companies no such result is observed.

Zhang (2005) uses daily data from Hong Kong and finds that larger companies and companies with lower book-to-market ratios conduct stock buybacks when their stock price is in a declining course. For smaller companies, as well as companies with a high book-to-market ratio, no statistically significant abnormal return is observed, during the period preceding the buyback. Moreover, for smaller companies and companies with high book-to-market ratio, the market reaction is stronger both at the announcement date and during the short-run period following the announcement.

Hypothesis 3: *Companies with different characteristics repurchase their own shares under different conditions.*

Hypothesis 4: *The market reaction will be different, depending on the characteristics of the companies that conduct repurchases.*

2.4. Stated reasons for approving stock repurchase programs

Otchere and Ross (2002) examine a sample of announcements of SRPs for which the stated reason for their approval is share undervaluation. These announcements are treated as a positive signal by the investors and the market reacts favorably for the companies that approve SRPs.

Such reaction is smaller, albeit positive for companies of the competition, a fact that is consistent with the undervaluation hypothesis.

Peyer and Vermaelen (2009) find that at the announcement of SRP approval, the market reaction is stronger for firms that state undervaluation as the motive for the approval.

Akyol and Foo (2013) use daily data from Australia and conclude that for companies which announce as a reason for initiating an SRP the fact that the stock is underpriced, the investors reaction is positive and stronger compared to the companies that announce a different reason for SRP approval. This observation holds both for the announcement date of the SRPs and for the dates of the actual repurchases. In addition, companies which mention their stock underpricing as a reason for approving repurchases eventually buy back fewer shares in relation to companies which state a different reason for SRP approval, while daily repurchases do not seem to occur as a response to the stock price trend.

Hypothesis 5: *A stronger market reaction is observed during actual repurchases by companies whose stock is more likely to be underpriced.*

Hypothesis 6: *The stated reason for approving SRPs affects the market reaction at the time of actual share repurchases.*

3. Disclosure requirements and share repurchase data

In Greece, an open market SRP must be authorized by the General Meeting. At the date of the authorization, the General Meeting defines the maximum number of shares that can be purchased, the duration of the SRP and the maximum and minimum price that can be paid. A firm may repurchase up to 10% of the outstanding shares. On the day of the actual buyback, the repurchase price cannot be higher than the price of the last independent trade or the current

independent bid. The maximum daily volume of the buybacks is 25% of the average daily volume. In cases of extreme low liquidity, a firm may repurchase up to 50%, given than both the stock market authority and the investors are informed in advance, as per Commission Regulation 2273/2003. From 2007, the maximum duration of the programs changed from twelve to twenty-four months. The key data about the repurchase programs that are available to the investors include: the date of the general meeting, the maximum number of shares to be repurchased, the duration of the program and the reason for initiating a repurchase program, as stated by the company at the date of the SRP authorization.

Until 2005, firms disclosed their repurchase activity over irregular intervals spanning from a few months to a whole year. Starting from 2005, when the Directive 2003/6/EU was implemented with the Greek Law 3340/2005, the daily repurchase activity of the firms had to be posted on the Daily Official List of the Athens Stock Exchange immediately and, in any case, in a time frame not exceeding seven trading days. The key available data about the companies' daily repurchase activity are: the date of the actual repurchase, the date of the announcement of the repurchase, the number of repurchased shares and the average price paid.

Capitalizing on this transparency of the Greek stock market, we construct a unique, hand-collected dataset including public announcements of companies whose stocks trade on the Athens Stock Exchange. The data concerning the repurchase programs and the daily open market repurchase activity are hand-collected from the *Daily Official List* of the Athens Stock Exchange. The rest of the data such as stock prices, book-to-market-value ratios and firm size (market value of equity) are obtained from Thomson Reuters DataStream and Thomson Reuters WorldScope.

Table 1 reports the share repurchase activity in Greece from August 2005 to December 2010. We obtain 7,619 announcements of actual share repurchases, made by 74 firms under 120

program authorizations. Some announcements report the daily transactions up to seven trading days later. The repurchase dates are 9,664. A factor that differentiates the present paper from other studies about actual share repurchases is that the number of the announcements and the number of repurchase days do not coincide (Panel A).

