

**DIVIDEND YIELDS FOR FORECASTING STOCK MARKET RETURNS:
AN EMPIRICAL EVIDENCE FROM THE ATHENS STOCK EXCHANGE**

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ΔΗΛΩΣΗ ΕΚΠΟΝΗΣΗΣ ΜΕΤΑΠΤΥΧΙΑΚΗΣ ΕΡΓΑΣΙΑΣ

(περιλαμβάνεται, μαζί με τα υπόλοιπα στοιχεία που απαιτούνται, στην πρώτη σελίδα της εργασίας)

«Δηλώνω υπεύθυνα ότι η συγκεκριμένη μεταπτυχιακή εργασία για τη λήψη του Μεταπτυχιακού Διπλώματος Ειδίκευσης στη Διοίκηση Επιχειρήσεων, έχει συγγραφεί από εμένα προσωπικά και δεν έχει υποβληθεί ούτε έχει εγκριθεί στο πλαίσιο κάποιου άλλου μεταπτυχιακού ή προπτυχιακού τίτλου σπουδών, στην Ελλάδα ή στο εξωτερικό.

Η εργασία αυτή έχοντας εκπονηθεί από εμένα, αντιπροσωπεύει τις προσωπικές μου απόψεις επί του θέματος. Οι πηγές στις οποίες ανέτρεξα για την εκπόνηση της συγκεκριμένης μεταπτυχιακής αναφέρονται στο σύνολό τους, δίνοντας πλήρεις αναφορές στους συγγραφείς, συμπεριλαμβανομένων και των πηγών που ενδεχομένως χρησιμοποιήθηκαν από το διαδίκτυο».

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TABLE OF CONTENTS

SUMMARY	8
INTRODUCTION	10
CHAPTER 1	12
LITERATURE REVIEW	12
1.1. CAPITAL ASSET PRICING MODEL (CAPM)	14
1.2. EFFICIENT MARKET HYPOTHESIS	19
1.3. MARKET ANOMALIES IN THE CAPITAL & MONEY MARKETS	23
CHAPTER 2	40
DATA AND METHODOLOGY	40
2.1. DATA	41
2.2. METHODOLOGY	43
CHAPTER 3	45
EMPIRICAL FINDINGS	45
3.1. EMPIRICAL RESULTS FOR THE SUBPERIODS 2000 - 2005 AND 2006 - 2010	48
CONCLUSIONS	52
REFERENCES	54

ΠΕΡΙΛΗΨΗ

Ζούμε σε έναν παγκοσμιοποιημένο κόσμο, όπου οι συνθήκες αλλάζουν πολύ γρήγορα και τα μοντέλα και θεωρίες που αντανάκλασαν την πραγματικότητα μέχρι πρόσφατα, σήμερα δεν μπορούν να την ερμηνεύσουν. Έννοιες, όπως το CAPM και η υπόθεση της αποτελεσματικής αγοράς έχουν, ιδιαίτερα τα τελευταία χρόνια, αμφισβητηθεί από ερευνητές που υποστηρίζουν ότι τα συμπεράσματα από αυτές τις θεωρίες δεν ισχύουν πια. Αυτοί οι ερευνητές προτείνουν διαφορετικούς τρόπους μελέτης της συμπεριφοράς των αποδόσεων, καθώς βρήκαν εμπειρικά ότι αυτές οι μεταβλητές που σχετίζονται με τα θεμελιώδη στοιχεία μιας εταιρείας μπορεί να προσδιορίσουν καλύτερα τις αποδόσεις των τίτλων.

Αυτός είναι, ως εκ τούτου, ο στόχος της διπλωματικής αυτής: η έρευνα των θεμελιωδών μεταβλητών που μπορούν να εξηγήσουν και να προβλέψουν τις μελλοντικές αποδόσεις της χρηματιστηριακής αγοράς. Η έρευνά μας εξετάζει ειδικά τη συμπεριφορά της μερισματικής απόδοσης στο Χρηματιστήριο Αθηνών για μια δεκαετία.

Οι ανωμαλίες της αγοράς ήταν πάντα ένα αντικείμενο της έρευνας από πολλούς μελετητές και των επαγγελματιών των χρηματοπιστωτικών, δεδομένου ότι δημιουργεί ευκαιρίες για υπερκέρδη και λήψη αποφάσεων που βασίζονται σε προηγούμενες πληροφορίες. Μεταξύ άλλων, οι Basu (1997), Fama και French (1992), Jaffe κ.ά (1989), καθώς και οι Lakonishok κ.ά (1994) τεκμηρίωσαν την αναποτελεσματικότητα της αγοράς σε σχέση με το P/E για παράδειγμα, στις αγορές των ΗΠΑ και του Ηνωμένου Βασιλείου σε διαφορετικές χρονικές περιόδους. Στη μελέτη μας παρουσιάζουμε αναλυτικά μερικές από τις πιο σημαντικές θεμελιώδεις μεταβλητές που είναι το μέγεθος μιας επιχείρησης, όπως υπολογίζεται με τη μεταβλητή της χρηματιστηριακής αξίας της αγοράς, το BV/MV, η τιμή προς κέρδη (P/E), ο λόγος (CF/P), η αύξηση των πωλήσεων και τέλος, παρουσιάζουμε τη μερισματική απόδοση και τη σημασία της για την πρόβλεψη των αποδόσεων των τιμών των μετοχών. Βασιζόμαστε σε αυτή τη μεταβλητή, προκειμένου να εξετάσουμε αν η μεταβλητή αυτή μπορεί να προβλέψει τις αποδόσεις των τιμών των μετοχών για τις επιχειρήσεις που περιλαμβάνονται στο Χρηματιστήριο Αξιών Αθηνών (ΧΑΑ) κατά τη διάρκεια μιας περιόδου 10 ετών (2000 - 2010).

Η μεθοδολογία που υιοθετήθηκε βασίζεται στην ανάλυση παλινδρόμησης. Χρησιμοποιώντας διαστρωματικές παλινδρομήσεις καταφέραμε να αποδείξουμε αν τεκμηριώνεται η προβλεψιμότητα της μερισματικής απόδοσης. Ο κύριος στόχος αυτής της ανάλυσης είναι η εμπειρική διερεύνηση της μερισματικής απόδοσης, έτσι ώστε να διαπιστωθεί αν η προαναφερθείσα βασική μεταβλητή μπορεί να προβλέψει τις μελλοντικές αποδόσεις της ελληνικής χρηματιστηριακής αγοράς.

Τα αποτελέσματά μας έχουν επεκταθεί σε ολόκληρη την περίοδο δέκα ετών (η περίοδος αυτή εκτείνεται από 2000 - 2010) και για δύο διαφορετικές υποπεριόδους

(2000 - 2005 και 2006 - 2010). Τα στοιχεία από παλαιότερες έρευνες έχουν υποστηρίξει ότι η αναποτελεσματικότητα της μερισματικής απόδοσης ισχύει και για το Ηνωμένο Βασίλειο και την αγορά των ΗΠΑ και επομένως οι μερισματικές αποδόσεις μπορούν να χρησιμοποιηθούν για την επιλογή των μετοχών εκείνων που θα πετύχουν εξαιρετικές αποδόσεις στο μέλλον. Η ίδια υπόθεση φαίνεται να είναι έγκυρη και για το Χρηματιστήριο Αξιών Αθηνών.

Ωστόσο, τα εμπειρικά ευρήματα της δικής μας ανάλυσης δεν ταιριάζουν με εκείνα άλλων μελετών. Τα αποτελέσματά μας δείχνουν μια αδύναμη (σχεδόν μηδενική) αρνητική σχέση μεταξύ του λόγου της μερισματικής απόδοσης και των αποδόσεων των μετοχών. Τα ευρήματα αυτά υποδηλώνουν ότι η μερισματική απόδοση δεν αποτελεί καθοριστικό παράγοντα των μελλοντικών αποδόσεων των τιμών των μετοχών στην ελληνική χρηματιστηριακή αγορά.

Επιπλέον, πρέπει να σημειωθεί ότι, αν στην έρευνά μας προσθέσουμε μια άλλη μεταβλητή που είναι το BV/MV , αυτή η μεταβλητή δεν μπορεί να εξηγήσει επαρκώς τις αποδόσεις των μετοχών στην αγορά του χρηματιστηρίου Αθηνών για το συγκεκριμένο χρονικό διάστημα. Τέλος, διαπιστώσαμε ότι για τις δύο υποπεριόδους (2000-2005, 2006-2010) τα ευρήματά μας είναι παρόμοια με αυτά που βρήκαμε για το σύνολο της περιόδου. Ως εκ τούτου, η μερισματική απόδοση δεν μπορεί να προβλέψει τις μελλοντικές αποδόσεις των μετοχών στην αγορά, ούτε την πρώτη ούτε τη δεύτερη υποπερίοδο. Επιπλέον, τα ευρήματα για τη μεταβλητή BV/MV επιβεβαιώνουν το αρχικό συμπέρασμα, καθώς παρατηρείται ότι η προβλεψιμότητα της δεν είναι αρκετά ισχυρή και τα αποτελέσματα αυτά ισχύουν και για τις δύο υποπεριόδους.

Η παρούσα μελέτη διερευνά την αποτελεσματικότητα της ελληνικής χρηματιστηριακής αγοράς. Η εμπειρική έρευνα εξέτασε τη συμπεριφορά μιας συγκεκριμένης θεμελιώδους μεταβλητής που είναι η μερισματική απόδοση σε σχέση με τις μελλοντικές αποδόσεις της χρηματιστηριακής αγοράς. Διαπιστώθηκε ότι δεν υπάρχει καμία σχέση μεταξύ της μερισματικής απόδοσης και των μελλοντικών αποδόσεων στη χρηματιστηριακή αγορά σε μια περίοδο δέκα ετών και, επιπλέον, διαπιστώθηκε ότι η και η προβλεψιμότητα της άλλης μεταβλητής (BV/MV) είναι εξίσου πολύ αδύναμη.

SUMMARY

We, nowadays, live in a globalized world where the conditions change very fast and models and theories that reflected the reality until recently, today they cannot interpret it. Concepts, like the Capital Asset Pricing Model and the Efficient Market Hypothesis have, particularly the last years, been doubted as there are researchers who maintain that the conclusions of these theories are not valid anymore. These researchers suggest different ways of studies of the behavior of the returns, as they found empirically that these variables which relate to fundamental elements of a firm can determine better the returns of securities.

This is, therefore, the goal of our paper: the investigation of fundamental variables which can explain and predict the future stock market returns. In our research we examine specifically the behavior of the dividend yield in the Athens stock exchange for a decade (2000-2010).

Market anomalies have always been an object of research by many scholars and financial professionals since they create opportunities for abnormal gains to be earned by profitable investment decision-making based on past information. Among others, Basu (1997), Fama and French (1992), Jaffe, et.al. (1989), as well as, Lakonishok, et.al. (1994) documented the existence of P/E effect, for example, as market inefficiency, in the US and UK markets at different periods of time. In our study we present in detail some of the most significant fundamental variables which are the size of a firm as it is counted with the variable of the Market value, the Book to Market Ratio, the Sales to Price, the Price to Earnings (P/E), the Cash Flow to Price (CF/P), the sales growth and finally we present the dividend yield and its significance to the prediction of the stock market returns. We base on this variable in order to examine the possibility this variable to can predict the stock market returns for firms listed on Athens Stock Exchange (ASE) during a period of 10 years (2000 - 2010).

The methodology that we adopted was based on regression analysis. Using cross-sectional regressions we managed to produce evidence that documented the predictability of the dividend yield. The main goal of this analysis is the empirical investigation of the dividend yield so that to be noted whether the aforementioned fundamental variable can predict the future stock market returns in the Greek stock market.

Our results were extended to a whole period of ten years (this period extends from 2000 – 2010) and for two different subperiods (extended from 2000 – 2005 and 2006 – 2010). Evidence from past research has argued that dividend yield inefficiency holds for the UK and the US markets since dividend yields can be used for selecting stocks that would earn exceptional future returns. The same case is found to be valid for ASE.

However, our empirical findings do not match with those of other studies. Our results demonstrate a weak (almost zero) negative relationship between the dividend yields ratio and the subsequent equity returns. These findings indicate that the dividend yield is not a determinant factor of the future stock market returns in the Greek stock market.

Furthermore, it is noted that if we add to our investigation another variable which is BV/MV, this variable cannot explain adequately the stock market returns in the Athens stock exchange for this specific period. Finally, we found that for the two subperiods (2000-2005, 2006-2010) our findings are similar to these one we found for the whole period. Therefore, the dividend yield cannot predict the future stock market returns in nor the first subperiod neither the second one. Furthermore, the findings for variable BV/MV confirms the initial conclusion as it is observed that its predictability power is not strong enough and these results are valid for both the two subperiods.

