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Testing the Efficient Market Hypothesis in The Greek Secondary Capital Market

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Abstract: This study uses cointegration tests and event study methodology to provide evidence on the Efficient Market Hypothesis (EMH) in the secondary (parallel) capital market of Athens Stock Exchange (ASE). It examines the existence of interdependence between primary and secondary market in order to test the autonomy of secondary market price behaviour. It also measures the effects of the announcements for issuing new stocks by the listed companies. The empirical results indicate that there is evidence of a bi-directional causality and price co-movement between the primary and secondary capital market in Greece. These findings have significant implications for the rejection of the weak form efficiency. It also provides evidence, which suggests that the announcement of issuing new stocks gives support (total or partial) to specific classes of capital structure theories. The existence of non-zero abnormal returns around the announcement periods leads to the rejection of the semi-strong EMH for the secondary market of the ASE.

JEL Classification: C12, G14

Key words: secondary capital markets, cointegration, event study methodology, market efficiency

Introduction

The secondary (parallel) stock markets function in certain world financial centers giving the opportunity to small and medium enterprises (SMEs) to derive funds for financing their development. The term secondary markets indicates the financial markets of parallel negotiation that function concurrently with the primary in the framework of an integrated financial center in which the introduction of smaller enterprises is less difficult since the entry requirements are limited.

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The secondary markets aim to make stock markets accessible to small-medium enterprises, offering lower costs, availability of capital for investment plans and entrepreneurial development. This is achieved by loosening their introduction requirements and by reducing the cost of their introduction under the primary markets.

The smaller the firm, the larger the costs for external investors due to the fact that these enterprises are subject to a larger risk in capital markets. Entrepreneurs are hesitant towards external financing and the investors are cautious to offer their capital to firms that do not have significant investment plans and development possibility. The efficiency with which the capital markets allocate resources has drastically changed. For some time now, the existence of imperfections in the capital markets concerning the commission of financing smaller businesses has become accepted because of the inability of the firms, as well as of the investors, to appreciate the quality of their investment opportunities.

The Greek secondary market was created in 1989-90 as an alternative source of financing small-medium firms and the development of entrepreneurship. The significance of this market derives from the fact that 98per cent of Greek companies are small and medium, according to National Statistical Service of Greece. According to the COMPENDIA data set of EIM for the period 1974-1998 the business ownership rate in Greece exceeds 15 per cent, while the weighted average of the sample (23 OECD countries) in 1998 is approximately 11 per cent (Audretsch and Thurik, 2000 and Audretsch, Thurik, Verheul and Wennekers, 2002).

NASDAQ is the first independent market for new technology based firms (NTBFs) of medium capitalisation that was created in 1971 and had a great retinue as an alternative way of allocating resources. This success and the desire of the European governments to increase the financing sources of small businesses led to the creation of parallel markets. Great Britain and Ireland created the 'Unlisted Securities Market' (USM) in 1980 that was testamentary to the 'Alternative Investment Market' (AIM) in 1996. France created the 'Second Marché' in 1983, Italy in 1978, Spain in 1986, and Germany recently upgraded its 1987 second-tier market by creating the 'Neuer Market' in 1997. In Portugal, secondary capital market was created in 1992. All parallel markets in Europe function and are regulated within the organised stock exchanges[1].

The studies of developed and emerging markets are several, while studies that concern the secondary stock markets are minimal and mainly concern statistical comparisons and analyses[2]. These markets are characterised in the last few years by high returns and compose an interesting research endeavor.

This research is significant for the following reasons: a) an initial examination of the Greek parallel market for a decade, b) testing the efficient market hypothesis on both levels, weak and semi-strong and c) indicates the secondary capital market, as an alternative source of financing small-medium enterprises.

The second section of this study presents the market efficiency in Greek secondary capital market, while the third section analyses the main methodological issues. The fourth section describes the data and presents the empirical results and finally, the paper is completed with the inscription of the basic conclusions as they came forth from our research.

