



## CAPITAL STRUCTURE SIGNALING THEORY: EVIDENCE FROM THE GREEK STOCK EXCHANGE

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### Abstract

The paper's aim is to review the capital structure theories, and especially signaling theory. It investigates whether the capital structure signaling theory is reliable in cases of companies listed at the Athens Stock Exchange. The companies used in the sample, raised new equity from 2004 until 2006, and the paper examines their stock price reaction to the announcement.

**Key words:** capital structure, signaling theory.

**JEL Classification:** G32

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### 1. INTRODUCTION

The paper aims at finding new empirical results about signaling theory of the capital structure of companies listed at the Athens Stock Exchange. Signaling theory has been found to be in effect in many countries, but there is not enough evidence for the Greek Stock Exchange. The Greek Stock Market only recently has made progress to be considered mature, so it would be interesting to find out how investor react to a company's decision to raise equity.

The paper is divided in three parts. The first part includes a short description of the capital structure theories and an introduction to the signaling theory.

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The second part consists of the empirical findings of the investigation and their analysis. The third part includes the conclusions of the empirical investigation and some topics for further research.

## **2. CAPITAL STRUCTURE THEORIES, SIGNALING THEORY AND THE FINDINGS OF PREVIOUS EMPIRICAL INVESTIGATIONS**

### **2.1 Capital structure theories**

Capital structure is an important decision for every company. It is important, not because of the need to maximize the investments' returns, but due to its effect in the company's capability to face the competition's challenges. The best-known capital structure theory is Modigliani and Miller's (1958, 1963). In their first article they came to the conclusion that capital structure does not affect the company's value. So, there would be no optimal capital structure, nor minimal weighted average cost of capital (W.A.C.C.). In their second article, they included taxation, and found that a company should use as much debt as it can, to take advantage of the tax reduction and maximize their value.

The Modigliani – Miller theory was criticized, mostly for its hypotheses, and less for its content. Its most important flaw is the fact that presupposes the existence of perfect financial markets. In their second article, the writers import the notion of taxation, leaving all the other hypotheses the same. In this case, the optimal capital structure, is the one where the company was financed almost exclusively with debt, something that is not usual in reality, because the cost of debt increases, when leverage increases. The increase of a firm's leverage seems to be a solution, but in fact it is a short – term solution, since a company cannot constantly increase its debt.

Trade – off theory suggests as an optimal capital structure, that mix of equity and debt where present value of tax advantages equals to the present value of costs related to debt. Its main advantage is the fact that it suggests mediocre leverage and that it is easy to understand. Its disadvantage is the fact that it is a general, descriptive theory that does not explain which exactly is the right level of leverage.

Myers and Majluf (1984), and Myers (1984) developed the pecking order hypothesis. According to this theory, companies prefer to be financed by internal funds, then by debt, and finally by raising new equity. Their results are strengthened by Krasker (1986).

There are two main approaches explaining pecking order (Halov and Heider, 2005). The first refers to transaction costs of external financing, while the second one is based to asymmetric information theory. According to the approach of

transaction costs, the type of funds that will be preferred depends on the costs of the issue. According to the asymmetric information theory, debt is preferred to equity, because taking a loan is a positive sign for investors who are not as well informed as the management. If a company undertakes a loan, investors will assume that the management believes that the company's common stock is undervalued. Pecking order hypothesis is better supported by empirical investigations (Myers and Sunder, 1999; Baskin, 1989).

Managerial opportunism hypothesis states that capital structure is the cumulative result of the managers' actions (Baker and Wurgler, 2002). Managers issue stocks when the company's stock is overvalued, and repurchase them, when the stocks are undervalued. Managers' aim is to be synchronized with the market, so as to take profits for the current investors. This theory has common points with pecking order hypothesis, as they both act for the current investors' benefit, and with signaling theory, as they both believe that the company issues stocks when their price is overvalued.

In general, we can conclude that Modigliani and Miller theory agrees with the trade off theory, while pecking order hypothesis is consistent with the asymmetric information theory and signaling theory. Despite the research, there is no thorough explanation for the optimal capital structure of firms (Haris and Raviv, 1991).

Myers (2001), in his article for trade off, pecking order and free cash flow theory, states that none of these theories gives general explanations for financial strategies, as they were not designed to be general. These capital structure theories are valid under conditions. Each one emphasizes in certain costs and advantages of different financing strategies. Every researcher can find statistical results that agree with more than one theories, because each theory is valid for parts of the sample.