The current dissertation explores the efficiency of the Greek stock market. This empirical research examined the behavior of a specific fundamental variable which is the dividend yield in relation to the future stock market returns. It found that there is no relationship between the dividend yield and the future stock market returns in a range of ten years and furthermore we found that the predictability of another variable (BV/MV) is too weak as well.

INTRODUCTION

We live in a globalized environment where the economies of the countries interact and the situation in which an economy is, can affect the other ones. A characteristic example of our sayings is the experience, nowadays, of the Greek economy. The financial imbalances of the Greek economy influence the economic situation of other countries as we act and trade in an open world where the actions (political and economic) of an economy, regardless its size, may affect other economies which may be stronger. Therefore, whereas the contribution of the gross domestic product of the Greek economy to the world economy is too small, however the financial situation of this market has influenced not only the emerging markets but also the established economies as well. It is obvious observing the current situation in the world economy that the initial financial problem of Greece has transferred to other economies which have similar characteristics (for example, high deficit, low competitive market etc). Parallel to this and a crucial question is whether the globalization contributes to the right distribution of the wealth. Undoubtedly, the right allocation of the wealth to these changing circumstances relate surely with the risk which we wish to accept. So, the undertaking of any huge risk shall be accompanied with returns which justify this risk. Therefore, it is sought the wealth to be invested to these economies and markets where there is the best combination between the risk and the return so that the investors to have the best return with the less risk. The markets are based on the above rule as their behavior in relation to the risk is part of an extended study in the world economy.

The complexity of the world financial system has made the markets realize that the behavior of the stock market returns depends on many factors which have been taken into consideration if someone wishes to decrease or eliminates the undertaking risk. Many researchers have observed that as the conditions change in the world economy, models and theories that reflected the reality until recently, today they cannot interpret it. Concepts, like the Capital Asset Pricing Model and the Efficient Market Hypothesis have, particularly the last years, been doubted as there are researchers who maintain that the conclusions of these theories are not valid anymore. These researchers suggest different ways of studies of the behavior of the returns, as they found empirically that these variables which relate to fundamental elements of a firm can determine better the returns of securities.

This is, therefore, the goal of our paper: the investigation of fundamental variables which can explain and predict the future stock market returns. More specifically, our research focuses on the behavior of the dividend yield in the Athens stock exchange for a decade.

This study is separated into four sections: 1) Literature Review is a reference to prior research. 2) Data and Methodology describes the process of our analysis. 3)

Empirical Findings presents the results of our research and 4) Conclusion refers to the implications of our findings.

CHAPTER 1

LITERATURE REVIEW

The most well known theory which describes the relationship between the return and the risk is the Capital Market Theory (CMT). This theory was based on the Portfolio Theory¹ which was the first step of the determination of the risk and the CMT describes the way with which the return of an asset is defined.

Sharpe, Lintner and Mossin independently, building on the earlier work of Harry Markowitz on diversification and modern portfolio theory developed the theory in the mid of 1960 and they presented the model of Capital Asset Pricing Model (CAPM)². Until then, number of economists had developed normative models dealing with asset choice under conditions of risk. Markowitz developed an analysis based on the expected utility maxim and proposed a general solution for the portfolio selection problem. Tobin³ showed that under certain conditions Markowitz's model implies that the process of investment choice can be broken down into two phases: first, the choice of a unique optimum combination of risky assets and second a separate choice concerning the allocation of funds between such a combination and a single riskless asset. Hicks⁴ used a model similar to that proposed by Tobin to derive corresponding conclusions about individual investor behavior, dealing somewhat more explicitly with the nature of the conditions under which the process of investment choice can be dichotomized.

Although all the authors cited used virtually the same model of investor behavior none of the above theories attempted to construct a market equilibrium theory of asset prices under conditions of risk. Sharpe theory showed that such an extension provides a theory with implications consistent with the assertions of traditional financial theory described above. This aforementioned theory shed considerable light on the relationship between the price of an asset and the various components of its overall risk. For these reasons this theory considered to be a model of the determination of capital asset prices (CAPM).

In finance, the capital asset pricing model (CAPM) is used to determine a theoretically appropriate required rate of return of an asset if that asset is to be added to an already well-diversified portfolio given that asset's non-diversifiable risk. The model takes into account the asset's sensitivity to non-diversifiable risk (also known as systematic risk or market risk), often represented by the quantity beta (β)

¹ Markowitz H. (1952)

² Sharpe W. (1964)

³ Tobin J. (1958)

⁴ Hicks J. (1961)

in the financial industry, as well as the expected return of the market and the expected return of a theoretical risk-free asset.

This model and its theory is one of the most significant theories in the finance and although there are some doubts for this theory⁵ which tend to reject the CAPM model as a good theory of the explanation of the returns in the stock market of United States, this model has achieved to describe with a simple way complicated relationships and ideas.

The Efficient Market Hypothesis (EMH) is the key which the modern finance theory has been based on⁶. According to this theory in an efficient market the present values of the securities reflect the available information. The primary role of the capital market is allocation of ownership of the economy's capital stock. The ideal is a market in which prices provide accurate signals for resource allocation: that is, a market in which firms can make production – investment decisions and investors can choose among the securities that represent ownership of firms' activities under the assumption that security prices at any time "fully reflect" all available information. A market in which prices always "fully reflect" available information is called "efficient".

In other words a market is efficient when the prices of the securities reflect all the information concerning the future profits, the dividends, the rate increase of dividends, the risk of the security, the expected return and in general any information that could affect the price. As a result, in an efficient market, any investor cannot use historical or published information in order to attempt abnormal (non – ordinary) returns. The reason is simple: this information has already been discounted and is included in the price of the security. The investors will achieve just ordinary returns similar to the risk the investors undertake⁷.

The recent years, a lot of scientific studies have brought in the surface new theories that tend to dispute all that we have already discussed before. More specifically, these theories doubt if CAPM can explain the returns of the securities or whether in an efficient market the current change of the price of a share is independent from a previous change. The changes, therefore, are random variables which follow a random procedure or as it is referred in the bibliography a "random walk"⁸.

The common element to the above theories, that is CAPM and the Efficient Market Hypothesis (EMH) is the fact that the investors are considered to be reasonable. These investors take decisions trying to maximize the total utility. In practice, new theories are formulated and these doubt to the classical ones. According to these, the traditional models do not interpret appropriate the behavior of the investor as this one can be affected and to take decisions that are based on psychological or

⁵ Banz R. (1981), Reinganum M. (1981)

⁶ Fama E. (1970)

⁷ Spyrou S. (2001)

⁸ Elton E., Gruber M. and Blake C. (1996)

subjective factors. Therefore, a new branch of the finance is the behavioral finance. In the behavioral finance there are opinions that were considered to be heretic such as the concept of the marginal rational investor. According to this opinion, it is content the marginal investor who takes the decision to be rational and the prices will be determined with a rational way.

Furthermore, recent studies, starting from the stock market of the United States of America, give a new dimension regarding how the returns of the stock market are explained. These studies have shown that there are some fundamentals variables which explain the stock market returns.

Some of these variables can be the size, the ratio E/P , the ratio BV/MV , the ratio S/P , the ratio CF/P and the dividend yield.

In the continuance of the bibliography presentation, there are concepts that are presented in depth such as the model of CAPM, the Efficient Market Hypothesis, theories that are considered to be the base of the finance until now. Furthermore, we present some fundamental variables, the relationship these variables may have with the stock returns and we describe the fundamental variable of the dividend yield in detail. Furthermore we present the reasons why this variable is important and finally we examine empirically if there is any relationship between this variable and the stock returns in the Athens Stock Exchange.

1.1. CAPITAL ASSET PRICING MODEL (CAPM)

CAPM is one of the most significant theories in finance and it is the base of the financial economics. This model is based on the Portfolio Theory of Markowitz⁹. Markowitz showed that the variance of the rate of return is a meaningful measure of portfolio risk under a reasonable set of assumptions. He also derived a formula for computing the variance of a portfolio. These formulas for the variance of a portfolio not only indicate the importance of diversifying the investments to reduce the total risk of a portfolio, but also showed how to effectively diversify.

The Markowitz model is based on several assumptions regarding the behavior of investors. First of all, investors consider each investment alternative as being presented by a probability distribution of expected returns over some holding period. Furthermore, investors minimize one-period expected utility and their utility curves demonstrate diminishing marginal utility of wealth. They estimate the risk of the portfolio on the basis of the variability of expected returns. Investors base decisions solely on expected return and risk, so their utility curves are a function of expected return and the expected variance (or standard deviation) of returns only. For a given risk level, investors prefer higher returns to lower returns. Similarly, for a given level of expected returns, investors prefer less risk to more risk.

⁹ Spyrou S. (2001)

CAPM is based on the Portfolio theory of Markowitz. This model, in contrast to Markowitz analysis that is based only to securities which are risky, includes and securities that are free of risk and these securities consist of an important part of the portfolio of the average investor. Therefore, the Capital Market Theory where CAPM is based on, is the natural extension of Portfolio theory as this model analyses what happened when securities that bring risk and securities free of risk are combined.

CAPM is based on some assumptions which are necessary in order to pose it correctly. The most important are the following:

All investors,

- Aim to maximize economic utilities.
- Are rational and risk-averse.
- Are broadly diversified across a range of investments.
- Are price takers meaning that they cannot influence prices.
- Can lend and borrow unlimited amounts under the risk free rate of interest.
- Trade without transaction or taxation costs.
- Deal with securities that are all highly divisible into small parcels.
- Assume all information is available at the same time to all investors.

Further, the model assumes that standard deviation of past returns is a perfect proxy for the future risk associated with a given security¹⁰.

In short, the CAPM assumptions imply that the market portfolio must be on the minimum variance frontier if the asset market is to clear.

The market reward-to-risk ratio is effectively the market risk premium and by rearranging the above equation and solving for $E(R_i)$, we obtain the Capital Asset Pricing Model (CAPM) as it is presented below:

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

where:

$E(R_i)$ is the expected return on the capital asset.

R_f is the risk-free rate of interest such as interest arising from government bonds.

β_i (the beta) is the sensitivity of the expected excess asset returns to the expected excess market returns, or also

$$\beta_i = \frac{\text{Cov}(R_i, R_m)}{\text{Var}(R_m)}$$

$E(R_m)$ is the expected return of the market.

$E(R_m) - R_f$ is sometimes known as the market premium (the difference between the expected market rate of return and the risk-free rate of return).

$E(R_i) - R_f$ is also known as the risk premium

¹⁰ http://en.wikipedia.org/wiki/Capital_asset_pricing_model (Assumptions of CAPM)

Restated, in terms of risk premium, we find that:

$$E(R_i) - R_f = \beta_i(E(R_m) - R_f)$$

which states that the individual risk premium equals the market premium times β .

The aforementioned relationship which describes the relationship between the expected return is in its simple form the equation that Sharpe, Lintner and Treynor developed in the mid of 1960¹¹. For more than 75 years the market risk premium has been calculated in an average of 9% annually.

Therefore, it is obvious that CAPM explains simply but schematically the relationship between the expected return and the risk. But a financial model is a simplistic representation of the reality. It serves both to interpret situations and to know whether what we interpret is valid. This happens exactly with CAPM as well. It interprets with a simple way the concept of the risk and its relationship with the expected return an investor asks. Despite the significance of this model in the finance, there are some studies which tend to reject CAPM as this model faces some problems some of the most significant are the followings:

- The model assumes that the variance of returns is an adequate measurement of risk. This would be implied by the assumption that returns are normally distributed, or indeed are distributed in any two-parameter way, but for general return distributions other risk measures will reflect the active and potential shareholders' preferences more adequately. Indeed risk in financial investments is not variance in itself, rather it is the probability of losing: it is asymmetric in nature.
- The model assumes that the probability beliefs of active and potential shareholders match the true distribution of returns. A different possibility is that active and potential shareholders' expectations are biased, causing market prices to be informationally inefficient. This possibility is studied in the field of behavioral finance, which uses psychological assumptions to provide alternatives to the CAPM such as the overconfidence - based asset pricing model of Kent Daniel, David Hirshleifer, and Avanidhar Subrahmanyam.
- The model does not appear to adequately explain the variation in stock returns. Empirical studies show that low beta stocks may offer higher returns than the model would predict. Either that fact is itself rational (which saves the efficient-market hypothesis but makes CAPM wrong), or it is irrational (which saves CAPM, but makes the EMH wrong – indeed, this possibility makes volatility arbitrage a strategy for reliably beating the market).
- The model assumes that given a certain expected return, active and potential shareholders will prefer lower risk (lower variance) to higher risk and conversely given a certain level of risk will prefer higher returns to lower ones. It does not allow for active and potential shareholders who will accept lower returns for higher risk.