Market Efficiency in Greek Secondary Capital Market

In a efficient market the competing market participants reflect information rationally and instantaneously on prices, making past relevant information useless in predicting future prices. An efficient market should react only to new information but since this is unpredictable by definition, price changes or returns in an efficient market, cannot be predicted.

Fama (1970) distinguished three types of market efficiency. A market is said to be weak form efficient if past prices are useless in predicting future prices. A market is semi-strong efficient if all publicly available information like inflation, interest rates and earnings have no predictive power. Finally, a market is strong form efficient if all information is reflected on prices, including the inside information.

Under the Efficient Market Hypothesis we have (Fama 1976),

$$P_t - P_t^*/I_{t-1} = u_t \qquad (1)$$

Where I_{t-1} is the information set available at time t-1, P* is the expected price which is based on the information test I_{t-1}, so P* is uncorrelated with u_t and additionally the forcast error P_t-P_t* is uncorellated with variables in the information set I_{t-1} so that,

$$E[(P_t - P_t^*)/I_{t-1}] = 0 \quad \text{or} \quad E(u_t) = 0 \qquad (2)$$

under the assumptions of a zero constant equilibrium return and risk neutrality.

Tests for market efficiency usually examine weather the forecast error is uncorrelated with variables in the information set I_{t-1}. According to the Efficient Market Hypothesis the best predictor of tomorrow's price, is today's price. Thus in a efficient market, the series of stock returns are uncorrelated with the variables in the information set I_{t-1}.

The main purpose of this study is to investigate whether it is possible to predict stock price changes in the Greek Secondary Capital Market (Parallel Market) that could be due to its cofluctuation with the primary market. The secondary market in Greece is a small market with no adequate 'depth' and 'width' compared with other relative markets. Furthermore, this study was performed to shed more light on the existence and the workings of a small market, such as the Greek Secondary Capital Market.

The parallel market in Greece works with speculative characteristics as to the movement of stock prices and with erratic and sometimes unjustifiable price swings. The latter give an indication that market prices may not, at all times, rationally reflect all information existing in the market and that possibly other factors may affect security prices.

There have been several studies so far, testing the price behavior in the ASE and performing tests of the efficient market hypothesis (Niarchos 1972, Panas 1990, Alexakis and Petrakis 1991, Niarchos and Alexakis 1998). However up to now there has been no research and subsequently no evidence as to the price index performance of the secondary capital market, its linkage with the primary market in ASE and its significance for the small-medium enterprises as an alternative source of finance.

In this paper the linear regression model was used. The research started with cointegration analysis among the series and then Granger causality models were applied to test whether a cointegrated explanatory variable, say P_t, can be used to predict the dependent, say S_t .

Methodological Issues

Cointegration and Causality

The theory of cointegration became the most sufficient method for testing the co-dependence between stock markets' indices. The cointegration examines the existence of a long-run common stochastic trend among stock prices. The cointegration between two stock markets implies that it is possible to use the price movements in one market in order to predict the price movements in the other market.

According to the literature (Granger 1986, Chan, Gup, and Pan 1992, Arshanapalli and Doukas, 1993) if two markets are collectively efficient in the long run, then their stock prices cannot be cointegrated. In other words, if two markets are cointegrated, then it is not possible to explore profits from arbitrage.

The results of cointegration tests have important implications for portfolio diversification through investing strategy. Diversifying into stock markets cannot be effective if those markets are cointegrated (there are price co- movements). This is because the systematic/country risk cannot be diversified away. Therefore, it is not in the best interest of investors who want diversified portfolios to invest in cointegrated markets.

