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1. Introduction

1.1 Motivation and relevance of the subject

As a result of the bankruptcy of Lehman Brothers in 2008 and the European debt crisis since 2009, central banks around the world lowered the interest rates. In combination with low returns of bonds and increased stock prices, this led to the discussion whether bubbles on the stock market and the property market are arising. According to experts, this is especially true for many developed countries due to the fact that investors withdrew their money from emerging markets and the highly indebted members of the Eurozone (Portugal, Ireland, Italy, Greece and Spain).

Along with the low stock returns in emerging countries in the last years, this discussion highlighted the importance of investment strategies which are able to generate an outperformance in every market phase. An often-cited approach is the purchase of value stocks, which has been mentioned for the first time in the year 1934 by Benjamin Graham and David Dodd (as cited in Graham and Dodd 2009, p.xiii) and permanently developed by other authors until now. A popular enhancement, which has been made by Piotroski (2000), is aimed at discriminating between strong and weak value firms by using 9 individual fundamental signals. In his study, Piotroski (2000, p.12) constructed the F_Score, which is the composite score of these 9 financial signals.

The investment strategy of Piotroski (2000) will be applied to the Greek stock market for the period from 1994 until 2014. The Greek stock market is still largely neglected by researchers and financial analysts despite the increasing importance of the Greek stock market in the last 20 years as a result of the introduction of the Euro (cf. European Central Bank 2016) and the reclassification from Emerging to Developed Market by Morgan Stanley Capital International (MSCI) (cf. MSCI 2016) in the year 2001. Nevertheless, there only exist studies about the outperformance of Greek value stocks (see, e.g., Spyrou and Kassimatis 2009; Kyriazis and Christou 2013) but no studies which apply Piotroski's (2000) F_Score to discriminate between strong and weak value firms. Furthermore, Greece is still suffering from the financial crisis after the bankruptcy of Lehman Brothers in 2008, so that it would be interesting to investigate whether the F_Score investment strategy works as well in long time downturns. Further interest arises from the fact, that Greece is classified as Emerging Country again by MSCI since 2013 (cf. MSCI 2016).

With the test of this investment strategy, the efficient market hypothesis (EMH) can be examined. On the one hand, an unsuccessful investment strategy, i.e. it is not possible to generate a long-term outperformance by the application of the F_Score, would be a point in favor of the EMH.

On the other hand, a profitable application could be the result of biased expectations and mispricing of stocks. Therefore, it would be more likely that only the weak or the semi-strong form of market efficiency hold true in the case of Greece.

1.2 Structure of the Thesis

For the application of the F_Score-based strategy, this study is split into 3 parts. Chapter 2 will give an overview of existing literature and addresses the theoretical and practical profitability of deviating from the market portfolio. The theoretical background of capital markets, which will be described in part 2.1, consists of the Capital Asset Pricing Model (CAPM), the EMH and the occurrence of market anomalies. Afterwards, part 2.2 will deal with the approach of value investing by explaining the theoretical background and giving empirical evidences for differences between value and growth stocks. Furthermore, the value premium will be described and explained. In Part 2.3 will follow an overview of prior literature about the predictive power of fundamental analysis on future stock performance and the applicability of accounting-based investment strategies.

Chapter 3 will specify the Piotroski (2000) F_Score. For doing so, in part 3.1 there will be a description of the 9 fundamental signals being important for the classification of value stocks. Furthermore, the construction of the composite score, i.e. F_Score, will be described in part 3.2.

The F_Score will be applied to Greek Stocks over the period from 1994 until 2014 in part 4. Part 4.1 consists of the sample selection (4.1.1), the calculation of returns (4.1.2), the calculation of the financial performance signals (4.1.3), the composite score (4.1.4) and the description of the empirical tests (4.1.5).

The results of these tests will be presented and compared to the study of Piotroski (2000) in part 4.2. In doing so, this part consists of 5 empirical tests. In part 4.2.1 and 4.2.2 will be presented the financial characteristics of high B/M firms and the calculation of buy-and-hold returns from a high B/M investment strategy. Afterwards, part 4.2.3 will summarize the results of the correlation matrix presented in table 2. Part 4.2.4 will present the calculation of returns to a fundamental analysis strategy and 4.2.5 the calculation of returns conditional on firm size.

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This study examined whether it is possible to successfully apply the F_Score, developed by Piotroski (2000), to Greek high B/M firms over the period from 1994 to 2014. The F_Score is calculated as a composite score consisting of 9 fundamental signals, and with which Piotroski (2000) was able to identify high B/M firms in the US with a high probability of an outperformance in the near future, so that the return of a portfolio investing in high B/M firms can even be increased by buying stocks of high F_Score firms and selling stocks of low F_Score firms.

With a portfolio consisting of all high B/M firms from Greece, it is possible to generate positive raw returns as well as market-adjusted returns when considering mean returns. Due to the fact that some correlations between the return measures and the 9 fundamental signals are negative, there is a negative correlation between the return measures and the composite score (F_Score). Therefore, it is unsurprising that there is no outperformance of firms with a high F_Score neither against firms with a low F_Score nor against all high B/M firms.

This arises from the finding that the average returns of high F_Score firms are lower than the average returns of low F_Score firms and all high B/M firms. This result was observed for one- and two-year raw returns as well as for one- and two-year market-adjusted returns. The underperformance of high F_Score firms is most striking in the case of small and large firms, whereas medium firms performed about as good or bad as the other high B/M firms and low F_Score firms.

One potential explanation for this finding is the quite low number of observations, which is only 459 due to the small size of the Greek stock market, compared to about 14,000 in the study of Piotroski (2000, p.14) for US-stocks. The validity of the study could be increased by considering stock markets of other European countries. But also in this case, unfortunately, they can only be compared to Greece to some extent, because no other country in the euro-zone has been suffering as much from the financial crisis over such a long period. Most of the other countries with small economies and a small number of listed companies faced a recession only in 2008 and 2009. This is not the case for Greece, where the GDP decreased every year from 2008 until 2013 (Eurostat 2015).

With an increase in the number of companies, it would be possible for the classification of high and low F_Score firms, which is made in this study and differs from the classification used by Piotroski (2000), to be redefined. While in his study the group of high (low) F_Score firms consisted of all firms with a F_Score of 8 or 9 (0 or 1), in this study firms with a F_Score of 6 or above (3 or less) were classified as high (low) F_Score firms. A higher number of companies would allow, by calculating calendar-year returns, to test whether the findings are only a result of

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the financial crisis or a result of a biased calculation towards the more recent years, because of a lower number of observations at the beginning of the sample period.

Analyzing stocks from countries other than Greece would increase the practicability of an F_Score based investment strategy for many investors due to the imminent withdrawal of Greece from the eurozone. The so-called Grexit would lead, according to forecasts, to a massive devaluation of the new Greek currency and therefore to huge losses for foreign investors. Thus, they would only be willing to invest a small part of their capital in Greek stocks. Considering the systemic risks of the stocks from one country, a construction of a multi-country portfolio would raise the question of the weighting of every country.

Another problem arises from the fact that some fundamental signals are not correlated at the same way with all the return measures, as they have a negative correlation with some of them and a positive correlation with others. To deal with this problem, the criteria used for the classification of financial performance signals into binary variables would have to be reversed, in the case where most of their correlations with the return measures are negative. Because it is possible to generate positive returns with a simple high /BM investment strategy, i.e. to buy all high B/M firms irrespective of their F_Score, this adjustment of the investment strategy could increase the performance.