## 2.2 Signaling theory

At the end of the 70's, Ross (1977), and other writers developed the capital structure signaling theory based upon the problems of the asymmetrical information between managers and investors. These models are based upon the idea that the top executives of the firm that have inner information, have a motive to transfer this knowledge to the external investors, so that the stock price will rise. However, managers cannot simply announce the good news to the investors, since they will face it with suspicion.

One solution to this problem (for the underestimated firms) is to send to the investors a signal containing this information, by adopting a financial policy. This strategy is forbidden from the aspect of cost for a firm of less value. To the external users what makes the signal credible is its cost. Bhattacharya and Dittmar

(2004) argued about costless and costly signals. Managers would not announce the good news that they have, because all companies could do this without being valid. Instead of this, the administration increases the leverage of the firm. This capital structure is a commitment for the firm, which, a firm of mediocre prospects would not dare to undertake. The firms that want to send the signal that they have good prospects, increase their leverage. In contrast, the overestimated firms are not willing to undertake the burden of lending because in this way they face the risk of bankruptcy. Furthermore, the precision of the signal is significant as well (Veronesi, 2000).

Thus, finally, managers many times use the changes in capital structure, in order to transfer some information for the profitability and the risk of the firm, to the external users. Signaling theory is founded upon the idea that the internal users know more things than the external users. Moreover, the wages and the privileges that managers have are some times dependent on the market value of the company. This gives the firm the motive to provide the information to the investors that the firm is underestimated. The increased leverage indicates greater possibilities of bankruptcy. It signals positive evolutions, since the request for a loan means that the administration believes that the good progress of the firm will allow it pay off.

The information will be credible only if the cost of the false revelation is high enough to force the firm to reveal the truth. The leverage increase is an effective signal. The loan contracts force the firm to have stable cash flows during the loan period and if the firm does not have it, it will face serious consequences, such as bankruptcy. On the contrary, in the case of equities, things are more flexible. Stockholders wait typically for, some cash payments, but in this case the administration has the aptitude to reduce or omit them during financial recessions. For this reason, taking a new loan is a credible signal for the future cash flows to fulfil its obligations.

The economist who first dealt with the asymmetric information was Akerlof with his Lemons Problem, which concerned the car market. Michael Spence continues Akerlof's idea, in his article (1973), in which he introduces the notion of the signaling theory in the labor market. In 2001, Akerlof, Spence and Stiglitz were nominated with the Nobel Prize for their research on the asymmetrical information during the 70's. This is a sign of the importance of the financial asymmetric information.

According to a group of theories, for example Ross (1977) and Leland and Pyle (1977), the choice of the capital structure of the firm is a signal for the external users. According to Noe, the quality of the firms that raise loans tends to be better than this of the firms that issue stocks. Thus, Noe's model predicts a negative reaction of the stock price in the announcement of the stocks' issue.

Ross believes that capital structure functions as a signaling mechanism in the market. One of the best-known signals is the undertaking of debt. This action

increases the possibilities and the costs of financial distress for a firm. The investors know that, and when they notice that a firm increases its debt they interpret it as a sign that the managers await in the future such cash flows that will avoid recession.

Other financial signals are:

- Dividends
- Leverage
- Stock repurchase
- Announcement of a merger or acquisition
- Announcement of a tender offer
- Announcement of a spin off
- Announcement of poison pill

The changes in capital structure can alter the conception of the market for the firm's value. The above writers argue that stock issue affects negatively the stock price. To sum up, we see that Ross (1977), Noe (1988) and Narayanan (1988) predict a positive reaction of the stock price to the debt increase, while Myers and Majluf (1984) predict that the stock price will not be affected by the undertaking of a risk free loan. Lucas and McDonald (1990) find that the stock price falls after the announcement of an equity raise, but after a small period of time it rises. According to Krasker (1986), the stock price is negatively correlated with the issue size.

### **2.3 Results of other empirical researches**

The importance of signaling theory has been the object of many researches. Suggestively, the following will be mentioned. Johnson's (1988) research indicates that signaling theory is in force in the USA during 1970-1988. The excessive returns of the common stocks were negatively connected with the reductions of the loan's pay-off and the flexibility of the dividends' distribution. The refunding of the debts can alter the common stocks' prices, if the exchange offer reveals new information about the firm's prospects. Thirty occasions of exchange offers were examined.