¹¹ Sharpe W. (1964), Lintner J. (1965) and Treynor J. (1961, unpublished)

- The model assumes that there are no taxes or transaction costs, although this assumption may be relaxed with more complicated versions of the model.
- The market portfolio consists of all assets in all markets, where each asset is weighted by its market capitalization. This assumes no preference between markets and assets for individual active and potential shareholders, and that active and potential shareholders choose assets solely as a function of their risk-return profile. It also assumes that all assets are infinitely divisible as to the amount which may be held or transacted.
- The market portfolio should in theory include all types of assets that are held by anyone as an investment (including works of art, real estate, human capital). In practice, such a market portfolio is unobservable and people usually substitute a stock index as a proxy for the true market portfolio. Unfortunately, it has been shown that this substitution is not innocuous and can lead to false inferences as to the validity of the CAPM, and it has been said that due to the inobservability of the true market portfolio, the CAPM might not be empirically testable. This was presented in greater depth in a paper by Richard Roll in 1977, and is generally referred to as Roll's critique.
- Finally, empirical tests show market anomalies like the size and value effect that cannot be explained by the CAPM.

Studies that doubted the efficiency of the CAPM to predict the returns of the stocks with an efficient way starting to appear in the late 1970s. Specifically, evidence mounts that much of the variation in expected return is unrelated to market beta.

The first blow is Basu's¹² (1977) evidence that when common stocks are sorted on earnings-price ratios, future returns on high E/P stocks are higher than predicted by the CAPM. Banz¹³ (1981) documents a size effect which means that when stocks are sorted on market capitalization (price times shares outstanding), average returns on small stocks are higher than predicted by the CAPM. Bhandari¹⁴ (1988) finds that high debt-equity ratios (book value of debt over the market value of equity, a measure of leverage) are associated with returns that are too high relative to their market betas. Finally, Statman¹⁵ (1980) and Rosenberg, Reid, and Lanstein¹⁶ (1985) document that stocks with high book-to-market equity ratios (BV/MV, the ratio of the book value of a common stock to its market value) have high average returns that are not captured by their betas.

There is a theme in the contradictions of the CAPM summarized above. Ratios involving stock prices have information about expected returns missed by market betas. On reflection, this is not surprising. A stock's price depends not only on the

¹² Basu S. (1977)

¹³ Banz R.W. (1981)

¹⁴ Bhandari C. (1988)

¹⁵ Statman D. (1980)

¹⁶ Rosenberg B, Reid K. and Lanstein R. (1985)

expected cash flows it will provide, but also on the expected returns that discount expected cash flows back to the present. Thus, in principle the cross-section of prices has information about the cross-section of expected returns. (A high expected return implies a high discount rate and a low price.) The cross-section of stock prices is, however, arbitrarily affected by differences in scale (or units).

The contradictions of the CAPM summarized above suggest that earnings-price, debt-equity, and book-to-market ratios indeed play this role. Fama and French¹⁷ (1992) update and synthesize the evidence on the empirical failures of the CAPM. Using the cross-section regression approach, they confirm that size, earnings-price, debt–equity and book-to-market ratios add to the explanation of expected stock returns provided by market beta. Fama and French¹⁸ (1996) reach the same conclusion using the time-series regression approach applied to portfolios of stocks sorted on price ratios. They also found that different price ratios have much the same information about expected returns. This is not surprising given that price is the common driving force in the price ratios, and the numerators are just scaling variables used to extract the information in price about expected returns.

Fama and French (1992) also confirm the evidence of Lakonishok and Shapiro¹⁹, (1986) that the relation between average return and beta for common stocks is even flatter after the sample periods used in the early empirical work on the CAPM.

Despite the fact that these aforementioned theories tended to doubt the CAPM model, due to the fact that the Capital Market Theory and therefore CAPM model have significant influence in the financial science, many academic studies tried to test whether the stocks in the real world and therefore its returns behave with a way the theory indicates.

A significant study is that of Fama and MacBeth²⁰ (1973) who confirmed using data from the New York Stock Exchange that first of all the expected return of a security item has a positive relationship with the systematic risk as this risk is expressed with beta (β) and secondly beta explains the behavioral of the stock returns very well.

Furthermore, another study which confirms the validity of CAPM is this of Black²¹ (1993). According to the results of Black study who investigated a period of 60 years in the New York Stock Exchange, from 1931 to 1991, it is proved that the stocks with high beta (β) present better performance than those stocks with lower beta (β). Indeed, the study showed that the relationship between the risk and the average returns is too strong from 1931 to 1966 and this relationship is weaker from 1966 to 1991. An explanation for the above fact is that the data of the first and longer period is more reasonable and additionally the returns reflect expectations and therefore

¹⁷ Fama F. and French K. (1992)

¹⁸ Fama F. and French K. (1996)

¹⁹ Lakonishok J. and Shapiro A. (1986)

²⁰ Fama F. and MacBeth J. (1973)

²¹ Black F. (1993)

incorporate “noise”, especially in the second period this “noise” makes difficult to judge if CAPM applies better in the first or the second examined period.

1.2. EFFICIENT MARKET HYPOTHESIS

The Efficient Market Hypothesis is one of the most significant theories in the financial science. Fama²² is considered to be the founder of the theory of the Efficient Markets. Nevertheless, the concept of the efficient capital started with a random discovery. In 1953, Kendall²³ presented an article that caused controversy as this article referred to the behavior of the stock and commodity prices. Kendall was expecting to find that the prices would follow circles which mean that he expected to see whether these prices could be forecasted. However, he observed that this was not true. He noted that the prices of the stock and the commodities followed a “Random Walk”.

Therefore, before Fama (1970) formulates his theory of the Efficient Markets, there were some elements relative to the Efficient Market Hypothesis. Nevertheless, Fama explained in detail the concept of the theory of the efficient markets. He noted the theory that in an efficient market the current prices of the securities reflect all the necessary information with a fast and accurate way. In consequence of this, one cannot consistently achieve returns in excess of average market returns on a risk-adjusted basis, given the information available at the time the investment is made. Therefore, in an efficient market the current variance in the stock price comes from unexpected information. The past information is not important while this information has been discounted and now is reflected to the price. If changes in the past prices could be used in order to predict changes in the future prices, then the investors would have the opportunity to achieve fast and without big effort earnings. However, in an efficient market these profits do not endure. As the investors will try to advantage of the information for the past prices, these prices will adjust immediately until these non – ordinary profits to disappear. The result will be the information of the past prices to be reflected in the current stock price. In other words, the prices of the securities will follow a “Random Walk”.

There are three major versions of the hypothesis²⁴: “weak”, “semi-strong”, and “strong”. The weak-form of the Efficient Market Hypothesis (EMH) claims that prices on traded assets (e.g., stocks, bonds, or property) already reflect all past publicly available information. The semi-strong-form EMH claims both that prices reflect all publicly available information and that prices instantly change to reflect new public

²² Fama F. (1970)

²³ Kendall M. (1953)

²⁴ http://en.wikipedia.org/wiki/Efficient-market_hypothesis

information. The strong-form EMH additionally claims that prices instantly reflect even hidden or "insider" information.

In weak-form efficiency, future prices cannot be predicted by analyzing prices from the past. Excess returns cannot be earned in the long run by using investment strategies based on historical share prices or other historical data. Technical analysis techniques will not be able to consistently produce excess returns, though some forms of fundamental analysis may still provide excess returns. Share prices exhibit no serial dependencies, meaning that there are no "patterns" to asset prices. This implies that future price movements are determined entirely by information not contained in the price series. Hence, prices must follow a random walk. This 'soft' EMH does not require that prices remain at or near equilibrium, but only that market participants not be able to systematically profit from market 'inefficiencies'. However, while EMH predicts that all price movement is random, many studies have shown a marked tendency for the stock markets to trend over time periods of weeks or longer and that, moreover, there is a positive correlation between degree of trending and length of time period studied. Various explanations for such large and apparently non - random price movements have been promulgated.

In semi-strong-form efficiency, it is implied that share prices adjust to publicly available new information very rapidly and in an unbiased fashion, such that no excess returns can be earned by trading on that information. Semi-strong-form efficiency implies that neither fundamental analysis nor technical analysis techniques will be able to reliably produce excess returns. To test for semi-strong-form efficiency, the adjustments to previously unknown news must be of a reasonable size and must be instantaneous. To test for this, consistent upward or downward adjustments after the initial change must be looked for. If there are any such adjustments it would suggest that investors had interpreted the information in a biased fashion and hence in an inefficient manner.

In strong-form efficiency, share prices reflect all information, public and private, and no one can earn excess returns. If there are legal barriers to private information becoming public, as with insider trading laws, strong-form efficiency is impossible, except in the case where the laws are universally ignored. To test for strong-form efficiency, a market needs to exist where investors cannot consistently earn excess returns over a long period of time. Even if some money managers are consistently observed to beat the market, no refutation even of strong-form efficiency follows: with hundreds or thousands of fund managers worldwide, even a normal distribution of returns should be expected to produce a few dozen "star" performers.

Empirical analyses have consistently found problems with the efficient-market hypothesis, the most consistent being that stocks with low price to earnings

outperform other stocks²⁵. Alternative theories have proposed that cognitive biases cause these inefficiencies, leading investors to purchase overpriced growth stocks rather than value stocks²⁶. Although the efficient-market hypothesis has become controversial because substantial and lasting inefficiencies are observed, there are studies which consider that it remains a worthwhile starting point²⁷.

Beyond the Efficient Market Theory, there are some conditions which are necessary so as the EMH to be achieved. These conditions are the followings²⁸:

- There are a large number of analysts, investors, brokers who participate actively in the market and continuously analyze and evaluate all available information.
- Market participants should try to maximize their overall utility (utility maximizing agents) and to have rational expectations which will have to adjust them when they receive new information.
- Small investor or group of investors can not affect the stock price.
- The information should be available to everyone in the market at the same time, has no cost and reaches randomly.
- Investors should react quickly and accurately to any new information.
- Rational investors do not systematically wrong in their estimates.
- The wrong estimates do not affect the equilibrium prices because of the rational arbitrage.

In conclusion, beyond the normal utility maximizing agents, the efficient-market hypothesis requires that agents have rational expectations; that on average the population is correct (even if no one person is) and whenever new relevant information appears, the agents update their expectations appropriately. EMH allows that when faced with new information, some investors may overreact and some may underreact. All that is required by the EMH is that investors' reactions be random and follow a normal distribution pattern so that the net effect on market prices cannot be reliably exploited to make an abnormal profit, especially when considering transaction costs. Thus, any one person can be wrong about the market—indeed, everyone can be—but the market as a whole is always right.

Investors and researchers have disputed the efficient-market hypothesis both empirically and theoretically. Behavioral economists attribute the imperfections in financial markets to a combination of cognitive biases such as overconfidence, overreaction, representative bias, information bias, and various other predictable human errors in reasoning and information processing.

²⁵ Basu S. (1977), Rosenberg B., Reid K. and Lanstein R. (1985)

²⁶ Fox J. (2002)

²⁷ Beechey M., Gruen D. and Vickery J. (2000)

²⁸ Σπύρου Σ. (2001)

Empirical evidence has been mixed, but has generally not supported strong forms of the efficient-market hypothesis²⁹. According to Dreman and Berry³⁰, low P/E stocks have greater returns.

One can identify "losers" as stocks that have had poor returns over some number of past years. "Winners" would be those stocks that had high returns over a similar period. The main result of one such study is that losers have much higher average returns than winners over the following period of the same number of years. A later study showed that beta (β) cannot account for this difference in average returns³¹. This tendency of returns to reverse over long horizons is yet another contradiction of EMH. Losers would have to have much higher betas than winners in order to justify the return difference. The study showed that the beta difference required to save the EMH is just not there.

Speculative economic bubbles are an obvious anomaly, in that the market often appears to be driven by buyers operating on irrational exuberance, who take little notice of underlying value. These bubbles are typically followed by an overreaction of frantic selling, allowing shrewd investors to buy stocks at bargain prices. Behavioral psychology approaches to stock market trading are among some of the more promising alternatives to EMH (and some investment strategies seek to exploit exactly such inefficiencies). Indeed defenders of EMH maintain that behavioral finance strengthens the case for EMH in that behavioral finance highlights biases in individuals and committees and not competitive markets.

Further empirical work has highlighted the impact transaction costs have on the concept of market efficiency, with much evidence suggesting that any anomalies pertaining to market inefficiencies are the result of a cost benefit analysis made by those willing to incur the cost of acquiring the valuable information in order to trade on it. Additionally the concept of liquidity is a critical component to capturing "inefficiencies" in tests for abnormal returns. Any test of this proposition faces the joint hypothesis problem, where it is impossible to ever test for market efficiency, since to do so requires the use of a measuring stick against which abnormal returns are compared - one cannot know if the market is efficient if one does not know if a model correctly stipulates the required rate of return. Consequently, a situation arises where either the asset pricing model is incorrect or the market is inefficient, but one has no way of knowing which the case is.