The empirical investigation of price changes in one market generating price changes in the other market is given in equation :

$$P_t-\delta_0-\delta_1 S_t = \varepsilon_t \tag{3}$$

where P_t and S_t are contemporaneous primary and secondary price indices at time t; and are parameters; and is the deviation from parity. If P_t and S_t are non-stationary but the deviations are stationary, P_t and S_t are cointegrated and an equilibrium relationship exists between them (Engle and Granger, 1987). For P_t and S_t to be cointegrated, they must be integrated in the same order. Performing unit root tests on each price series determines the order of integration. If each series is non stationary in the levels, but the first differences and the deviations are stationary, then the prices are cointegrated of order (1,1), denoted CI (1,1), with the cointegrating coefficient δ_1.

In order to test for cointegration between the two markets, the Johansen's Maximum Likelihood Procedure (Johansen, 1988) is implemented. This is a preferred method of testing for cointegration as it allows restrictions on the cointegrating vectors to be tested directly, with the test statistic being χ^2 distributed. This specific procedure provides a unified framework of estimating and testing the cointegration relationships in a VAR error correction mechanism, which incorporate different 'short-run' and 'long-run' dynamic relationships in a variable system.

The Johansen's procedure firstly specifies the following unrestricted N-variable VAR:

$$x_t = \mu + \sum_{i=1}^{k} \Pi_i x_{t-1} + \varepsilon_t \tag{4}$$

where $x_t' = [\, p_t', s_t' \,]$, μ is a vector of intercept terms and ε_t is a vector of error terms. Johansen (1988) and Johansen and Juselius reparameterized eq. (4) in the form:

$$\Delta x_t = \mu + \sum_{i=1}^{k-1} \Gamma_i \Delta x_{t-1} - \Pi x_{t-k} + \varepsilon_t \tag{5}$$

Equation (5) is now a VAR reparameterised in error correction form, where Π=-(Π-Π_1-…-Π_k) represents the long response matrix. Writing this matrix as $\Pi = \alpha\beta'$, then the linear combinations $\beta' x_{t-k}$ will be I(0) in the existing of cointegration, with α being the adjustment coefficients, and the matrix Π will be of reduced rank. The Johansen approach can be used to test for cointegration by assessing the rank (r) of the matrix Π. If r=0 then all the variables are I(1) and there are no cointegrating vectors. If r=N then all of the variables are I(0) and, given that any linear combinations of stationary variables will also be stationary, there are N cointegrating vectors. Finally, if 0<r<N there will be r cointegrating vectors.

The cointegration between two series involves a continuous adjustment of innovation prices, so that these would not become larger in the long run. Engle and Granger (1987) have shown that all the cointegrated series can include an error correction (the 'Granger representation theorem') and, on the contrary, the existence of cointegration is a necessary condition in order to construct error correction models.

The acceptance that secondary and primary price indices compose a cointegrating system leads to the implementation of an error correction model, which is characterised by the ability to overcome problems caused by spurious results.

If ΔS_t and ΔP_t denote the first differences of secondary and primary price indices, the following cointegrating regressions are possible:

$$\Delta S_t = \alpha_1 + a_S z_{t-1} + \sum_{i=1}^{n} \alpha_{11}(i)\Delta S_{t-1} + \sum_{i=1}^{n} \alpha_{12}(i)\Delta P_{t-1} + \varepsilon_{St} \quad (6)$$

$$\Delta F_t = \alpha_2 + a_P z_{t-1} + \sum_{i=1}^{n} \alpha_{21}(i)\Delta S_{t-1} + \sum_{i=1}^{n} \alpha_{22}(i)\Delta P_{t-1}\varepsilon_P \quad (7)$$

where $z_t = S_t - [b + a P_t]$ is the error correction term. Equations (6) and (7) represent a vector autoregression (VAR) in first differences; thus, all variables are held jointly endogenous and OLS is an appropriate method of estimation.