(Insert **Table 1** here)

To include an announcement in the study, we require that the number of shares that are bought and the average price are reported daily. Several announcements are excluded because: the company had preferred shares as well as common shares at the date of the SRP authorization, they contained buybacks for two to seven days but did not report the number of shares or the average price for every day separately, they were made later (not immediately) and is considered very likely that investors had already been informed by another source, such as the Internet or a newspaper. Other reasons for excluding announcements are repetition of the purchase date and incomplete information. To eliminate extreme observations, announcements that contained buybacks for more than seven trading days or are made after a reverse split (which changed significantly the number and the price of the company's traded shares) are not included in the study. Panel B of Table 1 reports in detail the number of announcements that are excluded. The final dataset includes 7,463 announcements of actual share repurchases, made by 69 firms under 109 program authorizations (Panel C).

The aim of this study is to examine the price performance surrounding the announcements of actual share repurchases. It is obvious that the number of announcements is quite large for the study period. In Panel D, we observe that most firms (53%) made more than fifty announcements. The percentage of firms that announced more than a hundred daily transactions is 33%. Throughout the period under consideration two firms made only one

announcement, while one firm made 558. To avoid undue weighting of firms and clustering problems we follow the approach of Zhang (2005), i.e., when a firm makes multiple repurchase announcements within the month, only the first announcement is included in the final sample.

Panel A of Table 2 reports descriptive statistics for the 826 announcements of the final sample. Quartile rankings are determined relative to all firms that are listed on the Athens Stock Exchange (ASE) on the day of the buyback announcement. Small firms and firms with higher B/M ratio have made less repurchase announcements, while larger firms report more repurchase days during the study period. Panel B of Table 2 reports the number of trading days per announcement. The announcements that report more than one repurchase day are about 23,5% of the dataset. We proceed with the estimation of the short-term market reaction surrounding the actual share repurchase announcements.

(Insert **Table 2** here)

4. Empirical evidence

4.1. Short-term share price performance

We are using the standard event study methodology to estimate the cumulative abnormal return (CAR) around the announcements of actual share repurchases. The market model is used as the benchmark model, with an estimation period ranging from 200 to 21 days before the announcement (−200, −21) and an event window that starts 20 trading days before the date of the announcement and ends 20 days after the announcement (−20, +20). The market returns are based on the General Index of the Athens Stock Exchange. Day "0" is the day of the announcement at the *Daily Official List* of the Athens Stock Exchange.

Table 3 reports the average cumulative abnormal return around the announcements of actual share repurchases. The window (−20, −1) is used to examine whether firms tend to repurchase when the stock price underperforms the market. Repurchasing when the stock price follows a downward trend is consistent with both the market timing and the price support hypothesis. The window (0, +1) aims to capture the effect of the initial announcement. The windows (+2, +10) and (+2, +20) are used to examine the short-term market reaction immediately after the announcement and a month (approximately 20 trading days) after the announcement.

(Insert **Table 3** here)

Figure 1 shows the cumulative average abnormal return for the 41-day period surrounding the announcement date (−20, +20). The results for the full sample (Panel A of Table 3) suggest that companies buy shares after intervals where the stock price shows a downward trend. The immediate response is not statistically significant. In the period immediately after the announcement, i.e., event window (+2, +10), investors show a slightly positive reaction that gradually disappears. Between (+2, +20), the reaction is not statistically different from zero. The results are consistent with the price support hypothesis and agree with Ginglinger and Hamon (2007).

(Insert **Figure 1** here)

The next section examines whether and how some company and announcement characteristic affect the company repurchase decision and the market reaction.

4.2. Share price performance related to company and repurchase characteristics

Various studies suggest that company characteristics affect the company repurchase activity as well as the investors' reaction. Dittmar (2000) argues that different firms proceed to buybacks for different reasons. Ikenberry et al. (1995, 2000) find that companies with higher book-to-market ratio report higher long-term abnormal return after the announcement of SRP authorizations. Furthermore, the market reacts more favorably to buyback announcements of smaller companies. Cook et al. (2004) observe that larger firms repurchase after periods when the price of the stock underperforms the market.

We proceed with the examination of the company characteristics. In Panel B of Table 3 the announcements are grouped according to firm size and B/M ratio. The firm size is estimated as the market value of equity. Quartile rankings are computed using all listed firms on the day of the actual repurchases announcement.

Overall, the results suggest that smaller firms and firms with higher B/M ratio (whose shares are likely to be undervalued) repurchase shares even though the share price has not experienced any abnormal change in the period preceding the announcement. Investors short-term reaction is positive and statistically significant. Larger firms and firms with lower B/M ratio buy back shares after intervals when the shock price follows a declining path. After the acquisitions we observed stabilization of prices. The results for smaller firms and firms with higher B/M ratio are in accordance with the signaling hypothesis. The results for the larger firms and firms with lower B/M ratio are consistent with the price support hypothesis. The findings are similar to those of Zhang (2005).

