The Dividend Puzzle: Testing the Signalling Hypothesis in an European Context

by

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Master Dissertation in Finance

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2016

Biographical Sketch

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Acknowledgements

I would like to thank my dissertation supervisor Dr. Júlio Fernando Seara Sequeira da Mota Lobão for his support and advice throughout this project. I was told by my colleagues that I would find myself in good hands if I chose him as my supervisor and I can say without a doubt that they were not wrong and his willingness to listen to my problems and help me find solutions blew my expectations away.

I would also like to thank my family for providing me this chance of obtaining my Master degree at FEP and their support and patience throughout these last months.

I would also like to thank my friends at FEP Amir Tussupov and Dário Veiga for sharing their knowledge with me and helping me whenever I asked for their aid.

Finally, last but not least, I would like to thank my best friend Bruno Ferreira do Vale Quaresma for providing his support and advice throughout this project.

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Abstract

The dividend policy is one of the most discussed research topics in financial literature. The so called "Dividend Puzzle" remains exactly that, a puzzle. The purpose of this study is to analyse the dividend payout of a number of European companies that had sustained earnings growth for a minimum period of 5 years with a decline in the last year and test the Signalling Hypothesis.

This study complements the current literature on the Signalling Hypothesis by testing its assumptions in a European context and providing more evidence towards the resolution of the "Dividend Puzzle" using data from a market that has seen limited research in the past. This dissertation is also unique in that it is the first that runs and compares the results of several different models including the recently created Simultaneous-Equation Model (Liu and Chen (2015)) in its linear and nonlinear formats alongside the more simple OLS based estimation run in older studies. Finally, we also provide an additional contribution to the literature in that we are the first to calculate the Dividend Premium for several European countries, something that had only been done in the North-American market.

Our results show that managers change dividends to signal equity-scaled earnings prospects instead of asset-scaled earnings as managers seem to identify equity investors as the accepters of dividends and the most direct targets to signalling information. We also find evidence that managers change dividends for signalling previous earnings changes and may distribute dividends to reduce agency costs. Our findings also support the assumption that the Simultaneous-Equation Model is a superior model as it captures evidence that the OLS based estimation does not capture.

Key Words: Cash Dividends, Signalling Hypothesis, Behavioural Finance, Financial Crisis

1. Introduction

The dividend policy has been one of the most important themes of study amongst the financial scholars since the decade of 1950 and because of this the field has grown considerably with time and the available literature is sizeable. Despite this, when we look at the results obtained in the majority of the studies we easily conclude that the dividend decision is the most elusive and controversial in managerial decision making and that's why we currently label this subject as the "Dividend Puzzle".

One specific area of research that this study is going to focus on is the "Dividend Signalling Hypothesis", which states that dividends provide signals to the market in terms of the future prospects of a company. Other studies have been developed in the past, but the most recent studies used mostly American firms (e.g. DeAngelo *et al.* (1996); Grullon *et al.* (2005)) but also some UK firms (Gwilyn *et al.* (2004)); Hussainey *et al.* (2009)). The majority of the studies concluded with mixed results relative to the theory of dividend signalling, however the most recent ones seem to point to the irrelevance of the signalling capacity of dividends.

The scholars that support the theory of dividend signalling theorise that dividends provide a signalling effect that helps combat the agency problems between managers and investors who are less informed about the firm's prospects. Those against the theory defend that dividends contain no signal to investors and that even if there was some kind of signal, it would be an erroneous signal since managers suffer from bias (e.g. over optimism) and some even may have reasons to send false signals to the market.

The purpose of this study is to analyse the dividend policy of a number of European companies that had sustained earnings growth for a period of at least 5 years with a decline in the last year. We test the empirical importance of dividend signalling using a different sample compared to the previous authors who either focused on a completely different market (US, Korea, South Africa) or used a much smaller sample (UK firms only). This study also has a wider scope than the previous European ones since we want to study firms with a longer period of sustained earnings growth and capture the effect of the financial crisis of 2008 on the dividend policy of these firms.

Hence, the objectives of this study are as follows:

a) Study whether the managers use changes in dividends to convey earnings prospect;
b) Examine the effect of signalling in the subsequent years following the decline in year 0;
c) Examine if the signalling effect becomes stronger during the transition from a period of sustained growth to a period of decline on earnings;
d) Examine the effect of behavioural bias in determining the dividend policy;

To achieve the objectives of this study we will be using the same methodology that was used in past studies such as the Linear Model of Earnings Expectations but also additional models in order to compare the results and run robustness tests. Specifically we employ the Simultaneous-Equation Model system developed by Liu and Chen (2015) that incorporates an equation that allows us to regress current dividend changes on future earnings changes and at the same time control for additional motives of dividend changes as well. The reasoning behind the creation of this model is that it addresses the mutually endogenous problem between dividend changes and future earnings changes that are not fully controlled in previous studies. Furthermore we also employ the Simultaneous-Equation Model both in its linear and nonlinear forms as developed by Nissim and Ziv (2001) and Grullon *et al.* (2005) respectively.

Besides this chapter, this dissertation is structured as follows: in chapter 2, a literature review of the topic is made, starting by defining "Dividend Policy" and presenting the main theories behind the payment of dividends, focusing on the Signalling Hypothesis. This chapter is concluded after listing a number of past studies similar to this one and making a critical analysis of all past literature.

Additionally chapter 3 is dedicated to analysing the methodological considerations of previous studies and the ones used in our own study. Chapter 4 includes a simple analysis of the sample included in this study as well as details relative to the collection of data and other criterions or calculations executed. Chapter 5 of this dissertation contains the empirical results obtained from each model run in the study. Furthermore,

chapter 6 of this dissertation is dedicated to robustness tests that serve the purpose of verifying if the findings from chapter 5 are robust to alternative specifications.

The final chapter of this dissertation is chapter 7 which includes the conclusions obtained from the study.

2. Literature Review

This chapter will be dedicated to the description of past literature on the topic of the Dividend Policy, starting with a brief definition of "Dividend Policy". The chapter will also include the main theories related to the Dividend Policy, giving wider focus to the Signalling Hypothesis since it is the one that is being explored in this dissertation. The chapter also includes information about past studies that are similar to the one we have developed and ends with a critical analysis of the literature reviewed, pointing weaknesses and holes in these studies that were either explored in this dissertation or can be explored in future research.

2.1. Main theories behind the dividend policy

A dividend is nothing more than a distribution or payment in either cash or shares to the shareholders of the company out of the firm's earnings (Ross *et al.* (2003)). The decision on the dividend policy takes a number of factors into consideration prior to the final release. Some of these factors are the firm's current net earnings, future CAPEX needs and stream of cash flows, the investor's preferences or even the market sentiment. We can also add competitors to these factors as managers usually look at what is being done in the competition as they set the policy. Other factors are related to the human nature like the managerial profile, behavioural bias (e.g. over optimism) and reasons that may lead the manager to send false information.

The dividend policy depends on how much of the net earnings are available to be used as dividends and the future investment opportunities since these will require additional cash flow that can be financed using the firm's current earnings instead of going for the more costly alternative: external financing. Because of this we know that high-growth firms will not pay large dividends because they need net earnings to support their growth. We also know that the largest and more profitable firms are the ones that usually pay the highest dividends and are more likely to increase those (Grullon *et al*. (2005).

Finally, past studies (DeAngelo and DeAngelo (1990)) have concluded that firms have a tendency to have stable dividends, so the establishment of dividends in these companies is in accordance with the level of current earnings as well as dividends in previous years. Some authors defend that this is done because the dividend policy is a kind of ritual

between managers and shareholders and solves some of the agency problems that can be created with the opposition of interests between managers and investors (Frankfurter and Lane (1992)).

Next, following Ling (2008), we will list the most important dividend related theories, focusing on the following ones: dividend irrelevance theory, agency theory, information asymmetry, Bird-in-Hand fallacy, clientele effect and finally, the most relevant one to our own study, the dividend signalling theory. We will obviously be focusing on the Signalling Hypothesis as that is the theory that is being tested in this dissertation.

a) Dividend Irrelevance Theory

This theory was first put forward by Miller and Modigliani (1961) and it states that in a perfect and efficient market and a world without taxes and transaction costs, dividends are irrelevant and because of that the value and investment decisions of a company are indifferent from the dividend policy.

Because of the irrelevance of dividends in such a world, the pattern of cash flows provided in the dividend policy is also irrelevant as shareholders are free to mould the pattern to suit their consumption patterns using the capital market (Lumby and Jones (1981)). The only source of value for shareholders is the investment decision alone.

b) Agency Theory

The Agency Theory is born from the existence of a conflict between managers and investors. This conflict exists when there are differences in ownership and control of the company. On one hand managers must make decisions focusing on maximizing the shareholder's wealth, on the other hand managers can also make decisions for their own personal interest.

In order to guarantee that the shareholder's best interest is safeguarded, they must impose monitoring actions but doing so creates a trade-off for both parties. For shareholders the trade-off consists between monitoring costs and the compensation to motivate the manager to act on the owner's best interest. For managers the trade-off consists between maximizing shareholder's wealth and their own interests.

Rozeff (1982) defends that the greater the dividend the better it is for the company because the agency costs between shareholders and managers will be greatly reduced. The logic is that a dividend policy with higher dividends means that managers will be looking for financing outside the company and that leads to higher scrutiny of firm's operations.

c) Information asymmetry

This theory is related to the fact that there is a difference between the information that managers possess and the information that shareholders possess. Managers, as insiders of the company, naturally possess more information than shareholders since the latter ones have limited access to information. Knowing this, the dividend policy could be interpreted as a way, a channel of sorts whose main objective is to signal a firm's future prospects to outsiders (Bhattacharya (1979); John and Williams (1985); Miller and Rock (1985)). Obviously, these problems of asymmetric information become less important if the ownership of the company is more concentrated (Vieira and Raposo (2007)).

d) Bird-in-Hand fallacy

The Bird-in-Hand fallacy is based on a behavioural bias from the part of shareholders who are assumed to be risk-averse and because of that prefer dividends instead of capital gains because they consider dividends a much more certain source than capital gains.

The problem with this theory is that when dividend payments are announced the share price of a firm tends to drop slightly compared to the dividend on the pre-dividend announcement day so the choice between dividends and share price appreciation is conditioned. Secondly, when a company increases its dividends without changing their policy, the payment is financed by issuing new shares and because of that the increase in dividends is compensated by losing an amount equivalent to the present value of price appreciation (Damodaran (2001)). The opposite can be said since lower dividends mean higher investment, higher risk and thus higher share price.

e) Clientele effect

This theory presupposes imperfections in the capital market so there are taxes, transaction costs, limited amount of capital, different interest rates, asymmetric information which means that it presupposes a world completely different from the world envisioned by Miller and Modigliani.

In such a world shareholders will be faced with costs every time changes in the dividend policy are made. Therefore, wealth maximization may not be the only desire for shareholders and they may appreciate a stable flow of dividends that can be used to counter the extra costs and match the desired consumption pattern of shareholders (Lumby and Jones (1981)).

So, the company is faced with a dilemma: increase dividends too much and you are left with less cash flows to finance new projects and your only alternative is external financing which is much more costly. Because of this companies tend to prefer stable dividend policies in order to incur lesser costs.

f) Dividend Signalling Theory

The Dividend Signalling Theory implies that dividends contain information that can be used to signal the market about a firm's future prospects, namely its earnings, by pushing share prices upward and further increasing the returns to shareholders. This is a theory first presented by Miller and Modigliani (1961), who refer to this as the "information content of dividends".

To further this theory we must first state how Miller and Modigliani valued a company: through its future earnings and not its current earnings. Since the dividend policy depends on the earnings of a firm it would seem logical to say that its dividends could contain information about expected future earnings, which means that dividends would be a kind of surrogate for these earnings. Lintner (1956) conducted studies that suggest that current dividends are dependant not only on future but also current and past earnings.

From here on out there are two distinct views about this theory: those that believe dividends contain signals about future earnings and those that believe earnings that

changes in the dividend policy contain no such insight on future prospects. From the first group of scholars we should note John Lintner (1956) who showed, through studies, that changes in earnings will impact the dividend policy. Other studies conducted by Fama and Babiak (1968) achieved similar results, attesting to dividends changes containing lagged changes in earnings. On the opposite side, the scholars that argue against this theory state that companies do not want to decrease dividends because such a movement is viewed very negatively by the market and tends to cause a decrease in share prices (Damodaran (2001)).

Over the decades, two different hypotheses related to the Dividend Signalling Theory have come up: the free cash flow hypothesis and the maturity hypothesis. The free cash flow hypothesis states that the dividend policy of a firm reflects information on the investment policies of overinvestment firms (Litzenberger and Ramaswamy (1979)). So, if a firm increases its dividends it could mean that they lack investment opportunities and are just trying to attract new investors. The maturity hypothesis states that an increase in dividends means not only less investment opportunities but as well less returns on assets, less future earnings prospects and less systematic risks (Grullon *et al*. (2002)).

Recently, Karpavicius (2014) showed that dividends have a tendency to be stable and this is directly related with a firm's value (the more stable the stream of dividends the more valuable the firm). Also, the author defends that the relationship between dividends and future firm performance is a statistical artefact driven by dividends smoothing and that past studies of the Signalling Theory might be misspecified.

Main literature that supports the Signalling Hypothesis

In this section we will mention a number of past studies that found evidence that managers use changes in dividends as a way to signal information about future earnings of a company. Bhattacharya (1979), John and Williams (1985), Miller and Rock (1985), Fama and French (1998) and more recently Harada and Nguyen (2005) and Baker *et al*. (2006) suggest that changes in dividends are a tool that managers frequently use to convey data about unexpected shock in earnings.

Furthermore, Kaplan and Roll (1972) specify that dividends contain important information about future prospects because financial statements only reflect past information that can be manipulated by managers. Later studies (Brickley (1983), Healy and Palepu (1988), Aharony and Dotan (1994)) also found that an increase in dividends tends to lead to the increase in future earnings. These findings propelled further research in the topic of the Signalling Hypothesis and thus Aharony and Dotan (1994) found that firms that decrease dividends experience less unexpected changes in earnings in the following years. Finally Nissim and Ziv (2001) also found evidence of a positive relationship between current dividend increases and changes in earnings in the subsequent two years while controlling a linear form of mean reversion in earnings.

Main literature that goes against the Signalling Hypothesis

One of the first studies that obtained evidence against the Signalling Hypothesis is the study of Miller and Modigliani (1961). In this study both researchers defend the irrelevance of dividends and support this claim on the market efficiency theory. Miller and Modigliani suggest that the only way dividends can carry information content is if there exists insider information. Later studies by Watts (1973) and Gonedes (1978) showed that there is no relationship between current dividends and future earnings.

Marsh and Merton (1987) initially defended the Signalling Hypothesis but later considered it unlikely when finding evidence that managers react to the dividend announcements of their competitors and as such will always be conditioned when setting their own firm's dividend policy. Benartzi *et al*. (1997) researched the hypothesis but their findings went against the existence of a relationship between changes in dividends and changes in earnings in subsequent years. In fact, their research discovered a new phenomenon: the earnings reversal phenomenon which is identified when changes in dividends reflect changes in earnings in the current year.

Fudenberg and Tirole (1995), Vieira and Raposo (2007) identified a trend amongst managers which in turn makes dividends sticky. According to these researchers managers are unwilling to decrease dividends as they fear negative response by the shareholders and the market. They only decrease dividends as a last resort and if they are sure the earnings will not grow in the following years. Abeyratna and Power (2002)

stated that dividend cuts represent good news for a declining firm as they represent attempts by managers to solve the firm's problems and Grullon *et al*. (2005) found evidence that changes in dividends are strongly related to concurrent earnings.

Finally a recent study from DeAngelo *et al*. (2009) identified the influence of behavioural bias at the managerial level like overconfidence and the idiosyncratic preferences of controlling stockholders as having a major impact on the dividend policy. On the other hand these researchers recognise that managerial signalling has at most a minor influence in the dividend payout.

2.2. Similar studies

In this section we are going to look at relevant papers that have been published in the past with the main goal of studying the signalling capacity of dividends. Some of these papers use the same methodology as the one we will be using for our own study (looking at the dividend pay-out of firms with high past earnings growth with a decline after a number of years) while others use different methodologies but also study the relationship between future earnings prospects and dividends. The following list consists of these studies:

a) "Reversal of fortune: Dividend signalling and the disappearance of sustained earnings growth" **(DeAngelo *et al*. (1996))**

DeAngelo *et al*. (1996) studied the signalling content of manager's dividend decisions for 145 NYSE firms whose annual earnings decline after nine or more consecutive years of growth. The authors used Compustat as a database for the sample and found no support for the notion that dividend decisions help identify firms with superior future earnings. In fact the study found evidence that dividends tend to be unreliable signals because of: behavioural bias (over optimism) that leads managers to overestimate future earnings; modest cash commitments when managers do increase dividends; signs that managers make mistakes when evaluating the future prospects of the firm.

b) "Dividend Cuts, Firm Profitability & Financial Characteristics" **(Ap Gwilym *et al*. (2004)).**

This study investigates the dividend decisions of firms in the UK reporting losses after sustained periods of profitability. The authors concluded that loss-making firms are more likely to reduce dividends compared to firms that remain profitable, although a loss is far from a guarantee that the dividend payment will be reduced. Interesting enough, the study found that due to the stronger culture of dividend payment in the UK compared to the US, there is a lower propensity to lower dividends in the UK.

The study also found that the size of a loss as well as leverage to be important factors in a firm's dividend policy. Higher levels of debt are consistent with a greater likelihood of a reduction in the distribution whilst also supressing profitability in the future years. Profit margins before the loss year can also be considered a significant factor in dividend policy since firms with a lower margin are more likely to reduce dividends.

Finally, some evidence is found that dividend reductions are a sign that future earnings will be lower than for non-reducing firms, although the statistical significance of these findings is quite low.

c) "Disclosure and dividend signalling when sustained earnings growth declines" **(Hussainey and Aal-Eisa (2009))**

This study's aim was to examine whether voluntary disclosure and dividends signal future earnings for decline earnings growth firms. The study's methodology is very similar to the study from DeAngelo *et al*. (1996) in which the authors examine the behaviour of 33 non-financial UK firms after a decline of their sustained earnings growth.

The study found that increasing dividends does not convey value relevant information about future earnings for decline earnings growth firms. However, based on the disclosure signalling theory, it was also found that increasing levels of forward-looking information in annual reports can be an important mechanism for signalling future earnings for firms.

d) "Corporate Payout Policy" **(DeAngelo *et al*. (2009))**

In this book the authors compiled all academic research on dividend policy grounded on the foundations of Lintner and Miller and Modigliani's work. It was found that a simple asymmetric information framework emphasized on the need to distribute free cash flow and that embeds agency costs serves as a good explanation for the main features of dividend policies (size of dividends, timing and form). The authors also concluded that signalling, clientele, tax benefits, investors' behavioural heuristic and investor sentiment are minor influences on the pay-out policy but behavioural biases from managers and preferences of controlling shareholders have a first order impact.

e) "Dividend Changes do not Signal Changes in Future Profitability" **(Grullon and Michaely (2005))**

This study identified all the dividend announcements made between 1963 and 1997 by firms listed on the NYSE and AMEX stock exchanges. They make the same restrictions as the ones in DeAngelo *et al*. (1996).

The authors show that, after controlling for the well-known nonlinear patterns in the behaviour of earnings, dividend changes contain no information about future earnings changes. The authors also show that dividend changes are negatively correlated with future changes in profitability and investigate whether including dividend changes improves out-of-sample earnings forecasts. They find that models that include dividend changes do not outperform those that do not include dividend changes

f) "Do firms use dividend changes to signal future profitability? A simultaneous equation analysis" **(Liu and Chen (2015))**

In this study the authors retest the signalling hypothesis by examining whether managers change dividends to signal their expectation of earnings prospects using a simultaneous-equation approach which allows for more efficient testing and facilitates the control of alternative motives managers may have on setting the dividend policy. The results show that managers change dividends to signal equity-scaled rather than asset-scaled earnings prospects. They also find evidence that managers also change

dividends for signalling previous earnings changes and for catering to dividend clienteles.

2.3. Critical analysis of the literature reviewed

There is an extensive literature on the topic of the dividend policy but still no conclusive answer about the informativeness of dividends and their connection with future earnings growth. As mentioned in the beginning of this dissertation the scholars are divided between those that believe dividends hold signalling information and those that are completely against it. However, the more recent studies seem to point against the Signalling Hypothesis and Behavioural Finance has been used more often as a way to provide an answer to the Dividend Puzzle.

The key seems to be in explaining the biases behind managers and investors that lead to the establishment of a dividend policy. In fact, another criticism that can be made to past literature is that it focuses too much on the role of managers, which although crucial, is only half of the puzzle. Investors have an appetite for dividends that seems difficult to justify and few studies focus on their role in this puzzle.

One criticism that can be made on past studies of the Signalling Hypothesis is that they might be misspecified as there is a chance that scholars are trying to find something that does not exist and reaching conclusions that are not exactly correct because of their own biases.

Finally, there is the question of the scope of the previous studies, with most limiting themselves to one country instead of an entire region or at least a wider sample. There could be differences in the results caused by cultural factors or development reasons.

3. Methodological considerations

In this chapter we will be approaching the methodological considerations of the study. We will briefly review the methodology chosen by other similar studies and explain the differences amongst them. In the last section we will be focusing on the methodological considerations for this study, focusing on the specifications and past literature of the econometric models that were developed.

The methodology is a key component of every research since it can determine the success or failure of the study. Even if the study is well performed and follows the proposed methodology by heart it does not mean that it was a successful study if the methodology that was proposed in the first place is wrong or simply out-dated. Knowing this, it is important to review every single methodological consideration from past studies, compile them and understand which aspects can be applicable in the current study and which aspects have no place in the study either because they are no longer viable and there are better ones in the present or simply because they do not serve the goals of the study.

3.1. Methodological aspects of similar studies

In this section we can see a compilation of the main methodological aspects of each of the similar studies that have been approached in a previous section. One aspect that is inevitable in these types of studies is the exclusion of the companies with US SIC codes 6000-6999. This happens because the firms with these codes are financial institutions and it would be illogical to add these institutions to the sample as they have no bearing for this study.

By looking at the sample size in each study we can see that the ones that restricted their sample size with a requirement in terms of years of sustained earnings growth had a much smaller sample size. The original study of DeAngelo *et al*. (1996) set a requirement of 9 years of sustained growth for a firm to be qualified for the sample, while later studies such as the ones performed by Ap Gwilym *et al*. (2004) and Hussainey *et al*. (2009) required 5 and 4 years respectively. Most studies were focused on the North American market while only 2 focused on the European market, with 1 country in sight: the United Kingdom.

In terms of Database, all the studies that focused on United States firms used Compustat as their main database while the ones in the United Kingdom used the FAME database. Finally, when it comes to the statistical analysis most studies decided to follow the methodology from DeAngelo *et al*. (1996) using an Earnings Growth Model, the only differences being that the study from Grullon *et al*. (2005) adapted the original model slightly in the form of a Linear Model of Earnings Expectations.

Linear and Non-Linear Models of Earnings Expectations:

The Linear Model of Earnings Expectations was developed by Nissim and Ziv (2001) and is an updated version of the previous model used by DeAngelo *et al*. (1996) as well as other researchers that followed them. Nissim and Ziv (2001) found a positive association between current dividend changes and future earnings changes and argued that previous studies were unsuccessful in uncovering the this relation because researches were using the wrong model to control for the expected changes in earnings. Nissim and Ziv (2001) go into more detail and report that when using a regression that controls for a linear form of mean reversion in earnings, dividend changes are positively related with future earnings changes. Equation 1 represents this regression model that allows for asymmetric reactions to dividends increases and decreases and controls for uniform mean reversion and momentum in earnings:

$$(E_T-E_{T-1})/B_{-1}= \beta_0 + \beta_{1P}\, DPC_0 \times R\Delta DIV_0 + \beta_{1N}\, DNC_0 \times R\Delta DIV_0 + \beta_2 ROE_{T-1} + \beta_3(E_0-E_{-1})/B_{-1} + \varepsilon_T \quad (1)$$

Where E_t is earnings before extraordinary items in year t (year 0 is the event year), B_{-1} is the book value of equity at the end of year –1, $R\Delta DIV_0$ is the annual percentage change in the cash dividend payment in year 0, DPC(DNC) is a dummy variable that takes the value of 1 for positive (negative) dividend changes and 0 otherwise, and ROE_{T-1} is equal to earnings before extraordinary items in year T-1 scaled by the book value of equity at the end of year T-1. T represents the event year or the year 0, when earnings first decline. This means that T-1 is the year before year 0 so if the earnings of a firm first declined in 2005 then the T-1 for that firm is year 2004.

Grullon *et al*. (2005) later argued that the assumption of linear mean reversion process of earnings that is made by Nissim and Ziv (2001) in their model is inappropriate.

Grullon *et al*. (2005) defend that the mean reversion process of earnings is highly non-linear and thus consider that the positive correlation between dividend changes and future earnings changes obtained by Nissim and Ziv (2001) is spurious. Grullon *et al*. (2005) control the non-linearity by using a model of unexpected earnings that corrects this problem by assuming the rate of mean reversion and coefficient of autocorrelation as non-linear. This model also has the advantage of controlling for more factors and taking advantage of the information contained in the cross-section of earnings. The Non-Linear Model of Earnings Expectations is represented in equation 2:

$$(E_T-E_{T-1})/B_{-1}= \beta_0 + \beta_{1P}\ DPC_0 \times R\Delta DIV_0 + \beta_{1N}\ DPN_0 \times R\Delta DIV_0 + (Y_1 + Y_2NDFED_0 + Y_3NDFED_0 \times DFE_0 + Y_4PDFED_0 \times DFE_0) \times DFE_0 + (\lambda_1 + \lambda_2NCED_0 + \lambda_3NCED_0 \times CE_0 + \lambda_4PCED_0 \times CE_0) \times CE_0 + \varepsilon_T \quad (2)$$

where $DFE_0 = ROE_0 - E[ROE_0]$, $E[ROE_0]$ is the fitted value from the cross-sectional regression of ROE_0 on the logarithm of total assets in year -1, the logarithm of the market-to-book ratio of equity in year -1, and ROE_{-1}. $PDFED_0$ ($NDFED_0$) is a dummy variable that equals to 1 if DFE_0 is positive (negative) and 0 otherwise. $PCED_0$ ($NCED_0$) is a dummy variable that equals 1 if $CE_0 = (E_0 - E_{-1})/B_{-1}$ is positive (negative) and 0 otherwise. In this model β_1 can be either positive or negative.

Simultaneous-Equation Model:

The recent study from Liu and Chen (2015) used an updated model that according to the authors fixed many of the downfalls of the models used in previous literature. The Simultaneous-Equation Model employs an equation that allows the model to regress current dividend changes on future earnings changes and at the same time control for other motives of dividend changes as well. According to the authors this methodology allows for more accurate testing of the signalling hypothesis because is the signalling hypothesis is true, meaning that managers possess insider information about firms earnings prospects and use dividends as a signalling tool, then the implication is that it should be the forecasted future earnings change that determine current dividend changes but not the reverse. The Simultaneous-Equation Model is therefore a more efficient model that examines whether dividends are changed on the basis of manager's expectations of earnings prospects.

The simultaneous-equation model incorporates a "dividend change equation" and a "future earnings change equation" where the future earning change equation is the regression of future earnings changes on dividend changes. The inclusion of the future earnings change equation together with the dividend change equation addresses the mutually endogenous problem between dividend changes and future earnings changes not fully controlled for in previous studies. This means that if a univariate equation is estimated using the OLS method, the results can be biased and inconsistent and lead to wrong results. The Simultaneous-Equation Model therefore applies the method of the two-stage least square (2SLS).

Table 1- Comparison between the methodologies of past studies

Authors	Country of study	Sample size	Database	Period of analysis	Exclusions	Statistical Analysis
DeAngelo et al. (1996)	U.S.A.	145	Compustat	1970-1987 (9 years sustained growth)	US SIC codes 6000-6999	Regression, Earnings Growth Model
Ap Gwilym et al. (2004)	U.K.	108	LSPD, FAME	1991-2000 (5 years sustained growth)	US SIC codes 6000-6999	Regression, Earnings Growth Model
Gullon et al. (2005)	U.S.A.	2778	CRPS/Compustat	1963-1997	US SIC codes 6000-6999	Regression, Non-Linear model of earnings expectations
Hussainey et al. (2009)	U.K.	33	FAME, Northcote	2000-2007 (4 years sustained growth)	US SIC codes 6000-6999	Regression, Earnings Growth Model
Liu and Chen (2015)	U.S.A	15321	Compustat	1981-2009	US SIC codes 6000-6999	Simultaneous-equation model, Regression

Notes: This table contains important methodological considerations of the most prominent recent studies on the signalling hypothesis. One of the key characteristics of the samples in these studies is the exclusion of firms with SIC codes 6000-6999. It is also important to note the difference in statistical analysis as investigation gave rise to new and improved regression models in this area.

3.2. Methodological considerations used in this dissertation

The main purpose of this study is to run the same models applied on previous studies to the European market and analyse the data obtained by taking into consideration the conclusions of those past studies. However, as we have already seen in a previous section, not all studies use the same methodology so we aim to apply these different

methodologies used in past studies and by using this approach compare the results obtained to verify if the simultaneous equation model is indeed superior to the simple OLS estimation run by the linear model of earnings expectations.

The simultaneous equation model is supposed to be more accurate as it fixes the mutually endogenous problem between dividend changes and future earnings changes. If you use a simple OLS estimation the results can be erroneous while a Two-Stage Least Square regression supposedly leads to better results. The mutually endogenous problem exists because manager's expectations of future profitability can influence dividends and so changes in dividends by result might also influence future profitability by affecting the capital structure of the companies. The endogenous problem is thus related to both the dividend changes and future profitability and their relationship so a stronger and more accurate econometric model is required to test the dividend signalling theory.

In this study we perform tests of the dividend signalling hypothesis by examining how current dividend changes are influenced by future earnings changes. By running the simultaneous-equation model we incorporate an equation that lets us regress current dividend changes on future earnings changes while controlling for other motives of dividend changes, as well. This model is based on a principle that we have already discussed previously: managers change dividends because they know that future earnings will change. The future earnings do not change because of dividends, it is the opposite. The models that we implement in our study use actual future earnings changes as we do not have access to forecasted future earnings changes but considering that managers have access to insider information, actual future earnings should be positively related to forecasted earnings.

Chapter 5 of this report will provide the analysis of the results of the model but it is important to understand exactly the difference between what we are testing. First and foremost we analyse the results that were obtained by regression using the linear model of earnings expectations. We begin by examining the relation between dividend changes and future earnings changes and to do this we estimate the following model:

$$R\Delta DIV_0 = \alpha_0+\alpha_1[(E_T\text{-}E_{T\text{-}1})/B_{\text{-}1}]+\alpha_2 PR\Delta FCFD_{\text{-}1}\times R\Delta FCF_{\text{-}1}\times NR\Delta QD_{\text{-}1}\times R\Delta Q_{\text{-}1}+\alpha_3 NR\Delta FCFD_{\text{-}1} \times R\Delta FCF_{\text{-}1}\times PR\Delta QD_{\text{-}1}\times R\Delta Q_{\text{-}1}+\alpha_4 R\Delta E_{\text{-}1}+\alpha_5 NDDivP_0\times R\Delta DivP_0+\alpha_6 PDDivP_0\times R\Delta DivP_0+\mu_T \quad (3)$$

Where $R\Delta DIV_0$ is the annual rate of change in dividend; B_{-1} is the book value of equity at the beginning of the dividend-change event year; $R\Delta FCF_{-1}= (FCF_{-1} – FCF_{-2})/FCF_{-2}$ is the rate of change in free cash flow in year -1; $R\Delta Q_{-1} = (Q_{-1} – Q_{-2})/Q_{-2}$ is the rate of change in Tobin's Q in year -1; $PR\Delta FCFD_{-1}(NR\Delta FCFD_{-1})$ is a dummy variable that equals 1 for positive $R\Delta FCF_{-1}$ and 0 otherwise; $PR\Delta QD_{-1}(NR\Delta QD_{-1})$ is a dummy variable that equals 1 for positive $R\Delta Q_{-1}$ and 0 otherwise; $R\Delta E_{-1} = (E_{-1} – E_{-2})/E_{-2}$ is the rate of change in earnings in year -1; $R\Delta DivP_0 = (DivP_0 – DivP_{-1})/DivP_{-1}$ is the contemporaneous dividend premium change rate; $PDDivP_0$ ($NDDivP_0$) is a dummy variable that equals 1 if $R\Delta DivP_0$ is positive and 0 otherwise. According to the signalling hypothesis α_1 should be positive, α_2 and α_3 should be positive and negative respectively.