The research of Pugh and Jahera (1990) ends up in accordance with signaling theory in the USA, although it examines the theory from the aspect of the stocks' repurchase, while it adds that the stock prices of the firms of greater capitalization are less affected. The excessive returns related with the repurchase announcements, are usually considered reaction to the statement of the managers that the firm's stock is underestimated. This signal from the behalf of the administration provides new information that improves the market value of the firm. Two dependent

variables were used, the adjusted to risk excessive returns for the days before and after the announcement and the premium offered by the administration. One of the independent variables is the debt ratio before and after the repurchase.

Signaling theory seems to be valid to the Middle East enterprises as well, according to a research that took place in 1994-1996 (Du and Dai, 2005). The sample comprised of enterprises of nine Asian economies, while the time period stops before the Asian crisis, which would alter the result. Dependent variables were the leverage in historical prices and leverage in market prices.

Finally, the research of Antoniou, Gunay and Paudyal (2006) in France, Germany and the United Kingdom supports signaling theory, examining the debts' maturity from 1983, 1987 and 1969 for each country, to 2000. The debts' maturity is used as the dependent variable, while among the assumptions checked is the validity of signaling theory, which is expressed with the use of four factors, leverage, liquidity, variability and the quality of the firm.

In Egypt, the theory does not seem to be in effect, it is valid only for high risk enterprises (Eldomiaty, 2004). This research examines the dynamic relations between the changes in the capital structure of the enterprises and their effect on the market price, under different levels of systematic risk. The market price, or capitalization, of the firm is used as the dependent variable, while the debt ratio is used as the independent variable. The enterprises included in the sample are divided in 3 categories with high, medium and low beta ratio respectively. The results confirm to some degree the signaling theory, especially for the high-risk enterprises.

### **3. EMPIRICAL RESEARCH OF SIGNALING THEORY FOR THE GREEK STOCK MARKET FIRMS**

#### **3.1 General information**

The alterations caused to the capital structure of a firm from the administration, are expected to have as a consequence some variations to the stock price of the firm. Thus, according to signaling theory, the equity raise of a firm, should have as an effect a fall of its stock price. This statement is the core of empirical research of the Greek stock market.

We should mention that the Greek Stock Exchange had a great rise at the end of the 90s due to the entrance of the Greek economy in the European Monetary Union. But under the pressure of speculative forces, there was a fall in 2000. This financial crisis affected the whole Greek society. We tried to see how investors reacted to the announcement of equity raises, a few years after the crisis. Moreover, very few researches concern the Greek Stock Exchange, the same period of time

the Greek economy was trying to become a mature financial market. The case of the Greek Stock Exchange is not a usual one, as at the period we examine, the Greek economy was trying to come out of a financial crisis, and at the same time become a full member of the European Monetary Union.

The research begins with an introductory reference to the notion of the equity raise and how this can be achieved, and the procedure followed. Next, we refer to the choice of the sample used, the methodology followed and the statistic analysis. The third unit ends with the conclusions of this statistic analysis.

### **3.2 Equity raise**

The stock markets are known as capital markets, since they are the fundamental way for the enterprises to find capitals. The enterprises either issue new stocks, or, if they have already issued stocks, they move to equity raise.

The equity raise can be achieved in two ways, either with capitalization of the retained earnings or with extra cash payment. In the first case, the firm moves to financial inscriptions that transfer the retained earnings to the equity. Analogous to the capitalized earnings, new stocks are issued with equal name value, as the existing ones and are distributed free of charge to the investors. There might also occur a capitalization of the obligations or capitalization of the result coming from the readjustment of the financial assets, according to which, the book value of the assets is adjusted with their approximate market value. In the second case of the cash payment, the equity raise leads to new capitals for the enterprise. This actually means that the firm wants to find new capitals from the investors, either the old ones, or new. But if new investors buy the new stocks, the old stockholders will have to face a reduction of their ownership percentage. In order for this not to happen, there is a preference right for the old investors – in fact with better conditions than the official price of the stocks' issue.

The equity raises are sometimes faced with suspicion. Especially after the financial crisis in 2000, many enterprises faced serious problems, and the equity raise was the only solution to improve their financial situation. Some of them, however, did not manage to cover the equity raise.