Regardless the criticism of the EMH, the theory of the efficient market is too important to the financial science and for this reason a lot of studies examined if the three common forms, weak-form efficiency, semi-strong form efficiency and strong form efficiency apply or not. First of all, in the weak form the researchers³² counted

²⁹ Basu S. (1977), Rosenberg B., Reid K. and Lanstein R. (1985)

³⁰ Dreman N. and Berry A. (1995)

³¹ Chopra N., Lakonishok J. and Ritter R. (1985)

³² De Bondt W. and Thaler R. (1985), Lakonishok J. and Levis M. (1982)

the profitability of some rules that the investors were using, which claimed that following these rules they could find patterns in order to predict the stock prices.

Secondly, in the semi-strong form the researchers³³ counted how fast the stock prices correspond to various information such as profits or dividend announcements, news for mergers and acquisitions etc. A study of two researchers³⁴ indicated how fast the stock prices change when new information becomes available. They found that when a company publishes its last profits or announces a change in the dividend policy, the price is adjusted in the five or ten minutes after the announcement.

Finally, in the strong form some the researchers³⁵ found that the managers of funds could win only for some years the market and therefore they concluded that these managers could not use the information in order to achieve abnormal returns.

The recent years there are various studies for the Greek stock market concerning the Efficient Market Hypothesis. The total of these studies³⁶ conclude that the Greek market may not be efficient and therefore according to the Efficient Market theory as there is no efficiency to the market then any one can predict both the market and the returns as well. But as the theory of the Efficient Market is not valid, the change in the price of a stock will not be random and therefore the current variance can be predicted in relation to the past one.

Furthermore, when CAPM described before, we noted with emphasis that according to CAPM only the systematic risk which is expressed with beta (β) determines the stock returns. Nevertheless, nowadays many studies of researchers tend to reject CAPM as a theory which explains the returns of the securities. These studies claim that except for the systematic risk, there are variables of a firm which explain the stock returns. This phenomenon that apart from the systematic risk there are other variables which determine the returns, is out of CAPM concept and therefore this is considered to be an “anomaly” of the market.

1.3 MARKET ANOMALIES IN THE CAPITAL & MONEY MARKETS

The theories of CAPM and of the Efficient Market Hypothesis have been proved an effective tool for the financial science. In recent years, these theories are getting more and more important as there are studies which doubt for the aforementioned theories. According to these studies CAPM does not explain satisfactorily the behavior of the returns and additionally the basic principle of the Efficient Market Hypothesis is circumvented and therefore the stock returns are not random variables. This phenomenon is well known as market anomalies as it tends to reject the traditional theories. Before describing the market anomaly, we have to say that

³³ Fama F. et al. (1969), Ball B. and Brown P. (1968)

³⁴ Patell J. and Wolfson M. (1984)

³⁵ Finnerty J. (1976), Malkiel B. (1995)

³⁶ Spyrou S. (1998), Dockery E. and Kavussanos M. (1996)

the word “anomaly” has been associated with scientific and technological matters from the very beginning of its use.

The use of the word “anomaly” in financial economics is a deviation from the common or natural order, or an exceptional condition. Of course, we must ask what it is that is “regular,” “common,” “natural,” or “unexceptional” by which we identify an anomaly. In his famous work, the “Structure of Scientific Revolutions”, Thomas Kuhn (1970) supplies us with one answer: Discovery commences with the awareness of anomaly, i.e., with the recognition that nature has somehow violated the paradigm-induced expectations that govern normal science. It then continues with a more or less extended exploration of the area of anomaly. And it closes only when the paradigm theory has been adjusted so that the anomalous has become the expected. Anomalies, by definition, exist only with respect to firmly established expectations.

Market anomalies have always been an object of research by many scholars and financial professionals since these create opportunities for abnormal profits to be earned by profitable investment decision-making based on past information. For instance, among others, Basu (1997), Fama and French (1992), Jaffe, et.al. (1989), Lakonishok et.al. (1994) documented the existence of P/E effect as market inefficiency, in the US and UK markets at different periods of time. These researchers found that high future stock returns are generally associated with initially low P/E stocks so it is possible to accumulate excess returns by taking long positions in such stocks. In the continuance of this study we will present in detail some of the most significant fundamental variables which are the size of a firm as it is counted with the variable of the Market value, the Book to Market Ratio, the Sales to Price, the Price to Earnings (P/E), the Cash Flow to Price (CF/P), the sales growth and finally we present the dividend yield and its significance to the prediction of the stock market returns. We base on this variable in order to examine the possibility this variable to can predict the stock returns for firms listed on Athens Stock Exchange (ASE) during a period of 10 years (2000 - 2010).

Therefore, starting to display the effectiveness of the aforementioned variables, it is crucial to refer the results of some of the most scientific studies. A variable which relates to fundamental features of a firm is the size. One of the first studies which refers to the size effect was that of Banz³⁷. The evidence presented in this study suggests that the CAPM is misspecified. On average, small NYSE firms have had significantly larger risk adjusted returns than large NYSE firms over a forty year period. This size effect is not linear in the market proportion (or the log of the market proportion) but is most pronounced for the smallest firms in the sample. The effect is also not very stable through time. There is no theoretical foundation for such an effect. The study does not conclude surely whether the factor is size itself or

³⁷ Banz R. (1981)

whether size is just a proxy for one or more true but unknown factors correlated with size. It is possible, however, to offer some conjectures and even discuss some factors for which size is suspected to proxy. To summarize the study and according to Banz results, the size effect exists but it is not at all clear why it exists. It should be interpreted with caution. It might be tempting to use the size effect, e.g., as the basis for a theory of mergers - large firms are able to pay a premium for the stock of small firms since they will be able to discount the same cash flows at a smaller discount rate. Naturally, this might turn out to be complete nonsense if size were to be shown to be just a proxy.

Furthermore, Reinganum³⁸ in 1981 examined the size effect and noted that firms with small capitalization have greater returns than those firms with big capitalization. Additionally, the same researcher in 1983 ascertained that small firms experience large returns in January and exceptionally large returns during the first few trading days of January. The empirical tests of this study indicate that the abnormally high returns witnessed at the very beginning of January appear to be consistent with tax-loss selling. However, tax-loss selling cannot explain the entire January seasonal effect. The small firms least likely to be sold for tax reasons (prior year 'winners') also exhibit large average January returns, although not unusually large returns during the first few days of January.

Moreover, Keim in the same year as Reinganum (1983) examined month-by-month, the empirical relation between abnormal returns and market value of NYSE and AMEX common stocks. He noted that daily abnormal return distributions in January have large means relative to the remaining eleven months and that the relation between abnormal returns and size is always negative and more pronounced in January than in any other month — even in years when, on average, large firms earn larger risk-adjusted returns than small firms. In particular, nearly fifty percent of the average magnitude of the 'sizeeffect' over the period 1963–1979 is due to January abnormal returns. Further, more than fifty percent of the January premium is attributable to large abnormal returns during the first week of trading in the year, particularly on the first trading day.

In addition to the above studies, Leledakis et al. (2003) examined the validity of the size effect in the period of 10 years in the Athens Stock Exchange. Their study was an investigation into the cross-sectional determinants of stock returns in a small market, the Athens Stock Exchange. A further empirical problem that was addressed was the possibility that the results were being driven by the 'January effect'. The findings for the Athens market suggest that there was only one substantive variable in explaining the cross-sectional variation of market and that is market equity (which captures a size effect).

³⁸ Reinganum M. (1981)

Another study that examines the relationship between the returns and the size of the firm is this of Lam and Spyrou (2003). This study examines the association of a number of fundamental variables with the cross section of stock returns in the Hong Kong Stock Exchange. The results suggest that, during the 1990s, the small-firm effect has actually gone into reverse and that size and book-to-market equity have a statistically significant relationship with average returns. Beta has little or no role as an explanatory variable. This conclusion is in contrast to the results of the studies that we have already presented.

From the results of a study of Reinganum (1982) arises the fact that the effect of the size exists regardless the underestimation of beta (β) which as it is described from CAPM, is considered to be the only factor which determines the stock returns. More specifically, Reinganum indicates that small firms earn higher average rates of return than large firms, even after accounting for beta risk. Roll conjectured that the small firm effect might be attributed to improper estimation of security betas. The evidence shows that while the direction of the bias in beta estimation is consistent with Roll's conjecture, the magnitude of the bias appears to be too small to explain the firm size effect.

Additionally, a study of Lau et al. (2002), using data from Singapore and Malaysia for the period 1988–1996, examined the relationship between stock returns and beta, size, the earnings-to-price ratio, the cash flow-to-price ratio, the book-to-market equity ratio, and sales growth (SG). They found the presence of anomalies in these emerging markets. There is a conditional relationship between beta and stock returns for both countries. During months with positive market excess returns, there is a significant positive relationship. They also found a negative relationship between beta and stock returns during months with negative market excess returns. They documented the existence of a negative relationship between stock returns and size for both countries. Indeed, for Malaysia, they observed that the aforementioned influence is not absorbed by the influence of the variable earnings to price. These relationships are only significant in non - January months.

Chou et al. (2000) in their study examined if the size is a determinant factor for the stock returns. Although the CAPM is a one-period model which states that the market beta is the sole factor explaining the cross-sectional variation in expected stock returns, the length of a period is never clearly stated, either theoretically or empirically. This study empirically examined the validity of the CAPM over investment horizons of one month, six months, and one year. Using return data from the Tokyo Stock Exchange, this study investigates how beta, size, and ratio of book to market equity account for the cross-section of expected returns over different lengths of investment horizons. Parallel to the U.S. results, the empirical results show that beta (β), adjusted for infrequent or not, fails to explain the cross-section of monthly expected returns. Nevertheless, it significantly accounts for the cross-section of expected returns over half-year and annual intervals. Size is also a

significant factor explaining the cross - sectional variation, especially for monthly horizon. Its significance, however, diminishes for longer horizons when beta (β) is also included as an additional independent variable.

Other researcher³⁹ argues that the size-related regularities in asset prices should not be regarded as anomalies. Indeed, the opposite result is demonstrated. Namely, a truly anomalous regularity would be if an inverse relation between size and return was not observed. He shows theoretically (1) that the size-related regularities should be observed in the economy and (2) why size will in general explain the part of the cross-section of expected returns left unexplained by an in-correctly specified asset pricing mode. In light of these results he argues that size - related measures should be used in cross - sectional tests to detect model misspecifications. The results of the study provide a theoretical explanation of the size effect within the current asset pricing paradigm.

Finally, Fama and French (1995) studied whether the behavior of stock prices, in relation to size and book to market equity (BE/ME), reflects the behavior of earnings. Stock prices forecast the reversion of earnings growth observed after firms are ranked on size and BE/ME. Finally, there are market size and BE/ME factors in earnings like those in returns. The market and size factors in earnings help explain those in returns. These two researchers (1992) found that two variables, market equity (ME) and the ratio of book equity to market equity (BE/ME) capture much of the cross section of average stock returns. If stocks are priced rationally, systematic differences in average returns are due to differences in risk. Thus, with rational pricing, size (ME, stock price times shares outstanding) and BE/ME must proxy for sensitivity to common risk factors in returns. They also confirm in 1993 that portfolios constructed to mimic risk factors related to size and BE/ME add substantially to the variation in stock returns explained by a market portfolio. In their study in 1995, they noted that size is also related to profitability. Controlling for BE/ME, small stocks tend to have lower earnings on book equity than do big stocks. The size effect in earnings is, however, largely due to the low profits of small stocks after 1980. Until 1981, profitability shows little relation to size. But the recession of 1981 and 1982 turns into a prolonged earnings depression for small stocks. For some reason, which remains unexplained, small stocks do not participate in the boom of the middle and late 1980s.

Furthermore, except for the described studies above concerning the size effect, there are additionally interesting studies both for established and for emerging markets⁴⁰.

³⁹ Berk J. (1995)

⁴⁰ Chan et al. (1991), Lakonishok J. and Shapiro A. (1986), Kim D. (1997), Davis J. (1994), Kothari et al. (1995), etc.

The next variable we present in our study is this of the Book Value of the Equity to the Market Value of the Equity (BV/MV). Most of the studies reach to the conclusion that there is a relationship between BV/MV and the stock returns and this relationship is positive and statistical significant. One of the first studies that examine the influence of the aforementioned variable is this of Fama and French in 1992. These researchers conclude that BV/MV is a determinant factor of the stock returns. Additionally, these two researchers in 1995 investigated whether there is a relationship between the stock prices and the variable of the BV/MV and whether this relationship is in line to the earnings' behavior. Using data from the New York Stock Exchange for a 30-year period noted that high BV/MV (a low stock price relative to book value) signals sustained low earnings on book equity. High BV/MV stocks are less profitable than low BV/MV stocks for four years before and at least five years after ranking dates. In a nutshell, low BV/MV (a high stock price relative to book value) is typical of firms with high average returns on capital (growth stocks), whereas high BV/MV is typical of firms that are relatively distressed.

Like Penman (1991), they found that low book-to-market-equity firms remain more profitable than high BV/MV firms for at least five years after portfolios are formed on BV/MV. Like Lakonishok, Shleifer, and Vishny (1994) however, they found that the growth rates of earnings of low and high BV/MV stocks become more similar in the years after portfolio formation.