Equation 3 is also the **dividend change equation** in the simultaneous-equation model but we first begin by running the OLS estimation and analysing the results that we obtained before introducing the Two-Stage Least Square regression and the second equation, the future earning change equation, both on the linear form and nonlinear form.

As explained in this section, the dividend-signalling hypothesis states that managers change dividends in order to signal earnings prospects. This is not the only reason but it represents the epicentre of the hypothesis. Knowing this, firms that predict higher (lower) earnings prospects are expected to pay out more (less) dividends and this implies that dividend changes depends on future earnings changes. Equation 3 is used in our OLS estimation and represents this hypothesis in that we regress dividend changes on future equity-scaled earnings changes, thus the name "dividend change equation". In order for the theory to prove true the coefficient of future equity—scaled earnings changes should be positive and significant. But this equation contains other variables and these variables exist in order to control for the additional motives that lead managers to change dividends like:

a) **Reduction of agency costs-** managers may want to increase dividends in order to reduce the natural costs that exist from the fact that the relation between managers and investors is not symmetrical. Managers have inside information

and their own motivations while investors do not have access to this information and want to see their investment returned and generating profits.

The free cash flow hypothesis states that managers may increase dividends by using surplus cash that went unused after all positive NPV projects were financed in order to reduce these agency costs. In order for this theory to hold true in the model then dividends must increase (decrease) as free cash flow increases (decreases) and investment opportunities decrease (increase). Thus the model adds a variable for positive (negative) changes in preceding free cash flow and negative (positive) changes in preceding investment opportunity set and the coefficient must be positive in order to validate the theory. The free cash flow is calculated using equation 4 from Liu *et al.* (2015):

FCF = EBITDA – Income Taxes − Changes in Working Capital − Capex (4)

For measuring the investment opportunity set the variable that is computed in the equation is Tobin's Q because Adam and Goyal (2008) show that it has higher information content with respect to investment opportunities than other measures such as the market-to-book equity ratio, the earnings-price ratio and the ratio of capital expenditures over the net book value of plant, property and equipment. Tobin's Q is thus calculated using equation 5 from Damodaran (2006) in "Damodaran on Valuation":

$$\textbf{Tobin's Q} = \frac{(Market\ Cap + Current\ Liabilities + Long\ Term\ Debt)}{(Total\ Assets + Current\ Liabilities + Long\ Term\ Debt)} \quad (5)$$

b) **Confirming the persistence of previous earnings changes-** Managers may want to manipulate the dividend policy in order to validate their belief that earnings will continue to increase (decrease) or remain constant with previous financial exercises. To test this theory the equation includes as an additional variable the rate of change in earnings one year before the dividend-change event year in the equation and its coefficient should be positive if the theory is to hold true.

c) **Catering to dividend clienteles-** Some managers use the dividend policy as a sort of ritual between themselves and investors. For them it is important to keep a specific dividend policy constant despite the firm's future earnings prospects. Managers may also set a dividend policy that favours investors in order to attract new investors and gain market benefits as investors naturally pay more for firms that pay higher cash dividends.

In order to test this hypothesis the equation includes an additional variable, the contemporaneous changes in the dividend premium ($R\Delta DivP_0$) which allows for asymmetric effects of dividend premium increases and decreases. Increasing (decreasing) the dividend premium should increase (decrease) dividend levels. Thus the dividend premium (DivP) is a measure used to measure the dividend preference in the market. According to Baker and Wurgler (2004) the dividend premium can be calculated as the difference in the logs of the annual market-value-weighted average market-to-book ratio of dividend paying companies and dividend non-paying companies:

$$\textbf{DivP} = Log\left(\frac{Market}{Book}\right) Payer - Log\left(\frac{Market}{Book}\right) Nonpayer \qquad (6)$$

When the dividend premium is high, this means that non-paying firms try to cater to the demand of investors by initiating dividends. In the study performed by Liu and Chen (2015) their sample contained only North-American firms and because of that they were capable of computing the dividend premium for their sample simply by collecting those values from Baker and Wurgler's website which contains values for the dividend premium until the year of 2010. In the case of this study we could not collect that information because our sample is made of European firms and we could not find any study that had already calculated the dividend premium for European countries.

Another problem that we faced when looking for a way to calculate the dividend premium for our sample data was that taking into consideration every single dividend paying company and every non-dividend paying in Europe would lead

to an extremely time-consuming exercise that could put at risk the entire study given the time constraints. In order to solve this we researched past studies on the dividend premium and came up with a solution from Ferris *et al*. (2009) who also calculated the dividend premium for a large number of countries (23) in their research **"**Catering effects in corporate dividend policy: The international evidence**"**.

Ferris *et al*. (2009) set a requirement of ten dividend paying companies and ten non-dividend companies for each country in the sample in order to guarantee that the dividend premiums are computed based on a minimum number of firms. We proceeded to do the same calculations in our study and were able to obtain the values for the dividend premiums for different countries and in different years with the exception of Estonia, Luxembourg and Czech Republic which were countries whose companies lacked sufficient financial information in the database Amadeus. We did not remove them from the sample however since both Luxembourg and Estonia were represented by only one country each and Czech Republic only three. The data relative to the dividend premium calculations will be presented in chapter 5 of this study where we will showcase the results of the application of the model.

After computing the OLS estimation for the dividend change equation and presenting the results of the regression we then turn to the simultaneous-equation model and the Two-Stage Least Square method to compare the results obtained by both models. As denoted by the name of the method, it is characterized by two steps or stages of OLS regressions. Stage one is performed by running the regression of the future earning change equation and obtaining the fitted values for that regression. Once the software EViews has calculated the fitted values for that first regression it runs the second step, this is, another regression using the dividend change equation alongside the previously calculated fitted values. As we will see just ahead, there are two types of future earning change equations: linear and nonlinear.

Future earning change equation

Most past studies on the dividend signalling hypothesis used a linear model of earnings expectations to examine the relation between dividend changes and future earnings changes. This was the case with Nissim and Ziv (2001) who improve the future earning change equations of past studies which assume that earnings follow a random walk with drift (DeAngelo *et al*. (1996)). Their contribution is related to the inclusion of ROE in the equation, which they consider an important predictor of future earnings changes and also mean reverting (Fama and French (2000) and Freeman *et al*. (1982))**.** Nissim and Ziv (2001) also make an additional contribution as they believe the relation between dividend changes and future earnings changes may be due to autocorrelation in the earnings change series and to test this they include ROE_{T-1} and $CE_0 = (E_0-E_{-1})/B_{-1.}$ The purpose of these variables is to control for the mean reversion and autocorrelation in earnings while assuming that the rate of mean reversion and the level of autocorrelation as uniform along the entirety of the observations. The linear model established by Nissim and Ziv (2001) is the following one:

$$(E_T-E_{T-1})/B_{-1} = \beta_0 + \beta_1 R\Delta DIV_0 + \beta 2 ROE_{T-1} + \beta_3 CE_O + \varepsilon_T \quad (7)$$

Grullon *et al.* (2005) criticize this linear model exactly because such a regression assumes that the rate of mean reversion and the level of autocorrelation are uniform across all observations. This is considered an issue as empirical evidence from past studies indicates that the mean reversion process of earnings and the level of autocorrelation are highly non-linear. This means that using the linear model created by Nissim and Ziv (2001) possibly leads to a spurious positive correlation between dividend changes and future earnings changes. These findings are based on the studies by Brook and Buckmaster (1976), Elgers and Lo (1994) and Fama and French (2000). These authors found out that large changes in earnings revert faster than small changes and negative changes revert faster than positive changes. Thus assuming a linear model when the true functional form is nonlinear has the exact same consequences as leaving out relevant independent variables: the coefficients of the linear model of earnings expectations are biased.

Fama and French (2000) showed in their study that a model with a nonlinear rate of mean reversion is superior to a model with a uniform rate of mean reversion in explaining the evolution of earnings. In Grullon et al.'s study they modify Nissim and Ziv's model for the nonlinear earnings process by using a modified partial adjustment model proposed by Fama and French (2000). This model controls for the nonlinearities in the relation between future earnings changes and lagged earnings levels and changes. Thus, in our own study we decided to also run the nonlinear regression of Grullon et al. (2005) and compare the results with those obtained with the linear regression of Nissim and Ziv (2001). Equation 8 represents the future earnings change equation in its nonlinear form:

$$(E_T\text{-}E_{T\text{-}1})/B_{\text{-}1} = \beta_0 + \beta_1 R\Delta DIV_0 + (Y_1 + Y_2 NDFED_0 + Y_3 NDFED_0 \times DFE_0 + Y_4 PDFED_0 \times DFE_0) \times DFE_0 + (\lambda_1 + \lambda_2 NCED_0 + \lambda_3 NCED_0 \times CE_0 + \lambda_4 PCED_0 \times CE_0) \times CE_0 + \varepsilon t \quad (8)$$

where $DFE_0 = ROE_0 - E[ROE_0]$, $E[ROE_0]$ is the fitted value from the cross-sectional regression of ROE_0 on the logarithm of total assets in year -1, the logarithm of the market-to-book ratio of equity in year -1, and $ROE_{\text{-}1}$. $PDFED_0$ ($NDFED_0$) is a dummy variable that equals to 1 if DFE_0 is positive (negative) and 0 otherwise. $PCED_0$ ($NCED_0$) is a dummy variable that equals 1 if $CE_0 = (E_0 - E_{\text{-}1})/B_{\text{-}1}$ is positive (negative) and 0 otherwise. In this model β_1 can be either positive or negative.

To conclude, by combining the future earnings change equation with the dividend change equation in a simultaneous equation framework with the use of a Two-Stage Least Square regression we should get more accurate results and that is what we have done, following Liu *et al*. (2015). In chapter 5 we present the results of these regressions, analyse and compare the values obtained using the OLS estimation and the 2SLS estimation. In chapter 6 we also run further regressions as robustness tests, specifically to gauge the relationship between dividend changes and future asset-scaled earnings changes, dividend changes and ROE levels, dividend changes and ROA levels and lastly dividend changes and abnormal earnings.

4. Data and Summary Statistics

The methodology of this study follows closely the methodology used in previous studies. As such the sample contains European firms with a minimum of 5 years of sustained earnings growth before the first year of decline in earnings. This means that companies with more than 5 years of sustained earnings growth are also included in the sample. Amadeus database has information about companies for a period of 10 years, going from the year of 2005 to the year of 2014 so it would be difficult to find a sample with considerable size if the restrictions were steeper. There are companies in the sample that have had earnings growth starting from a period prior to 2005 but these are special cases of firms that had their financial information available to us in Datastream or through their annual reports that dated that far back in time.

While using the Database Amadeus, certain restrictions had to be imposed in order to reflect previous studies. The companies with SIC Codes 6000-6999 were removed because they are financial institutions and have no part in this study. The sample only includes firms that are dividend-paying firms so all companies that have had 5 years or more of sustained growth but don't pay dividends were removed.

For the gathering of all the data relative to the sample of this study it was also required the use of the Database Thompson Datastream as Amadeus does not provide information about the dividends of the firms. Once we had the final list of companies from Amadeus that met our criterions we had to look for these companies in Datastream in order to verify if they were in fact dividend-paying companies. To confirm the accuracy of the databases we inspected each firm's annual reports for the year that Amadeus indicates that earnings first decline as well as the previous year. We also verified the information regarding dividends.

The study follows the rules of an Event study in that it will be divided in 3 stages: pre-event, on-the-event and post-event. The pre-event represents the 5 years before the first year of decline and the data relative to these years will be important in calculating the abnormal future earnings of the sample firms using the growth-adjustment model. The on-the event represents the first year of decline, the so-called year 0, and data relative to this year will be important in testing whether the signalling hypothesis holds because it is the dividend policy set by the managers in this year that could very well reflect what

will happen to the sample companies in the following years. Finally, the post-event represents the 2 years after the first year of decline and the information relative to these years will be fundamental in testing whether what was predicted by the dividend policy was in fact correct or not. For this reason companies that had 5 years or more of consecutive earnings growth with the year 0 being 2014 or 2015 were immediately deleted from the sample as we did not have sufficient information about the years +1 and +2 and as so we could not run the model including these firms.

Finally we also ended up removing companies that had 5 or more years of sustained earnings growth that did not have complete information about other key figures in Amadeus or we couldn't find their annual reports in the web. This is because in order to run the models and the respective regressions we needed financial information not only relative to the dividends and earnings of the company but also the return on assets, return on equity, book value, liabilities, market capitalization, long term debt, taxes, Ebitda, changes in working capital, depreciation, Capex, Free Cash Flow to Firm and total assets.

There were special calculations like the dividend premium, the future abnormal returns or the DFE_0 or CE_0 that were required for the estimation of certain equations but the tables containing the results of these calculations and also the reason behind them will be discussed further ahead in the chapter related to the application of the model.

Table 2 contains the distribution of countries for the sample of this study. As we can see most of the firms that have had high earnings growth for a minimum period of 5 years with a decline afterwards are firms from bigger markets like Great Britain, Germany or Spain. To eliminate the influence of outliers we truncated two of the top and two of the bottom firms from the dividend changes distribution. This procedure is consistent with the study from Grullon *et al*. (2005) and Liu and Chen (2015). This is done because the sample size is not big enough to not get majorly influenced by the results of odd companies that vary from the remaining sample.

Table 2- Country distribution amongst the sample

Sample List		
Country	Number of firms	%
Belgium	4	5.00%
Croatia	5	6,25%
Czech Republic	3	3,75%
Estonia	1	1,25%
France	5	6,25%
Germany	11	13,75%
Great Britain	15	18,75%
Greece	1	1,25%
Italy	7	8,75%
Luxembourg	1	1,25%
Netherlands	3	3,75%
Norway	1	1,25%
Poland	7	8,75%
Spain	9	11,25%
Sweden	5	6,25%
Switzerland	2	2,5%

Notes: This table contains the countries that are part of the sample used in this study as well as the number of firms that represent each country. It is not surprising that more powerful countries like Germany, Great Britain or Spain are represented by more firms as these countries have larger and more mature companies and as such it is easier to find dividend paying firms with a long period of sustained earnings growth there.

Table 3 includes additional information relative to the sample we are using in this study:

Table 3- Descriptive statistics of key characteristics of the sample firms for dividend-decrease, dividend-increase and dividend-no-change events

Panel A: Dividend Decreases						
	Mean	Std.	5%	50%	95%	N
RΔDIV	-47.89%	42%	1%	9%	27%	9
MV (thousands of euros)	516,420	449,035	9,385.85	100,956.56	293,364.31	9
M/B	3.73	5.03	0.11	1.13	3.29	9
ROE(%)	21.59	12.06	0.25	2.71	7.88	9
ROA(%)	10.14	5.31	0.11	1.19	3.47	9
Panel B: Dividend Increases						
	Mean	Std.	5%	50%	95%	N
RΔDIV	39.63%	68%	1%	15%	45%	64
MV (thousands of euros)	1,276,908	1,876,775	14,710.81	421,955.13	1,226,137.02	64
M/B	2.87	2.39	0.02	0.54	1.56	64
ROE(%)	22.16	11.46	0.09	2.58	7.49	64
ROA(%)	12.16	9.25	0.07	2.08	6.04	64
Panel C: No Changes						
	Mean	Std.	5%	50%	95%	N
RΔDIV	0%	0%	0%	0%	0%	3
MV (thousands of euros)	348,902	384,242	3,011.82	86,389.03	251,033.30	3
M/B	4.96	5.99	0.05	1.35	3.92	3
ROE(%)	29.89	26.46	0.21	5.95	17.29	3
ROA(%)	17.34	19.07	0.15	4.29	12.46	3

Notes: This table reports the descriptive statistics of key characteristics of the sample firms for dividend-increase, dividend-decrease and dividend-no-change events. 2 dividend-increasing firms and another 2 dividend-decreasing firms were removed from the sample as they were outliers that heavily influenced the results. RΔDIV denotes the annual dividend change rate. MV is the market value and it is equal to calendar year-end stock price times shares outstanding. M/B represents the ratio of market value to book value of equity at the end of the dividend event year. ROE and ROA represent the return on equity and return on assets respectively. N represents the sample size.

The resulting sample contains 80 firms (compared to 145 from DeAngelo *et al*. (1996)) from various European countries but after removing two top and two bottom firms from the sample for this analysis we ended up with 76 firm observations. 64 firms increased their dividends on the year 0 (the year where earnings decline), while 9 decreased their dividends and only 3 made no changes to their policy. This suggests the dominant theory that states that managers have a tendency to not decrease the amount of dividends as the dividend policy constitutes a ritual between investors and managers.

Managers are thus reluctant to decrease dividends and the results obtained in this study are consistent with previous studies.

Table 3 provides descriptive statistics on the annual dividend change rate (RΔDIV), market value (MV), market to book ratio of equity (M/B), return on equity (ROE) and return on assets (ROA) for dividend-increasing firms, dividend-decreasing firms and firms that made no changes to their dividend policy during the event year (the year when earnings first decline). The average decrease in dividends is 47.89% with a standard deviation of 42%. The average increase in dividends is 39.63% with a standard deviation of 68%. After looking at the data in each panel we can come up with an interesting conclusion: dividend-increasing firms have the highest market value (€1277 million vs. €516 million) which means that they are larger than the dividend-decreasing firms and those that do not change their dividend policy. This conclusion is also consistent with previous studies such as Grullon *et al*. (2005) and Liu and Chen (2015). Firms that increase dividends are also more profitable than those that do not as their average ROE and ROA are higher (22.16 vs. 21.59 and 12.16 vs. 10.14) although the difference in these statistics are not as dramatic as the market value of the companies.

5. Empirical Results

5.1. Dividend changes and future equity-scaled earnings changes

5.1.1. Univariate Analysis

The first step before running the simultaneous-equation analysis and the OLS estimation is to run a univariate analysis of the association between future earning changes and dividend changes. The results are shown in table 4.

In this analysis we follow the same model as the one used by Nissim and Ziv (2001), Grullon *et al*. (2005) and Liu and Chen (2015). As the name of the model indicates, a univariate analysis includes only 1 independent variable and in this case it is the mean rate of change in equity-scaled earnings in each of the subsequent two years of the dividend-change event year [$(E_T-E_{T-1})/B_{-1}$, T=1 and 2]. The goal is to verify if this variable is significantly less (more) than zero for the subsamples of dividend decreases (increases). For the variable, E_T denotes income before extraordinary items at the end of year T after the dividend-change event year and B_{-1} denotes the book value of equity at the beginning of the dividend-change event year (year 0).

After conducting the univariate analysis for the entirety of the sample of years and also for the subsample of different years we came to the conclusion that dividend increases have positive but insignificant (1%, 5% and 10%) mean rate of change in equity scaled earnings in both T=1 and T=2. Dividend decreases have positive and insignificant mean rate of change in equity scaled earnings in T=1 but negative in T=2. If we look at the subsamples we find that dividend increases have the largest significance rate in T=1 (3 out of 4 compared to 2 out of 4 for dividend decreases). It is interesting to note that in T=2 the results are mostly insignificant for both dividend increases and decreases at the 1%, 5% and 10% level with just year 2012 proving significant at the 1% level for dividend decreases.

It seems that the year following the dividend-change event year provides more significant results for the analysis as both dividend increases and decreases provided significant results in different years (2011 and 2012 for dividend decreases and 2011, 2012 and 2013 for dividend increases). It is relevant to note however that dividend increases proved more significant as the results from the years 2011 and 2012 were

significant at the 1% level while the results for dividend decreases were only significant at the 5% level. Thus, the results of the univariate analysis suggest managers may increase dividends to signal future equity-scaled earnings increases in the following year or dividend increases may contain information about future equity-scaled increases or both at the same time. However, in T=1 for both dividend increases and decreases not all rates of changes in equity follow the sign they are supposed to for the hypothesis to hold true so further tests are necessary (dividend increases (decreases) should have positive (negative) rates of change).

Table 4- Univariate analysis of the association between future equity-scaled earnings changes and dividend changes for the total sample and subsamples of different years

Dividend changes and future equity-scaled earnings changes: univariate analysis						
	T=1		T=2			
	Div. Decrease	Div. Increase	Div. Decrease	Div. Increase	Obs. of Div. Dec.	Obs. of Div. Inc.
Total Sample	0.016	0.012	-0.119	0.016	11	65
Y 2010	-0.037	0.044	-0.006	-0.01	2	13
Y 2011	-0.294**	-0.09***	-0.204	0.005	3	15
Y 2012	0.254**	0.326***	-0.368***	-0.028	3	20
Y 2013	-0.07	0.041**	0.048	0.033	3	17
Significance Rate	2/4	3/4	1/4	0/4		

Notes: This table contains the results of the univariate analysis on the relation between future equity-scaled earning changes ($(E_T-E_{T-1})/B_{-1}$) and dividend changes for the total sample and subsample of years from the sample. E_T denotes income before extraordinary items at the end of year T (T=1 and T=2) after year 0 or the event year when earnings first decline. For the Signalling Hypothesis to hold true, the population mean rate of future equity-scaled earnings should be greater than zero for dividend increases and lower than zero for dividend decreases.*,**,*** denote significance at 10%, 5% and 1% respectively. The significance rate represents the ratio of the number of significant years to the total number of years observed.

5.1.2. Model Specifications

In this section we will present the equations for both the Dividend Change Equation and Future Earning Change Equation in their respective linear and nonlinear forms when analysing the relation between dividend changes and future equity-scaled earnings changes:

a) Linear model system:

Dividend Change Equation-

$$R\Delta DIV_0 = \alpha_0+\alpha_1[(E_T-E_{T-1})/B_{-1}]+\alpha_2 PR\Delta FCFD_{-1}\times R\Delta FCF_{-1}\times NR\Delta QD_{-1}\times R\Delta Q_{-1}+\alpha_3 NR\Delta FCFD_{-1} \times R\Delta FCF_{-1}\times PR\Delta QD_{-1}\times R\Delta Q_{-1}+\alpha_4 R\Delta E_{-1}+\alpha_5 NDDivP_0\times R\Delta DivP_0+\alpha_6 PDDivP_0\times R\Delta DivP_0+\mu_T \quad (9)$$

where $R\Delta DIV_0$ is the annual rate of change in dividend. E_T denotes the income before extraordinary items at the end of year T after the dividend-change event year. B_{-1} is the book value of equity at the beginning of the dividend-change event year. RΔFCF is the rate of change in free cash flow in year -1. $R\Delta Q_{-1}$ is the rate of change in Tobin's Q in year -1. $PR\Delta FCFD_{-1}$ ($NR\Delta FCFD_{-1}$) is a dummy variable that equals 1 for positive (negative) RΔFCF and 0 otherwise. $PR\Delta QD_{-1}$($NR\Delta QD_{-1}$) is a dummy variable that equals 1 for positive (negative) $R\Delta Q_{-1}$ and 0 otherwise. $R\Delta E_{-1}$ is the rate of change in earnings in year -1. $R\Delta DivP_0$ is the contemporaneous dividend premium change rate, where DivP is the difference in the logs of the annual market-value-weighted average market-to-book ratios of dividend paying firms and nonpayers. $PDDivP_0$($NDDivP_0$) is a dummy variable that equals 1 if $R\Delta DivP_0$ is positive (negative) and 0 otherwise.

In order to run the dividend change equation we needed to calculate the dividend premium for the countries of our sample. We chose 10 dividend paying firms and 10 non-dividend paying firms and calculated the market to book ratio for each using the database Amadeus. These calculations are summarized in tables 66 to 81 in the annexes. After having calculated these values for each firm we then proceeded to calculate the average dividend premium for each country in the sample while taking into consideration each different year (2008 to 2012) as shown in table 5. Lastly we simply calculated the average dividend premium of the entire sample and used those values for the dividend change equation.

Table 5- Dividend Premium per subsample of country and year alongside the average Dividend Premium for the study's sample

Dividend Premium	2008	2009	2010	2011	2012	2013
United Kingdom	0.174	-0.019	-0.103	0.086	-0.004	0.045
Germany	0.172	-0.122	0.081	-0.103	0.277	-0.373
France	0.012	-0.121	-0.054	-0.033	0.003	-0.048
Spain	0.383	0.367	0.432	0.263	0.738	0.666
Poland	0.694	-0.035	0.186	0.213	0.036	0.228
Ukraine	-0.252	0.187	0.271	-0.126	-0.090	-0.334
Greece	0.452	0.339	0.180	0.645	0.247	0.326
Italy	0.101	0.036	0.171	0.174	0.044	-0.263
Sweden	0.284	0.261	0.385	0.577	0.452	0.481
Romania	-0.540	-0.297	0.001	-0.102	0.052	0.090
Netherlands	0.146	0.242	0.279	0.279	0.339	0.385
Slovenia	0.426	0.039	0.061	0.405	-0.075	-0.054
Belgium	-0.819	-0.633	-0.633	-0.559	-0.105	-0.057
Croatia	0.032	0.136	0.058	-0.102	0.099	0.216
Switzerland	0.117	0.137	-0.034	-0.595	-0.546	-0.191
Norway	-0.341	-0.029	0.027	0.149	-0.051	-0.101
Average	0.065	0.030	0.082	0.073	0.088	0.064

Notes: This table contains the dividend premium for each of the countries from our sample and for each subsample of years where dividends were paid. A positive dividend premium signifies that the market (investors) is willing to pay more for dividend-paying firms than nonpayers. The higher the dividend premium the higher is the dividend preference in the market and if the catering hypothesis of dividends is to hold true then an increase in the dividend premium should trigger an increase of dividend levels. The line in yellow represents the average dividend premium amongst all the countries for each year and it is this value that we use in the dividend change equation.

Future Earnings Change Equation-

$$(E_T\text{-}E_{T\text{-}1})/B_{-1} = \beta_0 + \beta_1 R\Delta DIV_0 + \beta_2 ROE_{T\text{-}1} + \beta_3 CE_O + \varepsilon_T \quad (10)$$

where $R\Delta DIV_0$ is the annual rate of change in dividend. $ROE_{T\text{-}1}$ is equal to $E_{T\text{-}1}/B_{T\text{-}1}$. CE_O is equal to $(E_0\text{-}E_1)/B_{-1}$. E_T denotes the income before extraordinary items at the end of year T after the dividend-change event year.

b) Nonlinear model system:

Dividend Change Equation-

$$R\Delta DIV_0 = \alpha_0+\alpha_1[(E_T-E_{T-1})/B_{-1}]+\alpha_2 PR\Delta FCFD_{-1}\times R\Delta FCF_{-1}\times NR\Delta QD_{-1}\times R\Delta Q_{-1}+\alpha_3 NR\Delta FCFD_{-1} \times R\Delta FCF_{-1}\times PR\Delta QD_{-1}\times R\Delta Q_{-1}+\alpha_4 R\Delta E_{-1}+\alpha_5 NDDivP_0\times R\Delta DivP_0+\alpha_6 PDDivP_0\times R\Delta DivP_0+\mu_T \quad (11)$$

The dividend change equation is always the same in the linear and nonlinear formats of each model.

Future Earnings Change Equation-

$$(E_T-E_{T-1})/B_{-1} = \beta_0 + \beta_1 R\Delta DIV_0 + (Y_1 + Y_2 NDFED_0 + Y_3 NDFED_0 \times DFE_0 + Y_4 PDFED_0 \times DFE_0) \times DFE_0 + (\lambda_1 + \lambda_2 NCED_0 + \lambda_3 NCED_0 \times CE_0 + \lambda_4 PCED_0 \times CE_0) \times CE_0 + \varepsilon_T \quad (12)$$

where $DFE_0 = ROE_0 - E[ROE_0]$, $E[ROE_0]$ is the fitted value from the cross-sectional regression of ROE_0 on the logarithm of total assets in year -1, the logarithm of the market-to-book ratio of equity in year -1, and ROE_{-1}. $PDFED_0$ ($NDFED_0$) is a dummy variable that equals to 1 if DFE_0 is positive (negative) and 0 otherwise. $PCED_0$ ($NCED_0$) is a dummy variable that equals 1 if $CE_0 = (E_0 - E_{-1})/B_{-1}$ is positive (negative) and 0 otherwise. In this model β_1 can be either positive or negative.

We can find the tables with the calculations related to DFE_0 in the annexes (table 63 and table 63).

5.1.3. Regression Results

In this section we will present the results of the OLS and the Two-Stage Least Square estimations that analyse the relationship between dividend changes and future equity-scaled earnings changes.

OLS Regression of the dividend change equation

We begin our regressions with the OLS estimation of the dividend change equation (equation 9). All the values that were used to run the regression in EViews are presented in tables 47 to 56 in the annexes. Table 6 contains the results for the OLS estimation of this equation:

Table 6- Simple OLS Regression of the dividend change equation (Dividend Changes and Future Equity-Scaled Earnings Changes)

Dividend Changes and Future Equity-Scaled Earnings Changes- OLS Regression							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.113	0.831	0.409	Intercept	0.109	0.804	0.424
$\alpha_1[(E_T-E_{T-1})/B_{-1}]$	0.174	0.590	0.557	α_1	-0.067	-0.325	0.746
$\alpha_2 PR\Delta FCFD_{-1}$...	0.419	0.952	0.344	α_2	0.426	0.966	0.337
$\alpha_3 NR\Delta FCFD_{-1}$...	-0.065	-0.177	0.860	α_3	-0.087	-0.238	0.812
$\alpha_4 R\Delta E_{-1}$	0.393	3.464	0.001	α_4	0.389	3.405	0.001
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.395	-0.566	0.573	α_5	-0.437	-0.626	0.533
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	-0.013	-0.101	0.920	α_6	-0.010	-0.075	0.940
R-squared	0.161			R-squared	0.158		

Notes: This table reports the OLS estimated regression of the dividend change equation for the subsequent two years after the dividend-change event year (T=1 and 2). The purpose behind this OLS regression is to compare the results with the other results obtained using the 2SLS model further ahead in this study. Basically we are comparing different models used by different researchers and gauging each model's efficiency.

As we can see, the coefficient on future equity-scaled earnings changes (α_1) is positive (0.174) but insignificant at the 1%, 5% and 10% level for T=1. For the second year the coefficient is negative (-0.067) and also insignificant at the 1%, 5% and 10% level. These results indicate that dividends are not adjusted based on long-term earnings prospects and go against the signalling hypothesis.

If we look at the coefficients of the control variables, even though α_2 and α_3 are positive and negative respectively as expected by the free cash flow hypothesis, they are both insignificant at the 1%, 5% and 10% level. This indicates that surplus cash and investment opportunities are not determinants of dividend changes. However, when we look at α_4 and the first year after year 0, the coefficient for preceding earnings changes is positive (0.393) and significant at the 1% level. The same happens for T=2 and these results support the previous earnings hypothesis and strongly suggest that managers adjust dividends to reflect past earnings changes. If we look at α_5 and α_6 however we can see that all the coefficients for T=1 and T=2 are negative and insignificant which goes against the catering hypothesis and strongly suggests that managers do not change dividends according to the investor's preference for dividends.

Simultaneous-Equation Model (Linear)

The regression results we will show in this section are related to the simultaneous-equation model in its linear form. This is done to analyse with higher precision the signalling hypothesis using the Two-Stage Least Square method with year fixed effects and clustered standard errors by firms.

The first stage of the 2SLS method is the regression of the future earnings change equation in its linear form (equation 10). The results of the regression for the future earnings change equation can be found in table 7:

Table 7- First stage of the 2SLS regression using the future earnings change equation in its linear form (Dividend Changes and Future Equity-Scaled Earnings Changes)

Dividend Changes and Future Equity-Scaled Earnings Changes- Future Earnings Change							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	-0.108	-2.000	0.049	Intercept	-0.032	-0.723	0.472
$\beta_1 R\Delta DIV_0$	0.013	0.317	0.752	β_1	-0.034	-0.656	0.514
$\beta_2 ROE_{T-1}$	0.419	1.499	0.138	β_2	0.420	6.108	0.000
$\beta_3 CE_O$	-0.494	-1.853	0.068	β_3	-0.288	-0.838	0.405
R-squared	0.079			R-squared	0.331		

Notes: This table reports the first stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the future earnings change equation in its linear form. We estimate both the linear and non-linear models in order to compare the results from both and verify if the nonlinear model by Grullon *et al*. (2005) is indeed superior to the linear model by Nissim and Ziv (2001).

By looking at the results of the regression we can see that the coefficients for β_1 are positive for year T=1 (0.013) and negative for year T=2 (-0.034) but these coefficients are also insignificant at the 1%, 5% and 10% level. However, when we look at the control variables we reach interesting conclusions. If we observe the coefficient for β_2 we find that although it is insignificant for T=1, it is positive and significant at the 1% level for year T=2. This means that for the second year after the event year the level of ROE for the previous year helps explain the earnings changes for the next year. It can be argued that there is some merit for Nissim and Ziv's theory that ROE can be an important predictor of future earnings changes. For the coefficient β_3 the values are negative and insignificant for year T=2. When we look at year T=1 however they remain negative but significant at the 10% level showing some signs of autocorrelation

between the earnings of year 1 and those of year 0. Since the p-value is not that high and the same does not happen in year T=2 we must take these conclusions with a grain of salt.