The failure of an equity raise causes nasty comments to the market, having as a result a negative effect upon the stock. Therefore, it is a common practice, for the basic investors, who may either have to cover the part that is not disposed. This fact also changes in many cases the, after the equity raise, stockholders composition.

It is worth mentioning here that the announcement of an equity raise has a direct effect on the stock of the firm, besides the fact that from the moment the General Assembly decides its materialization until it is approved by the stock

market, a long period of time intermediates. So, we realize that the investors are reluctant to participate to the capital increases of firms, since some of them do not have adequate liquidity. Moreover, some of the firms do not have investing interest with long-term prospects, while, at the same time, include the risk for devaluation of the titles.

Systematic abstinence of the investors is noticed mainly in the equity raises of small companies, something that points out the reduced trust of the investors to these companies. On the other hand, companies of great capitalization do not face this problem.

### **3.3 Sample**

We investigate cases of equity raise that occurred in the Greek Stock Exchange between 2004 and 2006. This period of time was chosen, because investors needed some time after the financial crisis of 2000 in order to start acting normally again. Furthermore, 2004 was the year when the country hosted the Olympic Games, so the expectations for further economic development the following years, counting especially on tourism, made the investors feel optimistic. These two opposite influences make the results more difficult to explain. Under these circumstances, the results may not be correct, because investors are still suspicious against any announcement of firms. We have chosen companies that proceeded in equity raise, but not as a consequence of a merger or acquisition. The third factor that we took into consideration was the availability of the data.

Finally, the sample consists of 13 cases of equity raise. We should note that the firm PLIAS was by that time under surveillance, something that may have affected its price and the investors' reactions to its announcements.

The sample is quite small, due to the fact that the firms at that period tended to raise their equity only when they proceeded to a merger or acquisition. But the announcement of a merger or acquisition is a positive signal for the investors, so the results if we included these cases of equity raises, would be confused, as we would use a positive signal and a negative signal at the same time.

### **3.4 Methodology**

Our work is the result of two procedures, the collection of the data and its further statistical analysis. The data used in this paper is extracted from many sources. The data related to the stock prices are from the site of the Greek Stock Exchange. The details for each equity raise were extracted from the annual reports of the firms, the press, and the Internet. The data covers three years 2004-2006.



The statistical analysis was done, with the use of the stock prices of the firms two months before and two months after the announcement of the equity raise. As announcement day, we consider the day when the Informative Report was published. We assume that, in order for signaling theory to be valid, the equity raise should have a negative effect on the stock price, in comparison with the time before the announcement.

In order to fully understand the tables, we should give some information. Table 1 analyzes the sample of the research, the capital raised, the conditions, the percentage of coverage and the day of the announcement. Table 2 gives the meanings of the abbreviations used in the statistical analysis. Table 3 and Table 8 compare the mean of the sample with the neutral value, 0. Tables 4 and 9 show whether the data follow the normal distribution. Tables 5 and 10 compare the scores of the same respondents in two different periods, before and after the announcement. Tables 6 and 11 test the equality of the variances, while Table 7 and Table 12 express the extent to which the prices before and after the announcement vary together.

### **3.5 Statistical analysis**

The software that was used is SPSS. The correspondence between the abbreviations used and their meanings appears in Table 2.

#### ***3.5.1 Examination of the returns of the stocks 30 days before and 30 days after the publication of the Informative Report***

Firstly, we examine the returns of the stock 30 days before and 30 days after the publication of the Informative Report. We examine the logarithmic returns in two periods. The first period of time ends the day before the announcement, while the second one, contains all the rest. The names of the stocks of the first period have the abbreviation “\_b(efore)”, while the ones of the second period have the abbreviation “\_a(fter)”

##### ***3.5.1.1 T-Test***

We test whether the average returns of the two periods equal to zero. This actually means that we test whether the returns belong to a distribution, which has average equal to zero, something that we theoretically expect to happen.

Test hypotheses:

$H_0$ : the average equals to zero ( $\mu=0$ )

$H_1$ : the average is not equal to zero

With the use of One-Sample Test, we accept the  $H_0$  for all the companies, because the possibility (p-value) appears greater than 0.05 (Table 3). Moreover, the level of significance is 95% (columns lower/upper). Within it, there is price zero (the smallest price is negative, while the biggest price is positive). As an exception, we should mention Emporiki after the announcement of the equity raise, for which the expected price is greater than zero.

### 3.5.1.2 Kolmogorov – Smirnov Test

We test whether the prices follow the Normal Distribution.