Each equation is interpreted as having two parts. The first part is the equilibrium error (from the cointegrating regressions). This measures how the left-hand-side variable adjusts to the previous period's deviation from the long run equilibrium. The remaining portions of the equations are the lagged first differences, which represent short-run effects of the previous period's price changes on the current period's price changes. For example, in equation (6) the change in is due to both 'short-run' effects, possibly from both ΔPs and ΔSs, and to the last-period equilibrium error, , which represents adjustment to long-run equilibrium.

The error correction term enters into the two equations with a one period lag and is estimated from the cointegrating regressions, with constant terms being included to make the mean of the error series zero. The coefficients α_S και α_P attached to the error correction term measures the single-period response of the left-hand-side variable to departures from equilibrium ('speed of adjustment coefficients'). At least one speed of adjustment coefficients must be nonzero for the model to be an error correction model. If the value of α_S in eq. (6) is zero, the current period change in the index does not respond to the last period's deviation from long-run equilibrium.

The link between cointegration and causality stems from the fact that if secondary and primary market indices are cointegrated, then causality must exist in at least one direction (unidirectional causality) and possibly, in both directions (bi-directional causality) (Granger, 1986). Since cointegration implies that each series can be represented by an error correction model that includes last period's equilibrium error, as well as lagged values of the first differences of each variable, temporal causality can be assessed by examining the statistical significance and the relative magnitudes of the error correction coefficients and the coefficients on the lagged variables (Wahab and Lashgari, 1993).

The Standard Granger causality tests do not take into account the significance of error correction coefficients. Engle and Granger (1987) focused on the fact that the estimates of a VAR are misspecified in the case of cointegrated variables, because the error correction terms that are attached to error correction models are not accounted. The argument is that the models implemented for testing the causality relationship are misspecified if the variables, which are tested for the direction of causality, are cointegrated.

The existence of a unidirectional causality from S_t to P_t requires: (i) that some of the 's in eq. (7) must be non-zero while all the 's in eq. (6) must be equal to zero and/or (ii) the error correction coefficient α_F in eq. (7) is statistically significant at conventional levels.

If the coefficients and are individually and jointly non-zero, then a feedback relationship or a bi-directional causality between the two price series exists. On the other hand, if the above coefficients are equal to zero, then there is not a causality relationship between the two variables, as each variable is determined by its prices and the relevant innovations.

Event Study Methodology

Event study methodology may be interpreted as analysing the market's reaction to 'events' or as an empirical investing of the relationship between security prices and economic informational events such as mergers, aquititions, dividends announcements, issuing new stocks[3] etc.

The most commonly used generating process is the Single Index Market Model (SIMM), which presents a linear relationship between the returns from a given security and some market portfolio. In this paper we used the Parallel Market Index at time t as the portfolio tested. According to the above the market model is,

$$R_{i,t} = a + b_i R_{p,t} + e_{i,t} \tag{8}$$

Where, $R_{i,t}$ = the small firm's stock returns
$R_{p,t}$ = the return of the Parallel Market Index
b_i = securities specific intercept and slope coefficients
$e_{i,t}$ = the unpredictable component of the return

In our case the events tested are firm's capital stock increase by issuing new stocks either with bonus, or with rights, or possibly by using both ways (complex). For each event the market model was estimated on daily data for an estimation period of 80 to 140 trading days, according to the firm, and an event period of 20 to 60 days. The estimation period is used to forecast the expected returns for the event period. This will show us how the returns would have reacted if the events haven't occurred.

The estimation period is an arbitrary period of time chosen to include no security specific market events. Event period is also arbitrary selected to capture exante or expost effect of the event on security price.

The abnormal return is estimated by,

$$\hat{u}_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt} \tag{9}$$

where, t is the event time at T+1,…., T+m and i=1,….,N.

Averaging these prediction error (abnormal returns) across all securities yields to the average abnormal return for day t.

$$AR_t = N^{-1} \sum_{i=1}^{N} \hat{u}_{it},\ t = T+1,\dots\dots,T+m \tag{10}$$

These series of returns is used to investigate whether the 'event' had any significant effects on returns. It also provides evidence for semi-strong market efficiency, since persistent non-zero abnormal returns around an 'event' are consistent with the hypothesis that security prices adjust quickly to reflect new information.