Having run the regression for the future earnings change equation it is time for the second stage of the 2SLS regression which focuses on the dividend change equation (equation 9). Eviews takes the fitted values from the first regression and automatically uses them for this second stage. Table 8 presents the results for this step of the simultaneous-equation model:

Table 8- Second stage of the 2SLS regression using the dividend change equation in its linear form (Dividend Changes and Future Equity-Scaled Earnings Changes)

Dividend Changes and Future Equity-Scaled Earnings Changes- Dividend Change Equation							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.173	1.364	0.177	Intercept	0.117	0.845	0.401
$\alpha_1[(E_T-E_{T-1})/B_{-1}]$	4.233	3.442	0.001	α_1	-0.152	-0.409	0.684
$\alpha_2 PR\Delta FCFD_{-1}$...	0.849	1.998	0.050	α_2	0.378	0.818	0.416
$\alpha_3 NR\Delta FCFD_{-1}$...	0.115	0.333	0.740	α_3	-0.087	-0.238	0.812
$\alpha_4 R\Delta E_{-1}$	0.258	2.289	0.025	α_4	0.383	3.303	0.002
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.485	-0.749	0.456	α_5	-0.415	-0.595	0.554
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	0.066	0.528	0.599	α_6	-0.011	-0.082	0.935
R-squared	0.275			R-squared	0.159		

Notes: This table reports the second stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the Dividend Change Equation in its linear form.

In the dividend change equation the coefficient on future equity-scaled changes (α_1) in the linear model system is positive and significant at the 1% level for T=1. If we look at T=2 the coefficient is negative and insignificant. These results indicate that the dividend policy is changed based on future earnings prospects. When managers forecast earning levels for one year from now they signal this information to investors by changing the dividend policy. This is strong evidence in favour of the dividend signalling hypothesis.

If we look at the control variables only α_2 and α_4 provide significant results. The coefficient α_2 is positive and significant at the 5% level in year T=1. This result indicates that surplus cash was an important factor in determining the dividend policy

and supports the free cash flow hypothesis. The same does not happen for year T=2 as the coefficient is indeed positive but insignificant. The coefficient on the preceding earnings changes (α_4) is also significant and positive but this time this happens for both T=1 and T=2. For T=1 the coefficient is significant at the 5% level (0.025) and for T=2 the coefficient is strongly significant at the 1% level (0.002). This result supports the previous earnings hypothesis and tells us that managers change dividends not only to signal future earnings prospects but also to reflect past earnings changes.

Overall, the results of the 2SLS regression shows us that dividend changes cannot serve as a tool to predict firm equity-scaled earnings prospects even if dividend changes can be used by managers as a signalling tool.

Simultaneous-Equation Model (Nonlinear)

In this section we perform the exact same regressions using the 2SLS model with the difference being the usage of the nonlinear form of the future earnings change equation (equation 12). In table 9 we can find the results of the first stage of the 2SLS regression, where we estimate the future earnings change equation:

Table 9- First stage of the 2SLS regression using the future earnings change equation in its nonlinear form (Dividend Changes and Future Equity-Scaled Earnings Changes)

Dividend Changes and Future Equity-Scaled Earnings Changes- Future Earnings Change							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	-0.050	-0.786	0.435	Intercept	0.046	0.710	0.480
$\beta_1 R\Delta DIV_0$	-0.010	-0.203	0.840	β_1	-0.002	-0.050	0.960
y_1	2.778	0.916	0.363	y_1	-0.628	-0.206	0.837
$y_2 NDFED_0$	-2.509	-0.496	0.621	y_2	-1.820	-0.358	0.721
$y_3 NDFED_0 \times DFE_0$	-1.742	-0.080	0.936	y_3	-4.432	-0.203	0.840
$y_4 PDFED_0 \times DFE_0$	-18.553	-0.716	0.477	y_4	4.379	0.168	0.867
λ_1	-0.168	-0.108	0.914	λ_1	0.537	0.345	0.731
$\lambda_2 NCED_0$	0.285	0.174	0.862	λ_2	0.433	0.264	0.793
$\lambda_3 NCED_0 \times CE_0$	1.199	0.450	0.654	λ_3	0.401	0.150	0.881
$\lambda_4 PCED_0 \times CE_0$	0.713	0.357	0.722	λ_4	0.916	0.456	0.650
R-squared	0.108			R-squared	0.047		

Notes: This table reports the first stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the future earnings change equation in its nonlinear form as formulated by Grullon *et al*. (2005).

The results for the regression of the future earnings change equation in its nonlinear form are simple to analyse as all coefficients are insignificant either in T=1 and T=2. The most important coefficient however is β_1, which is the coefficient on the dividend changes and it is negative and insignificant in both years. These results are consistent with the linear model so we can confirm that neither the negative effect of dividend changes based on the pecking order theory nor the positive effect based on the agency cost theory is confirmed.

In table 10 we have included the results for the second stage of the 2SLS regression where we focus on the dividend change equation (equation 11) using the fitted values of the future earnings change regression:

Table 10- Second stage of the 2SLS regression using the dividend change equation in its nonlinear form (Dividend Changes and Future Equity-Scaled Earnings Changes)

Dividend Changes and Future Equity-Scaled Earnings Changes- Dividend Change Equation							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.130	0.974	0.333	Intercept	0.241	1.739	0.086
$\alpha_1[(E_T-E_{T-1})/B_{-1}]$	1.623	1.713	0.091	α_1	-3.630	-2.689	0.009
$\alpha_2 PR\Delta FCFD_{-1}\ldots$	0.639	1.429	0.157	α_2	0.614	1.446	0.152
$\alpha_3 NR\Delta FCFD_{-1}\ldots$	0.134	0.350	0.727	α_3	0.046	0.131	0.896
$\alpha_4 R\Delta E_{-1}$	0.409	3.654	0.001	α_4	0.382	3.519	0.001
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.472	-0.689	0.493	α_5	-0.320	-0.479	0.634
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	0.015	0.117	0.907	α_6	0.003	0.022	0.982
R-squared	0.190			R-squared	0.233		

Notes: This table reports the second stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the Dividend Change equation in its nonlinear form as formulated by Grullon *et al*. (2005).

If we look at the coefficient for α_1 we come to the same conclusions as the linear model. The coefficient is positive (1.623) and significant at the 10% level (0.091) for T=1. The biggest difference is for the year T=2 as the coefficient is still negative but this time highly significant at the 1% level whereas it was negative but insignificant for the linear model. Again, these conclusions support the dividend signalling hypothesis as managers seem to use dividends to signal forecasted earnings for the following year.

As for the control variables, the only significant coefficient is α_4. For the year T=1 α_4 is positive (0.409) and extremely significant at the 1% level (0.001) while for year T=2 the coefficient is also positive (0.382) and significant (0.001) at the 1% level. This coefficient is also positive and significant for the linear model in both years so these results coincide. What we can gather from the nonlinear model is support for the previous earnings hypothesis as the results tell us that managers change dividends not only to signal future earnings prospects but also to reflect past earnings changes.

5.2. Dividend changes and future asset-scaled earnings changes

5.2.1. The Model

In this section we will be replicating the OLS estimation and the simultaneous-equation model but making a slight change in the variables in the equation in order to gain more

evidence towards the dividend signalling hypothesis. The dividend signalling hypothesis does not state precisely what type of information managers want to convey when they change the dividend policy (future income or future profitability) so there could be other performance measures that could be more highly correlated to dividend changes. Such is the case ROA or asset-scaled earnings which is a measure widely used to capture firm performance and because of this in this section we will be replacing the change in equity-scaled earnings with the change in asset-scaled earnings. ROA can be considered a good measure of company performance because unlike equity-scaled earnings it is not sensitive to changes in capital structure and it is not affected by special items such as nonrecurring items reported before taxes, income taxes or accounting for minority interest. This method has been widely used in previous studies such as the ones from Grullon *et al*. (2005), Liu and Chen (2015), Nissim and Ziv (2001) and Fama and French (2000).

5.2.2. Model Specifications

In this section we will present the equations for both the Dividend Change Equation and Future Earning Change Equation in their respective linear and nonlinear forms when analysing the relation between dividend changes and future asset-scaled earnings changes:

a) Linear model system:

Dividend Change Equation-

$$R\Delta DIV_0 = \alpha_0+\alpha_1(ROA_T-ROA_{T-1})+\alpha_2 PR\Delta FCFD_{-1}\times R\Delta FCF\text{-}1\times NR\Delta QD_{-1}\times R\Delta Q_{-1}+\alpha_3 NR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1\times PR\Delta QD_{-1}\times R\Delta Q_{-1}+\alpha_4 R\Delta E_{-1}+\alpha_5 NDDivP_0\times R\Delta DivP_0+\alpha_6 PDDivP_0\times R\Delta DivP_0+\mu_T \quad (13)$$

where ROA_T denotes the earnings on asset at the end of year T after the dividend-change event year. $R\Delta FCF_{-1}$ is the rate of change in free cash flow in year -1. $R\Delta Q_{-1}$ is the rate of change in Tobin's Q in year -1. $PR\Delta FCFD_{-1}$ ($NR\Delta FCFD_{-1}$) is a dummy variable that equals 1 for positive (negative) $R\Delta FCF$ and 0 otherwise. $PR\Delta QD_{-1}$($NR\Delta QD_{-1}$) is a dummy variable that equals 1 for positive (negative) $R\Delta Q_{-1}$ and 0 otherwise. $R\Delta E_{-1}$ is the rate of change in earnings in year -1. $R\Delta DivP_0$ is the contemporaneous dividend premium change rate, where DivP is the difference in the logs of the annual market-value-weighted average market-to-book ratios of dividend

paying firms and nonpayers. $PDDivP_0$ ($NDDivP_0$) is a dummy variable that equals 1 if $R\Delta DivP_0$ is positive (negative) and 0 otherwise.

Future Earnings Change Equation-

$$(ROA_T\text{-}ROA_{T\text{-}1}) = \beta_0 + \beta_1 R\Delta DIV_0 + \beta_2 ROA_{T\text{-}1} + \beta_3 CE_O + \varepsilon_T \quad (14)$$

where $R\Delta DIV_0$ is the annual rate of change in dividend. CE_O is equal to $ROA_0 - ROA_{-1}$. ROA_T denotes the earnings on asset at the end of year T after the dividend-change event year.

The value for CE_O is different when compared to the value used in chapter 5.1 because we are now analysing dividend changes with future asset-scaled earnings changes. We can find the table containing the information the calculation of CE_0 in tables 67 and 68 in the annexes.

b) Nonlinear model system:

Dividend Change Equation-

$$R\Delta DIV_0 = \alpha_0+\alpha_1(ROA_T\text{-}ROA_{T\text{-}1})+\alpha_2 PR\Delta FCFD_{-1}\times R\Delta FCF\text{-}1\times NR\Delta QD_{-1}\times R\Delta Q_{-1}+\alpha_3 NR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1\times PR\Delta QD_{-1}\times R\Delta Q_{-1}+\alpha_4 R\Delta E_{-1}+\alpha_5 NDDivP_0\times R\Delta DivP_0+\alpha_6 PDDivP_0\times R\Delta DivP_0+\mu_T \quad (15)$$

Future Earnings Change Equation-

$$(ROA_T\text{-}ROA_{T\text{-}1})= \beta_0 + \beta 1 R\Delta DIV_0 + (Y_1 + Y_2 NDFED_0 + Y_3 NDFED_0 \times DFE_0 + Y_4 PDFED_0 \times DFE_0) \times DFE_0 + (\lambda_1 + \lambda_2 NCED_0 + \lambda_3 NCED_0 \times CE_0 + \lambda_4 PCED_0 \times CE_0) \times CE_0 + \varepsilon_T \quad (16)$$

where ROA_T denotes the earnings on asset at the end of year T after the dividend-change event year. $R\Delta DIV_0$ is the annual rate of change dividend. $DFE_0 = ROA_0 - E[ROA_0]$ where $E[ROA_0]$ is the fitted value from the cross-sectional regression of ROA_0 on the logarithm of total assets in year -1, the logarithm of the market-to-book ratio of equity in year -1, and ROA_{-1}. CE_O is equal to $ROA_0 - ROA_{-1}$. $PDFED_0$ ($NDFED_0$) is a dummy variable that equals 1 if DFE_0 is positive (negative) and 0 otherwise. $PCED_0$ ($NCED_0$) is a dummy variable that equals 1 if CE_O is positive (negative) and 0 otherwise.

The value for CE_O is different when compared to the value used in chapter 4.1 because we are now analysing dividend changes with future asset-scaled earnings changes. We can find the tables with the calculations related to DFE_0 in the annexes (tables 65 and 66).

5.2.3. Regression Results

In this section we will present the results of the simple OLS regressions and the Two-Stage Least Square regressions that analyse the relationship between dividend changes and future asset-scaled earnings changes.

OLS Regression of the dividend change equation

We begin our regressions with the OLS estimation of the dividend change equation (equation 13). In table 11 we can find the results for the OLS estimation of the dividend change equation:

Table 11- Simple OLS Regression of the dividend change equation (Dividend Changes and Future Asset-Scaled Earnings Changes)

Dividend Changes and Future Asset-Scaled Earnings Changes- Dividend Change Equation							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.105	0.774	0.442	Intercept	0.105	0.774	0.442
$\alpha_1(ROA_T\text{-}ROA_{T-1})$	-0.011	-0.073	0.942	α_1	0.011	0.072	0.943
$\alpha_2 PR\Delta FCFD_{-1}$...	0.429	0.946	0.347	α_2	0.430	0.957	0.342
$\alpha 3 NR\Delta FCFD_{-1}$...	-0.091	-0.249	0.804	α_2	-0.091	-0.249	0.804
$\alpha_4 R\Delta E_{-1}$	0.390	3.374	0.001	α_4	0.391	3.405	0.001
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.424	-0.607	0.546	α_5	-0.424	-0.607	0.546
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	-0.007	-0.055	0.957	α_6	-0.007	-0.054	0.957
R-squared	0.157			R-squared	0.157		

Notes: This table reports the OLS estimated regression of the dividend change equation for the subsequent two years after the dividend-change event year (T=1 and 2).

If we look at the results of this regression we can see that the only coefficient that is significant is α_4. The fact that both α_1s are highly insignificant suggests that the signalling of information about the change in ROA in the future is not the main objective of changes in the dividend policy. As in the previous section α_2 and α_3 are both insignificant, so these results do not support the free cash flow hypothesis. The

catering hypothesis also finds little support as α_5 and α_6 are both insignificant in years T=1 and T=2. It is interesting to note however that α_4 is positive and extremely significant for both years T=1 and T=2. This is consistent with the findings from the previous section which supports the previous earnings hypothesis, which suggests that managers change dividends to reflect past earnings changes.

Simultaneous-Equation Model (Linear)

In this section we will run the Two-Stage Least Square model in its linear form. We will follow the same steps as in the previous section and start by running the regression of the future earnings change equation and after that we will present the results for the second stage of the 2SLS regression which focuses on the dividend change equation.

Equation 14 represents the future earnings change equation adapted towards testing the relationship between dividend changes and future asset-scaled earnings changes. In table 12 we can find the results of the regression of the future earnings change equation:

Table 12- First stage of the 2SLS regression using the future earnings change equation in its linear form (Dividend Changes and Future Equity-Asset Earnings Changes)

Dividend Changes and Future Asset-Scaled Earnings Changes- Future Earnings Change							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.136	1.282	0.204	Intercept	0.068	6.376	0.000
$\beta_1 R\Delta DIV_0$	-0.022	-0.257	0.798	β_1	0.005	0.368	0.714
$\beta_2 ROA_{T-1}$	-0.892	-0.829	0.410	β_2	-0.976	-55.125	0.000
$\beta_3 CE_O$	0.168	0.300	0.765	β_3	-0.015	-0.177	0.860
R-squared	0.014			R-squared	0.976		

Notes: This table reports the first stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the future earnings change equation in its linear form

Looking at the results for this regression we find that all coefficients with the exception of β_2 are insignificant. The coefficient that measures the predictive ability of dividend changes on ROA changes (β_1) is negative for T=1 and positive for T=2 but insignificant for both years. These findings are not consistent with the results of Grullon *et al*. (2005) and Liu *et al*. (2015) for the North-American market. In both their studies the β_1 for T=1 was indeed negative but significant while the results for T=2 are consistent with our

findings. As for the control variables only β_2 is significant at the 1% level but only for the year T=2 (0.000). The coefficient is negative (-0.976) which means that for the second year after the event year (0) an increase in the ROA levels for year T=1 indicates a decrease on the level of ROA changes from year 2 to 1. These findings however are consistent with the studies performed by Grullon *et al*. (2005) and Liu *et al*. (2015).

We then proceed to the second stage of the 2SLS regression where the fitted values from the regression of the future earnings change equation are used by the software to run the regression on the dividend change equation. Equation 13 is the dividend change equation taking into consideration the ROA changes. Table 13 contains the results of this regression:

Table 13- Second stage of the 2SLS regression using the dividend change equation in its linear form (Dividend Changes and Future Asset-Scaled Earnings Changes)

Dividend Changes and Future Asset-Scaled Earnings Changes- Dividend Change Equation							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.434	3.206	0.002	Intercept	0.103	0.754	0.454
$\alpha_1(ROA_T\text{-}ROA_{T-1})$	-5.971	-4.896	0.000	α_1	-0.012	-0.076	0.939
$\alpha_2 PR\Delta FCFD_{-1}$...	0.856	2.189	0.032	α_2	0.445	0.978	0.331
$\alpha_3 NR\Delta FCFD_{-1}$...	-0.067	-0.211	0.834	α_3	-0.093	-0.253	0.801
$\alpha_4 R\Delta E_{-1}$	0.271	2.661	0.010	α_4	0.394	3.399	0.001
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.441	-0.727	0.469	α_5	-0.429	-0.613	0.542
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	0.031	0.269	0.789	α_6	-0.006	-0.045	0.965
R-squared	0.365			R-squared	0.157		

Notes: This table reports the second stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the Dividend Change equation in its linear form.

The results for the coefficients of the dividend change equation using the simultaneous-equation analysis are consistent with those from previous studies. The α_1s are negative for both year T=1 and year T=2 but this time the coefficient is extremely significant at the 1% level (0.000) for year T=1 while insignificant for year T=2. These results are contrary to those found in the section related to the equity-scaled earning model system where this coefficient was positive. This suggests that dividend changes do not happen for the purpose of signalling changes in ROA in the future. One possible explanation is

provided by Liu *et al*. (2015) where they state that equity investors as accepters of dividends and direct signalling targets to managers are more concerned about equity-scaled earnings changes than asset-scaled earnings changes and are willing to pay more for stocks of companies with better asset-scaled earnings prospects. As such it makes sense that when setting the dividend policy managers are more preoccupied with signalling information relative to equity-scaled earnings changes than asset-scaled earnings changes.

Looking at the control variables we can identify two coefficients as significant which are α_2 and α_4. The coefficient for α_2 is positive (0.856) and significant (0.032) on the 5% level for T=1. For the free cash flow hypothesis to be true the coefficient α_2 must be positive and significant, thus this is evidence in favour of that hypothesis. As for coefficient α_4, it is positive (0.271) and heavily significant on the 1% level (0.010) for year T=1 and also positive (0.394) and extremely significant for the year T=2 (0.001). This supports the previous earnings changes hypothesis, coinciding with the findings for the equity-scaled earning changes model.

Simultaneous-Equation Model (Nonlinear)

In this section we perform the exact same regressions using the 2SLS model with the difference being the usage of the nonlinear form of the future earnings change equation (equation 16). We can find the results of the first stage of the 2SLS regression in table 14, where we perform the regression of the future earnings change equation:

Table 14- First stage of the 2SLS regression using the future earnings change equation in its nonlinear form (Dividend Changes and Future Asset-Scaled Earnings Changes)

Dividend Changes and Future Asset-Scaled Earnings Changes-Future Earnings Change							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.038	0.301	0.765	Intercept	-0.042	-0.338	0.736
$\beta_1 R\Delta DIV_0$	-0.044	-0.465	0.643	β_1	0.033	0.355	0.724
γ_1	1.578	0.198	0.844	γ_1	-1.459	-0.186	0.853
$\gamma_2 NDFED_0$	-19.226	-1.052	0.296	γ_2	19.247	1.070	0.288
$\gamma_3 NDFED_0 \times DFE_0$	-261.356	-1.158	0.251	γ_3	283.988	1.278	0.205
$\gamma_4 PDFED_0 \times DFE_0$	2.815	0.024	0.981	γ_4	7.354	0.065	0.949
λ_1	-22.987	-0.134	0.894	λ_1	3.228	0.019	0.985
$\lambda_2 NCED_0$	27.407	0.159	0.874	λ_2	-7.396	-0.044	0.965
$\lambda_3 NCED_0 \times CE_0$	19.321	1.222	0.226	λ_3	-20.009	-1.286	0.203
$\lambda_4 PCED_0 \times CE_0$	672.467	0.103	0.918	λ_4	-24.427	-0.004	0.997
R-squared	0.043			R-squared	0.040		

Notes: This table reports the first stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the future earnings change equation in its nonlinear form

The test of the predictive ability of dividend changes on ROA changes using the nonlinear model is consistent with the linear model for β_1 as the coefficient is negative for T=1, positive for T=2 but insignificant at the 1%, 5% and 10% level for both years. All other coefficients are insignificant.

In table 15 we have included the results for the second stage of the 2SLS regression where we focus on the dividend change equation (equation 15) using the fitted values of the future earnings change regression:

Table 15- Second stage of the 2SLS regression using the dividend change equation in its nonlinear form (Dividend Changes and Future Asset-Scaled Earnings Changes)

Dividend Changes and Future Asset-Scaled Earnings Changes- Dividend Change Equation							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.269	1.934	0.057	Intercept	0.246	1.713	0.091
$\alpha_1(ROA_T\text{-}ROA_{T-1})$	-2.090	-2.970	0.004	α_1	1.759	2.356	0.021
$\alpha_2 PR\Delta FCFD_{-1}$...	0.343	0.824	0.413	α_2	0.474	1.118	0.267
$\alpha_3 NR\Delta FCFD_{-1}$...	0.030	0.086	0.931	α_3	0.010	0.028	0.978
$\alpha_4 R\Delta E_{-1}$	0.384	3.571	0.001	α_4	0.405	3.686	0.000
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.157	-0.237	0.814	α_5	-0.218	-0.321	0.750
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	-0.084	-0.656	0.514	α_6	-0.061	-0.469	0.641
R-squared	0.248			R-squared	0.217		

Notes: This table reports the second stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the Dividend Change equation in its nonlinear form.

The results for second stage of the 2SLS regression using the nonlinear model are similar to those of the second stage of the 2SLS regression using the linear model. The coefficient α_1 is negative (-2.090) for year T=1 and extremely significant at the 1% level (0.004). This coincides with the results for the linear model and provides further evidence that the purpose behind dividend changes is not to signal changes in ROA in the future. Although the results for T=2 are different (positive) the coefficient is only significant at the 5% level.

As for the control variables, again the nonlinear model coincides with the results from the linear model as only α_4 is significant for both years T=1 (0.001) and T=2 (0.000). This provides more proof that managers take into consideration previous earning changes when they set the dividend policy of their company.

6. Robustness Tests

6.1. Dividend changes and ROE levels

6.1.1. The Model

On this chapter we will be presenting robustness tests to verify the findings from our previous models and see if they hold up to alternate specifications. Other authors have been known to perform the same robustness tests such as Nissim and Ziv (2001), Grullon *et al*. (2005) and Liu and Chen (2015). These tests require us to replicate the simple OLS regression of the dividend change equation and the simultaneous-equation model replacing the change in earnings with earnings levels to ensure the robustness of the findings.

6.1.2. Model Specifications

For our first robustness test we will be estimating the following ROE linear and nonlinear model systems:

a) ROE linear model system:

Dividend Change Equation-

$$R\Delta DIV_0 = \alpha_0 + \alpha_1 ROE_T + \alpha_2 PR\Delta FCFD_{-1} \times R\Delta FCF_{-1} \times NR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_3 NR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1 \times PR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_4 R\Delta E_{-1} + \alpha_5 NDDivP_0 \times R\Delta DivP_0 + \alpha_6 PDDivP_0 \times R\Delta DivP_0 + \mu_T \quad (17)$$

where $R\Delta DIV_0$ is the annual rate of change in dividend. $R\Delta FCF$ is the rate of change in free cash flow in year -1. $R\Delta Q_{-1}$ is the rate of change in Tobin's Q in year -1. $PR\Delta FCFD_{-1}$ ($NR\Delta FCFD_{-1}$) is a dummy variable that equals 1 for positive (negative) $R\Delta FCF$ and 0 otherwise. $PR\Delta QD_{-1}$($NR\Delta QD_{-1}$) is a dummy variable that equals 1 for positive (negative) $R\Delta Q_{-1}$ and 0 otherwise. $R\Delta E_{-1}$ is the rate of change in earnings in year -1. $R\Delta DivP_0$ is the contemporaneous dividend premium change rate, where DivP is the difference in the logs of the annual market-value-weighted average market-to-book ratios of dividend paying firms and nonpayers. $PDDivP_0$ ($NDDivP_0$) is a dummy variable that equals 1 if $R\Delta DivP_0$ is positive (negative) and 0 otherwise. ROE_T denotes the earnings on equity at the end of year T after the dividend-change event year.

Future Earnings Change Equation-

$$ROE_T = \beta_0 + \beta_1 R\Delta DIV_0 + \beta_2 ROE_{T-1} + \beta_3 CE_O + \upsilon_1 MB_{-1} + \upsilon_2 Size_{-1} + \varepsilon_T \quad (18)$$

where CE_O is equal to ROE_0-ROE_{-1}. $R\Delta DIV_0$ is the annual rate of change in dividend. ROE_T denotes the earnings on equity at the end of year T after the dividend-change event year. MB_{-1} is the log of the market-to-book ratio of equity in year -1. $Size_{-1}$ is the log of total assets in year -1.

b) ROE nonlinear model system:

Dividend Change Equation-

$$R\Delta DIV_0 = \alpha_0 + \alpha_1 ROE_T + \alpha_2 PR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1 \times NR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_3 NR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1 \times PR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_4 R\Delta E_{-1} + \alpha_5 NDDivP_0 \times R\Delta DivP_0 + \alpha_6 PDDivP_0 \times R\Delta DivP_0 + \mu_T \quad (19)$$

Future Earnings Change Equation-

$$ROE_T = \beta_0 + \beta_1 R\Delta DIV_0 + (Y_1 + Y_2 NDFED_0 + Y_3 NDFED_0 \times DFE_0 + Y_4 PDFED_0 \times DFE_0) \times DFE_0 + (\lambda_1 + \lambda_2 NCED_0 + \lambda_3 NCED_0 \times CE_0 + \lambda_4 PCED_0 \times CE_0) \times CE_0 + \upsilon_1 MB_{-1} + \upsilon_2 Size_{-1} + \varepsilon T \quad (20)$$

where DFE_0 is equal to ROE_0 because the dependent variable in this equation is determined primarily by the ROE in year 0, MB_{-1} is the log of the market-to-book ratio of equity in year -1, $Size_{-1}$ is the log of total assets in year -1. CE_O is equal to ROE_0-ROE_{-1}. $PDFED_0$ ($NDFED_0$) is a dummy variable that equals 1 if DFE_0 is positive (negative) and 0 otherwise. $PCED_0$ ($NCED_0$) is a dummy variable that equals 1 if CE_0 is positive (negative) and 0 otherwise.

The reason behind the choice of ROE as the dependent variable is related to the fact that according to the dividend signalling hypothesis companies with higher forecasted future earnings, be it ROE or ROA (as we will see further ahead), are more likely to have managers that set a more generous dividend policy towards investors when compared with firms with lower forecasted future earnings. In the same way, dividends changes can also have a positive or negative effect on future earnings levels.

As we had already done on the previous chapter, we also needed to make special calculation before proceeding to the regressions. Specifically we had to calculate DFE_0 and CE_0 as their formulas are different for this model as shown in the specifications above. As for the remaining values of MB and Size they can all be found in tables 49, 50 and 53, 54 in the annexes. We can find the data relative to the calculation of CE_0 in tables 71 and 72 in the annexes and the same can be said about DFE_0 (tables 69 and 70).

6.1.2. Regression Results

In this section we will present the results of the simple OLS regressions and the Two-Stage Least Square regressions that analyse the relationship between dividend changes and ROE levels.

OLS Regression of the dividend change equation

In this sub-section we will perform the OLS estimation of the dividend change equation (equation 17) just like in previous models. Table 16 provides us with the results for the OLS regression:

Table 16- Simple OLS Regression of the dividend change equation (Dividend Changes and ROE levels)

Dividend Changes and ROE Levels							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.089	0.633	0.529	Intercept	0.008	0.055	0.957
$\alpha_1 ROE_T$	0.060	0.389	0.698	α_1	0.627	1.368	0.176
$\alpha_2 PR\Delta FCFD_{-1}$...	0.482	1.060	0.293	α_2	0.595	1.323	0.190
$\alpha_3 NR\Delta FCFD_{-1}$...	-0.100	-0.272	0.786	α_3	-0.079	-0.218	0.828
$\alpha_4 R\Delta E_{-1}$	0.401	3.456	0.001	α_4	0.417	3.661	0.001
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.434	-0.621	0.536	α_5	-0.490	-0.710	0.480
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	-0.004	-0.028	0.978	α_6	0.005	0.041	0.968
R-squared	0.159			R-squared	0.178		

Notes: This table reports the OLS estimated regression of the dividend change equation for the subsequent two years after the dividend-change event year (T=1 and 2).

Looking at the results from the regression we start seeing a pattern as the coefficient α_4 is again the only one that is significant at the 1% level. For year T=1 this coefficient is positive (0.401) and significant (0.001) and for year T=2 the coefficient is positive

(0.417) and significant as well (0.001). The previous earnings hypothesis receives additional support as these results coincide with the results from previous models.

Simultaneous-Equation Model (Linear)

In this section we focus on the first stage of the 2SLS regression, this is, the future earnings change equation in its linear form (equation 18). Table 17 presents us with the results for this regression:

Table 17- First stage of the 2SLS regression using the future earnings change equation in its linear form (Dividend Changes and ROE levels)

Dividend Changes and ROE Levels – Future earnings change(Linear)							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.046	0.108	0.914	Intercept	0.294	2.303	0.024
$\beta_1 R\Delta DIV_0$	-0.004	-0.042	0.967	β_1	0.009	0.348	0.729
$\beta_2 ROE_{T-1}$	0.400	0.523	0.602	β_2	-0.056	-1.601	0.114
$\beta_3 CE_O$	0.518	0.896	0.373	β_3	-0.030	-0.174	0.862
$\upsilon_1 MB_{-1}$	0.057	0.264	0.793	υ_1	0.175	3.391	0.001
$\upsilon_2 Size_{-1}$	0.018	0.244	0.808	υ_2	-0.038	-1.707	0.092
R-squared	0.025			R-squared	0.187		

Notes: This table reports the first stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the future earnings change equation in its linear form

By looking at the results from this regression we find consistency with previous findings as dividend changes cannot predict ROE levels. This conclusion can be obtained by looking at the coefficient β_1 and noticing that it is negative (-0.004) and insignificant (0.967) for T=1 and positive (0.009) while also insignificant (0.729) for T=2. As for the control variables the only ones with explanatory power are $\upsilon 1$ for the year T=2 as it is positive (0.175) and extremely significant (0.001) and υ_2 again for the year T=2 (negative and significant at the 10% level).

In table 18 we provide the results for the second stage of the 2SLS regression that focuses on the dividend change equation (equation 17):

Table 18- Second stage of the 2SLS regression using the dividend change equation in its linear form (Dividend Changes and ROE levels)

Dividend Changes and ROE levels- Dividend change equation (Linear)							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.132	0.522	0.604	Intercept	-0.154	-0.808	0.422
$\alpha_1 ROE_T$	-0.134	-0.130	0.897	α_1	1.928	1.887	0.063
$\alpha_2 PR\Delta FCFD_{-1}$...	0.447	0.999	0.321	α_2	0.509	1.181	0.242
$\alpha_3 NR\Delta FCFD_{-1}$...	-0.084	-0.228	0.820	α_3	-0.126	-0.354	0.725
$\alpha_4 R\Delta E_{-1}$	0.388	3.314	0.001	α_4	0.385	3.466	0.001
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.426	-0.609	0.544	α_5	-0.412	-0.604	0.548
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	-0.005	-0.039	0.969	α_6	0.005	0.038	0.970
R-squared	0.157			R-squared	0.196		

Notes: This table reports the second stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the Dividend Change equation in its linear form.

The coefficient α_1 is negative and insignificant for the year T=1, but positive (1.928) and significant (0.063) at the 10% level for the year T=2. The results for this coefficient in year T=1 do not support the signalling hypothesis, however year T=2 supports the dividend signalling hypothesis.