In Panel C of Table 3 the data are grouped according to announcement characteristics. Following the methodology of Zhang (2005) we used three variables: a) the number of days that

elapse between the announcement under consideration and the immediately preceding announcement within a year period, b) the number of company announcements in the quarter preceding the current announcement, c) the percentage of shares acquired. The first two variables estimate the degree of "surprise" of the announcement, that is whether it was expected or unexpected by investors. The announcements are divided into two categories with cut-off point the median of each distribution. The third variable is an estimate of the signal's strength. In this case the announcements are divided into two equal subsets.

When the announcements are frequent (either the distance between the announcements is less than three days or the number of announcements is greater than the median in the preceding quarter) the initial reaction is not statistically significant, which is somehow expected. For the cases where the number of days since the previous announcement and the repurchase size are small, we observe negative abnormal reaction for the preceding period. The CAR(+2,+20) is not statistically significant. The results are in accordance the price support hypothesis. For the cases where the number of announcements is small in the quarter before the announcement the findings are consistent with the market timing hypothesis. For the cases where the repurchase size is high, the results support the signaling hypothesis.

Akyol and Foo (2013) follow the methodology of Zhang (2005) with a slight variation. For the calculation of the variables that assess the degree of "surprise", they impose a further restriction that the announcements are made under the same program. We use the modification of Akyol and Foo (2013) and re-estimate the abnormal returns. The results are similar.[2]

[2] Available from the authors upon request.

4.3. Share price performance related to the reason for program authorization

In Greece companies are required to announce the reason for initiating a SRP at the date of the program authorization. The most common reason for authorization, as stated by the companies, is stock undervaluation. For a great percentage of the programs, the reason is not explicitly stated (the company just states that the acquisitions will be conducted in accordance to the respective applicable laws). Few programs fall into a third category, with various causes of approval, for example, the cancellation of shares to reduce its share capital, sell-back to the market, distribution to employees or a combination of these reasons.

We follow the same classification to examine the market reaction to announcements of actual share repurchases. From Table 4 it appears that the short-term market reaction is greater when the firm-stated reason for authorizing a SRP is to support the stock price in case of undervaluation. When the reason is not explicitly stated, the CAR for the preceding period is negative, while the short-term CAR(+2, +20) is not statistically significant. The results are consistent with the hypothesis that firms repurchase in a contrarian fashion to stem the decline in its stock price. When the reason is very specific but other than supporting the stock price, it appears that the information is already incorporated in the share price and there is no statistically significant reaction.

(Insert **Table 4** here)

4.4. Robustness test

During the period under examination some firms made only one share repurchase announcement. Other firms repurchased almost daily while their SRP was in effect. In order to examine if the Mean CAR has been affected by the companies with the largest number of announcements, we

conduct the following test. We calculate the average cumulative abnormal return for each company separately and then carry out significance tests across firms. The results are presented in Table 5 and are similar to the results in Table 3, Panel A.

(Insert **Table 5** here.)

4.5. Factors affecting the market reaction

Cross-sectional regression analysis is used, to examine whether and to what extent some characteristics of companies and announcements affect the market reaction to actual share repurchase announcements. Following Zhang (2005), we regress the initial market reaction, CAR(0, +1), the immediate short-term reaction, CAR(+2, +10), and a month after the announcement, CAR(+2, +20), on firm and repurchase characteristics.

"CAR(−20,−1)" denotes the abnormal return for the month before the announcement. "Firm size" is the natural logarithm of the market value of equity. "B/M" is the book-to-market-value ratio, measured on the day of the announcement. "NDLR" is the number of days since last repurchase announcement and estimates the time between the announcement under consideration and the previous one, within a year. "NAP3M" is the number of announcements during preceding 3 months calculated by the announcements made within the last 90 days before the announcement under examination. "NTDA" is the number of trading days included in the announcement and reports the trading days that the firms acquired shares and are disclosed on the same day. "Repurchase size" is the percentage of repurchased shares relative to shares outstanding. We also include dummy variables for the three different groups of stated reasons for SRP authorization: price support in case of undervaluation, not specific reason and stated

reason other than price support. Since the coefficients of the dummy variables are not statistically significant in any case, they are not further reported.

(Insert **Table 6** here.)

Table 6 presents the statistical characteristics of the quantitative variables. Table 7 shows the results of three main regression models with the method of ordinary least squares (OLS). To ensure that our results are robust to the clustering problem, we use alternative techniques for estimating standard errors and found similar results. We calculate standard errors adapted for heteroskedasticity and autocorrelation according to Newey and West (1987). Finally, we group the residuals in two dimensions, by company and by day, following the two-way technique proposed by Petersen (2009) and Thompson (2011). The coefficients of the variables about the stated reasons for SRP authorizations are not statistically significant in any model.