Finally, the cumulative abnormal returns (CARs) are estimated as the sum of the average abnormal returns for the period T+m_1 to T+m_2, around the event and shows if the events tested had positive or negative effect on the firm:

$$CAR_{m_1,m_2} = \sum_{j=m_1}^{m_2} AR_{T+j},\ 1 \le m_1 \le m_2 \le m \tag{11}$$

In order to compute the Average Cumulative Abnormal Returns for a specific event period we test the null hypothesis, CAR = 0, of no reaction to the event. The statistical significance of the CARs found were tested with t statistic,

$$t = CAR / \sqrt{T} \times S(AR) \tag{12}$$

Where, S(AR) is the sample standard diviation of the abnormal returns during the estimation period and

T = $t_2 - t_1 + 1$: where t_1 is the first day of the period for which the CAR is calculated and t_2 is the last.

As far as our 'events' in this study are concerned we could say that the rise of the capital stock for a small-medium enterprise by issuing stocks with bonus, it creates enthusiasm to the investors. These results are known as 'Positive Impact Hypothesis', first presented by Jensen and Meckling (1976), Ross (1977), Leland and Pyle (1977) and Heinkel (1982). They believe that the unexpected rise of the firms financial leverage signals positive managerial expectations for the forthcoming profits, positive re-estimation of the stock value and final increase of the stock price.

On the contrary, issuing stocks with rights leads to the fall of security returns and negative reaction of the investors. Such a reaction is known as 'Negative Impact Hypothesis', (Miller and Rock, 1985, and Mayers and Majluf, 1984).

Data and Empirical Results

Testing Weak Form Efficiency

Daily price indices of primary and secondary stock markets in Greece were used in this study. The indices simply represent prices. The data was converted to natural logs and covered the period from January 1998 to December 2003, a period where ASE was characterised as a bull market. Data was drawn from the Athens Stock Exchange Financial Statistics and the Center of Financial Studies (University of Athens).

To determine the order of each price series, the Dickey-Fuller and the Augmented Dickey-Fuller tests (Dickey and Fuller, 1981) are computed on the levels of each price series. Performing the tests on the levels of each series shows that the null hypothesis of a unit root is not rejected; thus, each series is I(0). On the contrary, the results of the tests on the first differences indicate that each of the series is I(1). Table 1 reports the results of the Unit roots tests.

Since all the series are I(1), the Johansen procedure test for cointegration is used. Hall (1991) has demonstrated that in using this procedure to test for cointegration it is necessary to carry out tests to establish the appropriate order of the VAR. The results of the Akaike information criterion (Akaike, 1973) established that a lag length of 2 is appropriate for all series[4].

Having established the appropriate lag length, we can now proceed to test whether secondary market cointegrates with primary market and the other dominant sectors. Table 2 reports the Likelihood ratio (LR) test for cointegration based on Maximal eigenvalue and Trace test statistics for the number of cointegrating vectors.

The hypothesis of cointegration between the primary and secondary markets and their relative indices in Athens Stock Exchange (ASE) is not rejected. The test statistics indicate that the null hypothesis of zero cointegrating vectors is rejected at 5 per cent level, while the hypothesis of one cointegrating vector cannot be rejected between primary and secondary markets and their relative indices.

The existence of cointegration in the two markets implies that it is possible to use the price movements in one market (primary) in order to predict the future price movements in the other market (secondary), and thus possible arbitrage profits can be explored in the long run.

Thus, the two markets are I(1), with linear combinations being I(0), confirming that the two price series are CI(1,1). This implies the inexistence of weak-form efficiency in the long run, and that the Greek primary and secondary markets are improper for domestic diversification.