As for the control variables only α_4 is significant both for years T=1 and years T=2. For T=1 the coefficient is positive (0.388) and significant at the 1% level (0.001) while for T=2 the coefficient is still positive (0.385) and also significant at the 1% level (0.001). Considering these results there is extremely strong evidence that managers take into consideration previous earnings changes when deciding the dividend policy.

Simultaneous-Equation Model (Nonlinear)

Table 19 presents us with the results for the first stage of the 2SLS estimation focusing on the future earnings change equation (equation 20) in its nonlinear form:

Table 19- First stage of the 2SLS regression using the future earnings change equation in its nonlinear form (Dividend Changes and ROE levels)

Dividend Changes and ROE Levels – Future earnings change (Nonlinear)							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.132	0.286	0.776	Intercept	0.306	2.432	0.018
$\beta_1 R\Delta DIV_0$	-0.059	-0.550	0.584	β_1	-0.021	-0.703	0.485
γ_1	-1.262	-0.548	0.585	γ_1	0.947	1.505	0.137
$\gamma_2 NDFED_0$	12.665	1.286	0.203	γ_2	-3.076	-1.142	0.258
$\gamma_3 NDFED_0 \times DFE_0$	-2.730	-0.312	0.756	γ_3	-1.946	-0.812	0.419
$\gamma_4 PDFED_0 \times DFE_0$	6.131	0.638	0.526	γ_4	1.206	0.458	0.648
λ_1	-7.032	-0.123	0.903	λ_1	-5.134	-0.327	0.744
$\lambda_2 NCED_0$	8.007	0.139	0.890	λ_2	5.989	0.381	0.704
$\lambda_3 NCED_0 \times CE_0$	2.490	0.536	0.594	λ_3	2.682	2.109	0.039
$\lambda_4 PCED_0 \times CE_0$	41.941	0.050	0.960	λ_4	40.044	0.176	0.861
$\upsilon_1 MB_{-1}$	0.065	0.284	0.777	υ_1	0.031	0.492	0.624
$\upsilon_2 Size_{-1}$	0.033	0.398	0.692	υ_2	-0.051	-2.275	0.026
R-squared	0.046			R-squared	0.342		

Notes: This table reports the first stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the future earnings change equation in its nonlinear form

The main conclusion we can take when looking at these regression results is that there is further indication that dividend changes cannot predict future ROE levels. These findings are consistent with the results from its linear counterpart as the β_1 coefficients for T=1 and T=2 are insignificant (0.582 and 0.485 respectively). In table 20 we provide the results for the second stage of the 2SLS regression that focuses on the dividend change equation (equation 19):

Table 20- Second stage of the 2SLS regression using the dividend change equation in its nonlinear form (Dividend Changes and ROE levels)

Dividend Changes and ROE levels- Dividend change equation (Nonlinear)							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.164	0.841	0.403	Intercept	-0.112	-0.650	0.517
$\alpha_1 ROE_T$	-0.298	-0.425	0.672	α_1	1.656	1.953	0.055
$\alpha_2 PR\Delta FCFD_{-1}$...	0.404	0.906	0.368	α_2	0.861	1.791	0.078
$\alpha_3 NR\Delta FCFD_{-1}$...	-0.094	-0.258	0.797	α_3	-0.098	-0.274	0.785
$\alpha_4 R\Delta E_{-1}$	0.383	3.315	0.001	α_4	0.430	3.817	0.000
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.432	-0.619	0.538	α_5	-0.370	-0.543	0.589
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	-0.008	-0.061	0.952	α_6	0.007	0.051	0.960
R-squared	0.159			R-squared	0.199		

Notes: This table reports the second stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the Dividend Change equation in its nonlinear form.

The results for the nonlinear regression of the dividend change equation are similar to those of its linear counterpart as the coefficient α_1 is insignificant (0.672) and negative (-0.298) for the year T=1 while significant (0.055) at the 10% level and positive (1.656) for the year T=2. Other similar results occurred for the coefficient α_4 as it is extremely significant (0.001) at the 1% level and positive for year T=1 and also extremely significant (0.000) at the 1% level and positive for year T=2. Just like in some of the previous models, there is evidence of the free cash flow hypothesis in year T=2 as α_2 for that year is significant (0.078) and positive (0.861).

6.2. Dividend changes and ROA levels

6.2.1. The Model

In this section we will run the same model as the one from the previous section with the difference being that we will replace ROE for ROA.

6.2.2. Model Specifications

Below we have presented the formulas for the ROA linear model system and ROA nonlinear model system:

a) ROA linear model system:

Dividend Change Equation-

$$R\Delta DIV_0 = \alpha_0 + \alpha_1 ROA_T + \alpha_2 PR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1 \times NR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_3 NR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1 \times PR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_4 R\Delta E_{-1} + \alpha_5 NDDivP_0 \times R\Delta DivP_0 + \alpha_6 PDDivP_0 \times R\Delta DivP_0 + \mu_T \quad (21)$$

where $R\Delta DIV_0$ is the annual rate of change in dividend. ROA_T denotes the earnings on asset at the end of year T after the dividend-change event year. RΔFCF is the rate of change in free cash flow in year -1. $R\Delta Q_{-1}$ is the rate of change in Tobin's Q in year -1. $PR\Delta FCFD_{-1}$ ($NR\Delta FCFD_{-1}$) is a dummy variable that equals 1 for positive (negative) RΔFCF and 0 otherwise. $PR\Delta QD_{-1}$($NR\Delta QD_{-1}$) is a dummy variable that equals 1 for positive (negative) $R\Delta Q_{-1}$ and 0 otherwise. $R\Delta E_{-1}$ is the rate of change in earnings in year -1. $R\Delta DivP_0$ is the contemporaneous dividend premium change rate, where DivP is the difference in the logs of the annual market-value-weighted average market-to-book ratios of dividend paying firms and nonpayers. $PDDivP_0$ ($NDDivP_0$) is a dummy variable that equals 1 if $R\Delta DivP_0$ is positive (negative) and 0 otherwise.

Future Earnings Change Equation-

$$ROA_T = \beta_0 + \beta_1 R\Delta DIV_0 + \beta 2 ROA_{T-1} + \beta_3 CE_O + \upsilon_1 MB_{-1} + \upsilon_2 Size_{-1} + \varepsilon_T \quad (22)$$

where CE_O is equal to ROA_0-ROA_{-1}. MB_{-1} is the log of the market-to-book ratio of equity in year -1. $Size_{-1}$ is the log of total assets in year -1. $R\Delta DIV_0$ is the annual rate of change in dividend. ROA_T denotes the earnings on asset at the end of year T after the dividend-change event year.

b) ROA nonlinear model system:

Dividend Change Equation-

$$R\Delta DIV_0 = \alpha_0 + \alpha_1 ROA_T + \alpha_2 PR\Delta FCFD_{-1} \times R\Delta FCF_{-1} \times NR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_3 NR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1 \times PR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_4 R\Delta E_{-1} + \alpha_5 NDDivP_0 \times R\Delta DivP_0 + \alpha_6 PDDivP_0 \times R\Delta DivP_0 + \mu_T \quad (23)$$

Future Earnings Change Equation-

$$ROA_T = \beta_0 + \beta_1 R\Delta DIV_0 + (Y_1 + Y_2 NDFED_0 + Y_3 NDFED_0 \times DFE_0 + Y_4 PDFED_0 \times DFE_0) \times DFE_0 + (\lambda_1 + \lambda_2 NCED_0 + \lambda_3 NCED_0 \times CE_0 + \lambda_4 PCED_0 \times CE_0) \times CE_0 + \upsilon_1 MB_{-1} + \upsilon_2 Size_{-1} + \varepsilon_T \quad (24)$$

where DFE_0 is equal to ROA_0. ROA_T denotes the earnings on asset at the end of year T after the dividend-change event year. MB_{-1} is the log of the market-to-book ratio of equity in year -1, $Size_{-1}$ is the log of total assets in year -1. CE_O is equal to ROA_0-ROA_{-1}. $PDFED_0$ ($NDFED_0$) is a dummy variable that equals 1 if DFE_0 is positive (negative) and 0 otherwise. $PCED_0$ ($NCED_0$) is a dummy variable that equals 1 if CE_0 is positive (negative) and 0 otherwise.

All calculations related to CE_O have already been presented in a previous chapter when we ran the regressions for the model that compared the relationship between dividend changes and future asset-scaled earnings changes.

6.2.3. Regression Results

In this section we will present the results of the OLS and the Two-Stage Least Square estimations that analyse the relationship between dividend changes and ROA levels.

OLS Regression of the dividend change equation

Table 21 presents the results for the OLS estimation of the dividend change equation (equation 21):

Table 21- Simple OLS Regression of the dividend change equation (Dividend Changes and ROA levels)

Dividend Changes and ROA levels							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.100	0.724	0.471	Intercept	-0.021	-0.130	0.897
$\alpha_1 ROA_T$	0.021	0.136	0.892	α_1	1.490	1.427	0.158
$\alpha_2 PR\Delta FCFD_{-1}$...	0.452	0.994	0.324	α_2	0.688	1.470	0.146
$\alpha_3 NR\Delta FCFD_{-1}$...	-0.093	-0.254	0.800	α_3	-0.094	-0.261	0.795
$\alpha_4 R\Delta E_{-1}$	0.395	3.412	0.001	α_4	0.447	3.766	0.000
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.430	-0.616	0.540	α_5	-0.440	-0.639	0.525
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	-0.005	-0.040	0.968	α_6	0.008	0.062	0.951
R-squared	0.157			R-squared	0.180		

Notes: This table reports the OLS estimated regression of the dividend change equation for the subsequent two years after the dividend-change event year (T=1 and 2).

Running the OLS estimation provides us with only one significant coefficient, α_4. The coefficient α_4 is positive (0.395) and significant (0.001) at the 1% level for T=1 and also positive (0.447) and significant (0.000) at the 1% level for T=2. These results support the previous earnings hypothesis.

Simultaneous-Equation Model (Linear)

Table 22 provides the results for the regression of the future earnings change equation in its linear form (equation 22):

Table 22- First stage of the 2SLS regression using the future earnings change equation in its linear form (Dividend Changes and ROA levels)

Dividend Changes and ROA levels- Future Earnings Change (Linear)							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.041	0.094	0.925	Intercept	0.234	4.154	0.000
$\beta_1 R\Delta DIV_0$	-0.020	-0.226	0.822	β_1	-0.002	-0.167	0.868
$\beta_2 ROA_{T-1}$	0.011	0.008	0.994	β_2	0.024	1.536	0.129
$\beta_3 CE_O$	0.168	0.295	0.769	β_3	0.000	0.002	0.999
$\upsilon_1 MB_{-1}$	0.033	0.161	0.873	υ_1	0.083	3.691	0.000
$\upsilon_2 Size_{-1}$	0.016	0.218	0.828	υ_2	-0.034	-3.475	0.001
R-squared	0.004			R-squared	0.271		

Notes: This table reports the first stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the future earnings change equation in its linear form

The findings from this regression are consistent with previous results. The coefficient β_1 is negative (-0.020) and insignificant (0.822) for T=1 and also negative (-0.002) and insignificant (0.868) for T=2. These results coincide with the results from section 5.2.3. that suggested dividend changes cannot predict future ROA levels. In terms of control variables only υ_1 is significant and for the year T=2.

Table 23 provides the data related to the second stage of the 2SLS regression (equation 21):

Table 23- Second stage of the 2SLS regression using the dividend change equation in its linear form (Dividend Changes and ROA levels)

Dividend Changes and ROA levels- Dividend Change Equation (Linear)

T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	1.943	6.073	0.000	Intercept	-0.119	-0.589	0.558
$\alpha_1 ROA_T$	-13.640	-6.120	0.000	α_1	2.869	1.461	0.148
$\alpha_2 PR\Delta FCFD_{-1}$	0.869	2.384	0.020	α_2	0.650	1.421	0.160
$\alpha_3 NR\Delta FCFD_{-1}$	0.192	0.638	0.526	α_3	-0.142	-0.391	0.697
$\alpha_4 R\Delta E_{-1}$	0.220	2.270	0.026	α_4	0.431	3.737	0.000
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.152	-0.266	0.791	α_5	-0.411	-0.597	0.553
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	0.053	0.495	0.622	α_6	0.010	0.077	0.939
R-squared	0.443			R-squared	0.181		

Notes: This table reports the second stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the Dividend Change equation in its linear form.

After computing the results for this regression we come to the conclusion that there is evidence of the previous earnings hypothesis as the coefficients for α_4 are positive (0.220 and 0.431) and significant (0.026 and 0.000) for both T=1 and T=2 and we also find evidence for the free cash flow hypothesis as the coefficient for α_2 in year T=1 is positive (0.869) and significant at the 5% level (0.020) even if it is not significant for the following year. As for the predictions of the dividend signalling hypothesis the coefficient for α_1 is negative (-13.640) and significant (0.000) at the 1% level for T=1 but insignificant for the year T=2 (0.148). This is evidence against the Signalling Hypothesis.

Simultaneous-Equation Model (Nonlinear)

Table 24 presents the results of the first stage of the 2SLS regression of the future earnings change equation in its nonlinear form (equation 24):

Table 24- First stage of the 2SLS regression using the future earnings change equation in its nonlinear form (Dividend Changes and ROA levels)

Dividend Changes and ROA levels- Future Earnings Change (Nonlinear)

T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.105	0.214	0.831	Intercept	0.156	3.166	0.002
$\beta_1 R\Delta DIV_0$	-0.042	-0.443	0.659	β_1	-0.013	-1.319	0.192
y_1	2.831	0.348	0.729	y_1	1.692	2.071	0.042
$y_2 NDFED_0$	-19.378	-1.036	0.304	y_2	-0.854	-0.455	0.651
$y_3 NDFED \times DFE_0$	-270.546	-1.157	0.251	y_3	6.140	0.262	0.795
$y_4 PDFED \times DFE_0$	12.452	0.104	0.918	y_4	8.331	0.692	0.491
λ_1	-34.930	-0.196	0.845	λ_1	-16.265	-0.911	0.366
$\lambda_2 NCED_0$	38.795	0.218	0.828	λ_2	16.258	0.910	0.366
$\lambda_3 NCED_0 \times CE_0$	20.001	1.211	0.230	λ_3	0.673	0.406	0.686
$\lambda_4 PCED_0 \times CE_0$	1191.628	0.176	0.861	λ_4	478.898	0.705	0.483
υ_1 MB_{-1}	-0.009	-0.043	0.966	υ_1	0.072	3.608	0.001
υ_2 $Size_{-1}$	-0.002	-0.027	0.979	υ_2	-0.022	-2.655	0.010
R-squared	0.035			R-squared	0.600		

Notes: This table reports the first stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the future earnings change equation in its nonlinear form

The results of this regression are consistent with those from its linear counterpart as they show no capacity for dividends to predict future ROA levels since α_1 is negative and insignificant for both T=1 and T=2. Similarly to its nonlinear model, υ_1 is also positive (0.072) and significant (0.001) which indicates some relation between the market-to-book ratio of equity in year -1 and the ROA of the second year after the even year (0).

Table 25 contains the results of the second stage of the 2SLS regression based on the dividend change equation in its nonlinear form (equation 23):

Table 25- Second stage of the 2SLS regression using the dividend change equation in its nonlinear form (Dividend Changes and ROA levels)

Dividend Changes and ROA levels- Dividend Change Equation (Nonlinear)

T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.385	2.089	0.040	Intercept	-0.010	-0.060	0.952
$\alpha 1 ROA_T$	-1.802	-2.168	0.033	α_1	1.449	1.052	0.296
$\alpha 2 PR\Delta FCFD_{-1}$...	0.242	0.556	0.580	α_2	0.646	1.346	0.182
$\alpha 3 NR\Delta FCFD_{-1}$...	0.035	0.097	0.923	α_3	-0.118	-0.324	0.747
$\alpha_4 R\Delta E_{-1}$	0.390	3.531	0.001	α_4	0.419	3.617	0.001
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.193	-0.282	0.779	α_5	-0.427	-0.616	0.540
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	-0.071	-0.539	0.592	α_6	0.008	0.061	0.952
R-squared	0.208			R-squared	0.170		

Notes: This table reports the second stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the Dividend Change equation in its nonlinear form.

The results are similar to those of its linear counterpart as there is evidence against the dividend signalling hypothesis in year T=1 (α_1 is negative and significant) and there is strong evidence of the previous earnings hypothesis in both years T=1 and T=2 (α_4 is positive and significant for the two consecutive years). Contrary to the linear model however this regression shows no evidence of the free cash flow hypothesis as α_2 is insignificant for both years.

6.3. Dividend changes and future abnormal earnings

6.3.1. The Model

In this section we will run and additional robustness test, but this time instead of examining the relationship between dividend changes and earnings levels we will focus on the relationship between dividend changes and abnormal earnings in each of the two years following the dividend change year. The advantage of abnormal earnings over future earnings is that unlike future earnings, the abnormal earnings cannot be affected by other actions such as retained earnings, stock issues and stock repurchases so it allows the tests to focus only on the effect of value-creating activities.

Abnormal future earnings are calculated as a total actual earning after the declining period minus total expected earnings over the same period, whereas expected earnings were those equal to the earnings in the recession period compounded forwards at historic growth rate for the earnings in the previous years prior to the decline. To obtain

the future earnings the only thing left is to standard the results by the shareholder's funds of the period before the initial decline, as expressed in equation 25 from Hussainey and Aal-Eisa (2009):

$$\frac{\sum Actual\ earning\ (t+1, t+2) - \sum Expected\ earning(t+1, t+2)}{Shareholder's\ funds\ (t-1)} \quad (25)$$

6.3.2. Model Specifications

Below we have presented the formulas for the Abnormal Future Earnings linear model system and Abnormal Future Earnings nonlinear model system:

a) Abnormal Future Earnings linear model system:

Dividend Change Equation-

$$R\Delta DIV_0 = \alpha_0 + \alpha_1 AE_T + \alpha_2 PR\Delta FCFD_{-1} \times R\Delta FCF_{-1} \times NR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_3 NR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1 \times PR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_4 R\Delta E_{-1} + \alpha_5 NDDivP_0 \times R\Delta DivP_0 + \alpha_6 PDDivP_0 \times R\Delta DivP_0 + \mu_T \quad (26)$$

where AE represents the Abnormal Future Earnings. The calculations for the Abnormal Future Earnings can be found in tables 57-62 in the annexes. $R\Delta DIV_0$ is the annual rate of change in dividend. RΔFCF is the rate of change in free cash flow in year -1. $R\Delta Q_{-1}$ is the rate of change in Tobin's Q in year -1. $PR\Delta FCFD_{-1}$($NR\Delta FCFD_{-1}$) is a dummy variable that equals 1 for positive (negative) RΔFCF and 0 otherwise. $PR\Delta QD_{-1}$($NR\Delta QD_{-1}$) is a dummy variable that equals 1 for positive (negative) $R\Delta Q_{-1}$ and 0 otherwise. $R\Delta E_{-1}$ is the rate of change in earnings in year -1. $R\Delta DivP_0$ is the contemporaneous dividend premium change rate, where DivP is the difference in the logs of the annual market-value-weighted average market-to-book ratios of dividend paying firms and nonpayers. $PDDivP_0$($NDDivP_0$) is a dummy variable that equals 1 if $R\Delta DivP_0$ is positive (negative) and 0 otherwise.

Future Earnings Change Equation-

$$AE_T = \beta_0 + \beta_1 R\Delta DIV_0 + \beta_2 ROE_{T-1} + \beta_3 CE_O + \upsilon_1 MB_{-1} + \upsilon_2 Size_{-1} + \varepsilon_T \quad (27)$$

where CE_O is equal to ROE_0-ROE_{-1}. ROE_{T-1} denotes the earnings on equity at the beginning of year T after the dividend-change event year. MB_{-1} is the log of the market-to-book ratio of equity in year -1, $Size_{-1}$ is the log of total assets in year -1.

b) Abnormal Future Earnings nonlinear model system:

Dividend Change Equation-

$$R\Delta DIV_0 = \alpha_0 + \alpha_1 AE_T + \alpha_2 PR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1 \times NR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_3 NR\Delta FCFD_{-1} \times R\Delta FCF\text{-}1 \times PR\Delta QD_{-1} \times R\Delta Q_{-1} + \alpha_4 R\Delta E_{-1} + \alpha_5 NDDivP_0 \times R\Delta DivP_0 + \alpha_6 PDDivP_0 \times R\Delta DivP_0 + \mu_T \quad (28)$$

Future Earnings Change Equation-

$$AE_T = \beta_0 + \beta_1 R\Delta DIV_0 + (Y_1 + Y_2 NDFED_0 + Y_3 NDFED_0 \times DFE_0 + Y_4 PDFED_0 \times DFE_0) \times DFE_0 + (\lambda_1 + \lambda_2 NCED_0 + \lambda_3 NCED_0 \times CE_0 + \lambda_4 PCED_0 \times CE_0) \times CE_0 + \upsilon_1 MB_{-1} + \upsilon_2 Size_{-1} + \varepsilon_T \quad (29)$$

where DFE_0 is equal to ROE_0. ROE_{T-1} denotes the earnings on equity at the beginning of year T after the dividend-change event year. MB_{-1} is the log of the market-to-book ratio of equity in year -1, $Size_{-1}$ is the log of total assets in year -1. CE_0 is equal to ROE_0-$ROE_{-1.}$ $PDFED_0$ ($NDFED_0$) is a dummy variable that equals 1 if DFE_0 is positive (negative) and 0 otherwise. $PCED_0$ ($NCED_0$) is a dummy variable that equals 1 if CE_0 is positive (negative) and 0 otherwise.

All calculations related to CE_0 have already been presented in a previous chapter when we ran the regressions for the model that compared the relationship between dividend changes and ROE levels. As for DFE_0 it is equal to ROE_0 and these values can also be found in that section.

6.3.3. Regression Results

In this section we will present the results of the OLS and the Two-Stage Least Square estimations that analyse the relationship between dividend changes and future abnormal earnings.

OLS Regression of the dividend change equation

Table 26 presents the results of the OLS estimation of the dividend change equation (equation 26):

Table 26- Simple OLS Regression of the dividend change equation (Dividend Changes and Abnormal Earnings)

Dividend Changes and Future Abnormal Earnings							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.119	0.865	0.390	Intercept	0.108	0.792	0.431
$\alpha_1 AE_T$	0.157	0.570	0.570	α_1	0.050	0.194	0.847
$\alpha_2 PR\Delta FCFD_{-1}$...	0.420	0.955	0.343	α_2	0.444	1.006	0.318
$\alpha_3 NR\Delta FCFD_{-1}$...	-0.066	-0.180	0.858	α_3	-0.088	-0.239	0.812
$\alpha_4 R\Delta E_{-1}$	0.396	3.482	0.001	α_4	0.398	3.377	0.001
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.397	-0.569	0.571	α_5	-0.426	-0.609	0.544
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	-0.013	-0.100	0.921	α_6	-0.007	-0.055	0.956
R-squared	0.161			R-squared	0.157		

Notes: This table reports the OLS estimated regression of the dividend change equation for the subsequent two years after the dividend-change event year (T=1 and 2).

The OLS estimation provides similar results to those from previous models. None of the coefficients are significant with the exception of α_4, which as always provides support to the previous earnings hypothesis. Both α_4s for year T=1 and year T=2 are positive (0.396 and 0.398) and extremely significant at the 1% level (0.001 and 0.001). On the other hand the coefficient α1 provides no support for the dividend signalling hypothesis as it is insignificant for both years T=1 and T=2.

Simultaneous-Equation Model (Linear)

Moving on to the first stage of the simultaneous equation model, we can find in table 27 the results of the regression of the future earnings change equation in its linear form (equation 27):

Table 27- First stage of the 2SLS regression using the future earnings change equation in its linear form (Dividend Changes and Abnormal Earnings)

Dividend Changes and Future Abnormal Earnings- Future Earnings Change (Linear)							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.238	1.041	0.301	Intercept	0.300	1.218	0.227
$\beta_1 R\Delta DIV_0$	-0.017	-0.353	0.725	β_1	-0.052	-1.021	0.311
$\beta_2 ROE_{T-1}$	0.302	0.739	0.462	β_2	0.008	0.117	0.907
$\beta_3 CE_O$	-0.424	-1.372	0.174	β_3	-0.322	-0.964	0.338
$\upsilon_1 MB_{-1}$	-0.064	-0.554	0.581	υ_1	-0.108	-1.093	0.278
$\upsilon_2 Size_{-1}$	-0.063	-1.562	0.122	υ_2	-0.068	-1.571	0.120
R-squared	0.060			R-squared	0.070		

Notes: This table reports the first stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the future earnings change equation in its linear form

By analysing the table we find consistency with previous findings as all β_1s are negative and insignificant. This means that dividend changes cannot be used to predict future earnings. The only difference with previous findings is that this time υ_1 is not significant in either year which implies no relationship between the market-to-book ratio of equity and future abnormal earnings.

Table 28 contains the results for the second stage of the 2SLS regression in its linear form (equation 26):

Table 28- Second stage of the 2SLS regression using the dividend change equation in its linear form (Dividend Changes and Abnormal Earnings)

Dividend Changes and Future Abnormal Earnings- Dividend Change Equation (Linear)							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.183	1.162	0.249	Intercept	-0.184	-1.122	0.266
$\alpha_1 AE_T$	1.201	0.957	0.342	α_1	-2.756	-2.816	0.006
$\alpha_2 PR\Delta FCFD_{-1}$...	0.618	1.297	0.199	α_2	0.051	0.115	0.909
$\alpha_3 NR\Delta FCFD_{-1}$...	-0.042	-0.116	0.908	α_3	-0.181	-0.519	0.606
$\alpha_4 R\Delta E_{-1}$	0.394	3.483	0.001	α_4	0.328	2.973	0.004
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.387	-0.557	0.579	α_5	-0.518	-0.781	0.438
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	0.011	0.083	0.934	α_6	-0.030	-0.237	0.813
R-squared	0.167			R-squared	0.240		

Notes: This table reports the second stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the Dividend Change equation in its linear form.

The results for the regression of the dividend change equation in its linear form are again similar to the findings from previous sections. The results for the coefficient α1 do not support the dividend signalling theory as α_1 is negative (-2.756) and extremely significant (0.006) at the 1% level for year T=2 and positive and insignificant for year T=1. As for the control variables, this time the free cash flow hypothesis shows no redeeming results to back it up as the coefficients are insignificant for all years but the previous earnings hypothesis proves extremely resilient once more as α_4 is positive and significant for both years.

Simultaneous-Equation Model (Nonlinear)

Finally, in this sub-section we have the last regressions of our study and in table 29 we can see the results for the first stage of the Two Stage Least Square regression in its nonlinear form (equation 29):

Table 29- First stage of the 2SLS regression using the future earnings change equation in its nonlinear form (Dividend Changes and Abnormal Earnings)

Dividend Changes and Future Abnormal Earnings- Future Earnings Change (Nonlinear)							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.346	1.414	0.162	Intercept	0.499	2.074	0.042
$\beta_1 R\Delta DIV_0$	-0.035	-0.604	0.548	β_1	-0.081	-1.436	0.156
γ_1	1.529	1.249	0.216	γ_1	1.014	0.842	0.403
$\gamma_2 NDFED_0$	-0.701	-0.134	0.894	γ_2	-5.630	-1.093	0.278
$\gamma_3 NDFED_0 \times DFE_0$	-1.725	-0.370	0.712	γ_3	-5.877	-1.283	0.204
$\gamma_4 PDFED_0 \times DFE_0$	-1.767	-0.346	0.731	γ_4	0.592	0.118	0.907
λ_1	4.220	0.138	0.890	λ_1	-5.992	-0.200	0.842
$\lambda_2 NCED_0$	-3.527	-0.115	0.908	λ_2	7.242	0.241	0.810
$\lambda_3 NCED_0 \times CE_0$	1.561	0.632	0.530	λ_3	2.030	0.835	0.407
$\lambda_4 PCED_0 \times CE_0$	-138.242	-0.312	0.756	λ_4	-51.949	-0.119	0.905
$\upsilon_1 MB_{-1}$	-0.067	-0.549	0.585	υ_1	0.024	0.198	0.844
$\upsilon_2 Size_{-1}$	-0.086	-1.975	0.052	υ_2	-0.096	-2.252	0.028
R-squared	0.089			R-squared	0.255		

Notes: This table reports the first stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the future earnings change equation in its nonlinear form

The results for the coefficient β_1 are exactly the same as the results obtained in its linear counterpart, providing more support to the idea that dividend changes cannot predict future earnings. The only difference between the linear and nonlinear model is that this time the coefficient υ_2 is significant at the 10% level for year T=1 (0.052) and significant at the 5% level for year T=2 (0.028). This result for the control variable recognises some relationship between the total assets in year -1 and abnormal earnings.

Table 30 is the final table of this chapter and contains the results of the dividend change equation in its non-linear form (equation 28):

Table 30- Second stage of the 2SLS regression using the dividend change equation in its nonlinear form (Dividend Changes and Abnormal Earnings)

Dividend Changes and Future Abnormal Earnings- Dividend Change Equation (Nonlinear)							
T=1				T=2			
	Coefficient	T-statistic	P-Value		Coefficient	T-statistic	P-Value
Intercept	0.272	1.831	0.071	Intercept	0.091	0.628	0.532
$\alpha_1 AE_T$	2.339	2.351	0.021	α_1	-0.128	-0.241	0.810
$\alpha_2 PR\Delta FCFD_{-1}$...	0.854	1.858	0.067	α_2	0.418	0.936	0.352
$\alpha_3 NR\Delta FCFD_{-1}$...	-0.056	-0.158	0.875	α_3	-0.092	-0.251	0.803
$\alpha_4 R\Delta E_{-1}$	0.497	4.195	0.000	α_4	0.381	3.114	0.003
$\alpha_5 NDDivP_0 \times R\Delta DivP_0$	-0.107	-0.156	0.876	α_5	-0.442	-0.631	0.530
$\alpha_6 PDDivP_0 \times R\Delta DivP_0$	-0.035	-0.271	0.788	α_6	-0.005	-0.035	0.972
R-squared	0.216			R-squared	0.158		

Notes: This table reports the second stage of the 2SLS estimated simultaneous-equation model system for the subsequent two years after the dividend-change event year (T=1 and 2). The equation being estimated is the Dividend Change equation in its nonlinear form.

The results found in this table for coefficient α_1 support the signalling hypothesis theory, unlike its linear counterpart, however this time instead of the coefficient being significant in year T=2, it is positive (2.339) and significant (0.021) at the 5% level in year T=1. Unlike its linear counterpart, the coefficient for α_2 is positive (0.854) and significant (0.067) in one of the years (T=1) which also provides support for the free cash flow hypothesis. One hypothesis that proves to be more than just that after analysing the results of each of these models is the previous earnings hypothesis since the coefficient α_4 is again positive (0.497 and 0.381) and extremely significant (0.000 and 0.003) at the 1% level for years T=1 and T=2.

7. Conclusions

The study that was performed in this dissertation tests the signalling hypothesis using models with control variables to more accurately test the validity of this theory as these variables control for other motives that may lead managers to change dividends other than signalling information to investors. Our study builds upon recent models that take into consideration other hypothesis that might explain dividend changes such as the previous earnings changes hypothesis, the free cash flow hypothesis or the dividend clientele hypothesis.

In this study we have performed not only the single-equation OLS based estimation but also a simultaneous-equation model system using the 2SLS method, which was a model first implemented by Liu and Chen (2015) to solve the mutually endogenous problem between dividend changes and future earnings changes. We found that in our estimations the 2SLS model did indeed prove superior to the OLS based estimation as it was capable of capturing evidence in favour of the dividend-signalling hypothesis while the OLS estimations only captured evidence of the previous earnings changes hypothesis and all signs of the dividend-signalling were non-existent.

After running our models we find that there is some merit to the dividend-signalling hypothesis but the evidence is not absolute like in the study of Liu and Chen (2015) for the North-American market. We can see the evidence in favour of this theory by looking at the coefficient α_1 in tables 8, 10, 15, 18, 20 and 30 (positive and significant). The evidence against the hypothesis can be found by looking at the coefficient α_1 in tables 10, 13, 15, 23, 25 and 28 (negative and significant). The difference between the results of our study and the one performed by Liu and Chen (2015) is in the robustness tests as those authors found overwhelming evidence in favour of the signalling hypothesis in those tests (almost all α_1s were positive and significant) while our own robustness tests provided mixed results.

On the other hand, as we can see in tables 8, 10, 13 and 15, our results support their findings that managers change dividends for signalling future equity-scaled earnings changes rather than future asset-scaled earnings changes. As suggested by the authors of the study, it seems that equity investors are the priority targets to the information that managers want to signal. We did however not find any evidence that points towards a

relation between dividend changes and ROA levels, which goes against Liu and Chen (2015), as in their study increased dividends meant decreased ROA while decreased dividends meant increased ROA while our study suggests no connection between the two (β_1 is insignificant in tables 22 and 24).