Test hypotheses:

$H_0$ : the returns follow the Normal Distribution

$H_1$ : the returns do not follow the Normal Distribution

In this case, we use One Sample Kolmogorof Test, which is used in quantitative variables and examines whether the cumulative frequency of a variable in the sample looks like the one that would theoretically appear if it followed the Normal Distribution. In order to accept the  $H_0$  hypothesis, the possibility (p-value) should be greater than the level of significance that is chosen.

For the two periods of time, we accept the basic hypothesis, that the variables follow the Normal Distribution. Forthnet is an exception before the announcement, as the price of Sig is 0.008, which is less than 0.05 (Table 4).

### 3.5.1.3 Paired Sample Test

We examined whether there is a difference between the averages of the two periods for each company. This test is used in dependent samples in two different periods of time. The test hypotheses that we made are the following:

$H_0$ : the averages are equal ( $\mu_1 - \mu_2 = 0$ )

$H_1$ : the averages are different

We used the Paired Samples Test, where  $u=0$ . In order to accept the  $H_0$  hypothesis, the possibility (p-value) should be greater than the level of significance that is chosen. Table 5 shows that the average returns of the stocks were lower

than the ones after the equity raise. This result is in contrary with the signaling theory that predicts a fall in the stock price after the announcement. On the other hand, the stock of FORTHNET has a positive statistic  $t=1.816$ , so its average returns are lower after the announcement, confirming signaling theory.

#### 3.5.1.4 Homogeneity of Variances Test

The last test is about the variances before and after the equity raise.

$H_0$ : the variances before and after the announcement are equal

$H_1$ : the variances are different

Using the Test of Homogeneity of Variances, we found that the variances remained the same (Table 6). In order to accept the basic hypothesis, the possibility (p-value) should be greater than the significance level. Exceptions are the prices of the companies ATE, LESVOS, PLIAS, ALPHA and KERANIS. In all these cases, the variance of the second period is greater.

#### 3.5.1.5 Correlations between the returns before and after the announcement

Finally, using the Paired Samples Correlations, we find that in all the companies (except for DIAS and GENIKI that have a significant positive correlation) do not have a strong linear correlation between the prices of the two periods (Table 7).

### 3.5.2 Examination of the returns of the stocks 14 days before and 14 days after the publication of the Informative Report

In the second round of tests, we used the same tests, altering the periods of time. We created a period comprising of the 14 days before the announcement and 14 days after the announcement. The names of the variables are followed by  $_p$  (before the announcement) and  $_k$  (after the announcement).

#### 3.5.2.1 T-Test

The 1<sup>st</sup> test shows again that the average price equals to zero (Table 8). But, in the significance level of 10%, the average price of EMPORIKI and FORTHNET before the announcement, and LAZARIDIS after the announcement, are smaller than zero.

### 3.5.2.2 Kolmogorov – Smirnov Test

In the 2<sup>nd</sup> test, most of the companies keep following the Normal Distribution. Exceptions in this case are, KERANIS before the announcement, and NAYTILIAKI LESVOU, after the announcement (Table 9).

### 3.5.2.3 Paired Sample Test

In the 3<sup>rd</sup> test, all companies have the same average returns before and after the announcement, apart from LAZARIDIS and FORTHNET. FORTHNET has a statistic  $t=-2,389$ , so we conclude that the average returns after the announcement is higher, opposing to the signaling theory (Table 10). This result is also in contrast with the first round of tests, when the same company confirmed signaling theory. LAZARIDIS confirms signaling theory, with a statistic  $t=1.747$ .

### 3.5.2.4 Homogeneity of Variances Test

In the 4<sup>th</sup> test, we see that ETE, MARFIN, ATE, LESVOS and FORTHNET have a diversification in variances before and after the announcement. Furthermore, all the companies, in this 28-day period, have higher variances than in the first case (Table 11). This result shows that a few days before and after the announcement, stock prices have greater dispersion.

### 3.5.2.5 Correlations between the returns before and after the announcement

Finally, in the test about the correlation coefficients, only MARFIN and EMPORIKI have a significant negative correlation of their returns before and after the announcement (Table 12). The other companies do not seem to have their prices before and after the announcement correlated.