(Insert **Table 7** here)

From Table 7 we observe that the coefficient of the B/M ratio is positive, a finding that supports the theory of signaling. Also, investors reaction is positive when the number of announcements is smaller in the previous quarter and therefore the degree of surprise greater. Interestingly, the coefficient of the abnormal performance in the period before the announcement is positive, but is statistically significant only in the period (+2, +10).

To reduce the influence of extreme values, the variables are formed by winsorization process. More specifically, the values of quantitative variables which are smaller or larger than 1% of the observations are set equal to the immediately next higher or lower values of the variables (in the range of 0.01 and 0.99 percent). The process is repeated for the values that are smaller or larger than 2% of the observations. The results are similar.

The variables “NDLR” and “NAP3M” are determined based on Zhang's (2005) methodology. We also reconstruct the variables using the methodology of Akyol and Foo (2013), who require that the previous announcements have been made within the same program. There is no difference between the results.

5. Conclusion

The paper contributes mainly to the literature on actual share repurchases in non-USA markets which are characterized by timely disclosure of buyback transactions. That literature is loosely defined by articles such as: Brockman and Chung (2001); Zhang (2005); McNally et al. (2006); Ginglinger and Hamon (2007); Akyol and Foo (2013). The paper studies how the market conditions, and more specifically, the stock price trend and some basic company characteristics affect the decision to implement approved stock repurchase programs and the investors’ reaction. The sample includes the announcements of share buybacks from August 2005 to December 2010.

First, we examine when the companies choose to acquire their own shares and how the market reacts when it learns about such company actions. By studying the full set of announcements, we observe that companies engage in buybacks when the stock price exhibits a declining trend, and that the short-term market reaction is not statistically significant. The results are consistent with the price support hypothesis.

Next, we examine if some company and announcement characteristics affect the behavior of the companies and the investors. Smaller companies and companies with a higher book-to-market ratio buyback shares without having observed significant fluctuations in the period preceding the buybacks. The short-term investor reaction is positive and statistically significant. The larger companies and the companies with a lower book-to-market ratio proceed to buybacks

after periods in which the stock price in a declining course. After the share acquisitions, a price stabilization takes place. In short, for companies with stock more likely to be underpriced, the results favor the signaling undervaluation hypothesis. For the rest of the companies, the findings are consistent with the price support hypothesis.

For the classification of the announcements according to their characteristics we use variables that define the time length between announcements, their frequency, and the percentage of shares acquired. When the announcements are very frequent, no statistically significant abnormal return is observed. For the cases in which there is a short time between announcements and the cases in which the percentage of shares bought back is low, the results confirm the price support hypothesis. For the cases in which there is a small number of announcements in a period of three months before the announcement, the results are in accord with the market timing hypothesis. For the cases in which the percentage of share bought back is high, the findings support the signaling undervaluation hypothesis.

Companies which state the price support as a reason for approving an SRP when it's stock is considered underpriced, receive a positive reaction by the market when they proceed with the actual implementation of the SRP. Companies which avoid to mention a specific reason for approving SRPs seem to use the stock buybacks as a means of stopping the declining trend of their share price. When the stated reason is very specific and different from price support due to undervaluation, it appears that the information has already been reflected in the stock price, because no statistically significant reaction is observed.

The regression analysis results indicate that the basic variables affecting the investor reaction to the announcement of actual share repurchases are the following: Book-to-market

ratio, the frequency of repurchases during the short period preceding the announcement and the stock price trend in the preceding period.

The literature reports various motives for which a company may approve and execute stock repurchase programs. From the present analysis, it follows that companies with different characteristics acquire their own shares for different reasons, with different frequency and at different times. For the better understanding of company behavior, a study of further special company characteristics is required, as well as a transparent framework of transactions disclosure.

References

Akyol, A., & Foo, C. (2013). Share repurchase reasons and the market reaction to actual share repurchases: Evidence from Australia. *International Review of Finance, 13*(1), 1-37.

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *Journal of Finance, 57*(1), 1-32.

Barclay, M.J., & Smith, C.W. (1988). Corporate payout policy: Cash dividends versus open-market repurchases. *Journal of Financial Economics, 22*(1), 61-82.

Bartov, E. (1991). Open-market stock repurchases as signals for earnings and risk changes. *Journal of Accounting and Economics, 14*(3), 275-294.