As for the control variables, we found no evidence that supports the dividend catering hypothesis (all α_5s and α_6s on the dividend change equations of all model specifications are insignificant) and some evidence towards the free cash flow hypothesis (the coefficient α_2 is positive and significant in tables 8, 13, 20 and 23). The previous earnings changes hypothesis however is strongly supported by our model (α_4 is positive and significant in all tables with the dividend change equation) which means that managers do indeed take into consideration past firm results and signal the persistence of these firm earnings. The findings related to the dividend catering hypothesis and the free cash flow hypothesis match those found by the authors in Liu and Chen (2015)'s study while the previous earnings changes hypothesis is not fully supported in their study since their results are mixed on that account.

As for the comparison between the linear and nonlinear formulations of the models we did not find major differences between the results of both formulations. The results mirror the evidence from Liu and Chen (2015) that also found opposite results to those from Grullon *et al.* (2005).

Finally, table 3 suggests that managers suffer from over-optimism as most managers increased the dividend levels following the decline of earnings in year 0 and some of them were met with decreased earnings the following year while those that decreased dividend levels had their predictions on spot the following year.

As a suggestion for future studies, it would be interesting to analyse the years surrounding the crisis of 2008 and verify if it had a huge impact on the dividend policy of firms affected by it. No other study has focused in this period and it could provide interesting results. Another suggestion is related to the sample size as our own study was restricted by the limitations of the databases that we used and future researchers can expand upon the time horizon and obtain a larger and more expressive sample of European countries.

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Annexes

Table 31 Dividend Premium for 10 dividend paying UK firms and 10 non-dividend paying UK firms

United Kingdom						
Payers	**Market to Book (2008)**	**Market to Book (2009)**	**Market to Book (2010)**	**Market to Book (2011)**	**Market to Book (2012)**	**Market to Book (2013)**
ROYAL DUTCH SHELL PLC	0.516	0.570	0.592	0.596	0.499	0.517
Associated British Foods PLC	1.055	1.282	1.442	1.488	1.584	2.256
Diageo PLC	4.596	5.301	5.067	5.766	5.975	5.941
Intertek Group PLC	4.729	5.861	5.831	5.984	7.798	6.736
James Halstead PLC	4.257	3.398	4.699	6.295	5.903	6.350
NCC Group PLC	2.652	2.451	2.536	3.485	4.273	3.314
Goodwin PLC	2.662	2.250	2.136	2.414	1.963	2.501
BRAINJUICER GROUP PLC	3.260	3.584	4.665	5.313	3.770	5.197
ZYTRONIC PLC	2.124	2.244	2.262	2.297	3.016	1.555
CARILLION PLC	1.108	1.549	1.762	1.322	1.385	1.451
Non-Payers						
SERVOCA PLC	-2.372	5.193	1.717	0.939	0.502	0.592
IMPERIAL INNOVATIONS GROUP PLC	1.551	2.115	2.986	1.646	1.216	1.176
ACCSYS TECHNOLOGIES PLC	4.299	1.263	1.737	1.082	1.516	1.387
ARCONTECH GROUP PLC	1.029	0.881	1.016	1.015	1.180	1.539
VERONA PHARMA PLC.	1.480	6.904	6.328	3.715	5.119	7.765
DIALOG SEMICONDUCTOR PLC	0.736	3.605	5.935	3.432	2.678	3.869
IMAGINATION TECHNOLOGIES GROUP PLC	4.097	5.025	9.845	9.647	10.198	5.958
AMERISUR RESOURCES PLC	1.654	0.846	6.046	3.890	11.937	8.170
VAST RESOURCES PLC	2.960	1.359	1.852	1.431	0.687	1.303
URANIUM RESOURCES PLC	2.616	2.592	1.855	1.868	1.490	0.559

Table 32- Dividend Premium for 10 dividend paying Germanic firms and 10 non-dividend paying Germanic firms

Germany						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
DAIMLER AG	0.748	1.239	1.424	0.871	1.123	1.553
ORBIS AG	0.484	0.594	0.632	0.654	1.080	1.528
SÜDZUCKER AG	0.834	0.824	0.925	1.016	1.040	1.446
ATOSS SOFTWARE AG	2.326	3.331	3.813	3.222	3.571	9.542
VOLKSWAGEN AKTIENGESELLSCHAFT	0.109	0.183	0.425	0.309	0.357	0.386
AMADEUS FIRE AG	1.511	2.640	4.071	3.256	5.229	7.006
RATIONAL AKTIENGESELLSCHAFT	7.300	7.136	7.973	9.255	10.299	10.222
E.ON SE	1.327	1.236	0.945	0.766	0.672	0.682
BAYERISCHE MOTOREN WERKE AKTIENGESELLSCHAFT	0.652	0.967	1.477	1.145	0.334	0.372
Aixtron SE	2.029	5.627	4.601	1.584	1.908	2.538
Non-Payers						
NEXUS AG	0.494	0.957	1.193	1.636	2.041	2.224
IVU TRAFFIC TECHNOLOGIES AG	0.618	1.465	1.019	0.732	0.744	1.042
MIC AG	2.218	1.253	0.788	0.522	0.530	0.671
RIM AG	0.402	0.418	0.681	0.765	1.293	72.917
B+S BANKSYSTEME AKTIENGESELLSCHAFT	0.417	1.250	1.509	6.456	3.438	0.950
MYHAMMER HOLDING AG	3.287	21.968	12.281	13.677	0.000	0.000
BIT BY BIT HOLDING AG	0.235	0.145	0.326	0.153	0.102	0.408
ARN. GEORG AKTIENGESELLSCHAFT	1.457	0.939	0.909	0.885	0.849	1.233
CINEMEDIA AG	1.250	1.346	1.710	1.406	1.702	1.120
CURASAN AG	1.275	1.784	1.408	1.745	2.845	2.614

Table 33- Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: France

France						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
SODEXO	3.393	2.771	2.632	3.212	3.256	3.553
EUTELSAT COMMUNICATIONS	3.552	3.037	4.203	4.132	2.993	2.461
VIRBAC	2.545	2.714	3.776	3.356	3.660	3.171
INTERPARFUMS	1.567	1.719	2.580	1.506	1.480	2.139
POUJOULAT	0.753	0.826	0.767	0.929	0.872	1.114
MGI Coutier	0.291	0.477	0.813	0.643	0.615	1.414
LINEDATA SERVICES	0.563	1.073	1.188	0.820	1.095	1.907
L'AIR LIQUIDE SOCIETE ANONYME	2.527	2.893	3.019	2.780	2.906	2.952
ESSILOR INTERNATIONAL	3.008	3.238	3.380	3.481	4.146	4.099
ORPEA	1.761	1.914	1.555	1.159	1.462	1.658
Non-Payers						
STORE ELECTRONIC SYSTEMS	1.783	1.643	1.331	1.224	1.406	1.820
LA COMPAGNIE GENERALE IMMOBILIERE DE FRANCE	0.911	1.160	1.103	1.050	0.985	1.170
C&CO	0.844	1.187	1.271	0.876	0.889	0.911
BUDGET TELECOM	1.519	1.340	1.171	0.567	0.605	1.537
SA ESKER	1.146	2.481	2.584	2.165	3.472	3.538
EURO RESSOURCES	5.664	10.248	8.443	9.111	6.280	5.271
SIDETRADE	3.561	4.031	4.403	4.220	3.634	3.908
HAULOTTE GROUP	0.506	0.875	1.955	0.807	0.983	1.985
AUFEMININ	2.345	2.401	2.727	2.088	1.989	3.277
MGI DIGITAL TECHNOLOGY	1.146	1.958	2.094	1.656	2.071	3.909

Table 34- Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Spain

Spain						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
Indra Sistemas, Sociedad Anonima	3.128	2.671	1.968	1.468	1.444	1.734
Miquel Y Costas & Miquel SA	0.790	0.951	1.297	1.304	1.301	1.800
OBRASCON HUARTE LAIN SA	1.025	1.388	0.971	0.934	0.789	0.881
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	3.406	4.001	3.901	3.108	3.744	4.694
ELECNOR SA	1.827	2.130	1.432	1.381	1.344	1.788
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	2.271	2.728	2.332	1.978	1.690	1.806
DURO FELGUERA SA	2.311	3.734	3.591	2.800	2.406	3.011
VISCOFAN SA	2.144	2.325	3.218	2.973	4.001	3.694
VIDRALA, SA	1.529	1.681	1.732	1.429	1.442	2.329
INDUSTRIA DE DISEÑO TEXTIL SA	4.952	3.922	5.297	5.356	5.576	7.584
Non-Payers						
MEDCOM TECH, SA	0.164	0.090	0.024	0.018	0.008	0.024
LIWE ESPAÑOLA, SA	0.549	0.561	0.463	0.400	0.348	0.520
SNIACE, SA	0.562	0.990	0.844	0.666	0.547	-0.493
URBAR INGENIEROS, SA	0.000	1.542	1.864	2.671	1.732	2.514
BIOSEARCH, SA	1.359	1.726	1.211	0.960	0.932	1.707
ANTEVENIO, SA	1.568	1.682	1.348	1.387	1.266	1.324
NICOLAS CORREA, SA	0.694	0.604	0.453	0.312	0.262	0.469
AYCO GRUPO INMOBILIARIO, SA	2.570	1.935	1.552	4.176	-1.317	-0.526
BARON DE LEY, SA	1.342	1.037	1.327	1.250	1.155	1.449
GENERAL DE ALQUILER DE MAQUINARIA SA	0.862	0.806	0.425	0.578	-0.589	-0.666

Table 35- Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Poland

Poland						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
POLSKI KONCERN NAFTOWY ORLEN S.A.	0.529	0.666	0.806	0.533	0.750	0.637
GRUPA LOTOS S.A.	0.231	0.612	0.627	0.383	0.592	0.501
ASSECO POLAND S.A.	0.960	1.126	0.702	0.525	0.522	0.525
BUDIMEX S.A.	1.999	3.167	3.728	2.705	4.140	5.228
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	2.334	1.781	1.659	0.440	-0.090	-0.228
RAFAKO S.A.	0.573	1.837	2.328	1.144	1.363	1.514
ORANGE POLSKA S.A.	1.506	1.271	1.489	1.580	1.264	1.018
S4E S.A.	1.745	1.975	1.608	0.777	0.871	1.036
GRUPA KĘTY S.A.	0.741	1.343	1.305	0.967	1.268	1.815
SANOK RUBBER COMPANY S.A.	0.709	1.246	1.573	1.193	1.673	3.378
Non-Payers						
STARHEDGE S.A.	1.005	0.720	0.594	0.757	0.570	0.178
Trakcja Prkii S.A.	2.016	1.759	1.619	0.281	0.281	0.835
MOSTOSTAL WARSZAWA	2.411	2.180	2.077	0.705	0.768	0.425
ZAKŁADY MIĘSNE HENRYK KANIA S. A.	1.017	4.747	1.354	1.599	1.657	3.208
MAGNA POLONIA S.A.	1.630	1.273	1.968	0.930	3.625	0.445
RESBUD S.A.	0.493	1.147	0.780	0.637	2.204	1.925
PFLEIDERER GRAJEWO S.A.	0.536	1.560	1.034	0.492	1.119	2.168
SFINKS POLSKA S.A.	-10.438	-1.327	-1.480	-0.634	-0.390	-0.857
PETROLINVEST S.A.	0.618	1.630	0.550	0.375	0.442	0.097
PEMUG S.A.	3.005	2.610	1.816	1.138	1.098	0.706

Table 36- Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Ukraine

Ukraine						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
ФАРМАК ПУБЛІЧНЕ АО (Farmak Public JSC AT)	3.959	3.209	2.837	2.488	1.447	1.152
Ilyich Iron	0.282	0.720	0.179	0.185	0.200	0.405
URKNAFTA	0.573	0.835	3.885	1.977	0.365	0.322
ZAPORIZHSTAL	0.159	0.635	1.508	0.174	1.706	1.243
Motor Sich	0.408	1.320	1.611	0.868	0.613	0.384
Northern Iron Ore Enrichment Works	2.587	0.598	3.097	1.657	1.419	1.109
DTEK Dniprooblenergo	-4.022	17.296	9.220	1.568	4.675	0.872
Interpipe Nyzhniodniprovsk Piping	1.533	1.223	0.997	0.304	0.185	0.347
Dnepr Metallurgical Works	0.681	0.489	1.512	-1.077	-0.175	-0.070
Central Iron Ore Enrichment Works	1.655	0.649	1.245	1.282	1.921	2.000
Non-Payers						
Mariupol Heavy Engineering Plant	0.794	4.089	-1.734	-0.039	2.180	0.172
STIROL CONCERN	0.302	0.613	1.311	0.748	-0.366	-0.122
Dneprovsky Iron & Steel Works	0.681	0.489	1.512	-1.077	-0.175	-0.070
Zaporizhkoks PAT	0.943	0.061	0.051	0.417	0.256	1.093
Kryukov Railway Car Building Works	2.176	1.444	2.666	1.232	0.784	0.690
Public Joint stock company. Tokmak Press	5.285	8.386	8.429	9.983	10.964	14.041
Zhytomyroblenergo	0.583	0.451	0.266	0.283	0.030	0.030
ENERGOMASHSPETSSTAL	0.215	0.040	0.067	0.061	0.241	0.172
Kirovogradoblenergo	2.166	1.780	0.980	0.601	0.876	0.599
Zaporozhabrasive (ЗАПОРІЗЬКИЙ АБРАЗИВНИЙ КОМБІНАТ ОАС	0.808	0.175	0.420	0.384	0.408	0.151

Table 37- Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Greece

Greece						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	2.581	2.508	2.652	2.375	0.817	0.794
KRI KRI MILK IND SA	1.300	1.169	0.997	0.824	1.565	2.507
ΕΛΛΗΝΙΚΑ ΠΕΤΡΕΛΑΙΑ Α.Ε.	0.667	0.952	0.704	0.770	0.906	1.046
ΜΟΤΟΡ ΟΙΛ (ΕΛΛΑΣ) ΔΙΥΛΙΣΤΗΡΙΑ ΚΟΡΙΝΘΟΥ Α.Ε.	2.733	3.348	1.790	1.196	1.610	1.746
ΔΗΜΟΣΙΑ ΕΠΙΧΕΙΡΗΣΗ ΗΛΕΚΤΡΙΣΜΟΥ Α.Ε.	0.609	0.529	0.418	0.154	0.273	0.526
Ο.Π.Α.Π. ΟΡΓΑΝΙΣΜΟΣ ΠΡΟΓΝΩΣΤΙΚΩΝ ΑΓΩΝΩΝ ΠΟΔΟΣΦΑΙΡΟΥ Α	9.722	7.912	5.953	2.463	1.482	2.742
ΟΡΓΑΝΙΣΜΟΣ ΤΗΛΕΠΙΚΟΙΝΩΝΙΩΝ ΕΛΛΑΔΟΣ Α.Ε.	2.684	2.677	1.812	0.804	1.257	2.065
ΜΥΤΙΛΗΝΑΙΟΣ ΟΜΙΛΟΣ ΕΠΙΧΕΙΡΗΣΕΩΝ Α.Ε.	0.514	0.768	0.605	0.406	0.536	0.609
ΕΛΛΑΚΤΩΡ Α.Ε.	0.392	0.466	0.412	0.278	0.417	0.577
TITAN Α.Ε. ΤΣΙΜΕΝΤΩΝ	0.746	1.071	0.715	0.525	0.355	0.573
Non-Payers						
ΚΡΙ-ΚΡΙ ΒΙΟΜΗΧΑΝΙΑ ΓΑΛΑΚΤΟΣ Α.Β.Ε.Ε.	1.300	1.169	0.997	0.825	1.565	2.507
STELIOS KANAKIS S.A.	0.855	0.546	0.650	0.829	0.538	0.834
PROFILE SYSTEMS & SOFTWARE Α.Ε.	0.666	0.870	0.507	0.143	0.622	0.664
ΓΙΟΥΡΟΜΠΡΟΚΕΡΣ ΜΕΣΙΤΕΣ ΑΣΦΑΛΙΣΕΩΝ Α.Ε.	1.399	4.063	5.839	-1.597	-0.680	-0.121
ΕΛΛΗΝΙΚΗ ΥΦΑΝΤΟΥΡΓΙΑ Α.Ε.	0.043	0.036	0.025	0.048	0.892	-0.046
ΕΛΒΕ Α.Β.Ε.Ε.	0.579	0.554	0.296	0.336	0.339	0.295
LOGISMOS - ΣΥΣΤΗΜΑΤΑ ΠΛΗΡΟΦΟΡΙΚΗΣ Α.Ε.	0.300	0.298	0.443	0.294	0.438	0.290
ΛΑΝΑΚΑΜ Α.Ε.	0.638	0.394	0.324	0.259	0.359	0.274
ΓΕΚΕ Α.Ε.	0.763	0.960	1.023	0.843	0.975	1.096
UNIBIOS Α.Ε. ΣΥΜΜΕΤΟΧΩΝ	1.204	0.914	0.500	0.240	0.176	0.425

Table 38- Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Italy

Italy						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
Recordati Industria Chimica e Farmaceutica S.P.A	1.616	1.912	2.347	1.803	2.042	2.957
ENI S.P.A.	1.200	1.256	1.051	0.951	1.059	1.036
MARR S.P.A.	1.922	2.008	2.723	1.900	2.252	3.293
TOD'S S.P.A.	1.547	2.399	3.664	2.786	3.833	4.639
DIASORIN S.P.A.	4.872	6.247	5.621	3.081	4.597	4.605
ENEL - SPA	1.042	0.860	0.661	0.529	0.555	0.565
GIORGIO FEDON & FIGLI SPA	1.018	1.106	0.823	0.650	0.510	0.656
BEGHELLI S.P.A.	0.913	0.983	0.897	0.578	0.584	0.874
FRENI BREMBO - S.P.A. O ANCHE PIU' BREVEMENTE BREMBO S.P.A.	0.863	1.191	1.590	1.318	1.631	3.047
REPLY S.P.A.	1.209	1.136	1.304	0.924	1.060	2.493
Non-Payers						
ASTALDI SOCIETA' PER AZIONI ED IN BREVE ASTALDI S.P.A.	1.166	1.553	1.099	0.089	0.896	1.247
AEFFE S.P.A.	0.367	0.328	0.341	0.413	0.408	0.523
CASA DAMIANI S.P.A.	1.200	0.552	0.657	0.765	0.859	1.032
INDUSTRIA E INNOVAZIONE S.P.A.	0.378	0.781	0.932	0.872	0.888	0.731
AEDES SOCIETA' DI INVESTIMENTO IMMOBILIARE QUOTATA SOCIETA' PER A ZIO	0.703	0.358	0.375	0.135	0.773	0.845
CHL S.P.A.	1.778	1.618	1.304	1.558	3.853	13.280
NEWRON PHARMACEUTICALS S.P.A.	1.143	2.354	2.055	1.604	2.554	6.671
K.R.ENERGY S.P.A.	3.052	2.560	3.926	0.555	0.966	1.819
MOLMED S.P.A.	2.410	6.390	1.295	2.231	3.864	16.579
ERGYCAPITAL S.P.A.	0.645	1.075	1.977	1.510	1.312	1.533

Table 39- **Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Sweden**

Sweden						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
Duni AB	0.756	1.534	1.721	1.216	1.349	1.865
NETENT AB (PUBL)	5.399	11.832	11.870	9.102	9.391	12.084
BETSSON AB	3.225	4.559	4.830	4.073	4.674	3.817
VITEC SOFTWARE GROUP AB (PUBL)	1.376	1.261	1.821	1.437	1.875	2.353
BIOGAIA AB	4.089	8.162	8.459	11.663	0.006	13.226
AKTIEBOLAGET VOLVO	0.731	1.328	2.316	1.123	1.613	1.754
ATLAS COPCO AKTIEBOLAG	2.342	3.438	4.850	4.296	4.252	3.762
H & M HENNES & MAURITZ AB	5.548	7.549	8.014	7.254	7.248	9.015
SKANSKA AB	1.584	2.368	2.556	2.322	2.191	2.463
AKTIEBOLAGET ELECTROLUX	1.212	2.658	2.774	1.594	2.581	3.542
Non-Payers						
CELLAVISION AB	2.602	3.191	2.183	2.500	2.805	2.770
VENUE RETAIL GROUP AKTIEBOLAG	0.829	0.887	0.897	1.231	1.151	1.381
ENIRO AB	0.779	0.945	0.793	0.352	0.312	1.358
VIKING SUPPLY SHIPS AB	0.592	0.514	0.656	0.379	0.245	0.381
SWEDISH ORPHAN BIOVITRUM AB	1.679	3.102	1.976	0.805	2.003	3.785
BONG AB	0.254	0.461	1.024	0.629	0.380	0.454
RNB RETAIL AND BRANDS AB (PUBL)	0.454	0.711	0.824	0.536	0.562	0.822
MEDIVIR AKTIEBOLAG	3.271	10.547	6.419	1.851	2.408	3.034
DORO AB	2.583	3.102	4.906	2.970	2.264	3.189
BERGS TIMBER AB	0.617	1.024	0.609	0.419	0.310	0.623

Table 40- **Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Romania**

Romania						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
ANTIBIOTICE SA	0.650	1.188	1.078	0.774	0.615	0.106
OMV Petrom SA	0.740	1.005	1.176	0.871	1.054	1.020
ALRO SA	0.569	1.197	1.468	1.541	1.200	0.867
TRANSGAZ SA	0.643	0.784	1.280	0.807	0.855	0.712
STIROM SA	0.244	0.187	0.310	0.628	0.263	0.239
AGRANA ROMANIA SA	0.643	0.672	1.358	0.316	0.772	3.073
ZENTIVA SA	0.387	1.016	1.234	1.417	1.277	1.581
PROSPECTIUNI SA	0.001	0.713	0.588	0.325	0.331	0.280
AEROSTAR SA	0.958	0.928	1.502	1.152	1.306	1.416
FARMACEUTICA REMEDIA SA	0.460	0.663	0.773	0.528	0.678	0.771
Non-Payers						
ELECTROARGES SA	2.084	1.113	1.800	0.762	0.709	0.933
REVA S.A.	0.457	0.447	0.326	0.311	0.385	0.247
RETRASIB SA	1.188	0.668	1.057	0.826	1.012	0.705
PRODPLAST SA	4.240	2.935	0.472	1.379	0.419	0.791
ELECTROMAGNETICA SA	0.489	0.588	0.461	0.684	0.525	0.511
ROPHARMA SA	0.157	2.435	1.707	2.206	1.801	1.563
TEHNOTON SA	0.216	0.209	0.132	0.123	0.283	0.266
ELECTROUTILAJ SA	0.734	0.927	0.642	0.743	0.459	0.747
SALTIM HERMES SA	3.169	2.508	0.511	0.401	0.286	0.372
SITEX DUMBRAVA SA	5.612	4.739	3.636	3.141	1.531	2.041

Table 41- **Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Netherlands**

Netherlands						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
Fugro N.V.	1.677	2.644	3.241	2.183	1.832	1.735
KONINKLIJKE VOPAK N.V.	1.671	2.661	2.915	2.840	3.462	2.820
ACCELL GROUP N.V.	1.264	1.878	2.162	1.384	1.284	1.363
ARCADIS N.V.	2.646	2.906	2.867	1.908	2.217	3.208
AMSTERDAM COMMODITIES N.V.	1.605	2.260	2.647	2.145	2.649	2.973
AIRBUS GROUP SE	0.881	1.080	1.593	2.233	2.339	3.952
UNILEVER N.V.	2.867	3.112	2.650	3.053	3.146	3.388
HEINEKEN HOLDING N.V.	1.052	1.268	0.891	0.902	0.935	1.072
RANDSTAD HOLDING NV	1.019	2.374	2.355	1.348	1.756	2.877
AKZO NOBEL N.V.	0.965	1.304	1.133	0.900	1.611	2.244
Non-Payers						
AND INTERNATIONAL PUBLISHERS N.V.	0.613	1.349	0.778	0.378	0.625	0.847
ORANJEWOUD N.V.	0.938	0.964	0.729	0.540	0.487	0.623
QIAGEN N.V.	3.066	3.085	2.345	1.590	2.010	2.756
VERENIGDE NEDERLANDSE COMPAGNIE N.V.	0.429	0.321	0.556	0.356	0.420	0.348
ICTS INTERNATIONAL N.V.	-1.140	-1.301	-0.514	-0.277	-0.156	-0.204
AFC AJAX N.V.	2.078	1.877	2.983	2.954	2.338	1.907
CTAC N.V.	1.187	1.471	1.291	1.300	1.420	1.759
N.V. KONINKLIJKE PORCELEYNE FLES	1.047	0.756	0.712	0.601	0.591	0.509
TRIODOS VASTGOEDFONDS N.V.	0.672	0.606	0.460	0.521	0.520	0.796
TIE KINETIX N.V.	2.289	3.188	2.483	1.965	1.481	1.223

Table 42- Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Slovenia

Slovenia						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
Krka, Tovarna Zdravil, D.D.,	2.179	2.431	2.108	1.643	1.437	1.596
PLAMA-PUR, PROIZVODNJA IN PREDELAVA PLASTIČNIH MAS, D.D. PODGRAD	0.714	0.575	0.601	0.561	0.618	0.656
ISTRABENZ, HOLDINŠKA DRUŽBA, D.D.	14.590	0.612	1.222	11.772	-0.041	-0.006
SALUS PROMET S FARMACEVTSKIMI, MEDICINSKIMI IN DRUGIMI PROIZVODI, D.D., LJUBLJAN	0.958	1.066	0.991	0.549	0.406	0.533
CETIS, GRAFIČNE IN DOKUMENTACIJSKE STORITVE, D.D.	0.454	0.182	0.180	0.141	0.135	0.144
DELO PRODAJA DRUŽBA ZA RAZŠIRJANJE IN PRODAJO ČASOPISOV, D.D.	0.767	0.495	0.435	0.373	0.315	0.232
INTEREUROPA, GLOBALNI LOGISTIČNI SERVIS, DELNIŠKA DRUŽBA	0.453	0.329	0.351	0.035	0.040	0.119
PETROL, SLOVENSKA ENERGETSKA DRUŽBA, D.D., LJUBLJANA	1.335	1.688	1.351	0.772	1.213	0.983
LUKA KOPER, PRISTANIŠKI IN LOGISTIČNI SISTEM, DELNIŠKA DRUŽBA	1.049	1.410	1.058	0.431	0.472	0.545
CINKARNA METALURŠKO-KEMIČNA INDUSTRIJA CELJE, D.D.	0.604	0.405	0.440	0.540	0.480	0.540
Non-Payers						
MELAMIN KEMIČNA TOVARNA D.D. KOČEVJE	0.505	0.416	0.336	0.333	0.389	0.684
TEKSTINA TEKSTILNA INDUSTRIJA AJDOVŠČINA D.D.	0.447	0.512	0.349	0.540	0.000	0.077
SAVA, DRUŽBA ZA UPRAVLJANJE IN FINANCIRANJE, D.D.	1.399	1.353	0.753	0.274	0.186	0.031
ELMO ELEKTROMONTAŽNO PODJETJE, D.D.	0.329	0.328	0.384	0.575	0.482	1.342
TERME DOBRNA, TERMALNO ZDRAVILIŠČE D.D.	0.349	0.276	0.273	0.202	0.268	0.275
NAMA TRGOVSKO PODJETJE D.D. LJUBLJANA	2.753	2.645	2.449	2.419	2.287	2.101
INLES PROIZVODNJA, TRŽENJE IN INŽENIRING, D.D. KOLODVORSKA 22, RIBNICA	0.275	0.264	0.492	0.240	0.357	0.350
TOVARNA OLJA GEA D.D.	0.680	0.649	0.631	0.535	0.544	0.557
TERME ČATEŽ D.D. ČATEŽ OB SAVI	1.339	1.344	1.344	1.257	1.221	0.212
MLINOTEST ŽIVILSKA INDUSTRIJA D.D.	0.584	0.606	0.587	0.250	0.292	0.416

Table 43- Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Belgium

Belgium						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
Resilux	1.318	1.664	1.654	1.406	1.387	2.349
ETABLISSEMENTS DELHAIZE FRERES ET CIE LE LION (GROUPE DELHAIZE)	1.056	1.227	1.107	0.815	0.594	0.872
UCB	1.063	1.213	1.025	1.236	1.725	2.158
KINEPOLIS GROUP	0.972	1.539	2.244	2.710	4.417	6.144
SOLVAY	0.947	1.240	0.988	0.810	1.404	1.307
UMICORE	1.267	2.055	2.965	2.221	2.771	2.364
PROXIMUS	4.059	3.386	2.541	2.481	2.325	2.390
D'IETEREN	0.403	1.336	1.782	1.230	1.002	1.161
ACKERMANS & VAN HAAREN	0.633	0.862	0.972	0.816	0.830	0.871
COMPAGNIE D'ENTREPRISES CFE - AANNEMINGSMAATSCHAPPIJ CFE	1.040	1.097	1.479	0.977	1.066	0.705
Non-Payers						
GREENYARD FOODS	1.039	0.767	0.807	0.477	0.607	1.131
SUCRERIE ET RAFFINERIE DE L'AFRIQUE CENTRALE	20.596	39.200	37.632	18.497	-0.616	-0.238
FLEXOS	34.925	11.063	10.877	5.046	1.856	2.949
IMMOPOOL	2.538	2.489	1.164	0.487	0.826	1.313
OPTION TRADING COMPANY	15.976	2.971	1.804	0.764	1.447	1.398
PHARCO	1.127	0.909	1.535	3.946	6.141	13.574
SV PATRIMONIA	2.524	2.838	2.294	0.214	0.690	0.575
REALCO	2.343	3.126	2.562	2.654	4.149	4.854
TIGENIX	2.248	2.743	1.510	1.092	1.874	1.721
OPTION	0.787	0.995	11.864	20.080	5.364	-4.104

Table 44- Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Croatia

Croatia						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
LEDO D.D.	2.042	2.250	1.750	1.266	0.954	1.417
KONČAR, D.D.	0.767	0.690	0.764	0.679	0.780	0.783
TURISTHOTEL D.D.	1.391	1.151	1.393	1.651	1.937	2.223
INA, D.D.	0.925	1.398	2.497	2.631	2.681	2.766
HT D.D.	1.429	2.373	2.129	1.763	1.483	1.344
MEDIKA, D.D.	0.931	0.814	0.700	0.649	0.568	0.556
ERICSSON NIKOLA TESLA D.D.	1.327	1.490	1.705	1.681	2.389	2.909
TISAK D.D.	1.697	1.609	0.948	0.753	1.530	1.618
VIRO TVORNICA ŠEĆERA D.D.	1.133	1.088	1.032	1.078	1.060	1.211
KRAŠ, D.D.	0.679	0.678	0.963	0.964	0.806	0.972
Non-Payers						
VIADUKT D.D.	0.710	0.722	0.630	0.236	0.691	0.669
ACI D. D.	2.373	0.830	0.707	0.686	0.807	1.026
ILIRIJA D.D.	1.062	0.887	0.808	0.572	0.477	0.602
IMPERIAL D.D.	0.517	0.354	0.353	0.322	0.407	0.499
HOTELI BRELA D.D.	0.183	0.316	0.139	0.108	0.175	0.318
TEHNIKA D.D.	1.019	0.830	0.658	0.446	0.377	0.310
TISAK D.D.	1.697	1.609	0.948	0.753	1.530	1.618
PETROKEMIJA, D.D.	0.331	0.574	0.847	0.840	1.215	1.724
PODRAVKA D.D.	0.841	1.283	1.423	1.069	1.166	1.221
CROATIA AIRLINES D.D.	2.714	2.494	5.640	11.567	4.444	1.611

Table 45- Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Switzerland

Switzerland						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
GROUPE MINOTERIES SA	1.419	1.425	1.297	1.907	1.809	1.296
NESTLÉ S.A.	2.881	3.414	3.051	3.058	3.075	3.293
NOVARTIS AG	2.579	2.515	2.225	2.376	2.454	2.911
ROCHE HOLDING AG	2.107	2.986	8.308	7.722	7.740	8.266
ABB LTD	2.862	3.112	3.330	2.662	2.718	3.183
ADECCO S.A.	1.624	2.334	2.603	1.605	2.036	3.064
LAFARGEHOLCIM LTD	0.878	1.010	1.101	0.836	1.105	1.172
KÜHNE + NAGEL INTERNATIONAL AG	3.884	5.263	6.603	5.263	5.452	5.509
SYNGENTA AG	3.073	3.727	3.719	3.652	4.261	3.915
SWISSCOM AG	3.127	3.044	3.411	4.291	4.916	4.076
Non-Payers						
PERFECT HOLDING SA	6.649	5.436	4.615	2.386	2.573	2.764
DUFRY AG	0.552	1.349	4.193	2.444	2.600	3.830
GROUPE BAUMGARTNER HOLDING SA	0.847	0.842	1.018	0.935	0.825	0.811
ALTIN AG	0.761	0.894	0.740	0.756	0.720	0.898
ADDEX THERAPEUTICS LTD	1.861	1.043	0.985	1.271	6.017	12.594
NEW VALUE AG	0.883	0.734	0.785	0.659	0.927	0.818
SANTHERA PHARMACEUTICALS HOLDING AG	1.302	1.113	0.448	0.419	1.234	1.976
ENR RUSSIA INVEST SA	0.711	0.668	0.840	0.844	0.761	0.848
KUROS BIOSCIENCES AG	4.115	8.004	10.074	-0.856	6.292	22.049
AIROPACK TECHNOLOGY GROUP AG	0.970	0.944	14.811	122.448	103.134	10.412