## 4. CONCLUSIONS

The results of the empirical analysis do not confirm signaling theory in the Greek Stock Exchange. Among the 13 cases of equity raise of the sample, only FORTHNET and LAZARIDIS had a fall in the stock returns after the publication of the Informative Report, while in 5 cases we had a raise in their variance after the publication.

The fact that signaling theory does not seem to be valid in this sample could be due to a number of factors:

The Greek Stock Exchange, during the period of time we examined, was coming out of a crisis, so the results may not be representative. Moreover, the Greek Stock Market is in effort to become one of the mature markets. The result could also be affected by the fact that some of the companies may have a small number of investors holding their stocks.

The data was for a small number of companies and for a small period of time. In the sample was also a company under surveillance.

Furthermore, many of the companies were banks and, in general, companies of great capitalization, so the investors have significant trust in them. The announcement of the equity raise was not viewed as a bad signal, as signaling theory predicted, because the investor did not worry about the quality of the companies and the reasons they proceeded in the equity raise.

Capital structure is one of the most argued subjects in finance. A great number of theories have tried to explain the difference between the debt ratios of companies. These theories suggest that companies determine their capital structure, depending on the costs and advantages that relate to each type of finance.

This paper examines signaling theory and whether it is valid in the Greek Stock Exchange. According to signaling theory, investors view the equity raise as a signal of risk, so we would expect a price fall after the announcement of the equity raise. But this does not seem to happen, according to the investigation. From the 13 firms of the sample, only two had a fall of their stock price.

The same investigation could be done using a larger and more representative sample, or using another signal.

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## APPENDIX

### TABLES

TABLE 1

#### Sample of the research

Company	Issue of new stocks with preference right	Ratio of issue of new to old stocks	Total capital	Percentage of coverage	Publication date of the Informative Report
Lannet	14761076.00	4:10	15351519.04		8/11/2005
Ete	135707764.00	4:10	3000498662.04	100	9/6/2006
Lazaridis	1436800.00	1:10	3448320.00	100	20/2/2004
Marfin	25000000.00		400000000.00	190	19/12/2005
Ate	624444444.00	20:09	1248888888.00	100	27/5/2005
Emporiki	26478294.00	5:20	397174410.00	100	10/11/2005
Geniki	14857143.00	-	89142858.00	100	27/2/2004
Lesvos	-	-	-	-	16/11/2005
Dias	25110000.00	1:01			26/5/2006
Plias	63908001.00	1,9:1	18238997.00		19/6/2006
Alpha Bank	97271.00		437709.77		24/11/2004
Forthnet	21411490.00	5:04	119904344.00	100	25/4/2006
Keranis	11459490,00	1:03	6548282.50	100	21/10/2004

TABLE 2

#### Meaning of the Abbreviations

The name of the company of the examined returns	The Returns of the Company 30 days before the announcement	The Returns of the Company 30 days after the announcement	The Returns of the Company 14 days before the announcement	The Returns of the Company 14 days after the announcement
Lannet	Lannet_b	Lannet_a	Lannet_k	Lannet_p
Ete	ETE_b	ETE_a	ETE_k	ETE_p
Lazaridis	Laz_b	Laz_a	Laz_k	Laz_p
Marfin	Marfin_b	Marfin_a	Marfin_k	Marfin_p
Ate	ATE_b	ATE_a	ATE_k	ATE_p
Emporiki	Emporiki_b	Emporiki_a	Emporiki_k	Emporiki_p
Geniki	Geniki_b	Geniki_a	Geniki_k	Geniki_p
Lesvos	Lesvos_b	Lesvos_a	Lesvos_k	Lesvos_p
Dias	Dias_b	Dias_a	Dias_k	Dias_p
Plias	Plias_b	Plias_a	Plias_k	Plias_p
Alpha Bank	Alpha_b	Alpha_a	Alpha_k	Alpha_p
Forthnet	Forth_b	Forth_a	Forth_k	Forth_p
Keranis	Keranis_b	Keranis_a	Keranis_k	Keranis_p