Another study which refers to the importance of the BV/MV in relation to the returns is this of Chan et al (1991). These two researchers investigated the Japanese market and the relationship between fundamental variables and stock returns. Their findings refer to a period from 1971 to 1988 and reveal a significant relationship between fundamental variables and expected returns in the Japanese market. The performance of the book to market ratio is especially noteworthy. This variable is statistically and economically the most important of the four variables investigated. Therefore, according to the results of this study, stocks with a high indicator of BV/MV will appear higher returns than those with lower indicator.

Additionally, Dhatt et al. (1999) examined whether there is a relationship between some fundamental variables and the stock returns for the stock exchange in Korea. They found that the variable BV/MV is statistically and economically significant. Using data from 1982 – 1992, they noted that among all the variables they used the ratio BV/MV has the most predictive power for the stock returns. Indeed, these results for a narrowed and emerging market come to strengthen the similar results for the established markets.

Another study which refers to Asiatic market is this of Lam (2002). Using data for the period July 1984–June 1997 he found results which are consistent with the findings of other studies. He noted that the variable BV/MV is a determinant factor of the stock returns and this can explain in combination with the market value and the earnings to price most of the change in the stock returns.

Drew and Veeraraghavan (2003) concluded that the ratio BV/MV is a determinant factor of the stock returns. Using data from 1991 to 1999 for the markets of Hong Kong, Korea, Malaysia and the Philippines, they found that BV/MV can explain the variation in average stock returns in a meaningful manner.

Most of the studies refer to established markets as those of United States and European countries and few are these that investigate emerging capital markets. However, when some studies examine emerging markets, these do not include many markets but examine one by one separately. A study that examines many emerging markets is this of Claessens et al. (1995). They found, that similar to substantial empirical evidence which suggests that a number of factors help to explain the cross sectional pattern of asset returns, this happens as well for nineteen Emerging Markets. Their results confirm some of the existing evidence for developed markets. They noted that the variable P/BV which is the reverse of the variable BV/MV has the opposite results from the ones we described earlier. They observed that the ratio P/BE is statistical significant to the stock returns only in six emerging countries.

Finally, Davis (1994) using a database that is free of survivorship bias found that BV/MV has significant explanatory power to the cross – section of realized stock returns during the period from July 1940 through June 1963. He observed that there is a strong January seasonal in the explanatory power of this variable, even through small stocks are by construction excluded from his sample.

Consequently, the variable of BV/MV most of the examined times has an explanatory power for the stock returns. Concerning the behavior of BV/MV there are many studies⁴¹ which examine the role of this variable to the explanation of the stock returns.

Furthermore, another variable we examine whether it has an explanatory power for the stock returns is the sales to price ratio. A study which investigates whether sales to price can explain the cross sectional of stock market returns is this of Leledakis and Davidson (2001). These two researchers evidenced, gathering data from the London Stock Exchange that S/P and D/E do not entirely absorb the roles of BV/MV and MV in explaining the cross-section of average stock returns in the U.K. market. They found that S/P has significant explanatory power beyond the contribution of BV/MV and Market value but the explanatory power of D/E is captured by Sales to Price.

In addition to the aforementioned study, another one which examines the statistical significance of sales to price and refers to the Greek stock market is this of Leledakis et al. (2003). The emerging markets have proved to be very attractive in the last ten years for the investors as the hope to take advantage of the abnormal returns and the differentiation of the portfolio risk. These researchers using data from Athens

⁴¹ Roseneberg B. et al. (1995), Kim D. (1997), Lam H. and Spyrou S. (2003), Leledakis G. and Davidson I. (2001), Stattman D. (1980)

Stock Exchange from July 1990 to June 2002 reached to the conclusion that sales to price do not have significant influence to the stock returns. Specifically, they noted that this variable when it is used in a model which included only this variable has a marginal influence for the stock returns. If this variable is used in model with other variables as well, for instance the market value and the BV/MV ratio then sales to price is not statistical significant and therefore the variable has no influence to the returns. They also noted that this variable is not statistical significant both for January and to the rest months as well.

Finally, Sheu et al. (1998) investigated the stock exchange of Taiwan for a period of 20 years, from July 1976 to June 1996 and they noted that sales to price can explain the cross sectional of the average returns. Their results reveal a significant cross sectional relationship between this variable and the average returns in the Taiwan capital market. They reach to the conclusion that sales to price have a positive and statistical significant relationship with the stock returns and this is due to the overreaction of the investors.

Furthermore, academic studies have reached to the conclusion that the variable price to earnings ratio and its reciprocal, earnings to price, (earnings yield) is a fundamental variable which can be used as a benchmark for equity valuation⁴². The application of P/E ratio was based on the idea that earnings are related to value. The fact that each share is worth a number of times its current earnings became commonly accepted as market makers and financial investors based their buy/sell decisions on a specific P/E level. The authors (Graham and Dodd) specified that P/E ratio, which is calculated by current fundamentals, never provides an exact appraisal for stocks. The price of equity fluctuates as earnings and any expectations related to them, continuously change through time. However, the P/E multiple can give general guidelines to a conservative stock buyer, by suggesting "speculative stocks". This term was used to describe stocks that comprise greater amount of risk and they should, therefore, be avoided by conservative (risk-averse) investors. Later researches (Basu, Jaffe, Keim and Westerfield and Fama and French) supported the effectiveness of the basic principle of such strategies, using P/E ratio (or E/P). They showed that stocks with low P/E ratios produce higher returns. Their resulting evidence presented P/E ratio as an indicator of underpriced stocks.

Basu⁴³ using a sophisticated cross - sectional analysis managed to present solid evidence that stocks associated with low P/E ratios repeatedly "beat the market", bearing lower degree of systematic risk. He found that the higher annual returns of low P/E portfolios were not related with neither risk (meaning market risk, with the average amount of 100 stocks, each portfolio was well diversified), nor taxes paid for earnings or other transaction costs. The fact that investing to low P/E stocks led to

⁴² Graham B. and Dodd D. (1934)

⁴³ Basu S. (1977)

high statistically significant, abnormal returns is contradictory to the efficient market hypothesis. For as long as past data can be used to predict future returns the market is inefficient. The case is that in a perfect arbitrary market all investors share the same piece of information, so they react immediately and uniformly to any new profitable chance, as soon as it is presented. In this way it is impossible for anyone to accumulate excess returns for a long period of time as the majority of investors will foresee this opportunity and act accordingly. As a result, if theory holds, then investor's behavior will eventually eliminate the P/E anomaly, as more and more market participants will invest in low P/E stocks, driving their prices up. Moreover, the absence of risk- return relationship somehow throws dispute to the estimators of market risk and abnormal returns. Nevertheless, high P/E portfolios were proved to be superior to any other portfolio randomly constructed by stocks from the sample. This superiority of the P/E portfolios was measured using Treynor's and Sharpe's ratios (reward- to- volatility and reward- to- variability measures).

Fama and French⁴⁴ found evidence that questioned the application of beta in the explanation of stock returns. In tandem with the previous research of Basu that although it had been carried out under the assumption of a strong positive relationship between market risk and return, its evidence proved otherwise. The findings of this research were in line with any past evidence regarding the relation between P/E and future stock returns. The researchers concurred to the idea that stocks with low P/E produce higher future returns (on a monthly basis). However, more importance was given to BE/ME ratio, as it appeared to hold more explanatory power when combined with market value - MV (size effect variable).

Of course, other strategies were also implemented to exploit behavioral and physiological factors of investors conduct. Some of these theories justified the existence of P/E anomaly. Researchers⁴⁵ showed that the majority of investors overreact to corporate news. They explained overreaction as the case of intense variances in stock prices which are followed by reverse movements (price corrections) of the same intensity. They showed for instance that when news for increased earnings occur, investors overreact, bidding the company's stock price too high. A correction to price occurs in the following three to five years. Thus, P/E ratio is at high levels in the first year (when price increases relative to earnings) and then slowly reduces until the third or the fifth year where the correction takes place. At the same period, prices drop generating negative returns. As a result, high initial levels of P/E are associated with low subsequent returns. If negative news concerning earnings growth follows, P/E is reduced and high subsequent returns are gained in the next three to five years (during the time of the price correction). It is

⁴⁴ Fama F. and French K. (1995)

⁴⁵ De Bondt W. and Thaler R. (1987)

necessary to underline that the whole idea is based on the assumption that future earnings growth volatility is below price volatility, otherwise the overreaction theory is not capable of explaining the P/E anomaly.

The overreaction hypothesis is consistent with the concept of “winners and losers”. It has been showed that “loser portfolios” gain superior risk - adjusted returns for the subsequent three to five years. They also pointed out an asymmetry of overreaction effect as it appeared to be much larger for “losers” than for “winners”. Hence, the duration of higher returns for the losers was longer than that of the winners (more than five years).

Other variable with explanatory power of the stock returns is this of Cash flow to price (CF/P). Studies which include this variable show that the relationship between the returns of the stock prices and CF/P is sometime positive and statistical significant and sometimes non – statistical significant.

A study which describes the relationship between CF/P and the stock returns is this of Davis (1994). This researcher using a database that is free of survivorship bias found that CF/P has significant explanatory power to the cross – section of realized stock returns during the period from July 1940 through June 1963. He observed that there is a strong January seasonal in the explanatory power of this variable, even through small stocks are by construction excluded from his sample. Also, Chan et al. (1991), in their study whether there is a relationship between fundamentals variables and the stock returns in Tokyo stock exchange, noted that one of the variables which has an explanatory power of the stock returns is this of the cash flow to price.

Also, a variable which can interprets the cross sectional of the average returns of the stock returns is the sales growth. A study of Lau et al. (2002), where this variable is one of the examined ones, reveals the following: First of all, for Singapore capital market and for a period from 1988 to 1996, it is noted that there is a negative relationship between the annual average sales of growth and the stock returns and secondly for the capital market of Malaisia and for the corresponding period there is a relationship between the variable and the stock returns but this is not statistical significant. Moreover, Lakonishok et al. (1994) using the average of the increase sales instead of the sales growth noted that there is a relationship between this variable and the stock returns and this relationship is negative and statistical significant.

Finally, a variable which seems to explain the expected stock returns is the dividend yield. Dividend yield in the international literature is defined as the ratio between the dividend payments and the price (D/P). There is much evidence that the dividend yield can forecast the stock returns. The forecasting power of the dividend yield on future stock market returns is a hypothesis that has a long tradition among practitioners and academics, for example, Dow (1920), Ball (1978). The theoretical and empirical literature offers evidence that expected stock returns are predictable.

However, the predictable component of stock market returns, or equivalently the variation through time of expected returns, is a relatively small fraction of return variances. Another interesting finding is that the power of the dividend yield to forecast future stock returns, measured by the simple coefficient of determination, increases with the time horizon under review, (Fama and French, 1988). These two researchers offer two explanations: (i) that high autocorrelation causes the variance of unexpected returns to grow faster than the return horizon, and (ii) the growth of the variance of unexpected returns with the return horizon is attenuated by a discount rate effect: shocks to expected returns generate opposite shocks to current prices.

Two researchers⁴⁶ in their study found that the stock returns appear to be predictable by lagged dividend-price ratios although stock prices behave like a random walk. They showed that standard tests of predictability of stock returns are severely biased towards rejection of non predictability when predictability of the dividend-yield component of returns is not correctly accounted for. Their results reveal that: Investors care about future dividend yields because they make up a substantial component of the total return and, in addition, because dividend yields are the safest component of the total stock return. Due to the high autocorrelation of dividend yields, shocks to current dividend yields are expected to persist far in the future. As a result, an unexpected increase in the dividend-price ratio leads investors to expect higher dividend yields in the future, hence, higher total returns, which is consistent with the lower stock price today. Expected stock returns are time varying and highly persistent in this view of the world, but their time-variation reflects predictable variation in future dividend yields rather than future capital gains. They suggest that valuation ratios, such as the dividend-price ratio, predict the least risky component of total returns, namely the dividend yield. Economic variables that reflect the state of the business cycle may be a better proxy of both risk premium and dividend growth than valuation ratios. Since shocks to stock prices and shocks to dividends are highly positively correlated, state variables which predict stock prices over the business cycle should also predict dividends, leaving the dividend-price ratio constant.

Another study which examines the ability of dividend yields to predict stock returns is this of Kothari and Shanken (1996). These researchers investigated whether the variables book to market equity and dividend yield can predict the stock returns. They found that the dividend yield is a determinant factor of the stock returns examining a period of 50 years from 1941 to 1991. However they noted that none of the variables book to market equity and the dividend yield prevails of the other to explanatory ability.

⁴⁶ Malliaropoulos D. and Priestley R. (2011)

Moreover, two other researchers⁴⁷ suggest that a negative relationship between the dividend yield and the stock returns is possible when the capital gains are taxed with a lower rate than the dividend income and therefore the investors prefer low dividend yields of the stocks. A study, also, of Leledakis et al. (2003) for the Greek stock market and for a period that extends from July 1990 to June 2000, reaches to the conclusion that the dividend yield does not have significant influence to the stock returns. Indeed, even in multivariate models, in which except for the dividend yield, are included and other variances, is noted that this variance does not have any explanatory power.