Since both price series are CI(1,1), an error correction model with lag length 2 on ΔS_t and ΔP_t is estimated using OLS regression:

$$\Delta LS_t = a_1 + a_S z_{t-1} + \sum_{i=1}^{2} \alpha_{11}(i)\Delta LS_{t-1} + \sum_{i=1}^{2} \alpha_{12}(i)\Delta LP_{t-1} + \varepsilon_{St} \tag{13}$$

$$\Delta LF_t = a_1' + a_P z_{t-1} + \sum_{i=1}^{2} \alpha_{21}(i)\Delta LS_{t-1} + \sum_{i=1}^{2} \alpha_{22}(i)\Delta LP_{t-1} + \varepsilon_{Pt} \tag{14}$$

Tests carried out for serial correlation, functional form, and heteroskedasticity confirmed the models' statistical adequacy[5].

Table 3 displays the test results of the restrictions imposed on the speed of adjustment coefficients (α_S and α_P) and the lagged variables coefficients (α_{12} and α_{21}) to eq. (13) and (14), using the Wald test statistic, which being χ^2 distributed.

The results of the Wald test on the speed of adjustment coefficients (α_S and α_P) indicate that the secondary and primary markets behave somewhat differently. The lack of significance of α_S means the secondary market does not respond to the previous period's deviation from equilibrium. The significance of α_P means the current period primary stock prices responds to the previous period's deviation from equilibrium. The finding that one of the speeds of adjustment coefficients is nonzero ($\alpha_P \neq 0$) confirms that the model is an error correction model.

The significant speed of adjustment in eq. (14) does not mean that the secondary market leads or causes the primary market. Respectively, the insignificant speed of adjustment in eq. (13) does not mean that the primary market is not leading the secondary market. In order to conclude the direction of causality or the lead-lag relationship between the two markets, we have to test the significance of the lagged variables coefficients. The results of the Wald test on coefficients α_{12} and α_{21} show that the null hypothesis (the coefficients are individually and jointly equal to zero) cannot be accepted. Thus, the significance of α_{12} and α_{21} indicates the existence of a bi-directional causality or a feedback relationship between the two markets, since the last period's price changes in S_t (P_t) 'short run' affect the current period's price changes in P_t (S_t).

Testing Semi-Strong Form Efficiency

The collection of data for this empirical work was based on 22 small firms listed in ASE for a decade, between 1990-2000. Each SME was tested for one or two 'events'.

The sample was identified through a research of their annual balance sheets, the monthly and quarterly ASE bulletins and publications and the firm's announcements on economic press.

To avoid the problem of infrequent trading in parallel market, the final data of our sample consists of all the dates of successful issuing stocks with at least 80 trading days during the respective estimation period. Thus, the final sample contains 30 'events' of issuing stocks. For every announcement, the daily stock returns were calculated for a period of 200 days surrounding the 'event'. These 200 days are divided into two groups from $t = -200$ to $t = -60$, the estimation period and $t = -60$ to $t = +20$, the event period.

The period of our research was characterised by high volatility, thin trading and other very significant events for the world economy, like the crisis in Yugoslavia, the increase of the oil price etc. All these factors affected the stock exchange trading and the use of the market model for our study[6].

The secondary capital market's firms showed different reactions on the three 'events' tested in this paper, due to the period of the event, the business profile of the firm, the developments plans, the profits of the last year, the perspectives and their future projects.

Table 4 presents the results for all the sample firms and the Cumulative Abnormal Returns calculated for each 'event'. In the first category (issuing stocks with bonus), 9 SMEs have positive CARs, while 5 of them show falling returns. More specifically, the positive reaction of the 9 stock returns prove their leading position in Parallel Market, their powerful investment plans, the profits and the good perspectives of the Greek secondary capital market at the end of the '90s. The negative CARs could be due to the immature initial period of parallel market at the beginning of the '90s, or due to the bad firms' profile. These results agree with the 'Positive Impact Hypothesis', where unexpected rise of capital leverage signals positive expectations and securities' prices increase.