Table 46- **Dividend Premium for 10 dividend paying firms and 10 non-dividend paying firms: Norway**

Norway						
Payers	Market to Book (2008)	Market to Book (2009)	Market to Book (2010)	Market to Book (2011)	Market to Book (2012)	Market to Book (2013)
AF GRUPPEN ASA	1.697	2.455	2.945	2.671	3.751	4.183
STATOIL ASA	1.665	2.311	1.956	1.716	1.383	1.317
TELENOR ASA	0.859	1.582	1.637	1.815	2.262	2.848
YARA INTERNATIONAL ASA	1.420	2.668	2.764	1.541	1.556	1.289
NORSK HYDRO ASA	0.635	1.282	1.209	0.674	0.780	0.744
AKER ASA	0.454	0.708	0.622	0.557	0.810	0.781
ORKLA ASA	0.925	1.198	1.246	1.336	1.587	1.567
MARINE HARVEST ASA	0.376	1.322	1.758	0.854	1.639	1.855
ATEA ASA	0.550	1.342	1.675	1.542	1.581	1.746
VEIDEKKE ASA	1.421	3.248	3.457	2.255	2.516	2.646
Non-Payers						
BIONOR PHARMA ASA	14.410	7.328	2.073	1.313	2.649	3.362
BIOTEC PHARMACON ASA	1.580	1.982	5.976	3.229	7.744	9.739
BIRDSTEP TECHNOLOGY ASA	0.437	0.884	0.696	0.730	1.328	2.952
BERGEN GROUP ASA	0.183	0.196	0.326	0.197	0.455	0.374
Q-FREE ASA	1.248	2.368	2.091	1.737	2.053	1.888
NORWEGIAN ENERGY COMPANY ASA	0.645	1.168	1.207	0.377	0.664	0.155
HAVILA SHIPPING ASA	0.485	0.559	0.580	0.408	0.368	0.485
NORSKE SKOGINDUSTRIER ASA	0.186	0.151	0.259	0.116	0.174	0.414
AKASTOR ASA	1.419	2.270	2.632	1.524	2.577	2.192
NORWEGIAN AIR SHUTTLE ASA	1.318	2.460	2.266	0.990	2.086	2.407

Table 47- Relevant Data for the application of the models (part 1)

Period of Growth	Year 0	Company Name	Country	RDivP0	NDDivP0	PDDivP0	RΔE-1	Earnings in year -2	Earnings in year -1	Earnings in year 0	Earnings in year 1	Earnings in year 2
2004/2011	2012	ACCELL GROUP N.V.	Netherlands	20.89%	0	1	11.69%	36,380	40,633	23,167	19,020	26,083
2004/2011	2012	AF GRUPPEN ASA	Norway	20.89%	0	1	11.30%	35,358	39,352	34,562	57,007	58,088
2005/2012	2013	AGGREKO PLC	Great Britain	-28.08%	1	0	6.14%	311,000	330,095	293,752	276,000	219,834
2005-2010	2011	Aixtron SE	Germany	-10.50%	1	0	330.00%	44,766	192,496	79,536	-145,436	-101,016
2004/2011	2012	AMADEUS FIRE AG	Germany	20.89%	0	1	19.29%	12,997	15,504	12,985	15,731	18,534
2004/2011	2012	ASSECO POLAND S.A.	Poland	20.89%	0	1	9.11%	125,902	137,366	135,954	153,833	121,886
2005/2010	2011	ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	Germany	-10.50%	1	0	7.89%	1,153	1,244	936	1,050	1,718
2005/2012	2013	ATOSS SOFTWARE AG	Germany	-28.08%	1	0	1.50%	5,675	5,760	3,020	7,032	7,591
2006/2012	2013	BETSSON AB	Sweden	-28.08%	1	0	7.78%	59,226	63,831	63,443	82,047	90,489
2005/2012	2013	BIOGAIA AB	Sweden	-28.08%	1	0	330.76%	8,923	38,437	7,245	15,755	13,208
2006/2011	2012	BRAINJUICER GROUP PLC	Great Britain	20.89%	0	1	27.63%	1,732	2,211	1,241	2,908	3,724
2005/2010	2011	BUDIMEX S.A.	Poland	-10.50%	1	0	59.57%	42,292	67,484	58,998	45,477	72,535
2005/2010	2011	CARILLION PLC	Great Britain	-10.50%	1	0	16.82%	153,114	178,864	164,898	198,775	126,934
2004-2009	2010	ČEZ, A.S	Czech Republic	168.44%	0	1	11.43%	1,758,703	1,959,680	1,881,189	1,579,551	1,597,102
2005/2011	2012	CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	Spain	20.89%	0	1	12.76%	125,440	141,449	100,054	91,037	62,129
2004/2009	2010	CTS EVENTIM AG & CO. KGAA	Germany	168.44%	0	1	18.96%	35,542	42,280	42,188	54,990	61,142
2004/2009	2010	DELKO S.A.	Poland	168.44%	0	1	20.13%	1,516	1,821	1,462	273	-1,392
2005/2011	2012	DELTICOM AG	Germany	20.89%	0	1	10.42%	32,629	36029	22157	11,555	2,857
2005/2011	2012	DIASORIN S.P.A.	Italy	20.89%	0	1	10.16%	90,418	99,607	87,684	83,111	84,074
2005-2010	2011	Duni AB	Sweden	-10.50%	1	0	4.08%	32,774	34,111	29,286	14,449	30,139
2004/2012	2013	DURO FELGUERA SA	Spain	-28.08%	1	0	15.96%	101,843	118,093	85,915	50,775	-80,070
2004/2010	2011	ELECNOR SA	Spain	-10.50%	1	0	27.52%	102,518	130,734	119,791	91,148	56,858
2006/2011	2012	ENERGOAQUA, A.S.	Czech Republic	20.89%	0	1	69.66%	3,176	5,388	1,629	6,752	6,490
2005/2011	2012	EUTELSAT COMMUNICATIONS	France	20.89%	0	1	25.59%	269,501	338,474	326,100	354,900	303,200
2004-2009	2010	FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	Greece	168.44%	0	1	2.22%	3,159	3,229	2,420	3,084	3,512
2003-2009	2010	Flughafen Zürich AG	Switzerland	168.44%	0	1	56.68%	81,950	128,397	110,226	140,386	78,332
2003-2009	2010	Fugro N.V.	Netherlands	168.44%	0	1	8.77%	289,456	314,834	280,153	295,270	301,442
2006/2012	2013	GIORGIO FEDON & FIGLI SPA	Italy	-28.08%	1	0	66.04%	1,390	2,308	1,909	1,272	1,501
2004-2010	2011	Goodwin PLC	Great Britain	-10.50%	1	0	5.57%	10,175	10,742	4,716	11,488	18,627
2006/2011	2012	GROUPE MINOTERIES SA	Switzerland	20.89%	0	1	12.61%	5,883	6,625	4,245	4,154	4,349
2004/2011	2012	HARGREAVES SERVICES PLC	Great Britain	20.89%	0	1	52.27%	25,290	38,509	-58,052	45,506	28,592
2004/2011	2012	IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PUBLIC LIMITED COMPANY	Great Britain	20.89%	0	1	62.13%	9,076	14,715	5,679	9,210	8,393
2004-2009	2010	Indra Sistemas, Sociedad Anonima	Spain	168.44%	0	1	6.40%	186,081	197,999	187,939	181,067	127,566
2005/2012	2013	INTERPARFUMS	France	-28.08%	1	0	349.47%	30,300	136,188	34,833	23,228	29,152
2005/2010	2011	ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	Italy	-10.50%	1	0	40.64%	4,227	5,945	722	-1,689	-10,495
2005/2012	2013	IZOSTAL S.A.	Poland	-28.08%	1	0	14.74%	4,327	4,965	3,180	1,156	576
2004-2010	2011	James Halstead PLC	Great Britain	-10.50%	1	0	7.99%	29,116	31,442	30,420	37,838	35,928
2007/2012	2013	JOURNEY GROUP PLC	Great Britain	-28.08%	1	0	-229.31%	-1,515	1,959	131	1,972	2,109
2003/2011	2012	KINEPOLIS GROUP	Belgium	20.89%	0	1	29.97%	28,062	36,471	35,704	37,541	35,167

Table 48- Relevant Data for the application of the models (part 2)

Period of Growth	Year 0	Company Name	Country	RDivP0	NDDivP0	PDDivP0	RΔE-1	Earnings in year -2	Earnings in year -1	Earnings in year 0	Earnings in year 1	Earnings in year 2
2005/2012	2012	KONČAR, D.D.	Croatia	20.89%	0	1	14.83%	22,231	25,528	23,604	21,184	20,265
2005/2011	2012	KONINKLIJKE VOPAK N.V.	Netherlands	20.89%	0	1	44.81%	300,800	435,600	369,500	360,900	295,600
2005-2010	2010	Krka, Tovarna Zdravil, D.D.,	Croatia	168.44%	0	1	6.01%	161,129	170,812	165,920	150,392	154,615
2004-2009	2010	LEDO D.D.	Croatia	168.44%	0	1	10.91%	12,465	13,825	13,665	16,839	17,593
2004-2009	2010	M&C Saatchi PLC	Great Britain	168.44%	0	1	7.39%	6,902	7,412	3,597	13,679	5,411
2005/2011	2012	MARR S.P.A.	Italy	20.89%	0	1	8.59%	45,685	49,608	48,902	47,318	51,105
2007-2012	2013	Miquel Y Costas & Miquel SA	Spain	-28.08%	1	0	18.44%	23,140	27,407	27,114	24,696	30,640
2003-2008	2009	MOURY CONSTRUCT	Belgium	-53.30%	1	0	54.93%	4,207	6,518	4,662	4,723	627
2004-2010	2011	NCC Group PLC	Great Britain	-10.50%	1	0	26.48%	8,819	11,154	9,441	9,519	16,943
2005-2010	2011	NETENT AB (PUBL)	Sweden	-10.50%	1	0	27.86%	10,503	13,429	12,973	15,527	18,866
2004/2010	2011	O2 CZECH REPUBLIC, A.S.	Czech Republic	-10.50%	1	0	11.11%	440,876	489,864	336,584	269,518	207,575
2005/2012	2013	OBRASCON HUARTE LAIN SA	Spain	-28.08%	1	0	215.70%	348,827	1,101,234	404,984	185,361	258,553
2007/2012	2013	ORBIS AG	Germany	-28.08%	1	0	5.68%	1,515	1,601	1,508	1,610	1,332
2004/2010	2011	PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	Poland	-10.50%	1	0	2.00%	54,075	55,156	38,595	-902,430	49,957
2004-2009	2010	PGE Polska Grupa Energetyczna S.A.	Poland	168.44%	0	1	63.05%	647,814	1,056,277	909,221	1,124,189	790,499
2004-2009	2010	PLAMA-PUR, PROIZVODNJA IN PREDELAVA PLASTIČNIH MAS, D.D. PODGRAD	Croatia	168.44%	0	1	40.01%	1,376	1,927	1,631	1,859	1,358
2004/2010	2011	POUJOULAT	France	-10.50%	1	0	8.55%	8,049	8,737	8,137	6,157	9,809
2006/2012	2013	PROSEGUR COMPAÑIA DE SEGURIDAD, SA	Spain	-28.08%	1	0	2.71%	167,044	171,567	155,674	158,428	183,369
2004/2012	2013	PSI AKTIENGESELLSCHAFT FÜR PRODUKTE UND SYSTEME DER	Germany	-28.08%	1	0	25.71%	7,444	9,358	371	4,099	7,500
2005/2011	2012	RAFAKO S.A.	Poland	20.89%	0	1	19.71%	11,176	13,379	-6,675	-32,415	6,716
2004/2010	2011	RATIONAL AKTIENGESELLSCHAFT	Germany	-10.50%	1	0	18.55%	67,305	79,793	78,745	93,300	97,244
2003-2009	2010	Recordati Industria Chimica e Farmaceutica S.P.A	Italy	168.44%	0	1	10.09%	100,429	110,566	108,580	116,446	118,497
2006/2012	2013	RED24 PLC	Great Britain	-28.08%	1	0	9.12%	820	895	895	997	1,222
2005-2010	2011	Resilux	Belgium	-10.50%	1	0	10.73%	11,055	12,241	7,989	10,143	8,973
2006-2011	2012	Retail Partners Colruyt Group	Belgium	20.89%	0	1	11.79%	13,862	15,497	13,239	13,770	13,306
2004-2009	2010	Rosetti Marino S.P.A.	Italy	168.44%	0	1	33.31%	36,113	48,143	19,613	13,890	19,257
2006/2011	2012	ROTALA PLC	Great Britain	20.89%	0	1	27.30%	1,971	2,509	2,307	2,296	1,483
2004/2009	2010	RWS HOLDINGS PLC	Great Britain	168.44%	0	1	32.04%	12,064	15,929	11,368	12,813	15,869
2005/2011	2012	SDL PLC	Great Britain	20.89%	0	1	19.18%	25,804	30,752	24,943	-33,316	8,485
2004/2010	2011	SMA SOLAR TECHNOLOGY AG	Germany	-10.50%	1	0	126.56%	161,120	365,041	166,054	75,105	-66,852
2007-2012	2012	Societe Financiere des Caoutchoucs SA Soparfi	Luxembourg	20.89%	0	1	45.15%	279,998	406,421	150,951	5,255	105,576
2006/2012	2013	SODEXO	France	-28.08%	1	0	16.41%	451,000	525,000	439,000	490,000	700,000
2005/2011	2012	SOFTWARE AKTIENGESELLSCHAFT	Germany	20.89%	0	1	0.90%	175,632	177,209	164,677	134,011	110,551
2004-2009	2010	TALLINNA VESI AS	Estonia	168.44%	0	1	14.85%	18,916	21,726	16,512	21,834	22,266
2004/2012	2013	TOD'S S.P.A.	Italy	-28.08%	1	0	7.41%	135,688	145,737	134,000	96,761	92,100
2005/2010	2011	TURISTHOTEL D.D.	Croatia	-10.50%	1	0	0.50%	5,551	5,579	5,009	8,550	8,027
2004/2010	2011	VIDRALA, SA	Spain	-10.50%	1	0	21.14%	40,927	49,578	43,699	46,542	52,308
2004/2010	2011	VIRBAC	France	-10.50%	1	0	63.37%	38,816	63,413	57,516	66,625	60,523
2005/2012	2013	VISCOFAN SA	Spain	-28.08%	1	0	3.77%	101,245	105,063	101,520	106,452	120,000
2006/2012	2013	VITEC SOFTWARE GROUP AB (PUBL)	Sweden	-28.08%	1	0	23.16%	3,109	3,829	3,412	5,224	8,507
2007/2012	2013	ZYTRONIC PLC	Great Britain	-28.08%	1	0	32.79%	3,109	4,129	1,988	3,806	5,113

Table 49- Relevant Data for the application of the models (part 3)

Company Name	Book Value at year 0	Book Value at year 1	Book Value at year -1	Market Cap (-1)	Market Cap (-2)	Current Liabilities (-1)	Current Liabilities (-2)	Long Term Debt (-1)	Long Term Debt (-2)	Q(-1)	Q(-2)	PRQD-1	NRQD-1	DeltaQ(-1)
ACCELL GROUP N.V.	247,710	239,983	214,646	297,000	390,000	152,497	131,588	58,509	61,131	2.41	3.02	0.00	1.00	-0.20
AF GRUPPEN ASA	165,736	159,095	171,732	459,008	365,497	347,979	214,699	0	0	2.32	2.70	0.00	1.00	-0.14
AGGREKO PLC	1,361,000	1,386,000	1,250,000	5,749,144	6,444,648	695,000	578,000	516,000	455,000	5.75	7.24	0.00	1.00	-0.21
Aixtron SE	628,340	470,020	600,324	2,762,000	2,327,000	161,190	111,636	636	70	18.07	21.83	0.00	1.00	-0.17
AMADEUS FIRE AG	41,307	40,823	42,694	139,000	148,000	8,157	7,575	2,874	2,796	13.60	15.27	0.00	1.00	-0.11
ASSECO POLAND S.A.	1,766,916	1,748,980	1,595,039	844,418	1,037,287	361,552	361,751	80,805	57,317	2.91	3.48	0.00	1.00	-0.16
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	49,245	49,569	49,034	54,000	74,000	30,371	28,701	0	0	2.78	3.58	0.00	1.00	-0.22
ATOSS SOFTWARE AG	11,738	14,935	23,246	83,000	68,000	7,694	7,437	0	0	11.79	10.14	1.00	0.00	0.16
BETSSON AB	229,394	327,240	183,849	860,850	609,037	119,437	104,437	40,147	0	6.39	6.83	0.00	1.00	-0.06
BIOGAIA AB	35,766	36,686	53,227	337,092	301,054	4,139	5,531	0	0	82.44	55.43	1.00	0.00	0.49
BRAINJUICER GROUP PLC	8,779	9,683	8,350	44,322	29,164	5,780	4,976	0	0	8.67	6.86	1.00	0.00	0.26
BUDIMEX S.A.	160,820	105,910	171,780	641,397	456,086	790,365	568,763	3,325	56,067	1.81	1.73	1.00	0.00	0.05
CARILLION PLC	1,174,004	1,207,360	1,012,785	1,791,821	1,360,657	2,080,821	1,980,136	262,795	211,684	1.76	1.62	1.00	0.00	0.09
ČEZ, A.S	9,057,338	8,995,143	7,810,567	17,596,934	17,330,734	4,953,262	5,706,547	4,494,208	2,407,898	2.86	3.14	0.00	1.00	-0.09
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	707,600	729,361	667,264	1,320,000	1,337,000	1,288,860	1,279,259	326,330	307,189	1.82	1.84	0.00	1.00	-0.01
CTS EVENTIM AG & CO. KGAA	179,858	216,508	158,107	818,000	586,000	289,143	242,112	7,974	26,042	3.75	3.19	1.00	0.00	0.18
DELKO S.A.	12,708	10,384	10,422	13,849	12,455	11,117	14,115	675	1,114	2.17	1.82	1.00	0.00	0.20
DELTICOM AG	62,636	51,679	75,480	786,236	783,608	89,697	69,582	3,150	0	9.47	12.26	0.00	1.00	-0.23
DIASORIN S.P.A.	368,081	414,135	351,178	1,082,000	1,776,000	72,012	82,693	21,293	20,799	12.60	18.16	0.00	1.00	-0.31
Duni AB	233,618	238,988	221,948	3,431,000	2,749,000	84,164	78,228	59,028	69,059	24.96	19.66	1.00	0.00	0.27
DURO FELGUERA SA	260,403	268,587	320,099	770,000	810,000	781,242	954,606	31,281	65,305	1.95	1.79	1.00	0.00	0.09
ELECNOR SA	628,572	612,888	605,990	868,000	1,025,000	1,382,922	1,038,982	759,022	598,264	1.41	1.63	0.00	1.00	-0.14
ENERGOAQUA, A.S.	67,460	66,023	68,749.72	41,091	40,538	4,381	3,281	174	0	10.02	13.36	0.00	1.00	-0.25
EUTELSAT COMMUNICATIONS	1,784,700	1,950,800	1,651,630	6,824,000	6,066,000	410,617	380,984	2,300,762	2,495,266	3.52	3.11	1.00	0.00	0.13
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	38,455	40,414	36,681	92,000	88,000	12,564	17,313	7,649	8,319	5.55	4.43	1.00	0.00	0.25
Flughafen Zürich AG	1,340,354	1,480,047	1,076,706	1,325,374	1,056,117	385,373	373,630	670,281	670,422	2.26	2.01	1.00	0.00	0.12
Fugro N.V.	1,523,247	1,674,134	1,199,510	3,171,000	1,569,000	639,522	725,493	441,339	395,384	3.93	2.40	1.00	0.00	0.64
GIORGIO FEDON & FIGLI SPA	16,780	17,416	15,691	8,000	9,000	21,005	22,425	4,358	5,487	1.32	1.32	0.00	1.00	-0.01
Goodwin PLC	49,670	59,940	46,242	77,035	73,339	32,361	43,378	11,924	9,276	2.74	2.39	1.00	0.00	0.14
GROUPE MINOTERIES SA	69,592	64,220	67,726	129,083	77,526	14,808	13,712	0	796	9.72	6.34	1.00	0.00	0.53
HARGREAVES SERVICES PLC	138,419	185,540	170,454	334,211	188,981	144,172	115,196	58,727	86,796	2.65	1.94	1.00	0.00	0.37
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PUBLIC LIMITED COMPANY	86,715	94,231	83,848	277,910	248,475	13,656	11,185	4,884	9,714	15.99	12.89	1.00	0.00	0.24
Indra Sistemas, Sociedad Anonima	1,066,785	1,099,802	1,011,545	2,702,000	2,657,000	1,316,186	1,525,280	106,688	53,147	2.90	2.68	1.00	0.00	0.08
INTERPARFUMS	354,885	367,739	344,531	510,000	325,000	185,313	133,563	0	12	3.75	3.43	1.00	0.00	0.09
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	56,701	62,208	57,348	57,000	106,000	124,542	104,300	24,647	26,352	1.38	1.81	0.00	1.00	-0.24
IZOSTAL S.A.	39,078	38,354	37,905	60,265	48,302	21,412	19,417	3,577	4,345	3.41	3.03	1.00	0.00	0.12
James Halstead PLC	94,866	116,915	81,844	384,169	249,605	62,079	44,431	245	234	7.16	6.59	1.00	0.00	0.09
JOURNEY GROUP PLC	12,951	13,861	13,532	11,080	9,583	7,471	7,785	218	14	2.44	2.23	1.00	0.00	0.10
KINEPOLIS GROUP	108,668	104,657	133,942	363,000	353,000	126,503	83,943	38,502	57,437	3.20	3.50	0.00	1.00	-0.08

Table 50- Relevant Data for the application of the models (part 4)

Company Name	Book Value at year 0	Book Value at year 1	Book Value at year -1	Market Cap (-1)	Market Cap (-2)	Current Liabilities (-1)	Current Liabilities (-2)	Long Term Debt (-1)	Long Term Debt (-2)	Q(-1)	Q(-2)	PRQD-1	NRQD-1	DeltaQ(-1)
KONČAR, D.D.	273,685	284,345	257,253	214,294	175,337	105,848	123,511	32,568	15,963	2.55	2.26	1.00	0.00	0.13
KONINKLIJKE VOPAK N.V.	1,968,400	1,927,500	1,837,800	5,219,000	4,519,000	539,100	618,700	1,593,800	1,397,700	3.45	3.24	1.00	0.00	0.06
Krka, Tovarna Zdravil, D.D.,	1,058,154	1,140,485	932,010	2,230,000	2,161,816	216,616	175,144	66,800	103,836	8.87	8.75	1.00	0.00	0.01
LEDO D.D.	99,219	114,919	89,109	1,467,000	1,144,000	93,739	42,009	12,931	16,418	14.75	20.58	0.00	1.00	-0.28
M&C Saatchi PLC	59,783	66,970	59,712	55,560	49,287	85,013	82,382	4,999	7,020	1.62	1.55	1.00	0.00	0.04
MARR S.P.A.	233,534	244,142	227,350	432,000	575,000	373,035	392,178	105,920	107,070	1.90	2.15	0.00	1.00	-0.12
Miquel Y Costas & Miquel SA	211,129	221,488	195,977	255,000	233,000	51,663	47,600	50,575	42,829	3.49	3.58	0.00	1.00	-0.02
MOURY CONSTRUCT	41,202	43,790	38,576	28,000	40,000	26,496	28,924	2,314	2,776	1.97	2.26	0.00	1.00	-0.13
NCC Group PLC	64,343	75,449	59,558	151,736	124,454	48,136	29,467	0	10,234	4.15	4.13	1.00	0.00	0.00
NETENT AB (PUBL)	26,704	33,623	22,277	264,543	201,308	11,930	7,283	0	0	23.17	28.64	0.00	1.00	-0.19
O2 CZECH REPUBLIC, A.S.	2,678,140	2,409,355	2,919,179	4,902,792	5,113,399	507,416	471,147	115,006	115,037	8.88	9.72	0.00	1.00	-0.09
OBRASCON HUARTE LAIN SA	3,335,142	3,545,370	2,774,691	2,189,000	1,933,000	3,101,598	3,991,801	5,265,674	5,738,909	1.26	1.20	1.00	0.00	0.05
ORBIS AG	19,632	20,178	17,398	21,000	12,000	3,984	3,348	119	0	6.12	4.58	1.00	0.00	0.33
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	513,492	-204,648	462,187	768,314	710,418	489,062	443,987	228,361	24,811	2.07	2.52	0.00	1.00	-0.18
PGE Polska Grupa Energetyczna S.A.	9,509,688	9,311,480	9,461,373	11,205,000	4,337,000	1,421,218	1,818,756	987,854	1,084,634	5.65	2.49	1.00	0.00	1.27
PLAMA-PUR, PROIZVODNJA IN PREDELAVA PLASTIČNIH	16,635	17,835												
MAS, D.D. PODGRAD			15,653	9,000	10,000	7,190	11,628	0	0	2.25	1.86	1.00	0.00	0.21
POUJOULAT	66,757	72,215	59,990	46,000	42,000	41,267	39,096	22,875	20,338	1.72	1.71	1.00	0.00	0.01
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	654,524	864,061	731,800	2,740,000	2,085,000	1,062,308	829,724	741,973	469,773	2.52	2.60	0.00	1.00	-0.03
PSI AKTIENGESELLSCHAFT FÜR PRODUKTE UND SYSTEME														
DER INFORMATIONSTECHNOLOGIE	68,813	68,294	73,637	244,000	220,000	69,729	67,253	3,900	795	4.31	4.23	1.00	0.00	0.02
RAFAKO S.A.	105,035	70,799	105,300	121,433	235,415	182,822	132,519	0	0	1.66	2.78	0.00	1.00	-0.40
RATIONAL AKTIENGESELLSCHAFT	206,915	237,400	230,266	1,836,000	1,354,000	28,260	30,126	18,982	21,749	39.86	27.10	1.00	0.00	0.47
Recordati Industria Chimica e Farmaceutica S.P.A	628,585	647,695	568,082	1,086,000	816,000	200,518	257,079	82,247	82,914	4.84	3.40	1.00	0.00	0.42
RED24 PLC	3,712	4,475	3,057	7,386	7,187	1,828	1,464	0	0	5.04	5.91	0.00	1.00	-0.15
Resilux	68,936	72,539	68,936	114,000	91,000	69,045	59,525	18,464	24,859	2.30	2.08	1.00	0.00	0.11
Retail Partners Colruyt Group	131,229	117,459	104,220	474,377	587,248	64,516	55,728	0	12	8.35	11.54	0.00	1.00	-0.28
Rosetti Marino S.P.A.	164,551	172,344	164,551	114,000	120,000	162,930	207,320	3,446	4,428	1.69	1.57	1.00	0.00	0.08
ROTALA PLC	27,049	28,307	24,495	16,770	11,665	15,846	10,569	14,910	19,554	1.55	1.39	1.00	0.00	0.11
RWS HOLDINGS PLC	61,386	67,053	52,895	144,456	146,832	9,502	15,249	0	0	16.20	10.63	1.00	0.00	0.52
SDL PLC	272,405	234,643	272,405	631,288	591,441	76,845	77,470	0	0	9.22	8.63	1.00	0.00	0.07
SMA SOLAR TECHNOLOGY AG	789,306	821,867	728,410	2,414,000	3,210,000	242,947	165,702	73,286	48,722	8.63	15.97	0.00	1.00	-0.46
Societe Financiere des Caoutchoucs SA Soparfi	1,478,621	1,257,610	1,478,621	498,000	392,000	152,867	472,124	8,753	22,246	4.08	1.79	1.00	0.00	1.28
SODEXO	2,953,000	3,221,000	3,024,000	9,879,000	8,143,000	6,300,000	5,898,000	2,550,000	2,262,000	2.12	2.00	1.00	0.00	0.06
SOFTWARE AKTIENGESELLSCHAFT	1,060,066	965,595	951,482	2,483,344	3,123,110	315,503	395,275	260,529	137,214	5.31	6.87	0.00	1.00	-0.23
TALLINNA VESI AS	73,470	79,303	88,914	200,000	180,000	7,354	12,296	75,034	69,321	3.43	3.21	1.00	0.00	0.07
TOD'S S.P.A.	801,102	814,608	763,987	2,928,000	1,919,000	210,404	244,359	52,192	66,848	12.15	7.17	1.00	0.00	0.70
TURISTHOTEL D.D.	31,276	30,893	30,774	42,906	34,203	2,831	2,971	4,390	5,383	6.94	5.09	1.00	0.00	0.36
VIDRALA, SA	319,051	348,154	295,626	512,000	429,000	197,262	182,313	155,319	207,929	2.45	2.10	1.00	0.00	0.17
VIRBAC	311,385	346,169	300,062	1,133,000	634,000	170,330	135,308	32,512	34,533	6.59	4.73	1.00	0.00	0.39
VISCOFAN SA	521,617	575,867	498,569	1,995,000	1,336,000	195,623	164,204	25,856	22,059	10.01	8.17	1.00	0.00	0.22
VITEC SOFTWARE GROUP AB (PUBL)	19,145	27,694	18,603	34,956	22,238	18,189	13,637	9,828	5,601	2.25	2.16	1.00	0.00	0.04
ZYTRONIC PLC	19,258	23,214	19,509	59,092	34,739	3,867	6,736	2,173	1,989	10.78	4.98	1.00	0.00	1.16

Table 51- Relevant Data for the application of the models (part 5)