A recent study of Cornell (2012) in some established countries showed that dividend yields are highly significant predictors of future returns in the United States, the United Kingdom and Japan. There is more marginal evidence that yields predict future returns in Australia and France. For the remainder of the countries, Canada, Germany, Italy, Spain and Sweden the relation between dividend yields and future returns is still positive, but far from statistically significant.

More specifically, Cornell (2012) argues that the evident predictability may be an artifact of the remarkably stable real growth of the American economy. To further investigate this question, he examined the relation between dividend yields, future returns and dividend growth using current international data. It is found that in some countries, dividend-price ratios predict future returns, in other countries they predict future dividend growth, and in still other countries a combination of the two. These heterogeneous findings support the interpretation that the relations between the variables depend on historical circumstances. He concludes that the predictability of stock returns, particularly based on dividend yield, remains a question of widespread interest among both academics and practitioners and whether the observed return predictability continues to hold, either in the United States or elsewhere, will depend on historical circumstances.

The ability of the current level of dividends to predict future equity returns is a deeply researched subject in financial economics. This confession is also demonstrated by other three researchers⁴⁸ who analyze the relationship between dividend yields and future returns as they find it important for two reasons: first, the relationship has proved to be an important test case for various testing procedures used in financial economics. Second, the relationship helps them understand the underlying behavior of economic agents. They demonstrate not only that this relationship seems to present in a number of countries, but that in each case the relationship appears to have a similar non-linear structure.

In the continuance, a study for the German stock market finds that the dividend yield has a statistically significant positive impact on the future stock returns in Germany:

⁴⁷ Black M. and Scholes M. (1974)

⁴⁸ Breedon F., Bianchi M. and Sharma D. (1997)

“low” stock prices relative to dividends forecast higher subsequent returns. In these cases and in line with previous findings and theoretical considerations, they⁴⁹ found that the power of dividend yields to forecast future stock expected returns increases with the return horizon. They conclude that the relationship between dividend yield and the future stock returns is one-way from the first to the latter if stock market returns are measured by the annualised one-month dividend growth rates in percent. Hence, in this case the dividend yield variable can best be characterized as a so-called “forcing variable” of future stock returns. For other measures of the dividend yield used by them, they found either a significant co-movement with causality going into directions or no cointegration, depending on the lag structure.

There are, also, other studies that they examine the subject of dividend predictability and carry out different results. Indicative, Hodrick (1992) examined the ability of dividend yields to predict long-horizon and found that there is as a strong evidence for the predictive power of one month ahead returns at least for the sample from 1952 to 1987 provided by the VAR test. The estimates and Monte Carlo results support the conclusion that changes in dividend yields forecast significant persistent changes in expected stock return. Furthermore, other two researchers⁵⁰ using the bootstrap methodology to model the distribution of regression statistics under the null hypotheses that stock returns are independently and identical distribution and not related to past dividends found that the null hypothesis that future returns are unrelated to the past dividend yields at conventional significance level is not valid. The same researchers in 1995 extended the analysis of dividend yield regressions and they found, for both the US and UK data, little evidence of predictability of long-horizon returns via dividend yield over the whole sample period. They also argued that tests over long periods may be affected by survivorship simulations and showed that regression statistics based on a sample drawn solely from surviving markets can be seriously biased toward finding predictability.

Claessens et al. (1995) examined the effect of a number of risk factors in addition to dividend yield on asset return for nineteen emerging markets and the results of their study confirm some of the published evidence for developed markets but contradictory findings were also brought to light as dividend yield plays an important explanatory role in seven from nineteen of the countries. Lewellen (2002) focused on short – term horizon on regression returns on lagged dividend yield for period extended from 1946 to 2000 to avoid overlapping in returns. Lewellen considered the same model of Stambaugh (1999), and, Nelson and Kim (1993) in estimating OLS regression for NYSE equal and value-weighted returns on log lagged dividends and this model provided strong evidence of predictability for the whole period from 1946 to 2000 and for various sub-sample. Campell and Yogo (2003) discussed that the

⁴⁹ Belke A. and Polleit T. (2006)

⁵⁰ Goetzmann W. and Jorion P. (1993)

conventional t-test suffers from weakness in the ability to predict due to the persistence of predictor variables which might leads to overestimate the predictive power using conventional critical value. They found that the traditional t -test is highly misleading for the dividend - price ratio. However, they found that the dividend - price ratio predicts returns only at annual frequencies.

Goyal and Welch (2003) regressed the U.S stock market returns with lag dividend ratio for the period from 1926 to 2002. In order to evaluate the forecasting ability of dividend ratio they suggested a simple recursive residuals (out-of-sample) graphical approach. They concluded that dividend yields had no forecasting power for one year a head returns, even prior to the 1990s. Lewellen (2004) examined the predictability of aggregate stock return using the financial ratios such as dividend yield and found that the dividend yield predicts market returns during the period 1946-2000, as well as in various sub samples.

Finally, Lyn and Zyowicsch (2004) examined the fundamental determinant of returns. Their findings suggested that the fundamental determinant of returns for developed markets of Eastern Europe is the same as of old emerging market and they observed that the dividend yields are positively and significantly related to 12-months forward - looking returns which is consistent with what has been observed in more established emerging markets.

In the international literature, the explanatory power of other variables is investigated such as the turnover as it is expressed with the value of the transactions measured in dollars relative to the number of the stocks which are negotiated. Other variables, nominally, are the debt to equity ratio, the trading volume and finally the leverage which can be distinguished in two subcategories. The first is the ratio of the total assets to the market value and this is a measure of the market leverage and the second one is the ratio of the total assets to book ratio and this is a measure of notional leverage.

Efficient market theory (Fama, 1970), as it is earlier described, predicts that all assets are correctly priced with no arbitrage profits in the market but late in the 1970's less favorable evidence for asset pricing models began to appear in the so - called literature of financial anomalies.

Financial Anomalies are empirical results that seem to be inconsistent with the maintained theories of the asset-pricing behavior, their existence indicate either markets inefficiency, where prices do not absorb all available information in the market (profit opportunities), or a misspecification in the underlying asset-pricing model. Stock market anomalies in the literature can be categorized as calendar and price-related anomalies. Calendar anomalies focuses on finding a timely pattern in the stock market price in which investors can formulate profitable investment opportunities and price related anomalies focuses on market fundamental as the main predictors of stock returns.

For the financial anomalies which were described above, they are various explanations some of which are presented below. The number of documented anomalies is large and continues to grow. Kuhn (1977) perceives anomalies as beneficial for the finance itself and says that though most of the times the anomalies do not result in the discovery of something new but they do break the existing paradigm thus causing in the emergence of the new theories.

Another important aspect discussed by the Kuhn (1970) is about the replacement of the paradigm. In science you need to have another paradigm to replace the existing one and if you do not have then rejecting the existing paradigm is rejecting the science itself. There are hundreds of the anomalies existing but we do not regard them until we have a better one to replace EMH/CAPM (Lakatos 1970). In short we can code the Fama (1998) argument that until and unless behavioral finance do not prove itself as a better theory from the EMH/CAPM, the presence of anomalies cannot shake the pillar of efficient market hypothesis , no matter how many of them are being discovered.

Behavioral explanation of anomalies:

One explanation is the failure of different models based on rational. Different models are being given in different times but many of them fail to explain the causes of the anomalous behavior of the assets. The three factor model of Fama and French (1993) gives a model for the analysis of the risk factors but Daniel and Titman (1997) criticized the three factor model that it has no explanation for the long term effect and the momentum returns for the assets. Next the non-linear model of the Berk et al. (1996) has the explanation for the value premium, size-effect and the momentum effect but failed in the reproducing of the contrarian and the momentum effect and according to Wrouter (2006) the model was quite difficult in use for the empirical testing. According to Boudoukh et al. (1994), there are three schools of thought giving the possible explanation of the financial market anomalies: revisionists, loyalists and the heretics. Revisionists thought that markets are efficient and studied the Efficient Market Hypothesis with the time varying economic risk premium. Second are the loyalists who also believe that the markets are efficient and problems are due to the measurement errors in the data. But third school of thought is completely having the different point of views and says that the market is not rational rather they make decisions on the basis of some psychological factors.

Wouters (2006) further categorized them into two groups, loyalist and revisionists as the rationalists and heretics as the behaviorists. Wouters (2006) further explains the rationalists as those who believes that the financial markets are efficient and the abnormal returns are either by chance or due to the common risk factors which are being ignored in the initial analysis of stock returns. Wouters (2006) further explains that the behaviorists make their decisions on the basis of the sentiments. The behaviorists are of the view that the all participants are not required to be the rationales rather a small number is being required which drive the whole market.

This results in the mispricing of securities and thus results in the market anomalies and the cause is the sentiments of the investors.

Other explanation of the financial anomalies is the behavioral cause of the overreaction and underreaction of the financial market. According to Wouters (2006) the under and overreaction of the market are due to the psychological reasons of the investors. Barberis and Sheilfer (1998) argues that the underreaction is the result of the conservatism of the investor as the investors react to the prior information but do not react with the same amount as being required by the information to do and stick to the prior information expecting that the security would do the same as it is being doing in the past. Their findings are consistent with those of Edwards (1968) describing the slow reaction of the investor, named as conservatism, causing the under reaction. Tversky and Kahneman (1974) described an important aspect of the human behavior representativeness bias which according to Barberis and Sheilfer (1998) results in overreaction as the investor with the recent information, perceives the same performance in the future as well and overvalues the security and then come to the disappointment resulting to the equilibrium.

A third explanation is the behavioral cause of momentum effect and contrarian effect. Barberis and Sheilfer (2003) divided the investors on the basis of different investing styles and argued that the investors invest according to the different styles, based upon the past performance, the cause of momentum effect, ending in the price bubble and the herd behavior of the investors in which they invest in the assets on the basis of the common style of investment prevailing in the market giving birth to the continuous rise of fall or the asset prices. Wouter (2006) described the presence of the positive autocorrelation. Though, they further argued, the prices would come to the equilibrium in long run but this behavior causes the positive autocorrelation in the short run and thus the momentum effect in the short run as well as the contrarian effect in the long run as the in the long run the autocorrelation goes negative.

In conclusion, as the efficient market hypothesis defines efficient market is that where all the investors are well informed about all the relevant information about the stocks and they take action accordingly. Due to their timely actions prices of stocks quickly adjust to the new information and reflect all the available information. Therefore, no investor can beat the market by generating abnormal returns. In the weak form of efficient market, technical analysis is useless, while in semi strong form, both the technical and fundamental analysis is of no use. And in strong form of efficient market even the insider trader cannot get abnormal return. But it is found in many stock exchanges of the world that these markets are not following the rules of Efficient Market Hypothesis. The functioning of these stock markets deviate from the rules of EMH. These deviations are called anomalies. Anomalies could occur once and disappear, or could occur repeatedly. From the study of anomalies we can conclude that investor can beat the market and can generate abnormal returns by

fundamental, technical analysis, by analyzing the past performance of stocks and by insider trading.

We presented above a lot of researches which investigate the existence of various types of abnormalities or deviations of stocks returns from the normal pattern which called anomalies. These anomalies are three main types a) calendar anomalies b) fundamental anomalies and c) technical anomalies. Calendar anomalies exist due to deviation in normal behaviors of stocks with respect to time periods. These include turn-of-year, turn-of week effect, weekend effect, Monday effect and January effect. There are different possible causes of these anomalies like new information is not adjusted quickly, different tax treatments, cashflow adjustments and behavioral constraints of investors. Another type is fundamental anomalies which includes that prices of stocks are not fully reflecting their intrinsic values. These include value versus growth anomaly, dividend yield anomaly (which we mainly focus on our study), overreaction anomaly, price to earnings ratio anomaly and low price to sales anomaly. Value strategies outperform than growth stock because of overreaction of market and growth stocks are more affected by market down movement. Dividend yield anomaly is that high dividend yield stocks outperform the market. Stocks having low price to earnings ratio outperform. Technical anomalies are based upon the past prices and trends of stocks. It includes momentum effect in which investors can outperform by buying past winners and selling past losers. Technical analysis also includes trading strategies like moving averages and trading breaks which includes resistance and support level.

CHAPTER 2

DATA AND METHODOLOGY

The cross – sectional relationship between the fundamental variables and the returns of the stock prices has attracted a big number of studies which refer to the established capital markets. However, the recent years the emerging countries have been proved attractive both to the researchers who examine whether the results arising from the study of the established capital markets apply for the emerging markets and to the investors who hope to take advantage of the abnormal returns as well as of the differentiation of the portfolio risk.