Ben-Rephael, A., Oded, J., & Wohl, A. (2014). Do firms buy their stock at bargain prices? Evidence from actual stock repurchase disclosures. *Review of Finance, 18*(4), 1299-1340.

Bens, D.A., Nagar, V., Skinner, D.J., & Wong, M.H.F. (2003). Employee stock options, EPS dilution, and stock repurchases. *Journal of Accounting and Economics, 36*(1-3), 51-90.

Bonaimé, A., Öztekin, Ö., & Warr, R. (2014). Capital structure, equity mispricing, and stock repurchases. *Journal of Corporate Finance, 26*, 182-200.

Brav, A., Graham, J.R., Harvey, C.R., & Michaely, R. (2005). Payout policy in the 21st century. *Journal of Financial Economics, 77*(3), 483-527.

Brockman, P., & Chung, D.Y. (2001). Managerial timing and corporate liquidity: Evidence from actual share repurchases. *Journal of Financial Economics, 61*(3), 417-448.

Comment, R., & Jarrell, G. (1991). The relative signalling power of Dutch-auction and fixed-price self-tender offers and open-market share repurchases. *Journal of Finance, 46*(4), 1243-1271.

Cook, D.O., Krigman, L., & Leach, J.C. (2004). On the timing and execution of open market repurchases. *Review of Financial Studies, 17*(2), 463-498.

Dann, L.Y. (1981). Common Stock Repurchases: An analysis of returns to bondholders and stockholders. *Journal of Financial Economics, 9*(2), 113-138.

Dann, L.Y., Masulis, R.W., & Mayers, D. (1991). Repurchase tender offers and earnings information. *Journal of Accounting and Economics, 14*(3), 217-251.

De Cesari, A., Espenlaub, S., Khurshed, A., & Simkovic, M. (2012). The effects of ownership and stock liquidity on the timing of repurchase transactions. *Journal of Corporate Finance, 18*(5), 1023-1050.

Denis, D.J. (1990). Defensive changes in corporate payout policy: Share repurchases and special dividends. *Journal of Finance, 45*(5), 1433-1456.

Dittmar, A.K. (2000). Why do firms repurchase stock? *Journal of Business*, *73*(3), 331-355.

Dittmar, A.K., & Field, L. (2015). Can managers time the market? Evidence using repurchase price data. *Journal of Financial Economics*, *115*(2), 261-282.

Fenn, G., & Liang, N. (2001). Corporate payout policy and managerial stock incentives. *Journal of Financial Economics*, *60*(1), 45-72.

Ginglinger, E., & Hamon, J. (2007). Actual share repurchases, timing and liquidity. *Journal of Banking and Finance*, *31*(3), 915-938.

Grullon, G., & Michaely, R. (2002). Dividends, share repurchases, and the substitution hypothesis. *Journal of Finance*, 57(4), 1649-1684.

Grullon, G., & Michaely, R. (2004). The information content of share repurchase programs. *Journal of Finance*, *59*(2), 651-680.

Ikenberry, D., & Vermaelen, T. (1996). The option to repurchase stock. *Financial Management*, *25*(4), 9-24.

Ikenberry, D., Lakonishok, J., & Vermaelen, T. (1995). Market underreaction to open market share repurchases. *Journal of Financial Economics*, *39*(2-3), 181-208.

Ikenberry, D., Lakonishok, J., & Vermaelen, T. (2000). Stock repurchases in Canada: Performance and strategic trading. *Journal Finance*, *55*(5), 2373-2397.

Ishikawa, M., & Takahashi, H. (2011). Testing the managerial timing ability: Evidence from stock repurchases in Japan. *Finance Research Letters*, *8*(1), 21-27.

Kahle, K. (2002). When a buyback isn't a buyback: Open market repurchases and employee options. *Journal of Financial Economics*, *63*(2), 235-261.

Lie, E. (2002). Do firms undertake self-tender offers to optimize capital structure? *Journal of Business*, 75(4), 609-639.

Lie, E., & McConnell, J. (1998). Earnings signals in fixed-price and Dutch auction self-tender offers. *Journal of Financial Economics*, *49*(2), 161-186.

McNally, W.J., Smith, B.F., & Barnes, T. (2006). The price impacts of open market repurchase trades. *Journal of Business Finance & Accounting*, *33*(5-6), 735-752.

Mitchell, J., & Dharmawan, G. (2007). Incentives for on-market buy-backs: Evidence from a transparent buy-back regime. *Journal of Corporate Finance*, *13*(1), 146-169.

Mitchell, J., Dharmawan, G., & Clarke, A. (2001). Managements' views on share buy-backs: An Australian survey. *Accounting and Finance*, *41*(1-2), 93-129.