On the contrary, when SMEs issue stocks with rights the reaction of the investors is mainly negative. The results show 7 negative CARs and only 4 positive ones. The positive reaction to these 'events' is related with the booming period of ASE in 1997 and the trust of the investors to the firm's future plans. Though, the majority of the announcements in this second category lead to the 'Negative Impact Hypothesis'.

Finally, in the last category (issuing stocks with bonus and rights) presented 4 SMEs with positive CARs and only one with negative. Such a reaction was mainly due to the event of issuing stocks with bonus and it was expected.

Table 5 demonstrates the reaction of seven SMEs' tested in both announcements (bonus and rights) in order to be compared. Six of them reacted on the expected way (positive) of issuing stocks with bonus, while only one had a negative sign. As far as the rights are concerned five firms had the expected negative reaction and two a positive one. The statistical significance of the results were tested with t-statistic and the confidence intervals in all levels confirm the results as these came forth from the event study.

Conclusions

This study presents cointegration tests and event study methodology to provide evidence on the EMH in the secondary (parallel) capital market of Athens Stock Exchange. First, it examines the existence of interdependence between the primary and secondary market in order to test the price behaviour of the parallel market and the market efficiency in a weak level.

The unit root tests conclude that each series is non-stationary in the levels but stationary after first differencing. The Johansen tests used indicate that the general index (primary market) and the parallel market index (secondary market) are cointegrated. Something, which implies the absence of weak form efficiency for the parallel market. Thus, an error correction model is developed in order to investigate the causality or the lead-lag relationship between the two markets.

The results of this model indicate the presence of a bi-directional causality between the general index and the parallel index, and thus an informational linkage, which is due to the absence of market efficiency. This means that the index prices in primary market may contain useful information regarding consequent price movements of the parallel market. This informational linkage between them implies that investors using these markets can explore significant arbitrage profits.

This paper also tests the reaction of the SMEs securities returns to the announcements of issuing new stocks (bonus, rights or complex). According to the empirical evidence of the Greek secondary capital market the 3 'events' have both positive and negative price effects. The signaling process can not be securily characterised from the same impact. Such is the heterogeneity of the results that it shows the difficulties of the empirical solution. The announcement for issuing new stocks with bonus was found to follow the 'Positive Impact Hypothesis'.

On the other hand, the signaling for rising the capital stock of a firm by issuing rights is negative. The nature of the information about increasing capital stock is consistent with the international evidence and gives support to specific capital structure theories mentioned in the literature review.

Finally, the basic conclusion is the rejection of semi-strong form efficiency in the secondary capital market of ASE. What confirms the above is the existence of non-zero cumulated abnormal returns around the announcements periods. These empirical findings offer the first sign of the important role that the Greek secondary capital market could have as an alternative source of financing small-medium firms' entrepreneurial plans and secure functioning.

NOTES

[1] The NTBFs that are traded in European secondary markets are few. This 'lack' of markets for NTBFs led to the creation of EASDAQ.

[2] Bannock, G. and Doran, A. (1987) *Going Public, The Markets in Unlisted Securities*, Harper & Row Publishers, London.

[3] For testing semi-strong form of efficiency in ASE, see Papaioannou 1984, Niarchos and Georgacopoulos 1986; and Tsangarakis 1993. etc.

[4] In order to assess the model adequacy, at each lag the VAR residuals are checked for satisfying the white noise assumption. The Breusch-Godfrey LM test for serial correlation (Godfrey, 1988) and the Jarque-Bera test for normality (Jarque and Bera, 1987), with the test statistics being χ^2 distributed, are used. The presence of serial correlation on the innovations of the VAR indicates also the existence of the effects of infrequent trading and the bid-ask price effect (Wahab and Lashgari, 1993). In the interests of brevity, test results are not presented here.

[5] The full output for the estimation of Engle-Granger tests, the error correction model and all diagnostic tests are available from the author upon request..