TABLE 3

One Sample t-test

	<b>t-statistic</b>	<b>p-value</b>
Lannet_b	0.342	0.735
ETE_b	-1.497	0.145
Laz_b	-1.688	0.102
Marfin_b	0.683	0.500
ATE_b	-1.090	0.285
Emporiki_b	0.871	0.391
Geniki_b	1.129	0.268
Lesvos_b	-0.427	0.673
Dias_b	-0.799	0.431
Plias_b	-0.352	0.728
Alpha_b	0.306	0.762
Forth_b	1.653	0.109
Keranis_b	-0.323	0.749
Lannet_a	0.715	0.479
ETE_a	0.493	0.625
Laz_a	0.781	0.440
Marfin_a	1.390	0.173
ATE_a	-0.703	0.487
Emporiki_a	2.077	0.045
Geniki_a	0.796	0.431
Lesvos_a	1.506	0.140
Dias_a	-0.591	0.558
Plias_a	0.630	0.532
Alpha_a	1.711	0.095
Forth_a	-0.766	0.448
Keranis_a	0.286	0.776

TABLE 4

One-Sample Kolmogorov-Smirnov Test

	Kolmogorov-Smirnov Z	p-value		Kolmogorov-Smirnov Z	p-value
Lannet_b	0.684	0.738	Lannet_a	0.988	0.283
ETE_b	0.668	0.764	ETE_a	0.760	0.611
Laz_b	0.980	0.292	Laz_a	0.746	0.634
Marfin_b	0.610	0.850	Marfin_a	1.090	0.185
ATE_b	1.055	0.216	ATE_a	1.011	0.258
Emporiki_b	0.667	0.765	Emporiki_a	0.641	0.806
Geniki_b	0.910	0.379	Geniki_a	0.774	0.586
Lesvos_b	1.291	0.072	Lesvos_a	1.156	0.138
Dias_b	1.062	0.209	Dias_a	0.913	0.375
Plias_b	0.861	0.449	Plias_a	1.292	0.071
Alpha_b	0.419	0.995	Alpha_a	0.391	0.998
Forth_b	1.665	0.008	Forth_a	0.896	0.398
Keranis_b	1.332	0.058	Keranis_a	0.997	0.273

TABLE 5

Paired Samples Test

	t-statistic	p-value
Lannet_b – Lannet_a	0.252	0.803
ETE_b – ETE_a	-1.010	0.321
Laz_b – Laz_a	-1.180	0.248
Marfin_b – Marfin_a	-0.787	0.437
ATE_b – ATE_a	0.682	0.501
Emporiki_b – Emporiki_a	-0.440	0.663
Geniki_b – Geniki_a	0.340	0.736
Lesvos_b – Lesvos_a	-1.879	0.070
Dias_b – Dias_a	-0.284	0.778
Plias_b – Plias_a	-0.648	0.522
Alpha_b – Alpha_a	-0.799	0.431
Forth_b – Forth_a	1.816	0.080
Keranis_b – Keranis_a	0.061	0.951



TABLE 6

**Test of Homogeneity of Variances**

	<b>Levene Statistic</b>	<b>p-value</b>
Lannet	0.185	0.668
ETE	0.062	0.804
Laz	1.601	0.210
Marfin	1.153	0.287
ATE	4.883	0.031
Emporiki	0.887	0.350
Geniki	1.481	0.228
Lesvos	22.466	0.000
Dias	0.095	0.758
Plias	4.226	0.044
Alpha	7.291	0.009
Forth	1.739	0.192
Keranis	3.475	0.067

TABLE 7

**Paired Samples Correlations**

	<b>Correlation</b>	<b>p-value</b>
Lannet_b & Lannet_a	0.298	0.110
ETE_b & ETE_a	-0.239	0.204
Laz_b & Laz_a	0.157	0.408
Marfin_b & Marfin_a	0.123	0.519
ATE_b & ATE_a	0.033	0.862
Emporiki_b & Emporiki_a	0.347	0.060
Geniki_b & Geniki_a	0.374	0.042
Lesvos_b & Lesvos_a	0.133	0.483
Dias_b & Dias_a	0.441	0.015
Plias_b & Plias_a	-0.059	0.756
Alpha_b & Alpha_a	-0.216	0.251
Forth_b & Forth_a	0.101	0.597
Keranis_b & Keranis_a	-0.121	0.526