Newey, W., & West, K. (1987). A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica*, *55*(3), 703-708.

Otchere, I., & Ross, M. (2002). Do share buy-back announcements convey firm-specific or industry-wide information?: A test of the undervaluation hypothesis. *International Review of Financial Analysis*, *11*(4), 511-531.

Petersen, M. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies*, *22*(1), 435-480.

Peyer, U., & Vermaelen, T. (2009). The nature and persistence of buyback anomalies. *Review of Financial Studies*, *22*(4), 1693-1745.

Stephens, C.P., & Weisbach, M.S. (1998). Actual share reacquisitions in open-market repurchase programs. *Journal of Finance, 53*(1), 313-333.

Simkovic, M. (2009). The Effect of mandatory disclosure on open-market repurchases. *Berkley Business School Journal*, *6*(1), 95-130.

Thompson, S. (2011). Simple formulas for standard errors that cluster by both firm and time. *Journal of Financial Economics*, *99*(1), 1-10.

Vermaelen, T. (1981). Common stock repurchases and market signalling: An empirical study. *Journal of Financial Economics, 9*(2), 139-183.

Zhang, H. (2005). Share price performance following actual share repurchases. *Journal of Banking and Finance*, *29*(7), 1887-1901.

Figure 1

Mean CAR for the window (−20,+20). Day "0" on the horizontal axis is the date of the announcement of the actual share repurchases

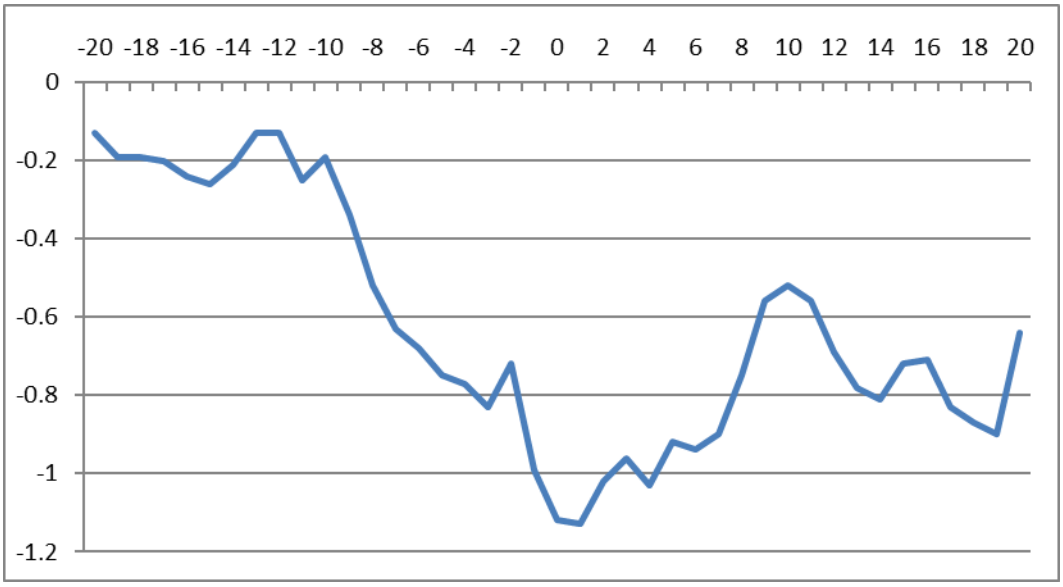

Table 1

Summary statistics of actual share repurchases in Greece from August 2005 to December 2010

Panel A: Full dataset	
Number of firms	74
Number of program authorizations	120
Number of repurchase announcements	7,619
Number of repurchase days	9,664
Total number of shares repurchased	276,627,699
Value of repurchased shares (in euro)	3,172,032,951
Average repurchase days (per firm)	131
Average repurchase announcements (per firm)	103
Panel B: Reason for excluding announcements	
Preference shares	87
The number of shares or the average price is not known for every day separately	42
Late announcements	1
Repetition of repurchase date	9
Missing information	2
The announcement reported more than seven trading days	10
Reverse split	5
Panel C: Dataset after excluding the announcements in Panel B	
Number of firms	69
Number of program authorizations	109
Number of repurchase announcements	7,463
Number of repurchase days	9,065
Total number of shares repurchased	269,574,548
Value of repurchased shares (in euro)	1,827,838,405
Average repurchase days (per firm)	131
Average repurchase announcements (per firm)	108
Panel D: Number of repurchase days per firm	
Numbers of firms with less than 10 repurchase days	11 (16%)
Numbers of firms with 11-20 repurchase days	9 (13%)
Numbers of firms with 21-50 repurchase days	12 (17%)
Numbers of firms with 51-100 repurchase days	14 (20%)
Numbers of firms with more than 100 repurchase days	23 (33%)