In this study, our goal is to investigate the empirical relationship of the dividend yield with the future stock market returns in the Athens Stock Exchange. Especially, we test the predictive power of the dividend yield to the future stock market returns. We investigate the explanatory power of the dividend yield but following the thought of the model of Kothari and Shanken (1997) we insert to our investigation the variable of the BV/MV. We add this aforementioned variable as we wish to examine if the dividend yield has an explanatory power when we put in our model another variable (BV/MV) or this variable can explain the movements in the stock market returns better than the dividend yield.

In this chapter, we describe both the data and the main variables we use and the methodology which is followed in order to derive our results and conclusions. Some of the studies which refer to the Greek stock market are described to this chapter.

The Athens stock market is of particular interest for empirical work in view of the reforms of the late 1980s, aimed largely at liberalizing, restructuring and regulating the Athens Stock Market (ASM). Previous tests for market efficiency in the ASM are attributed to Panas (1990) and indirectly Koutmos et al. (1993), who test for weak-form efficiency. Niarchos and Georgakopoulos (1986) investigated the reactions of the investors to the announcements and the disclosures of the profits for the listed companies and noted that the investors react to the information slowly. Panas (1990) examines monthly data on ten stocks listed in the ASM and performs independence tests on successive stock returns along with separate tests for randomness and normality for each individual stock return and concludes that the market is weakly efficient.

Dockery and Kavussanos (1996) investigated the price-efficiency of the Athens Stock Market using well known empirical tests for unit roots in the price series. Their results confirm the ASE as informationally inefficient which also implies that share prices tend to move systematically over time.

Theriou, Aggelidis and Maditinos (2005) found an unconditional relationship between beta and realised returns are, as expected, not significant and consistent with the findings of Fama and French (1992) that document, among others, no significant positive relationship between risk and return. However, when they take into consideration the conditional nature between beta and returns, the results prove the existence of a statistically significant systematic relation between beta and return for the total sample period and is consistent across subperiods and across months in a year.

Finally, Spyrou (1998) noted that January effect and Monday effect are appeared to the Athens Stock Exchange and Leledakis et al. (2003) examined the validity of the size effect in the period of 10 years in the Athens Stock Exchange. Their study was an investigation into the cross-sectional determinants of stock returns in a small market, the Athens Stock Exchange. The findings for the Athens market suggest that there was only one substantive variable in explaining the cross-sectional variation of market and that is market equity ME (which captures the size effect).

2.1. DATA

Initially we collected all companies listed in ASE (Athens Stock Exchange) for the time period 2000 - 2010. From this overall sample we deducted all firms that belonged to the financial sector⁵¹. The main argument for the above restriction is that these firms apply different accounting frameworks to the presentation of their financial statements and the determination of their accounting income. It is clear that in such cases, the comparability of accounting fundamentals of firms from the financial sector with those of the other companies is not realistic and does not provide any reliable evidence. On the other hand, we include the companies which are delisted⁵² in order to avoid the construction of a biased sample. In view of this qualification, the size of our research sample was reduced to 407 stock firms.

Price data and accounting information for each stock included in the sample were obtained from Datastream's electronic database. It is selected to use the daily cumulative returns (cumulative stock returns minus cumulative General Index returns) from the 1st of April of the current fiscal year to the 31st of March of the next. Therefore, we avoid the look ahead bias. Returns were calculated under the assumption that: the rates of stock return for each day are continuously compounded. Prices given from Datastream have been adjusted for stock splits, bonus issues, new issues, scrip dividends and capitalization of reserves.

⁵¹ As companies which belong to the financial sector are the following: banking, insurance, portfolio investment firms, finance lease, investment property.

⁵² Delisted companies are also known as dead companies and these may not be traded either they are bankrupt or they are merged.

The formula that was implemented for the computation of the cumulative returns was the following:

$$CARs_{it} = \sum_{i=1} \left(\frac{P_{it} - P_{it-1}}{P_{it-1}} \right) - \sum_{i=1} \left(\frac{P_{rt} - P_{rt-1}}{P_{rt-1}} \right)$$

where:

$CARs_{it}$ is the cumulative annual return of the stock i at day "t".

P_{it} is the closing price of the stock i at day "t".

P_{it-1} is the closing price of the stock i at day "t-1".

P_{rt} is the closing price of the General Index r at day "t".

P_{rt-1} is the closing price of the General Index r at day "t-1".

We present below the terminology of the variables used in our research procedure:

Dividend yield: The yield a company pays out to its shareholders in the form of dividends. It is calculated by taking the amount of dividends paid per share over the course of a year and dividing by the stock's price. In our approach, the corresponding dividend yield equals dividends paid from April of year t-1 to March of year t dividend by price at the end of March of year t.

BV/MV: Past evidence has argued that this ratio plays an important role to the formation of stock returns. This variable is defined as the ratio between the accounting value of the company (Book value per equity share is calculated by deducting all the liabilities and obligations from all assets and thereafter dividing it by the total number of outstanding shares) and the firm's market value (MV) which was computed on a daily basis by the closing share price multiplied by the number of ordinary shares in issue. The logarithmic form $\{\ln(BV/MV)\}$ was applied in order to smooth the distribution of values.

We use the logarithmic form only for the variable of the BV/MV as the main variable of our research which is the dividend yield is not used in the logarithmic form. The prefix $\ln(.)$ shows that the presented variable is used in logarithmic form.

Table 1 presents the descriptive statistics of the variables used in our research for a period of ten years, from 2000 to 2010.

TABLE 1: DESCRIPTIVE STATISTICS

Variables	Minimum	Maximum	Mean	Median	Standard Deviation
CARs	-0,93	5,87	-0,00002	0	0,0309
DY	0	52,5	1,985	0,89	3,132
BV/MV	-33,33	50	0,743	0,497	0,0024

2.2. METHODOLOGY

In our research, the methodology which is used is this of the cross sectional regressions. In the specific methodology we regress the cumulative returns for the period of ten years with the variables we examine. In order to avoid heteroscedasticity so that to avoid the overestimation of the statistical significance, we choose White statistical test which we performed with the use of the statistical program Eviews. In statistics, the White test is a statistical test that establishes whether the residual variance of a variable in a regression model is constant: that is for homoscedasticity. In regression and time-series modelling, basic forms of models make use of the assumption that the errors or disturbances have the same variance across all observation points. When this is not the case, the errors are said to be heteroscedastic or to have heteroscedasticity and this behavior will be reflected in the residuals. Heteroscedasticity-consistent standard errors are used to allow the fitting of a model that does contain heteroscedastic residuals. The first such approach was proposed by White (1980), and further improved procedures have been produced since for cross-sectional data, time-series data and GARCH estimation.

One of the crucial issues of the methodology was which models we will use in our regressions. For the empirical research, we use models which investigate the relationship between the cumulative stock market returns and the variables. Moreover, we construct models where we run the dependent variable (CARs) with the independent variable separately and we regress the CARs with the combination of the two dependent variables.

The models we used to test the significance of dividend yield to the future stock markets returns were the following:

- 1) $CAR_{it} = \gamma_{0,t} + \gamma_{1,t}(DY)_{i,t} + \varepsilon_{i,t}$
- 2) $CAR_{it} = \gamma_{0,t} + \gamma_{1,t}\ln(BV/MV)_{i,t} + \varepsilon_{i,t}$
- 3) $CAR_{it} = \gamma_{0,t} + \gamma_{1,t}(D/Y)_{i,t} + \gamma_{2,t}\ln(BV/MV)_{i,t} + \varepsilon_{i,t}$

Where: i is the number of stocks

CAR_{s_i} is the cumulative return of the stock " i " for the year t .

DY is the dividend yield of the firm at year t .

$\ln(BV/MV)$ is the ratio of the book value of the equity to the market value of the equity of the firm at year t .

CHAPTER 3

EMPIRICAL FINDINGS

In our research and for the extraction of the results regarding to the predictive power of the dividend yield we use the fundamental variable of the dividend yield (the ratio of the dividend paid to the current price at year t) and thereafter we use another variable which is the Book value of the equity to the market value of the equity in order to test whether the dividend yield has any explanatory power and to test if when we combine BV/MV with the dividend yield whether part or all of the predictive power of the dividend yield is absorbed by the other variable (BV/MV) or not. For the empirical results we study the behavior of the Greek stock market using the methodology of the cross sectional regressions. These regressions were conducted with the use of the statistical program Eviews.

In the methodology of the cross sectional regressions we investigate if the variables used in our models are statistical significant or not and according to the significance or not we present our conclusions. Therefore, we examine if the variables of the dividend yield and the BV/MV can explain the stock market returns in the Greek stock market for a specific period.

The analysis of the data refers to a period of ten years, from 2000 – 2010 and it is described to the following **tables 3 – 7**, after the correlations of the variables are presented in the **table 2**.

TABLE 2: CORRELATIONS

CORRELATIONS	CARs	DY	ln(BV/MV)
CARs	1		
DY	-0,0081**	1	
ln(BV/MV)	-0,0107**	0,0769**	1

** : Indicates statistical significance at 1% level.

Therefore, it is noted that according to the figures of the **table 2** the various variables are correlated each other. In the above table, the correlations are statistical significant at level 1%. For instance, the cumulative returns are correlated negatively with the other two dependent variables of the **table 2**.

To the following **tables 3, 4, 5** we present the coefficients of the variables. In the parenthesis we describe the t – statistic which reveals us whether the examined

variables are statistically significant or not. The analysis of the data was held for a period of ten years, from 2000 – 2010 and the examined models are presented to the **tables 3, 4, 5** with the following counting and these models will be explained with this aforementioned counting:

$$1) CAR_{s_{it}} = \gamma_{0,t} + \gamma_{1,t} (DY)_{i,t} + \varepsilon_{i,t}$$

$$2) CAR_{s_{it}} = \gamma_{0,t} + \gamma_{1,t} \ln(BV/MV)_{i,t} + \varepsilon_{i,t}$$

$$3) CAR_{s_{it}} = \gamma_{0,t} + \gamma_{1,t} (DY)_{i,t} + \gamma_{2,t} \ln(BV/MV)_{i,t} + \varepsilon_{i,t}$$

TABLE 3: EMPIRICAL FINDINGS

MODEL	$CAR_{s_{it}} = \gamma_{0,t} + \gamma_{1,t} (DY)_{i,t} + \varepsilon_{i,t}$			
	$\gamma_{0,t}$	DY	Adjusted R ²	F - Statistic
Coefficient	-0,0001	-0,00008	0,00006	69,28
t - statistic	(4,26)**	(-8,32)**		

** indicates statistical significance at 1% level.

Definition of variables: $CAR_{s_{it}}$ is the daily cumulative return of the stock “i” for the year t (daily cumulative returns equals to cumulative stock returns minus cumulative General Index returns).

DY is the dividend yield of the firm at year t. The yield a company pays out to its shareholders in the form of dividends. It is calculated by taking the amount of dividends paid per share over the course of a year and dividing by the stock's price.

Model (1) of the **table 3** indicates that the variable of the dividend yield has a negative coefficient -0,00008 and the corresponding t - statistic of this variable is -**8,32**. This negative relationship between the cumulative stock market returns and the dividend yield is statistically significant as the coefficient of the variable DY is significant at 1% level.

However, the evidence from the regression analysis presented in **table 3**, underlines that this negative association between the DY and the stock market returns is closing to zero and consequently we conclude that the predictive power of the dividend yield in the stock market returns is weak. This means that the dividend yield does not explain the movement in the stock market returns sufficiently for the period from 2000 – 2010 and so it is too difficult for someone to predict the returns taking into consideration only the dividend yield. Finally, it is obvious from the examination of the model (1) that it is almost impossible for someone who wishes to predict the future stock market returns in the Athens Stock exchange to lean only on the dividend yield.

TABLE 4: EMPIRICAL FINDINGS

MODEL	$CARs_{it} = \gamma_{0,t} + \gamma_{1,t} \ln(BV/MV)_{i,t} + \epsilon_{i,t}$			
	$\gamma_{0,t}$	$\ln(BV/MV)_{i,t}$	Adjusted R ²	F - Statistic
Coefficient	-0,0001	-0,0003	0,0001	119,93
t - statistic	(-3,36)**	(-10,95)**		

** : Indicates statistical significance at 1% level.

Definition of variables: $CARs_{it}$ is the daily cumulative return of the stock "i" for the year t (daily cumulative returns equals to cumulative stock returns minus cumulative General Index returns).

$\ln(BV/MV)$ is the ratio of the book value of the equity to the market value of the equity of the firm at year t. It is defined as the ratio between the accounting value of the company (Book value per equity share is calculated by deducting all the liabilities and obligations from all assets and thereafter dividing it by the total number of outstanding shares) and the firm's market value (MV) which was computed on a daily basis by the closing share price multiplied by the number of ordinary shares in issue. The logarithmic form $\{\ln(BV/MV)\}$ was applied in order to smooth the distribution of values.

Moreover, model (2) of the **table 4** indicates that the variable BV/MV has a negative coefficient -0,0003 and the corresponding t - statistic of this variable is **-10,95**. This negative relationship between the cumulative stock market returns and the BV/MV is statistical significant as the coefficient of this variable is significant at 1% level.