[6] Therefore, each period of our sample was tested for stationarity, normality, serial correlation, heteroskedasticity and structural stability in order to achieve a better specification of the model. In the interests of brevity, test results are not presented here but they are available upon request.

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Table 1: Unit Roots Tests in Markets

ASE	ADF	Statistic	ADF Critical Value*
GENERAL INDEX	Value	-2,5484	-3,4163
	ΔValue	-21,1621**	
PARALLEL MARKET INDEX	Value	-0,6774	-3,4163
	ΔValue	-18,0221**	

Notes:
Value = the logarithm of the market index
DValue = the first difference of the logarithms
* 5% critical value of the Augmented Dickey-Fuller test statistic.
** Statistically significant at 5% confidence interval.

Table 2: Johansen Tests for Cointegration

System	Null Hypothesis	Alternative Hypothesis	Tests for cointegration vectors based on	
			Maximal eigenvalue	Trace
PARALLEL MARKET INDEX-GENERAL INDEX	$r = 0$	$r \leq 1$	16.6641	20.9652
	$r \leq 1$	$r = 2$	3.3010	3.3010

Note:
The 95% critical values of the test based on Maximal eigenvalue are 15.8700 ($r = 0, r \leq 1$) and 9.1600 ($r \leq 1, r = 2$), while the critical values of the test based on Trace are 20.1800 and 9.1600 respectively.

Table 3: Wald Test Results.

Null Hypothesis (H_0)	Wald statistic	P – value
$\alpha_S = 0$	0.39640	0.344
$\alpha_F = 0$	6.6723	0.010
$\alpha_{12} = 0$	75.2182	0.000
$\alpha_{21} = 0$	21.2384	0.000
$\alpha_{12} = 0, \alpha_{21} = 0$	35.7234	0.001

Note: The Wald test statistic is distributed as χ^2 under the null hypothesis of coefficients equal to zero.

Table 4: Average Cumulative Abnormal Returns (CARs) Distribution and Statistical Significance for the Three 'Events'

Types of issuing new stocks ('events') (1)	CARs* (2)	Number of firms (3)	t (CARs) (4)
BONUS	Negative (-7,281 ≤ CARs ≤-1,120)	5	(4,64 ≤ t (CARs) ≤ 65,07)**
	Positive (0,103 ≤ CARs ≤ 17,836)	9	(7,64 ≤ t (CARs) ≤ 106,19) **
RIGHTS	Negative (-0,032 ≤ CARs ≤-0,270)	7	(1,37 ≤ t (CARs) ≤ 15,31)**
	Positive (0,432≤ CARs ≤2,802)	4	(2,14 ≤ t (CARs) ≤ 44,32) **
COMPLEX	Negative -1,156	1	36,46**
	Positive (0,231≤ CARs ≤12,779)	4	(13,03 ≤ t (CARs) ≤ 36,46) **

Note:
* The Cumulated Abnormal Returns are in logs
** Statistical significant CARs at 5% confidence interval

Table 5: Comparative Results for Seven SMEs Issuing New Stocks with Bonus and Rights.

Average Cumulative Abnormal Returns (CARs) distribution and statistical significance.			
Types of issuing new stocks ('events') (1)	CARs* (2)	Expected- unexpected signs (3)	t (CARs) (4)
BONUS	(0,103≤ CARs ≤5,188)	Positive 6	(4,64 ≤ t (CARs) ≤ 65,07)**
	-1,753	Negative 1	46,58**
RIGHTS	(0,432 ≤ CARs ≤0,909)	Positive 2	(15,31 ≤ t (CARs) ≤ 44,32)**
	(-4,009≤ CARs ≤-0,032)	Negative 5	(2,14 ≤ t (CARs) ≤ 75,93) **

Note:
* The Cumulated Abnormal Returns are in logs
** Statistical significant CARs at 5% confidence interval