Table 2

Descriptive statistics of open market share repurchases from August 2005 to December 2010

Panel A:									
Year	Repurchase announcement	Size quartile				Book-to-market quartile			
		1(small)	2	3	4(large)	1(high)	2	3	4(low)
2005	10	0	7	3	0	0	7	3	0
2006	49	0	21	14	14	5	22	13	9
2007	86	2	16	33	35	33	12	17	24
2008	240	19	70	35	116	50	43	77	70
2009	230	39	46	57	88	39	110	30	51
2010	211	16	48	61	86	32	63	65	51
All	826	76	208	203	339	159	257	205	205

Panel B:							
Trading days per announcement	1	2	3	4	5	6	7
Number of announcements	631	59	37	26	49	21	3
Percent	76.5	7.1	4.5	3.1	5.9	2.5	0.4

Table 3

Abnormal share price performance surrounding announcements of actual share repurchases

			Window						
		N	(−20,−1)	N	(0,+1)	N	(+2,+10)	N	(+2,+20)
Panel A: full sample									
CAR		826	−0.95%	824	−0.14%	826	0.58%	826	0.46%
t-test			(−2.880)***		(−0.977)		(2.050)**		(0.835)
Panel B: announcements grouped by firm characteristics									
By size quartile									
CAR	1 (small)	76	**2.22%**	74	**−0.17%**	76	**2.19%**	76	**3.67%**
t-test			*(1.205)*		*(0.058)*		*(1.766)**		*(2.495)***
CAR	2	208	**−0.62%**	208	**−0.47%**	208	**−0.05%**	208	**0.01%**
t-test			*(−0.590)*		*(−1.892)**		*(−0.147)*		*(0.150)*
CAR	3	203	**−0.98%**	203	**0.08%**	203	**0.77%**	203	**1.10%**
t-test			*(−1.328)*		*(0.290)*		*(1.667)**		*(1.170)*
CAR	4 (large)	339	**−1.85%**	339	**−0.06%**	339	**0.50%**	339	**−0.36%**
t-test			*(−3.577)****		*(−0.293)*		*(1.118)*		*(−0.900)*
By B/M quartile									
CAR	1 (high)	159	**1.53%**	159	**0.56%**	159	**2.15%**	159	**2.56%**
t-test			*(0.787)*		*(1.879)**		*(2.674)****		*(2.212)***
CAR	2	257	**−0.28%**	255	**−0.22%**	257	**0.48%**	257	**0.95%**
t-test			*(0.043)*		*(−0.639)*		*(1.702)**		*(1.749)**
CAR	3	205	**−2.82%**	205	**−0.22%**	205	**−0.39%**	205	**−1.18%**
t-test			*(−3.642)****		*(−0.559)*		*(−0.868)*		*(−1.778)**
CAR	4 (low)	205	**−1.84%**	205	**−0.50%**	205	**0.47%**	205	**−0.13%**
t-test			*(−2.880)****		*(−2.342)***		*(0.722)*		*(−0.451)*
Panel C: *announcements grouped by repurchase characteristics*									
By number of days since last repurchase announcement									
CAR	≤ 3	422	**−1.34%**	421	**−0.11%**	422	**0.97%**	422	**0.70%**
t-test			*(−2.968)****		*(−0.458)*		*(1.995)***		*(0.521)*
CAR	> 3	404	**−0.55%**	403	**−0.17%**	404	**0.17%**	404	**0.22%**
t-test			*(−1.085)*		*(−0.929)*		*(0.891)*		*(0.662)*
By number of announcements during the preceding 3 months									
CAR	≤ 13	416	**−1.79%**	*414*	**−0.15%**	416	**1.31%**	416	**1.38%**
t-test			*(−3.355)****		*(−0.979)*		*(3.703)****		*(2.435)***
CAR	> 13	410	**−0.10%**	410	**−0.13%**	410	**−0.16%**	410	**−0.47%**
t-test			*(−0.708)*		*(−0.402)*		*(−0.820)*		*(−1.267)*
By repurchase size (%)									
CAR	low	413	**−1.18%**	411	**−0.24%**	413	**0.26%**	413	**−0.03%**
t-test			*(−2.694)****		*(−1.183)*		*(0.595)*		*(−0.645)*
CAR	high	413	**−0.73%**	413	**−0.03%**	413	**0.90%**	413	**0.95%**
t-test			*(−1.379)*		*(−0.200)*		*(2.303)***		*(1.826)**

The symbols *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. The CARs are measured against the market model with the estimation period from 200 to 21 days before the announcement.