Therefore, the evidence from the regression analysis presented in **table 4**, underlines that there is a negative association between the BV/MV and the stock market returns but this reaches the zero and consequently we conclude that the BV/MV does not have a strong explanatory power of the stock market returns in the Athens stock exchange for the period from 2000 – 2010. This means that if someone takes into consideration the variable of the BV/MV then they are not able to explain a significant part of the movement of the stock market returns.

TABLE 5: EMPIRICAL FINDINGS

MODEL	$CARs_{it} = \gamma_{0,t} + \gamma_{1,t} (DY)_{i,t} + \gamma_{2,t} \ln(BV/MV)_{i,t} + \epsilon_{i,t}$				
	$\gamma_{0,t}$	DY	$\ln(BV/MV)_{i,t}$	Adjusted R ²	F - Statistic
Coefficient	-0,00004	-0,00007	-0,0003	0,0001	88,11
t - statistic	(1,15)*	(-7,50)**	-10,34**		

* : Indicates statistical significance at 10% level.

** : Indicates statistical significance at 1% level.

Definition of variables: $CARs_{it}$ is the daily cumulative return of the stock "i" for the year t (daily cumulative returns equals to cumulative stock returns minus cumulative General Index returns).

DY is the dividend yield of the firm at year t . The yield a company pays out to its shareholders in the form of dividends. It is calculated by taking the amount of dividends paid per share over the course of a year and dividing by the stock's price.

$\ln(BV/MV)$ is the ratio of the book value of the equity to the market value of the equity of the firm at year t . It is defined as the ratio between the accounting value of the company (Book value per equity share is calculated by deducting all the liabilities and obligations from all assets and thereafter dividing it by the total number of outstanding shares) and the firm's market value (MV) which was computed on a daily basis by the closing share price multiplied by the number of ordinary shares in issue. The logarithmic form $\{\ln(BV/MV)\}$ was applied in order to smooth the distribution of values.

In the continuance and in the model (3) we incorporate the two variables together as it is presented in the **table 5**. Our results show that both of the variables have negative coefficients and these variables are statistical significant at 1% level.

However, the evidence from the regression analysis presented in **table 5**, underlines that there is a negative association between the dividend yield, BV/MV and the stock returns. Our empirical results strengthen the initial conclusions we found in **the table 3 and 4** as **the table 5** indicates that the dividend yield has no predictive power even if the model incorporates the variable of the BV/MV. Furthermore, the explanatory power of the ratio BV/MV remains, even if it is not too strong, and this power is not absorbed from the dividend yield. Consequently, we conclude that the dividend yield cannot predict the stock market returns in the Athens stock exchange for the period from 2000 - 2010 and it seems that if we add another variable to our model which is BV/MV neither of the variables are able to predict the stock market returns for this specific period.

3.1. EMPIRICAL RESULTS FOR THE SUBPERIODS 2000 - 2005 AND 2006-2010

In this unity, the analysis of the data is being held to two subperiods. This happens in order to be noted whether the aforementioned results for the period of the ten years (2000 – 2010) are valid for smaller time periods. This demarcation occurred following two main characteristics. The first one has to do with the length of the time period. We supposed that the results would be more representative if we split the main period to two subperiods with the same horizon in order to include the exact same observations in our population. Furthermore, the other characteristic of the Greek stock market that was took into consideration was the fact that this market started to decline abruptly after 2000 and during the next five years the stock market reached a low point and after this point it started to react upward and this parallel movement was continuing after 2005 as well. We split, therefore, the initial period of the ten years to two subperiods and we investigated how the models

we described and used in the period from 2000 - 2010, behave to these two subperiods.

Specifically, for the first subperiod which extends from 2000 - 2005, the results are presented to the **table 6**. The figures out of the parenthesis are the coefficients of the examined variables and the figures in the parenthesis indicate the t – statistics. The numbering of the models follows the one of the analysis for the period from 2000 - 2010.

TABLE 6: EMPIRICAL FINDINGS

Variables	$\gamma_{0,t}$	DY	$\ln(BV/MV)_{i,t}$	Adjusted R ²	F - Statistic
Models					
(1)	-0,0002 (-4,81)**	-0,0001 (-8,11)**		0,0001	65,87
(2)	-0,0006 (-15,019)**		-0,0004 (-10,91)**	0,0001	119,18
(3)	-0,0004 (-8,56)**	-0,0001 (-7,36)**	-0,0004 (-10,37)**	0,0002	86,74

** : Indicates statistical significance at 1% level.

The definitions of the variables of **tables 6, 7** are the same we gave to the end of the **tables 3, 4, 5** and therefore we considered that it is not necessary to present them again.

The results which come of the analysis of the data for the period which extends from 2000 to 2005 are similar to the results for the whole period (2000 – 2010). It is noted that according to the figures of the **table 6** the variable of the dividend yield has a negative coefficient -0,0001 and the corresponding t - statistic is **-8,11**. This negative relationship between the cumulative stock market returns and the dividend yield is statistical significant as the coefficient of the variable DY is significant at 1% level.

However, the evidence from the regression analysis presented in **table 6**, shows that this negative association between the DY and the stock returns is almost zero and consequently we conclude that the predictive power of the dividend yield in the stock market returns is weak or with other words we could not lean on the dividend yields if we would like to predict the stock market returns in the Athens Stock Exchange in this aforementioned period. This happens as the dividend yield does not explain the movement in the stock market returns sufficiently for the period from 2000 – 2005.

In additional to, our results for the variable of BV/MV are similar to those for the whole period (2000 – 2010). It is noted according to the figures of the **table 6** that BV/MV has a negative coefficient -0,0004 and the corresponding t - statistic of this variable is **-10,91**. The described negative association between the cumulative stock returns and the BV/MV is statistical significant as the coefficient of this variable is significant at 1% level.

Therefore, the evidence from the regression analysis presented in **table 6**, suggests that there is a negative association between the BV/MV and the stock market returns but this reaches the zero and consequently we conclude that the BV/MV does not have a strong explanatory power of the stock market returns in the Athens Stock exchange for the period from 2000 – 2005. This association shows us that someone could not lean on the variable of BV/MV in order to explain the movement of the stock market returns.

Finally, the model (3) of **table 6** in which we incorporate the two variables together appears the same behavior with this we observed for the whole period. Our results show that both of the variables have negative coefficients and these variables are statistical significant at 1% level.

However, the evidence from the regression analysis presented in **table 6** strengthens the initial conclusions of the **table 6** indicating that the dividend yield has no predictive power even if the model incorporates the variable of the BV/MV. Furthermore, the explanatory power of the ratio BV/MV remains, even if it is not too strong, and this power is not absorbed from the dividend yield. As a final conclusion we can say that the dividend yield cannot predict the stock market returns in the Athens Stock exchange for the period from 2000 - 2005 and it seems that if we add another variable to our model which is BV/MV neither of the variables are able to predict the stock market returns for this specific period.

For the second subperiod which extends from 2006 – 2010, the results are presented to the **table 7**. The figures out of the parenthesis are the coefficients of the examined variables and the figures in the parenthesis indicate the t – statistics. The numbering of the models follows the one of the analysis for the period from 2000 - 2010.

TABLE 7: EMPIRICAL FINDINGS

Variables	$Y_{0,t}$	DY	$\ln(BV/MV)_{i,t}$	Adjusted R^2	F - Statistic
Models					
(1)	-0,0006 (13,27)**	-0,00007 (-6,51)**		0,00007	42,45
(2)	0,0004 (10,48)**		-0,0004 (-10,07)**	0,0001	101,46
(3)	0,0006 (11,97)**	-0,00007 (-5,82)**	-0,0004 (-9,63)**	0,0002	67,68

** : Indicates statistical significance at 1% level.

The results which come of the analysis of the data for the period which extends from 2006 to 2010 are similar to those of the whole period (2000 – 2010). It is noted that according to the figures of the **table 7** the variable of the dividend yield has a negative coefficient -0,00007 and the corresponding t - statistic is **-6,51**. This

negative relationship between the cumulative stock market returns and the dividend yield is statistical significant as the coefficient of the variable DY is significant at 1% level.

Nevertheless, the evidence from the regression analysis presented in **table 7** indicates that this negative association between the DY and the stock returns is almost zero and our final conclusion is that the predictive power of the dividend yield in the stock market returns is too weak and therefore we strongly believe that the dividend yield is not a determinant factor of the stock market returns as it cannot predict the returns for the examined period.

Furthermore, our empirical findings for BV/MV are similar to those for the whole period (2000 – 2010). It is noted that according to the figures of the **table 7** BV/MV has a negative coefficient -0,0004 and the corresponding t - statistic is **-10,07**. This negative association between the cumulative stock returns and the BV/MV is statistical significant at 1% level.

The evidence from the regression analysis presented in **table 7**, shows that there is a negative relationship between the BV/MV and the stock returns but this relationship is weak therefore, we conclude that the BV/MV has not a strong explanatory power of the stock market returns in the Athens Stock exchange for the period from 2006 – 2010. This relationship reveals us that someone could not lean on the BV/MV in order to explain the movement in the stock market returns.

Finally, the model (3) of **table 7** in which we incorporate the two variables together behaves with the same way as it did for the whole period and the first subperiod. Our empirical findings show that both of the variables have negative coefficients and these variables are statistical significant at 1% level.

Nevertheless, the evidence from the regression analysis presented in **table 7** makes stronger our initial conclusions of the **table 7** indicating that the dividend yield has no predictive power even if the model incorporates the variable of the BV/MV. Moreover, the explanatory power of the ratio BV/MV remains, even if it is not too strong, and this power is not absorbed from the dividend yield. As a final conclusion we can say that the dividend yield cannot predict the stock market returns in the Athens stock exchange for the period from 2006 - 2010 and it seems that if we add another variable to our model which is BV/MV neither of the variables are able to predict the stock market returns for this specific period.

CONCLUSIONS

The behavior of various variables which relate to fundamental features of a firm attracts many researchers recently who conduct empirical studies in order to find whether these variables have explanatory and predictive power which means that these variables can determine the movement of the stock market returns.

The main goal of this study is the empirical investigation of the dividend yield so that to be noted whether the aforementioned fundamental variable can predict the future stock market returns in the Greek stock market.

The study was divided to two parts: the first one was the literature review where we presented various studies of well known researchers and the results of specific studies regarding the behavior of the most used fundamental variables. Moreover, fundamental concepts such as the Capital Asset Pricing Model and the Efficient Market Hypothesis were presented and analyzed. These researches which include the study of these variables argue the validity of these theories (CAPM and EMH). For this reason, these studies claim that the current and the future stock market returns may be determined from fundamental features of a firm.

In the second part, which is the empirical one we examine exactly what we presented in the theoretical part of our study which means that we investigate whether specific variables and more specifically the dividend yield can predict the stock market returns in the Athens Stock Exchange. We study the behavior of the dividend yield and furthermore we include in our models the variable of BV/MV in order to test if there is another variable which captures better the predictability of the stock market returns.

In the empirical part, the analysis was held for a whole period of ten years (this period extends from 2000 – 2010) and for two different subperiods (extended from 2000 – 2005 and 2006 – 2010). Evidence from past research has argued that dividend yield inefficiency holds for the UK and the US markets since dividend yields can be used for selecting stocks that would earn exceptional future returns. The same case is found to be valid for ASE.

In our study, the empirical findings do not match with those of other studies. Our results from the **tables 3, 5, 6, 7** demonstrate a weak (almost zero) negative relation between the dividend yields ratio and the subsequent equity returns. These findings indicate that the dividend yield is not a determinant factor of the future stock market returns in the Greek stock market. This happens as the aforementioned negative relationship is too weak either if we regress the dividend yield alone or if we include BV/MV to our initial model.

Furthermore, it is noted that neither the variable BV/MV can explain adequately the stock market returns in the Athens Stock exchange for this specific period. It is

observed that the explanatory power of the BV/MV is weak and so we cannot base on BV/MV in case we are willing to predict the stock market returns. This weak relationship is appeared not only when we examine the BV/MV alone but also when we include it in a model with the participation of the dividend yield.

Moreover, for the two subperiods our findings are similar to these one we found for the whole period. Therefore, the dividend yield cannot predict the future stock market returns in nor the first subperiod neither the second one. Furthermore, the findings for variable BV/MV confirms the initial conclusion as it is observed that its predictability power is not strong enough and these results are valid for both the two subperiods.

The current dissertation explored the efficiency of the Greek stock market. This empirical research examined the behavior of a specific fundamental variable which is the dividend yield in relation to the future stock market returns. It found that there is no relationship between the dividend yield and the future stock market returns in a range of ten years and furthermore we found that the predictability of another variable (BV/MV) is too weak as well. Therefore, we reached finally the conclusion that the behavior of the Greek stock market in relation to the described variables is efficient when we examine this market for these ten years, from 2000 – 2010.

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