Company Name	EBITDA(-1)	EBITDA(-2)	Tax(-1)	Tax(-2)	Changes WC (-1	Changes WC (-2)	Fixed Assets (-1)	Fixed Assets (-2)	Fixed Assets (-3)	Depreciation (-1)	Depreciation (-2)	Capex (-1)	Capex (-2)
ACCELL GROUP N.V.	44,436	53,794	3,114	5,822	22,200	-59,700	76,056	69,138	71,304	7,355	7,494	14,273	5,328
AF GRUPPEN ASA	61,416	59,100	13,161	12,126	-42,437	12,568	70,060	60,504	100,461	10,967	12,382	20,523	-27,575
AGGREKO PLC	757,000	635,000	109,000	76,000	95,000	88,000	1,561,000	1,318,000	1,018,000	288,000	226,000	531,000	526,000
Aixtron SE	288,611	74,972	85,724	19,215	98,587	20,280	77,910	37,758	44,232	13,101	12,247	53,253	5,773
AMADEUS FIRE AG	22,955	19,716	7,224	5,728	574	2,757	1,154	1,252	1,345	772	870	674	777
ASSECO POLAND S.A.	147,742	145,223	24,153	-488	55,211	150,102	261,591	664,272	435,456	1,963	1,639	-400,718	230,455
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	4,128	4,117	312	377	438	134	77,792	76,981	79,130	1,970	1,939	2,781	-210
ATOSS SOFTWARE AG	8,191	7,794	2,768	2,735	1,055	-455	3,341	3,502	2,812	571	486	410	1,176
BETSSON AB	76,066	67,473	3,003	3,097	-5,495	1,309	8,406	5,777	3,545	12,235	8,247	14,864	10,479
BIOGAIA AB	52,286	12,184	13,094	3,293	1,077	1,671	5,734	2,712	2,148	2,406	609	5,428	1,173
BRAINJUICER GROUP PLC	3,850	2,774	1,087	863	1,011	1,414	851	572	322	554	180	833	430
BUDIMEX S.A.	92,647	47,881	16,238	12,305	-88,757	62,363	140,358	125,263	129,239	5,338	5,147	20,433	1,171
CARILLION PLC	259,049	171,550	17,676	12,928	-50,757	-157,777	509,904	537,134	528,043	74,215	76,107	46,985	85,198
ČEZ, A.S	3,441,865	3,239,140	494,729	496,401	-2,465,071	-1,656,786	14,976,863	12,150,247	10,414,799	864,519	818,866	3,691,135	2,554,314
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	201,571	193,823	14,260	4,377	111,055	-10,580	830,872	487,669	433,550	36,788	38,647	379,991	92,766
CTS EVENTIM AG & CO. KGAA	79,973	57,830	23,307	17,835	-8,858	-1,754	13,090	12,410	11,125	8,693	7,548	9,373	8,833
DELKO S.A.	2,916	2,580	448	367	-6,513	-1,316	895	1,950	1,406	340	296	-715	840
DELTICOM AG	35,313	55,046	10,330	16,916	-39,510	38,848	15,066	8,542	5,423	2,689	2,102	9,213	5,221
DIASORIN S.P.A.	133,389	119,078	1,347	1,162	25,290	37,158	63,317	58,122	42,548	26,713	21,595	31,908	37,169
Duni AB	59,974	59,550	12,485	10,534	18,142	-18,044	97,764	82,520	81,233	11,370	9,949	26,614	11,236
DURO FELGUERA SA	125,580	111,386	3,466	7,654	-82,672	301,522	150,480	145,921	147,233	7,461	8,197	12,020	6,885
ELECNOR SA	203,790	182,522	5,288	27,858	-285,978	465,452	1,306,557	1,033,948	785,433	68,934	45,418	341,543	293,933
ENERGOAQUA, A.S.	9,760	9,240	1,487	974	919	129	59,000	61,344	61,225	2,577	2,887	233	3,006
EUTELSAT COMMUNICATIONS	925,657	821,970	199,041	143,239	-67,134	177	2,861,781	2,819,102	2,580,236	280,459	313,419	323,138	552,285
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	3,229	3,159	939	563	284	505	36,820	37,746	42,043	2,336	2,444	1,410	-1,853
Flughafen Zürich AG	264,296	283,879	32,595	17,519	15,185	1,536	1,926,917	1,911,840	1,708,120	120,712	125,759	135,789	329,480
Fugro N.V.	548,198	535,691	74,412	94,793	27,834	72,940	1,093,804	889,623	625,142	183,708	149,446	387,889	413,927
GIORGIO FEDON & FIGLI SPA	5,656	5,599	639	1,323	-11,239	857	12,021	12,943	14,053	2,217	2,480	1,295	1,370
Goodwin PLC	19,952	18,492	4,582	4,470	3,888	1,787	27,835	24,531	20,726	3,785	3,057	7,089	6,862
GROUPE MINOTERIES SA	13,007	11,442	2,515	1,697	6,504	-244	58,233	57,345	50,515	3,838	3,855	4,726	10,685
HARGREAVES SERVICES PLC	73,166	63,258	11,596	11,101	9,087	32,082	99,947	101,419	82,717	23,762	21,510	22,290	40,212
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PUBLIC LIMITED	23,719	16,448	4,129	3,272	2,709	2,912	17,296		4,488	4,320	3,766		
COMPANY								6,086				15,530	5,364
Indra Sistemas, Sociedad Anonima	327,433	308,204	62,745	64,978	-79,342	702,991	213,039	646,236	202,672	42,039	37,736	-391,158	481,300
INTERPARFUMS	223,542	53,867	74,268	16,661	-9,056	46,146	26,024	16,394	13,865	10,228	7,566	19,858	10,095
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	20,711	18,942	3,177	5,704	8,677	3,406	18,303	15,049	14,130	9,441	7,555	12,695	8,474
IZOSTAL S.A.	10,677	9,354	1,198	1,049	2,941	-1,015	33,633	29,852	25,082	4,620	3,550	8,401	8,320
James Halstead PLC	48,219	41,896	12,332	9,544	5,420	335	41,578	38,503	32,102	4,320	3,482	7,395	9,883
JOURNEY GROUP PLC	24,968	1,099	-780	70	-579	-45	5,923	5,482	5,998	23,585	918	24,026	402
KINEPOLIS GROUP	73,295	68,134	13,701	11,970	-710	8,012	250,011	259,709	266,498	19,954	22,949	10,256	16,160

Table 52- Relevant Data for the application of the models (part 6)

Company Name	EBITDA(-1)	EBITDA(-2)	Tax(-1)	Tax(-2)	Changes WC (-1	Changes WC (-2)	Fixed Assets (-1)	Fixed Assets (-2)	Fixed Assets (-3)	Depreciation (-1)	Depreciation (-2)	Capex (-1)	Capex (-2)
KONČAR, D.D.	40,299	19,871	2,868	2,468	-1,575	7,892	191,176	174,118	155,713	27,744	13,047	44,802	31,452
KONINKLIJKE VOPAK N.V.	636,000	598,000	71,300	72,800	-177,400	52,000	3,772,600	3,316,600	2,689,000	166,600	152,900	622,600	780,500
Krka, Tovarna Zdravil, D.D.,	268,018	280,867	37,477	42,843	68,254	50,153	779,297	756,579	740,438	68,503	68,035	91,221	84,176
LEDO D.D.	20,535	19,192	3,126	2,779	-4,575	8,454	63,579	62,872	54,898	5,673	5,351	6,380	13,325
M&C Saatchi PLC	13,634	16,296	4,121	4,089	-8,318	-13,064	10,983	8,989	14,479	2,192	5,019	4,186	-471
MARR S.P.A.	91,401	82,848	25,622	23,189	15,756	-1,659	74,884	67,079	65,128	12,103	11,755	19,908	13,706
Miquel Y Costas & Miquel SA	50,615	45,075	10,188	8,919	2,376	-21,047	154,139	125,855	118,737	14,526	13,997	42,810	21,115
MOURY CONSTRUCT	8,785	6,337	3,659	2,048	1,237	-3,479	9,474	21,281	13,409	805	1,083	-11,002	8,955
NCC Group PLC	19,264	16,048	4,443	3,632	507	-367	3,456	3,344	3,925	3,245	2,887	3,357	2,306
NETENT AB (PUBL)	18,658	13,898	1,223	930	-763	-954	4,957	3,115	993	3,451	2,175	5,293	4,297
O2 CZECH REPUBLIC, A.S.	1,092,221	1,024,113	121,189	121,349	-63,696	219,572	2,268,214	2,189,416	2,373,883	472,950	454,405	551,748	269,938
OBRASCON HUARTE LAIN SA	830,701	1,224,900	341,905	194,995	237,727	-320,469	2,534,364	2,553,429	2,097,296	170,548	252,370	151,483	708,503
ORBIS AG	2,299	1,870	160	15	545	666	4,898	4,543	4,486	536	385	891	442
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	78,751	80,053	12,379	9,885	79,249	54,338	305,511	238,318	219,161	10,278	10,280	77,471	29,437
PGE Polska Grupa Energetyczna S.A.	1,303,802	794,956	253,598	121,130	146,519	92,302	10,183,966	9,840,680	11,908,291	2,160	3,509	345,446	-2,064,102
PLAMA-PUR, PROIZVODNJA IN PREDELAVA PLASTIČNIH	4,192	3,900	483	374	-1,473	2,218	12,004		13,040	1,858	1,835		
MAS, D.D. PODGRAD								12,870				992	1,665
POUJOULAT	19,707	19,411	4,274	4,176	6,444	-907	36,182	32,990	31,532	5,329	5,132	8,521	6,590
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	426,974	363,504	79,257	85,302	208,602	156,627	699,906	546,626	494,685	115,497	79,408	268,777	131,349
PSI AKTIENGESELLSCHAFT FÜR PRODUKTE UND SYSTEME	16,919	14,646	1,977	1,280	4,210	2,302	14,669		14,111	4,034	3,981		
DER INFORMATIONSTECHNOLOGIE								14,672				4,031	4,542
RAFAKO S.A.	16,914	17,698	4,510	3,100	60,885	-18,987	90,741	53,180	49,964	2,370	2,516	39,931	5,732
RATIONAL AKTIENGESELLSCHAFT	112,563	98,071	25,818	22,822	6,540	-4,995	54,205	56,371	61,245	6,796	7,589	4,630	2,715
Recordati Industria Chimica e Farmaceutica S.P.A	201,163	184,404	42,086	37,717	5,993	2,656	122,004	129,803	131,684	34,800	30,192	27,001	28,311
RED24 PLC	1,098	896	140	20	-138	490	292	295	306	66	57	63	46
Resilux	28,163	27,656	2,049	2,334	10,400	-10,755	60,836	50,997	49,708	10,316	10,636	20,155	11,925
Retail Partners Colruyt Group	15,831	13,083	2,724	-1,199	-11,224	16,610	27,848	31,493	31,573	3,759	3,432	114	3,352
Rosetti Marino S.P.A.	77,936	56,359	22,245	18,066	-44,390	69,245	74,425	67,201	26,682	5,348	3,716	12,572	44,235
ROTALA PLC	8,502	7,447	-325	-539	-499	131	35,104	33,783	28,953	4,414	3,327	5,735	8,157
RWS HOLDINGS PLC	15,718	16,907	-539	5,150	20	-1,387	4,998	2,520	1,073	979	848	3,457	2,295
SDL PLC	50,766	44,185	9,589	7,918	-377	11,950	14,747	15,899	12,866	10,722	10,708	9,570	13,741
SMA SOLAR TECHNOLOGY AG	548,106	244,717	153,066	71,070	185,973	20,577	268,580	149,142	94,219	31,300	16,334	150,738	71,257
Societe Financiere des Caoutchoucs SA Soparfi	276,173	603,863	85,922	163,885	-14,061	674	1,629,756	223,118	194,121	27,824	25,004	1,434,462	54,001
SODEXO	1,338,000	1,104,000	286,000	250,000	47,000	41,000	1,294,000	1,087,000	1,148,000	354,000	251,000	561,000	190,000
SOFTWARE AKTIENGESELLSCHAFT	315,472	314,996	82,085	78,738	-25,662	13,012	68,811	71,618	72,756	46,276	46,386	43,469	45,248
TALLINNA VESI AS	110,650	102,200	3,908	4,230	4,643	-4,933	137,599	138,632	134,201	81,127	76,293	80,094	80,724
TOD'S S.P.A.	247,172	230,518	61,980	61,198	51,732	34,078	208,184	200,722	181,958	38,335	35,888	45,797	54,652
TURISTHOTEL D.D.	8,271	8,611	1,269	1,415	-1,627	-707	14,231	17,274	19,828	3,113	3,533	70	979
VIDRALA, SA	100,574	89,846	9,525	5,858	47,583	-22,370	394,978	466,342	447,589	37,643	34,863	-33,721	53,616
VIRBAC	107,246	74,564	21,791	16,727	18,713	1,840	109,710	81,874	74,327	18,518	15,663	46,354	23,210
VISCOFAN SA	185,033	162,142	27,932	26,639	38,834	7,181	356,919	334,286	317,503	45,010	42,050	67,643	58,833
VITEC SOFTWARE GROUP AB (PUBL)	8,873	6,819	847	896	-458	675	1,575	1,655	890	3,865	2,566	3,785	3,331
ZYTRONIC PLC	6,649	5,573	1,124	999	762	553	10,824	9,711	10,011	1,301	1,336	2,414	1,036

Table 53- Relevant Data for the application of the models (part 7)

Company Name	FCF(-1)	FCF(-2)	DeltaFCF(-1)	PRFCFD(-1)	NRFCFD(-1)	ROA(-1)	ROA(0)	ROA(1)	ROA(2)	Market to book (-1)	Log(MTB(-1))	Assets-1	Assets-2	Log(Assets-1)
ACCELL GROUP N.V.	4,849	102,344	-0.95	0	1	9.36%	3.85%	3.28%	4.19%	1.38	0.14	433,996	383,934	5.64
AF GRUPPEN ASA	70,169	61,981	0.13	1	0	6.64%	5.14%	9.13%	9.65%	2.67	0.43	592,352	384,595	5.77
AGGREKO PLC	22,000	-55,000	-1.40	0	1	13.00%	12.46%	10.50%	7.90%	4.60	0.66	2,540,000	2,118,000	6.40
Aixtron SE	51,047	29,704	0.72	1	0	23.38%	10.23%	-25.97%	-17.94%	4.60	0.66	823,432	573,094	5.92
AMADEUS FIRE AG	14,483	10,454	0.39	1	0	24.84%	21.74%	25.53%	27.22%	3.26	0.51	62,410	54,619	4.80
ASSECO POLAND S.A.	469,096	-234,846	-3.00	0	1	6.41%	5.77%	6.63%	4.86%	0.53	-0.28	2,144,795	1,993,972	6.33
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	597	3,816	-0.84	0	1	1.56%	1.19%	1.38%	2.29%	1.10	0.04	79,555	79,325	4.90
ATOSS SOFTWARE AG	3,958	4,338	-0.09	0	1	17.25%	13.14%	24.27%	22.80%	3.57	0.55	33,443	31,392	4.52
BETSSON AB	63,694	52,588	0.21	1	0	18.53%	15.99%	15.38%	14.53%	4.68	0.67	344,515	255,061	5.54
BIOGAIA AB	32,687	6,047	4.41	1	0	63.80%	16.74%	35.61%	25.66%	6.33	0.80	60,245	31,399	4.78
BRAINJUICER GROUP PLC	919	67	12.72	1	0	15.44%	9.07%	15.66%	20.63%	5.31	0.72	14,316	11,294	4.16
BUDIMEX S.A.	144,733	-27,958	-6.18	0	1	6.58%	5.73%	5.39%	8.17%	3.73	0.57	1,026,415	813,324	6.01
CARILLION PLC	245,145	231,201	0.06	1	0	4.85%	3.73%	4.30%	2.92%	1.77	0.25	3,687,792	3,448,432	6.57
ČEZ, A.S	1,721,072	1,845,211	-0.07	0	1	9.78%	8.67%	6.81%	6.31%	2.25	0.35	20,039,305	17,574,590	7.30
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	-303,735	107,260	-3.83	0	1	5.94%	3.75%	3.24%	2.10%	1.98	0.30	2,380,799	2,223,693	6.38
CTS EVENTIM AG & CO. KGAA	56,151	32,916	0.71	1	0	10.43%	7.49%	6.44%	7.72%	5.17	0.71	461,885	405,087	5.66
DELKO S.A.	9,696	2,689	2.61	1	0	8.15%	4.98%	0.84%	-4.50%	1.33	0.12	23,333	21,039	4.37
DELTICOM AG	55,280	-5,939	-10.31	0	1	21.66%	14.17%	6.53%	1.74%	10.42	1.02	166,364	149,348	5.22
DIASORIN S.P.A.	74,844	43,589	0.72	1	0	21.01%	16.70%	15.78%	13.88%	3.08	0.49	474,201	447,627	5.68
Duni AB	2,733	55,824	-0.95	0	1	8.78%	7.09%	3.53%	7.23%	15.46	1.19	388,715	340,323	5.59
DURO FELGUERA SA	192,766	-204,675	-1.94	0	1	10.24%	8.40%	4.86%	-7.78%	2.41	0.38	1,153,091	1,325,377	6.06
ELECNOR SA	142,937	-604,721	-1.24	0	1	4.64%	3.91%	2.51%	1.67%	1.43	0.16	2,820,553	2,179,131	6.45
ENERGOAQUA, A.S.	7,121	5,131	0.39	1	0	7.02%	2.15%	9.11%	7.02%	0.60	-0.22	76,801	76,495	4.89
EUTELSAT COMMUNICATIONS	470,612	126,269	2.73	1	0	7.12%	6.56%	6.33%	4.33%	4.13	0.62	4,751,194	4,717,033	6.68
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	596	3,944	-0.85	0	1	5.62%	3.74%	4.80%	5.12%	2.51	0.40	57,455	60,269	4.76
Flughafen Zürich AG	80,727	-64,656	-2.25	0	1	5.36%	3.94%	4.48%	2.33%	1.23	0.09	2,397,886	2,271,710	6.38
Fugro N.V.	58,063	-45,969	-2.26	0	1	13.31%	9.07%	7.65%	7.23%	2.64	0.42	2,366,317	2,123,306	6.37
GIORGIO FEDON & FIGLI SPA	14,961	2,049	6.30	1	0	5.11%	4.22%	2.29%	2.69%	0.51	-0.29	45,178	45,711	4.65
Goodwin PLC	4,393	5,373	-0.18	0	1	10.84%	4.39%	8.97%	13.16%	1.67	0.22	99,111	91,793	5.00
GROUPE MINOTERIES SA	-738	-696	0.06	1	0	7.06%	4.44%	3.42%	3.64%	1.91	0.28	93,813	84,355	4.97
HARGREAVES SERVICES PLC	30,193	-20,137	-2.50	0	1	8.70%	7.57%	-12.06%	9.56%	1.96	0.29	353,648	334,133	5.55
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PUBLIC LIMITED COMPANY	1,351	4,900	-0.72	0	1	12.86%	5.12%	7.86%	6.79%	3.31	0.52	114,416	94,672	5.06
Indra Sistemas, Sociedad Anonima	735,188	-941,065	-1.78	0	1	7.95%	6.32%	5.14%	3.40%	2.67	0.43	2,489,529	2,461,628	6.40
INTERPARFUMS	138,472	-19,035	-8.27	0	1	25.46%	8.06%	5.27%	4.85%	1.48	0.17	534,984	353,194	5.73
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	-3,838	1,358	-3.83	0	1	2.64%	0.29%	-0.68%	-4.14%	0.99	0.00	225,400	200,541	5.35
IZOSTAL S.A.	-1,863	1,000	-2.86	0	1	7.23%	5.44%	2.00%	0.91%	1.59	0.20	68,662	61,610	4.84
James Halstead PLC	23,072	22,134	0.04	1	0	18.84%	17.41%	18.68%	18.24%	4.69	0.67	166,853	137,731	5.22
JOURNEY GROUP PLC	2,301	672	2.42	1	0	9.23%	0.65%	9.35%	8.60%	0.82	-0.09	21,221	19,438	4.33
KINEPOLIS GROUP	50,048	31,992	0.56	1	0	11.16%	10.90%	12.10%	10.25%	2.71	0.43	326,953	326,040	5.51

Table 54- Relevant Data for the application of the models (part 8)

Company Name	FCF(-1)	FCF(-2)	DeltaFCF(-1)	PRFCFD(-1)	NRFCFD(-1)	ROA(-1)	ROA(0)	ROA(1)	ROA(2)	Market to book (-1)	Log(MTB(-1))	Assets-1	Assets-2	Log(Assets-1)
KONČAR, D.D.	-5,796	-21,941	-0.74	0	1	9.92%	5.05%	4.68%	3.92%	0.83	-0.08	467,349	464,218	5.67
KONINKLIJKE VOPAK N.V.	119,500	-307,300	-1.39	0	1	10.27%	7.36%	7.48%	5.47%	2.84	0.45	4,240,200	3,831,000	6.63
Krka, Tovarna Zdravil, D.D.,	71,066	103,695	-0.31	0	1	13.01%	11.47%	10.28%	9.87%	2.39	0.38	1,446,311	1,312,939	6.16
LEDO D.D.	15,604	-5,366	-3.91	0	1	7.06%	9.77%	10.70%	4.75%	16.46	1.22	195,779	134,145	5.29
M&C Saatchi PLC	13,645	25,742	-0.47	0	1	4.81%	1.66%	6.22%	2.34%	0.93	-0.03	154,247	143,925	5.19
MARR S.P.A.	30,115	47,612	-0.37	0	1	6.79%	6.24%	5.91%	6.39%	1.90	0.28	730,382	733,952	5.86
Miquel Y Costas & Miquel SA	-4,759	36,088	-1.13	0	1	8.97%	8.11%	7.57%	8.67%	1.30	0.11	305,560	273,481	5.49
MOURY CONSTRUCT	14,891	-1,187	-13.55	0	1	8.34%	5.80%	5.98%	0.85%	0.73	-0.14	78,184	81,701	4.89
NCC Group PLC	10,957	10,477	0.05	1	0	9.44%	6.82%	6.18%	10.28%	2.55	0.41	118,196	92,885	5.07
NETENT AB (PUBL)	12,905	9,625	0.34	1	0	39.26%	26.13%	24.15%	31.37%	11.88	1.07	34,208	24,257	4.53
O2 CZECH REPUBLIC, A.S.	482,980	413,254	0.17	1	0	13.23%	9.76%	8.56%	7.70%	1.68	0.23	3,701,585	3,505,846	6.57
OBRASCON HUARTE LAIN SA	99,586	641,871	-0.84	0	1	9.02%	2.96%	1.30%	1.69%	0.79	-0.10	12,206,715	12,926,055	7.09
ORBIS AG	703	747	-0.06	0	1	5.43%	4.83%	4.95%	3.69%	1.21	0.08	29,461	25,683	4.47
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	-90,348	-13,607	5.64	1	0	4.60%	2.62%	441.00%	7.75%	1.66	0.22	1,199,970	976,183	6.08
PGE Polska Grupa Energetyczna S.A.	558,239	2,645,626	-0.79	0	1	7.97%	7.00%	8.46%	5.55%	1.18	0.07	13,260,083	11,449,055	7.12
PLAMA-PUR, PROIZVODNJA IN PREDELAVA PLASTIČNIH MAS, D.D. PODGRAD	4,190	-357	-12.74	0	1	8.32%	6.58%	7.57%	5.66%	0.57	-0.24	23,147	26,044	4.36
POUJOULAT	468	9,552	-0.95	0	1	6.77%	4.78%	3.43%	3.87%	0.77	-0.12	129,110	114,996	5.11
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	-129,662	-9,774	12.27	1	0	5.95%	5.37%	5.26%	6.61%	3.74	0.57	2,885,594	2,191,564	6.46
PSI AKTIENGESELLSCHAFT FÜR PRODUKTE UND SYSTEME DER INFORMATIONSTECHNOLOGIE	6,701	6,522	0.03	1	0	5.02%	0.21%	2.13%	3.74%	3.31	0.52	186,441	175,661	5.27
RAFAKO S.A.	-88,412	27,853	-4.17	0	1	4.27%	-2.09%	-12.64%	2.49%	1.15	0.06	313,466	239,577	5.50
RATIONAL AKTIENGESELLSCHAFT	75,575	77,529	-0.03	0	1	26.10%	27.81%	28.60%	25.77%	7.97	0.90	305,714	265,661	5.49
Recordati Industria Chimica e Farmaceutica S.P.A	126,083	115,720	0.09	1	0	12.53%	11.39%	11.30%	10.46%	1.91	0.28	882,582	875,050	5.95
RED24 PLC	1,033	340	2.04	1	0	18.30%	14.55%	16.48%	18.32%	2.42	0.38	4,888	3,653	3.69
Resilux	-4,441	24,152	-1.18	0	1	7.48%	4.50%	5.60%	4.91%	1.65	0.22	163,649	143,755	5.21
Retail Partners Colruyt Group	24,217	-5,680	-5.26	0	1	8.82%	6.84%	6.11%	5.48%	4.55	0.66	175,740	154,346	5.24
Rosetti Marino S.P.A.	87,509	-75,187	-2.16	0	1	14.19%	5.77%	3.77%	4.19%	0.69	-0.16	339,333	340,842	5.53
ROTALA PLC	3,591	-302	-12.89	0	1	4.46%	3.87%	3.76%	2.32%	0.68	-0.16	56,245	52,945	4.75
RWS HOLDINGS PLC	12,780	10,849	0.18	1	0	24.70%	15.36%	15.90%	16.64%	2.73	0.44	73,987	64,503	4.87
SDL PLC	31,984	10,576	2.02	1	0	8.86%	6.07%	-8.91%	2.12%	2.32	0.37	347,302	317,994	5.54
SMA SOLAR TECHNOLOGY AG	58,329	81,813	-0.29	0	1	29.17%	12.08%	5.65%	-5.31%	3.31	0.52	1,251,448	718,650	6.10
Societe Financiere des Caoutchoucs SA Soparfi	-1,230,150	385,303	-4.19	0	1	7.42%	7.42%	0.29%	4.90%	0.34	-0.47	2,035,441	1,983,949	6.31
SODEXO	444,000	623,000	-0.29	0	1	4.11%	3.48%	3.38%	4.84%	3.27	0.51	12,790,000	11,409,000	7.11
SOFTWARE AKTIENGESELLSCHAFT	215,580	177,998	0.21	1	0	10.54%	9.29%	6.71%	5.98%	2.61	0.42	1,680,695	1,599,610	6.23
TALLINNA VESI AS	22,005	22,179	-0.01	0	1	12.67%	8.98%	11.34%	11.12%	2.25	0.35	171,417	163,553	5.23
TOD'S S.P.A.	87,663	80,590	0.09	1	0	13.58%	12.11%	8.49%	9.40%	3.83	0.58	1,072,943	1,044,375	6.03
TURISTHOTEL D.D.	8,559	6,924	0.24	1	0	14.17%	12.69%	20.06%	17.58%	1.39	0.14	39,368	39,874	4.60
VIDRALA, SA	77,187	52,742	0.46	1	0	7.09%	6.27%	6.69%	7.47%	1.73	0.24	699,357	697,623	5.84
VIRBAC	20,388	32,787	-0.38	0	1	11.88%	9.77%	8.05%	6.75%	3.78	0.58	533,753	434,470	5.73
VISCOFAN SA	50,624	69,489	-0.27	0	1	13.51%	12.84%	12.14%	14.43%	4.00	0.60	777,569	697,296	5.89
VITEC SOFTWARE GROUP AB (PUBL)	4,699	1,917	1.45	1	0	7.66%	7.79%	6.35%	8.97%	1.88	0.27	50,004	36,775	4.70
ZYTRONIC PLC	2,349	2,985	-0.21	0	1	15.70%	8.01%	12.92%	14.88%	3.03	0.48	26,303	24,840	4.42

Table 55- Relevant Data for the application of the models (part 9)

Company Name	ROE(0)	ROE(-1)	ROE(1)	ROE(2)	Annual % change in cash dividend payment in year 0	(E0-E-1)/(B-1)	(E1-E0)/B-1	(E2-E1)/B-1	PCED0 (Eq.1)	NCED0 (Eq,1)
ACCELL GROUP N.V.	9.35%	18.93%	9.48%	13.09%	11.00%	-0.081	-0.019	0.033	0	1
AF GRUPPEN ASA	20.85%	22.92%	35.83%	34.96%	5.20%	-0.028	0.131	0.006	0	1
AGGREKO PLC	21.58%	26.42%	19.94%	14.53%	13.40%	-0.029	-0.014	-0.045	0	1
Aixtron SE	12.66%	32.06%	-30.94%	-21.71%	302.04%	-0.188	-0.375	0.074	0	1
AMADEUS FIRE AG	31.44%	36.31%	38.54%	42.32%	70.06%	-0.059	0.064	0.066	0	1
ASSECO POLAND S.A.	7.69%	8.61%	8.80%	6.51%	24.37%	-0.001	0.011	-0.020	0	1
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	1.90%	2.54%	2.12%	3.40%	14.29%	-0.006	0.002	0.014	0	1
ATOSS SOFTWARE AG	25.73%	24.82%	47.09%	40.09%	409.92%	-0.118	0.173	0.024	0	1
BETSSON AB	27.66%	34.72%	25.07%	26.37%	-100.00%	-0.002	0.101	0.046	0	1
BIOGAIA AB	20.26%	72.22%	42.95%	55.61%	66.67%	-0.586	0.160	-0.048	0	1
BRAINJUICER GROUP PLC	14.14%	26.47%	30.03%	37.60%	22.01%	-0.116	0.200	0.098	0	1
BUDIMEX S.A.	36.69%	39.30%	42.94%	46.70%	33.53%	-0.049	-0.079	0.158	0	1
CARILLION PLC	14.05%	17.66%	16.46%	10.81%	9.31%	-0.014	0.033	-0.071	0	1
ČEZ, A.S	20.77%	25.09%	17.56%	15.80%	6.36%	-0.010	-0.039	0.002	0	1
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	14.14%	21.20%	12.48%	8.30%	0.14%	-0.062	-0.014	-0.043	0	1
CTS EVENTIM AG & CO. KGAA	31.10%	32.16%	25.55%	28.93%	36.06%	-0.001	0.081	0.039	0	1
DELKO S.A.	11.51%	17.47%	2.62%	-14.62%	0.00%	-0.034	-0.114	-0.160	0	1
DELTICOM AG	35.38%	47.73%	22.36%	5.68%	8.53%	-0.184	-0.140	-0.115	0	1
DIASORIN S.P.A.	23.82%	28.36%	20.07%	17.39%	17.26%	-0.034	-0.013	0.003	0	1
Duni AB	12.54%	15.37%	6.05%	12.72%	40.17%	-0.022	-0.067	0.071	0	1
DURO FELGUERA SA	32.99%	36.89%	18.90%	-54.35%	-23.81%	-0.101	-0.110	-0.409	0	1
ELECNOR SA	19.06%	21.57%	14.87%	10.45%	46.06%	-0.018	-0.047	-0.057	0	1
ENERGOAQUA, A.S.	2.42%	7.84%	4.57%	7.84%	35.04%	-0.055	0.075	-0.004	0	1
EUTELSAT COMMUNICATIONS	20.49%	18.67%	18.19%	14.93%	28.27%	-0.007	0.017	-0.031	0	1
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	6.29%	8.80%	7.63%	8.20%	0.30%	-0.022	0.018	0.012	0	1
Flughafen Zürich AG	8.22%	11.93%	9.49%	5.09%	50.30%	-0.017	0.028	-0.058	0	1
Fugro N.V.	18.39%	26.25%	17.64%	15.24%	5.66%	-0.029	0.013	0.005	0	1
GIORGIO FEDON & FIGLI SPA	11.38%	14.71%	7.30%	7.96%	20.09%	-0.025	-0.041	0.015	0	1
Goodwin PLC	9.50%	23.23%	19.17%	25.09%	-50.00%	-0.130	0.146	0.154	0	1
GROUPE MINOTERIES SA	6.10%	9.80%	6.47%	6.31%	0.06%	-0.035	-0.001	0.003	0	1
HARGREAVES SERVICES PLC	22.59%	23.39%	-41.94%	24.53%	107.35%	-0.566	0.608	-0.099	0	1
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PUBLIC LIMITED COMPANY	6.55%	17.55%	9.77%	8.03%	26.65%	-0.108	0.042	-0.010	0	1
Indra Sistemas, Sociedad Anonima	17.62%	19.57%	16.46%	11.20%	7.95%	-0.010	-0.007	-0.053	0	1
INTERPARFUMS	9.82%	39.53%	6.32%	7.24%	139.31%	-0.294	-0.034	0.017	0	1
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	1.27%	10.37%	-2.72%	-20.75%	-0.30%	-0.091	-0.042	-0.154	0	1
IZOSTAL S.A.	8.14%	13.10%	3.01%	1.50%	5.89%	-0.047	-0.053	-0.015	0	1
James Halstead PLC	32.07%	38.42%	32.36%	33.70%	-30.29%	-0.012	0.091	-0.023	0	1
JOURNEY GROUP PLC	1.01%	14.48%	14.23%	15.40%	15.36%	-0.135	0.136	0.006	0	1
KINEPOLIS GROUP	32.86%	27.23%	35.87%	33.98%	0.47%	-0.006	0.014	-0.018	0	1

Table 56- Relevant Data for the application of the model (part 10)