Table 4

Mean CAR grouped by the reason for initiating the SRP, as stated in the company announcement.

	Window			
	(−20,−1)	(0,+1)	(+2,+10)	(+2,+20)
Stock considered undervalued				
CAR	−0.68%	0.08%	1.11%	1.77%
t-test	(−0.018)	(0.294)	(1.755)*	(2.097)**
Non-stated reason				
CAR	−1.37%	−0.19%	0.65%	0.52%
t-test	(−3.517)***	(−0.979)	(1.710)*	(0.632)
Stated reason, other than stock undervaluation				
CAR	0.49%	−0.09%	−0.08%	−0.70%
t-test	(0.149)	(−0.623)	(−0.002)	(−1.038)

The symbols *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. The number of announcements is 104, 576 and 146 for the first, second and third category of reason, respectively.

Table 5

Cumulative average abnormal return across firms

Event window	N	Mean CAR	PW-CAAR	Positive: Negative	Patell	SCST	GST
(−20,−1)	69	−2.56%	−1.20%	28:41	−3.155***	−2.617***	−1.648*
(0,+1)	68	0.23%	−0.14%	28:40	−1.103	−0.947	−1.538
(+2,+10)	69	0.63%	0.45%	42:27	1.651*	1.414	1.723*
(+2,+20)	69	1.73%	0.47%	43:26	1.272	0.982	1.963**

The symbols *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. N is the number of firms. “PW-CAAR” is the precision-weighted CAAR “Patell” is the Pattell serial test. “SCST” is the standardized cross-sectional test. “GST” is the generalized sign test. The CARs are measured against the market model.

Table 6

Descriptive statistics

	CAR (0,+ 1)	CAR (+2,+10)	CAR (+2,+20)	Firm Size	B/M	CAR (−20, −1)	NDLR	NAP3M	NTDA	Repurchase size (%)
Mean	−0.001	0.006	0.005	11.667	1.591	−0.01	11.838	21.505	1.642	0.038
Standard Error	0.001	0.003	0.004	0.067	0.085	0.004	0.905	0.697	0.047	0.002
Median	−0.003	0.002	0.002	11.161	1.104	−0.011	3	13	1	0.014
Standard Deviation	0.037	0.076	0.112	1.93	2.441	0.118	25.996	20.02	1.356	0.069
Minimum	−0.15	−0.474	−0.652	8.53	0.112	−0.69	0	0	1	0
Maximum	0.224	0.488	0.409	16.922	16.915	0.409	247	66	7	0.848
Number of observations	826	826	826	826	826	826	826	826	826	826

"B/M" is the book-to-market-value ratio measured on the announcement date. "Firm size" is the natural logarithm of the market value of equity on the announcement date. "NDLR" is the number of days since last repurchase announcement. "NAP3M" is the number of announcements during preceding 3 months. "NTDA" is the number of trading days included in the announcement. The CARs are measured against the market model.

Table 7

Regression results

	CAR (0,+1)	CAR (+2,+10)	CAR (+2,+20)
Intercept	−0.011	0.014	0.068
	(0.220)	(0.492)	(**0.040**)
CAR (−20,−1)	−0.022	0.052	0.048
	(0.209)	(**0.046**)	(0.256)
Firm size	0.001	0.000	−0.004
	(0.328)	(0.957)	(0.069)
B/M	0.001	0.002	0.001
	(**0.000**)	(**0.040**)	(0.444)
NDLR	0.000	0.000	0.000
	(0.232)	(0.817)	(0.796)
NAP3M	0.000	−0.0004	−0.001
	(0.860)	(**0.015**)	(**0.025**)
NTDA	0.001	−0.002	0.000
	(0.525)	(0.368)	(0.952)
Repurchase size	0.004	0.056	0.037
	(0.826)	(0.170)	(0.504)
Observations	826	826	826
Number of firms	69	69	69
R-squared	0.0108	0.0229	0.0230
F-statistic	3.85	4.01	2.52
Prob(F-statistic)	**0.0014**	**0.0010**	**0.0228**

p-values are reported in parentheses. Standard errors are clustered at the firm level. "B/M" is the book-to-market-value ratio. "Firm size" is measured by the natural logarithm of the market value of equity. "NDLR" is the number of days since last repurchase announcement. "NAP3M" is the number of announcements during preceding 3 months. "NTDA" is the number of trading days included in the announcement. CARs are measured against the market model.