TABLE 8

One-Sample Test for 14 days before and after the announcement

	t-statistic	p-value
Lannet_k	0.565	0.575
ETE_k	-0.207	0.837
Laz_k	0.996	0.326
Marfin_k	1.652	0.107
ATE_k	-0.115	0.909
Emporiki_k	1.689	0.099
Geniki_k	1.305	0.200
Lesvos_k	1.252	0.218
Dias_k	-0.327	0.746
Plias_k	0.433	0.668
Alpha_k	0.830	0.411
Forth_k	-1.724	0.093
Keranis_k	0.149	0.882
Lannet_p	0.546	0.589
ETE_p	-0.655	0.518
Laz_p	-1.867	0.072
Marfin_p	0.875	0.389
ATE_p	-1.187	0.245
Emporiki_p	1.347	0.188
Geniki_p	0.488	0.629
Lesvos_p	0.414	0.682
Dias_p	-0.992	0.329
Plias_p	-0.289	0.774
Alpha_p	0.914	0.368
Forth_p	1.532	0.136
Keranis_p	0	1

TABLE 9

One-Sample Kolmogorov-Smirnov Test for 14 days before and after the announcement

	Kolmogorov-Smirnov Z	p-value		Kolmogorov-Smirnov Z	p-value
Lannet_k	1.068	0.204	Lannet_p	0.765	0.602
ETE_k	0.676	0.750	ETE_p	0.467	0.981
Laz_k	0.956	0.320	Laz_p	0.622	0.834
Marfin_k	0.664	0.769	Marfin_p	0.828	0.499
ATE_k	0.752	0.624	ATE_p	1.088	0.188
Emporiki_k	0.708	0.698	Emporiki_p	0.645	0.800
Geniki_k	0.966	0.309	Geniki_p	0.672	0.757
Lesvos_k	0.896	0.398	Lesvos_p	1.808	0.003
Dias_k	0.889	0.408	Dias_p	1.250	0.088
Plias_k	1.053	0.217	Plias_p	0.798	0.548
Alpha_k	0.588	0.880	Alpha_p	0.543	0.930
Forth_k	1.173	0.128	Forth_p	1.151	0.141
Keranis_k	1.581	0.014	Keranis_p	0.950	0.328

TABLE 10

Paired Samples Test for 14 days before and after the announcement

	t-statistic	p-value
Lannet_k – Lannet_p	-0.469	0.643
ETE_k – ETE_p	0.187	0.853
Laz_k – Laz_p	1.747	0.091
Marfin_k – Marfin_p	-0.220	0.827
ATE_k – ATE_p	0.555	0.583
Emporiki_k – Emporiki_p	-0.172	0.864
Geniki_k – Geniki_p	0.907	0.372
Lesvos_k – Lesvos_p	1.137	0.265
Dias_k – Dias_p	0.597	0.555
Plias_k – Plias_p	0.466	0.644
Alpha_k – Alpha_p	-0.155	0.878
Forth_k – Forth_p	-2.389	0.024
Keranis_k – Keranis_p	-0.366	0.717

TABLE 11

Test of Homogeneity of Variances for 14 days before and after the announcement

	Levene Statistic	p-value
Lannet	1.346	0.250
ETE	7.085	0.010
Laz	0.228	0.635
Marfin	8.144	0.006
ATE	3.052	0.085
Emporiki	1.948	0.167
Geniki	0.782	0.380
Lesvos	5.772	0.019
Dias	0.122	0.728
Plias	0.030	0.863
Alpha	1.598	0.211
Forth	10.987	0.001
Keranis	1.874	0.176

TABLE 12

Paired Samples Correlations for 14 days before and after the announcement

	Correlation	p-value
Lannet_k & Lannet_p	-0.284	0.128
ETE_k & ETE_p	0.137	0.470
Laz_k & Laz_p	0.353	0.056
Marfin_k & Marfin_p	-0.397	0.030
ATE_k & ATE_p	-0.043	0.823
Emporiki_k & Emporiki_p	-0.382	0.037
Geniki_k & Geniki_p	-0.323	0.082
Lesvos_k & Lesvos_p	-0.014	0.942
Dias_k & Dias_p	-0.131	0.491
Plias_k & Plias_p	-0.122	0.520
Alpha_k & Alpha_p	-0.138	0.468
Forth_k & Forth_p	-0.027	0.889
Keranis_k & Keranis_p	-0.088	0.642

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## Resumo

Este artigo tem como objectivo analisar teorias da estrutura de capitais com particular enfoque na teoria da sinalização. Este trabalho de investigação visa constatar se esta teoria da estrutura de capital é viável para empresas cotadas na bolsa de valores de Atenas. As empresas estudadas procederam a aumentos de capital entre 2004 e 2006, estudando-se neste artigo as reacções das cotações aos anúncios feitos.

**Palavras-Chave:** Estrutura de capitais; teoria da sinalização.

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