Company Name	ROE(0)	ROE(-1)	ROE(1)	ROE(2)	Annual % change in cash dividend payment in year 0	(E0-E-1)/(B-1)	(E1-E0)/B-1	(E2-E1)/B-1	PCED0 (Eq.1)	NCED0 (Eq,1)
KONČAR, D.D.	8.63%	9.92%	7.45%	3.30%	-4.60%	-0.007	-0.009	-0.004	0	1
KONINKLIJKE VOPAK N.V.	18.77%	23.70%	18.72%	15.54%	13.16%	-0.036	-0.005	-0.036	0	1
Krka, Tovarna Zdravil, D.D.,	15.68%	18.33%	13.19%	12.55%	26.43%	-0.005	-0.017	0.005	0	1
LEDO D.D.	13.77%	15.52%	14.65%	7.61%	-99.98%	-0.002	0.036	0.008	0	1
M&C Saatchi PLC	6.02%	12.41%	20.43%	8.05%	0.45%	-0.064	0.169	-0.138	0	1
MARR S.P.A.	20.94%	21.82%	19.38%	20.23%	28.00%	-0.003	-0.007	0.017	0	1
Miquel Y Costas & Miquel SA	12.84%	13.99%	11.15%	12.99%	-0.12%	-0.001	-0.012	0.030	0	1
MOURY CONSTRUCT	11.32%	16.90%	10.78%	1.53%	10.00%	-0.048	0.002	-0.106	0	1
NCC Group PLC	14.67%	18.73%	12.62%	20.55%	17.39%	-0.029	0.001	0.125	0	1
NETENT AB (PUBL)	48.58%	60.28%	46.18%	43.91%	0.00%	-0.020	0.115	0.150	0	1
O2 CZECH REPUBLIC, A.S.	12.57%	16.78%	11.19%	10.22%	0.02%	-0.053	-0.023	-0.021	0	1
OBRASCON HUARTE LAIN SA	12.14%	39.69%	5.23%	5.37%	15.58%	-0.251	-0.079	0.026	0	1
ORBIS AG	7.68%	8.23%	7.98%	6.00%	54.82%	-0.005	0.006	-0.021	0	1
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	7.52%	11.93%	441.00%	-35.70%	0.00%	-0.036	-2.036	2.061	0	1
PGE Polska Grupa Energetyczna S.A.	9.56%	11.16%	12.07%	7.95%	-7.57%	-0.016	0.023	-0.035	0	1
PLAMA-PUR, PROIZVODNJA IN PREDELAVA PLASTIČNIH MAS, D.D. PODGRAD	9.81%	12.31%	10.42%	6.99%	121.90%	-0.019	0.015	-0.032	0	1
POUJOULAT	12.19%	14.56%	8.53%	12.14%	12.55%	-0.010	-0.033	0.061	0	1
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	23.78%	23.45%	18.34%	26.21%	35.76%	-0.022	0.004	0.034	0	1
PSI AKTIENGESELLSCHAFT FÜR PRODUKTE UND SYSTEME DER INFORMATIONSTECHNOLOGIE	0.54%	12.71%	6.00%	10.20%	19.98%	-0.122	0.051	2.435	0	1
RAFAKO S.A.	-6.36%	12.71%	-45.79%	11.12%	-100.00%	-0.190	-0.244	0.372	0	1
RATIONAL AKTIENGESELLSCHAFT	38.06%	34.65%	39.30%	36.17%	157.14%	-0.005	0.063	0.017	0	1
Recordati Industria Chimica e Farmaceutica S.P.A	17.27%	19.46%	17.98%	16.75%	10.35%	-0.003	0.014	0.004	0	1
RED24 PLC	24.11%	29.27%	22.28%	20.77%	25.64%	0.000	0.033	0.074	0	1
Resilux	11.01%	17.76%	13.27%	11.39%	10.03%	-0.062	0.031	-0.017	0	1
Retail Partners Colruyt Group	11.27%	14.87%	10.49%	9.21%	1.93%	-0.022	0.005	-0.004	0	1
Rosetti Marino S.P.A.	11.92%	31.66%	8.06%	10.25%	21.19%	0.000	0.084	0.033	0	1
ROTALA PLC	8.53%	10.24%	8.11%	4.59%	36.45%	-0.008	0.000	-0.033	0	1
RWS HOLDINGS PLC	18.52%	30.12%	19.11%	20.04%	14.89%	-0.086	0.027	0.058	0	1
SDL PLC	9.16%	11.82%	-14.20%	3.27%	7.16%	-0.021	-0.214	0.153	0	1
SMA SOLAR TECHNOLOGY AG	21.04%	50.12%	9.14%	-9.22%	130.77%	-0.273	-0.125	-0.195	0	1
Societe Financiere des Caoutchoucs SA Soparfi	0.42%	10.21%	0.42%	7.21%	-22.22%	-0.173	-0.099	0.068	0	1
SODEXO	14.87%	17.30%	15.21%	18.70%	8.60%	-0.028	0.017	0.069	0	1
SOFTWARE AKTIENGESELLSCHAFT	15.54%	18.63%	13.88%	10.91%	7.91%	-0.013	-0.032	-0.025	0	1
TALLINNA VESI AS	22.48%	24.44%	27.53%	26.27%	117.39%	-0.059	0.060	0.005	0	1
TOD'S S.P.A.	16.73%	19.08%	11.88%	13.24%	8.48%	-0.015	-0.049	-0.006	0	1
TURISTHOTEL D.D.	16.02%	18.13%	27.68%	23.31%	6.25%	-0.019	0.115	-0.017	0	1
VIDRALA, SA	13.70%	16.77%	13.37%	13.57%	10.26%	-0.020	0.010	0.020	0	1
VIRBAC	18.47%	21.13%	19.25%	14.61%	13.72%	-0.020	0.030	-0.020	0	1
VISCOFAN SA	19.46%	21.07%	18.49%	18.85%	6.77%	-0.007	0.010	0.027	0	1
VITEC SOFTWARE GROUP AB (PUBL)	17.82%	20.58%	18.86%	28.80%	26.46%	-0.022	0.097	0.177	0	1
ZYTRONIC PLC	10.32%	21.16%	16.40%	18.22%	6.33%	-0.110	0.093	0.067	0	1

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Table 57- Relevant Data for the calculation of the Future Abnormal Earnings (part 1)

Company Name	Earnings in year -5	Earnings in year -4	Earnings in year -3	Earnings in year -2	Earnings in year -1	Growth Rate year -5 to year -4	Growth Rate year -4 to year -3
ACCELL GROUP N.V.	19,814	28,567	32,740	36,380	40,633	44.18%	14.61%
AF GRUPPEN ASA	21,814	22,517	32,419	35,358	39,352	3.22%	43.98%
AGGREKO PLC	129,000	189,000	249,000	311,000	330,095	46.51%	31.75%
Aixtron SE	5,857	17,250	22,994	44,766	192,496	194.52%	33.30%
AMADEUS FIRE AG	8,473	10,261	10,879	12,997	15,504	21.10%	6.02%
ASSECO POLAND S.A.	53,198	96,911	106,637	125,902	137,366	82.17%	10.04%
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	1,041	1,140	1,143	1,153	1,244	9.51%	0.26%
ATOSS SOFTWARE AG	3,510	3,964	4,799	5,675	5,760	12.93%	21.06%
BETSSON AB	24,589	29,580	40,762	59,226	63,831	20.30%	37.80%
BIOGAIA AB	3,323	3,516	5,228	8,923	38,437	5.81%	48.69%
BRAINJUICER GROUP PLC	898	1,010	1,332	1,732	2,211	12.47%	31.88%
BUDIMEX S.A.	1,037	3,941	25,430	42,292	67,484	280.04%	545.27%
CARILLION PLC	90,102	106,832	117,110	153,114	178,864	18.57%	9.62%
ČEZ, A.S	475,101	1,045,911	1,606,907	1,758,703	1,959,680	120.14%	53.64%
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	88,301	106,708	119,706	125,440	141,449	20.85%	12.18%
CTS EVENTIM AG & CO. KGAA	20,891	28,498	29,823	35,542	42,280	36.41%	4.65%
DELKO S.A.	404	790	994	1,516	1,821	95.54%	25.82%
DELTICOM AG	8,348	11,731	20,228	32,629	36,029	40.52%	72.43%
DIASORIN S.P.A.	25,219	37,459	70,047	90,418	99,607	48.53%	87.00%
Duni AB	324	10,274	17,571	32,774	34,111	3070.99%	71.02%
DURO FELGUERA SA	52,885	70,736	97,283	101,843	118,093	33.75%	37.53%
ELECNOR SA	61,738	78,126	101,894	102,518	130,734	26.54%	30.42%
ENERGOAQUA, A.S.	1,767	2,699	3,076	3,176	5,388	52.74%	13.97%
EUTELSAT COMMUNICATIONS	159,377	172,276	247,348	269,501	338,474	8.09%	43.58%
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	1,959	2,812	2,919	3,159	3,229	43.54%	3.81%
Flughafen Zürich AG	38,141	54,426	78,870	81,950	128,397	42.70%	44.91%
Fugro N.V.	101,330	141,749	222,329	289,456	314,834	39.89%	56.85%
GIORGIO FEDON & FIGLI SPA	-3,295	-2,701	1,157	1,390	2,308	18.03%	142.84%
Goodwin PLC	5,053	7,102	8,585	10,175	10,742	40.55%	20.88%
GROUPE MINOTERIES SA	3,269	4,508	4,748	5,883	6,625	37.90%	5.32%
HARGREAVES SERVICES PLC	8,391	16,135	21,436	25,290	38,509	92.29%	32.85%
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PUBLIC LIMITED COMPANY	2,341	3,568	5,195	9,076	14,715	52.41%	45.60%
Indra Sistemas, Sociedad Anonima	107,428	117,936	154,781	186,081	197,999	9.78%	31.24%
INTERPARFUMS	21,119	22,647	26,807	30,300	136,188	7.24%	18.37%
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	588	1,189	2,751	4,227	5,945	102.21%	131.37%
IZOSTAL S.A.	1,464	1,469	1,877	4,327	4,965	0.34%	27.77%
James Halstead PLC	17,080	23,235	25,717	29,116	31,442	36.04%	10.68%
JOURNEY GROUP PLC	-10,983	-5,221	-4,669	-1,515	1,959	52.46%	10.57%
KINEPOLIS GROUP	14,727	15,186	22,177	28,062	36,471	3.12%	46.04%

Table 58- Relevant Data for the calculation of the Future Abnormal Earnings (part 2)

Company Name	Earnings in year -5	Earnings in year -4	Earnings in year -3	Earnings in year -2	Earnings in year -1	Growth Rate year -5 to year -4	Growth Rate year -4 to year -3
KONČAR, D.D.	11,432	14,472	19,793	22,231	25,528	26.59%	36.77%
KONINKLIJKE VOPAK N.V.	196,300	228,500	276,500	300,800	435,600	16.40%	21.01%
Krka, Tovarna Zdravil, D.D.,	90,056	113,027	126,521	161,129	170,812	25.51%	11.94%
LEDO D.D.	4,695	6,013	9,460	12,465	13,825	28.07%	57.33%
M&C Saatchi PLC	4,494	4,700	6,023	6,902	7,412	4.58%	28.15%
MARR S.P.A.	29,510	31,942	38,551	45,685	49,608	8.24%	20.69%
Miquel Y Costas & Miquel SA	11,673	17,428	20,149	23,140	27,407	49.30%	15.61%
MOURY CONSTRUCT	1,466	2,847	3,926	4,207	6,518	94.20%	37.90%
NCC Group PLC	6,658	7,899	8,085	8,819	11,154	18.64%	2.35%
NETENT AB (PUBL)	3,151	4,863	7,357	10,503	13,429	54.33%	51.29%
O2 CZECH REPUBLIC, A.S.	291,703	390,266	431,885	440,876	489,864	33.79%	10.66%
OBRASCON HUARTE LAIN SA	182,430	212,206	252,159	348,827	1,101,234	16.32%	18.83%
ORBIS AG	532	772	1,023	1,515	1,601	45.11%	32.51%
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	14,844	32,757	46,076	54,075	55,156	120.68%	40.66%
PGE Polska Grupa Energetyczna S.A.	181,886	404,039	579,635	647,814	1,056,277	122.14%	43.46%
PLAMA-PUR, PROIZVODNJA IN PREDELAVA PLASTIČNIH MAS, D.D. PODGRAD	490	943	1,217	1,376	1,927	92.45%	29.06%
POUJOULAT	4,696	5,590	6,829	8,049	8,737	19.04%	22.16%
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	126,645	149,480	160,410	167,044	171,567	18.03%	7.31%
PSI AKTIENGESELLSCHAFT FÜR PRODUKTE UND SYSTEME DER INFORMATIONSTECHNOLOGIE	4,140	6,603	7,047	7,444	9,358	59.49%	6.72%
RAFAKO S.A.	3,502	9,080	9,457	11,176	13,379	159.28%	4.15%
RATIONAL AKTIENGESELLSCHAFT	51,776	61,155	61,681	67,305	79,793	18.11%	0.86%
Recordati Industria Chimica e Farmaceutica S.P.A	64,543	74,031	84,865	100,429	110,566	14.70%	14.63%
RED24 PLC	-330,319	447,882	716,384	820	895	235.59%	59.95%
Resilux	-2,675	3,004	4,510	11,055	12,241	212.30%	50.13%
Retail Partners Colruyt Group	5,014	11,295	12,139	13,862	15,497	125.27%	7.47%
Rosetti Marino S.P.A.	9,282	12,211	14,929	36,113	48,143	31.56%	22.26%
ROTALA PLC	-1,536	1,451	1,675	1,971	2,509	194.47%	15.44%
RWS HOLDINGS PLC	6,688	8,709	11,149	12,064	15,929	30.22%	28.02%
SDL PLC	12,480	15,231	20,182	25,804	30,752	22.04%	32.51%
SMA SOLAR TECHNOLOGY AG	19,702	36,757	119,525	161,120	365,041	86.56%	225.18%
Societe Financiere des Caoutchoucs SA Soparfi	11,390	15,509	72,268	279,998	406,421	36.16%	365.97%
SODEXO	376,000	393,000	409,000	451,000	525,000	4.52%	4.07%
SOFTWARE AKTIENGESELLSCHAFT	88,407	115,860	140,795	175,632	177,209	31.05%	21.52%
TALLINNA VESI AS	11,143	15,583	17,752	18,916	21,726	39.85%	13.92%
TOD'S S.P.A.	84,588	86,140	110,786	135,688	145,737	1.83%	28.61%
TURISTHOTEL D.D.	2,616	2,649	4,429	5,551	5,579	1.26%	67.20%
VIDRALA, SA	29,259	38,558	40,649	40,927	49,578	31.78%	5.42%
VIRBAC	24,913	31,042	35,408	38,816	63,413	24.60%	14.06%
VISCOFAN SA	51,403	64,259	81,346	101,245	105,063	25.01%	26.59%
VITEC SOFTWARE GROUP AB (PUBL)	1,082	1,332	1,690	3,109	3,829	23.11%	26.88%
ZYTRONIC PLC	1,338	1,878	2,551	3,109	4,129	40.36%	35.84%

Table 59- Relevant Data for the calculation of the Future Abnormal Earnings (part 3)

Company Name	Growth Rate year -3 to year -2	Growth Rate year -2 to year -1	Geometric Growth Rate	Earnings in year 0	Expected Earnings year 1	Expected Earnings year 2	Actual Earnings in year 1	Actual Earnings in year 2	Shareholder's Funds year -1
ACCELL GROUP N.V.	11.12%	11.69%	17.02%	23,167	27,110	31,723	19,020	26,083	214,646
AF GRUPPEN ASA	9.07%	11.30%	10.98%	34,562	38,356	42,566	57,007	58,088	171,732
AGGREKO PLC	24.90%	6.14%	21.80%	293,752	357,782	435,768	276,000	219,834	1,250,000
Aixtron SE	94.69%	330.00%	119.27%	79,536	174,402	382,420	-145,436	-101,016	600,324
AMADEUS FIRE AG	19.47%	19.29%	14.78%	12,985	14,904	17,107	15,731	18,534	42,694
ASSECO POLAND S.A.	18.07%	9.11%	19.19%	135,954	162,046	193,145	153,833	121,886	1,595,039
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	0.87%	7.89%	2.04%	936	955	975	1,050	1,718	49,034
ATOSS SOFTWARE AG	18.25%	1.50%	9.29%	3,020	3,300	3,607	7,032	7,591	23,246
BETSSON AB	45.30%	7.78%	22.80%	63,443	77,908	95,671	82,047	90,489	183,849
BIOGAIA AB	70.68%	330.76%	50.71%	7,245	10,919	16,455	15,755	13,208	53,227
BRAINJUICER GROUP PLC	30.03%	27.63%	23.97%	1,241	1,539	1,908	2,908	3,724	8,350
BUDIMEX S.A.	66.31%	59.57%	156.71%	58,998	151,453	388,795	45,477	72,535	171,780
CARILLION PLC	30.74%	16.82%	17.43%	164,898	193,645	227,403	198,775	126,934	1,012,785
ČEZ, A.S	9.45%	11.43%	28.88%	1,881,189	2,424,478	3,124,669	1,579,551	1,597,102	7,810,567
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	4.79%	12.76%	11.16%	100,054	111,222	123,637	91,037	62,129	667,264
CTS EVENTIM AG & CO. KGAA	19.18%	18.96%	15.75%	42,188	48,833	56,525	54,990	61,142	158,107
DELKO S.A.	52.52%	20.13%	40.19%	1,462	2,050	2,874	273	-1,392	10,422
DELTICOM AG	61.31%	10.42%	37.00%	22,157	30,356	41,589	11,555	2,857	75,480
DIASORIN S.P.A.	29.08%	10.16%	33.42%	87,684	116,991	156,093	83,111	84,074	351,178
Duni AB	86.52%	4.08%	93.68%	29,286	56,722	109,858	14,449	30,139	221,948
DURO FELGUERA SA	4.69%	15.96%	17.54%	85,915	100,988	118,706	50,775	-80,070	320,099
ELECNOR SA	0.61%	27.52%	10.80%	119,791	132,730	147,067	91,148	56,858	605,990
ENERGOAQUA, A.S.	3.25%	69.66%	20.21%	1,629	1,959	2,355	6,752	6,490	68,750
EUTELSAT COMMUNICATIONS	8.96%	25.59%	16.86%	326,100	381,087	445,345	354,900	303,200	1,651,630
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	8.22%	2.22%	7.41%	2,420	2,599	2,792	3,084	3,512	36,681
Flughafen Zürich AG	3.91%	56.68%	25.52%	110,226	138,360	173,675	140,386	78,332	1,076,706
Fugro N.V.	30.19%	8.77%	27.83%	280,153	358,132	457,816	295,270	301,442	1,199,510
GIORGIO FEDON & FIGLI SPA	20.14%	66.04%	43.02%	1,909	2,730	3,905	1,272	1,501	15,691
Goodwin PLC	18.52%	5.57%	17.19%	4,716	5,527	6,477	11,488	18,627	46,242
GROUPE MINOTERIES SA	23.90%	12.61%	15.70%	4,245	4,912	5,683	4,154	4,349	67,726
HARGREAVES SERVICES PLC	17.98%	52.27%	41.09%	-58,052	-81,903	-115,554	45,506	28,592	170,454
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PUBLIC LIMITED COMPANY	74.71%	62.13%	57.71%	5,679	8,956	14,125	9,210	8,393	83,848
Indra Sistemas, Sociedad Anonima	20.22%	6.40%	14.10%	187,939	214,447	244,695	181,067	127,566	1,011,545
INTERPARFUMS	13.03%	349.47%	27.89%	34,833	44,548	56,974	23,228	29,152	344,531
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	53.65%	40.64%	73.56%	722	1,253	2,175	-1,689	-10,495	57,348
IZOSTAL S.A.	130.53%	14.74%	11.62%	3,180	3,550	3,962	1,156	576	37,905
James Halstead PLC	13.22%	7.99%	14.20%	30,420	34,739	39,672	37,838	35,928	81,844
JOURNEY GROUP PLC	67.55%	229.31%	54.14%	131	202	312	1,972	2,109	13,532
KINEPOLIS GROUP	26.54%	29.97%	18.38%	35,704	42,266	50,034	37,541	35,167	133,942

Table 60- Relevant Data for the calculation of the Future Abnormal Earnings (part 4)

Company Name	Growth Rate year -3 to year -2	Growth Rate year -2 to year -1	Geometric Growth Rate	Earnings in year 0	Expected Earnings year 1	Expected Earnings year 2	Actual Earnings in year 1	Actual Earnings in year 2	Shareholder's Funds year -1
KONČAR, D.D.	12.32%	14.83%	20.56%	23,604	28,456	34,306	21,184	20,265	257,253
KONINKLIJKE VOPAK N.V.	8.79%	44.81%	19.19%	369,500	440,420	524,952	360,900	295,600	1,837,800
Krka, Tovarna Zdravil, D.D.,	27.35%	6.01%	14.96%	165,920	190,738	219,269	150,392	154,615	932,010
LEDO D.D.	31.77%	10.91%	27.33%	13,665	17,399	22,154	16,839	17,593	89,109
M&C Saatchi PLC	14.59%	7.39%	10.86%	3,597	3,988	4,421	13,679	5,411	59,712
MARR S.P.A.	18.51%	8.59%	12.83%	48,902	55,176	62,255	47,318	51,105	227,350
Miquel Y Costas & Miquel SA	14.84%	18.44%	21.42%	27,114	32,923	39,977	24,696	30,640	195,977
MOURY CONSTRUCT	7.16%	54.93%	34.42%	4,662	6,267	8,424	4,723	627	38,576
NCC Group PLC	9.08%	26.48%	10.13%	9,441	10,397	11,451	9,519	16,943	59,558
NETENT AB (PUBL)	42.76%	27.86%	42.68%	12,973	18,510	26,411	15,527	18,866	22,277
O2 CZECH REPUBLIC, A.S.	2.08%	11.11%	9.55%	336,584	368,745	403,978	269,518	207,575	2,919,179
OBRASCON HUARTE LAIN SA	38.34%	215.70%	39.93%	404,984	566,677	792,927	185,361	258,553	2,774,691
ORBIS AG	48.09%	5.68%	25.16%	1,508	1,887	2,362	1,610	1,332	17,398
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	17.36%	2.00%	20.31%	38,595	46,435	55,868	-902,430	49,957	462,187
PGE Polska Grupa Energetyczna S.A.	11.76%	63.05%	44.54%	909,221	1,314,221	1,899,623	1,124,189	790,499	9,461,373
PLAMA-PUR, PROIZVODNJA IN PREDELAVA PLASTIČNIH MAS, D.D.									
PODGRAD	13.06%	40.01%	34.42%	1,631	2,193	2,947	1,859	1,358	15,653
POUJOULAT	17.86%	8.55%	15.93%	8,137	9,433	10,936	6,157	9,809	59,990
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	4.14%	2.71%	6.20%	155,674	165,324	175,572	158,428	183,369	731,800
PSI AKTIENGESELLSCHAFT FÜR PRODUKTE UND SYSTEME DER									
INFORMATIONSTECHNOLOGIE	5.63%	25.71%	15.52%	371	429	495	4,099	7,500	73,637
RAFAKO S.A.	18.18%	19.71%	22.06%	-6,675	-8,148	-9,945	-32,415	6,716	105,300
RATIONAL AKTIENGESELLSCHAFT	9.12%	18.55%	7.17%	78,745	84,387	90,434	93,300	97,244	230,266
Recordati Industria Chimica e Farmaceutica S.P.A	18.34%	10.09%	14.13%	108,580	123,919	141,424	116,446	118,497	568,082
RED24 PLC	99.89%	9.12%	59.88%	895	1,431	2,287	997	1,222	3,057
Resilux	145.12%	10.73%	63.80%	7,989	13,086	21,435	10,143	8,973	68,936
Retail Partners Colruyt Group	14.19%	11.79%	19.90%	13,239	15,873	19,031	13,770	13,306	104,220
Rosetti Marino S.P.A.	141.90%	33.31%	42.69%	19,613	27,985	39,931	13,890	19,257	164,551
ROTALA PLC	17.67%	27.30%	34.69%	2,307	3,108	4,186	2,296	1,483	24,495
RWS HOLDINGS PLC	8.21%	32.04%	21.72%	11,368	13,837	16,842	12,813	15,869	52,895
SDL PLC	27.86%	19.18%	24.87%	24,943	31,147	38,894	-33,316	8,485	272,405
SMA SOLAR TECHNOLOGY AG	34.80%	126.56%	96.26%	166,054	325,895	639,598	75,105	-66,852	728,410
Societe Financiere des Caoutchoucs SA Soparfi	287.44%	45.15%	114.48%	150,951	323,762	694,410	5,255	105,576	1,478,621
SODEXO	10.27%	16.41%	7.46%	439,000	471,761	506,967	490,000	700,000	3,024,000
SOFTWARE AKTIENGESELLSCHAFT	24.74%	0.90%	11.04%	164,677	182,855	203,040	134,011	110,551	951,482
TALLINNA VESI AS	6.56%	14.85%	15.25%	16,512	19,030	21,931	21,834	22,266	88,914
TOD'S S.P.A.	22.48%	7.41%	9.67%	134,000	146,956	161,165	96,761	92,100	763,987
TURISTHOTEL D.D.	25.33%	0.50%	5.74%	5,009	5,296	5,600	8,550	8,027	30,774
VIDRALA, SA	0.68%	21.14%	7.07%	43,699	46,786	50,092	46,542	52,308	295,626
VIRBAC	9.62%	63.37%	21.43%	57,516	69,844	84,814	66,625	60,523	300,062
VISCOFAN SA	24.46%	3.77%	15.74%	101,520	117,497	135,989	106,452	120,000	498,569
VITEC SOFTWARE GROUP AB (PUBL)	83.96%	23.16%	33.15%	3,412	4,543	6,049	5,224	8,507	18,603
ZYTRONIC PLC	21.87%	32.79%	31.91%	1,988	2,622	3,459	3,806	5,113	19,509

Table 61- **Abnormal Future Earnings for each subsample of company (part 1)**

Company Name	Abnormal Future Earnings Year 1	Abnormal Future Earnings year 2
ACCELL GROUP N.V.	-0.038	-0.026
AF GRUPPEN ASA	0.109	0.090
AGGREKO PLC	-0.065	-0.173
Aixtron SE	-0.533	-0.805
AMADEUS FIRE AG	0.019	0.033
ASSECO POLAND S.A.	-0.005	-0.045
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	0.002	0.015
ATOSS SOFTWARE AG	0.161	0.171
BETSSON AB	0.023	-0.028
BIOGAIA AB	0.091	-0.061
BRAINJUICER GROUP PLC	0.164	0.218
BUDIMEX S.A.	-0.617	-1.841
CARILLION PLC	0.005	-0.099
ČEZ, A.S	-0.108	-0.196
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	-0.030	-0.092
CTS EVENTIM AG & CO. KGAA	0.039	0.029
DELKO S.A.	-0.171	-0.409
DELTICOM AG	-0.249	-0.513
DIASORIN S.P.A.	-0.096	-0.205
Duni AB	-0.190	-0.359
DURO FELGUERA SA	-0.157	-0.621
ELECNOR SA	-0.069	-0.149
ENERGOAQUA, A.S.	0.070	0.060
EUTELSAT COMMUNICATIONS	-0.016	-0.086
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	0.013	0.020
Flughafen Zürich AG	0.002	-0.089
Fugro N.V.	-0.052	-0.130
GIORGIO FEDON & FIGLI SPA	-0.093	-0.153
Goodwin PLC	0.129	0.263
GROUPE MINOTERIES SA	-0.011	-0.020
HARGREAVES SERVICES PLC	0.747	0.846
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PUBLIC LIMITED COMPANY	0.003	-0.068
Indra Sistemas, Sociedad Anonima	-0.033	-0.116
INTERPARFUMS	-0.062	-0.081
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	-0.051	-0.221
IZOSTAL S.A.	-0.063	-0.089
James Halstead PLC	0.038	-0.046
JOURNEY GROUP PLC	0.131	0.133
KINEPOLIS GROUP	-0.035	-0.111

Table 62- **Abnormal Future Earnings for each subsample of company (part 2)**

Company Name	Abnormal Future Earnings Year 1	Abnormal Future Earnings year 2
KONČAR, D.D.	-0.028	-0.055
KONINKLIJKE VOPAK N.V.	-0.043	-0.125
Krka, Tovarna Zdravil, D.D.,	-0.043	-0.069
LEDO D.D.	-0.006	-0.051
M&C Saatchi PLC	0.162	0.017
MARR S.P.A.	-0.035	-0.049
Miquel Y Costas & Miquel SA	-0.042	-0.048
MOURY CONSTRUCT	-0.040	-0.202
NCC Group PLC	-0.015	0.092
NETENT AB (PUBL)	-0.134	-0.339
O2 CZECH REPUBLIC, A.S.	-0.034	-0.067
OBRASCON HUARTE LAIN SA	-0.137	-0.193
ORBIS AG	-0.016	-0.059
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	-2.053	-0.013
PGE Polska Grupa Energetyczna S.A.	-0.020	-0.117
PLAMA-PUR, PROIZVODNJA IN PREDELAVA PLASTIČNIH MAS, D.D.	-0.021	-0.102
POUJOULAT	-0.055	-0.019
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	-0.009	0.011
PSI AKTIENGESELLSCHAFT	0.050	0.095
RAFAKO S.A.	-0.230	0.158
RATIONAL AKTIENGESELLSCHAFT	0.039	0.030
Recordati Industria Chimica e Farmaceutica S.P.A	-0.013	-0.040
RED24 PLC	-0.142	-0.349
Resilux	-0.043	-0.181
Retail Partners Colruyt Group	-0.020	-0.055
Rosetti Marino S.P.A.	-0.086	-0.126
ROTALA PLC	-0.033	-0.110
RWS HOLDINGS PLC	-0.019	-0.018
SDL PLC	-0.237	-0.112
SMA SOLAR TECHNOLOGY AG	-0.344	-0.970
Societe Financiere des Caoutchoucs SA Soparfi	-0.215	-0.398
SODEXO	0.006	0.064
SOFTWARE AKTIENGESELLSCHAFT	-0.051	-0.097
TALLINNA VESI AS	0.032	0.004
TOD'S S.P.A.	-0.066	-0.090
TURISTHOTEL D.D.	0.106	0.079
VIDRALA, SA	-0.001	0.007
VIRBAC	-0.011	-0.081
VISCOFAN SA	-0.022	-0.032
VITEC SOFTWARE GROUP AB (PUBL)	0.037	0.132
ZYTRONIC PLC	0.061	0.085

Table 63-Calculation of DFE0 for the model that compares Dividend Changes with Future Equity-Scaled Earnings Changes (part 1)

Company Name	E(ROE0)	ROE0	DFE0	NDFED0	PDFED0
ACCELL GROUP N.V.	12.59%	9.35%	-3.24%	1	0
AF GRUPPEN ASA	17.09%	20.85%	3.76%	0	1
AGGREKO PLC	21.16%	21.58%	0.42%	0	1
Aixtron SE	23.44%	12.66%	-10.78%	1	0
AMADEUS FIRE AG	23.39%	31.44%	8.05%	0	1
ASSECO POLAND S.A.	4.45%	7.69%	3.24%	0	1
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	3.97%	1.90%	-2.07%	1	0
ATOSS SOFTWARE AG	18.49%	25.73%	7.24%	0	1
BETSSON AB	24.51%	27.66%	3.15%	0	1
BIOGAIA AB	42.12%	20.26%	-21.86%	1	0
BRAINJUICER GROUP PLC	20.64%	14.14%	-6.50%	1	0
BUDIMEX S.A.	25.88%	36.69%	10.81%	0	1
CARILLION PLC	13.47%	14.05%	0.58%	0	1
ČEZ, A.S	18.14%	20.77%	2.63%	0	1
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	15.41%	14.14%	-1.27%	1	0
CTS EVENTIM AG & CO. KGAA	23.83%	31.10%	7.27%	0	1
DELKO S.A.	11.14%	11.51%	0.37%	0	1
DELTICOM AG	33.39%	35.38%	1.99%	0	1
DIASORIN S.P.A.	20.05%	23.82%	3.77%	0	1
Duni AB	20.70%	12.54%	-8.16%	1	0
DURO FELGUERA SA	23.06%	32.99%	9.93%	0	1
ELECNOR SA	14.31%	19.06%	4.75%	0	1
ENERGOAQUA, A.S.	3.87%	2.42%	-1.45%	1	0
EUTELSAT COMMUNICATIONS	17.40%	20.49%	3.09%	0	1
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	10.02%	6.29%	-3.73%	1	0
Flughafen Zürich AG	9.36%	8.22%	-1.14%	1	0
Fugro N.V.	18.84%	18.39%	-0.45%	1	0
GIORGIO FEDON & FIGLI SPA	6.19%	11.38%	5.19%	0	1
Goodwin PLC	14.94%	9.50%	-5.44%	1	0
GROUPE MINOTERIES SA	9.46%	6.10%	-3.36%	1	0
HARGREAVES SERVICES PLC	15.94%	22.59%	6.65%	0	1
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PUBLIC LIMITED COMPANY	15.20%	6.55%	-8.65%	1	0
Indra Sistemas, Sociedad Anonima	15.90%	17.62%	1.72%	0	1
INTERPARFUMS	22.12%	9.82%	-12.30%	1	0
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	7.28%	1.27%	-6.01%	1	0
IZOSTAL S.A.	10.14%	8.14%	-2.00%	1	0
James Halstead PLC	26.02%	32.07%	6.05%	0	1
JOURNEY GROUP PLC	7.83%	1.01%	-6.82%	1	0
KINEPOLIS GROUP	18.95%	32.86%	13.91%	0	1

Table 64- Calculation of DFE0 for the model that compares Dividend Changes with Future Equity-Scaled Earnings Changes (part 2)

Company Name	E(ROE0)	ROE0	DFE0	NDFED0	PDFED0
KONČAR, D.D.	6.53%	8.63%	2.10%	0	1
KONINKLIJKE VOPAK N.V.	18.11%	18.77%	0.66%	0	1
Krka, Tovarna Zdravil, D.D.,	14.79%	15.68%	0.89%	0	1
LEDO D.D.	20.87%	13.77%	-7.10%	1	0
M&C Saatchi PLC	7.85%	6.02%	-1.83%	1	0
MARR S.P.A.	15.27%	20.94%	5.67%	0	1
Miquel Y Costas & Miquel SA	10.05%	12.84%	2.79%	0	1
MOURY CONSTRUCT	8.71%	11.32%	2.61%	0	1
NCC Group PLC	14.68%	14.67%	-0.01%	1	0
NETENT AB (PUBL)	39.19%	48.58%	9.39%	0	1
O2 CZECH REPUBLIC, A.S.	12.87%	12.57%	-0.30%	1	0
OBRASCON HUARTE LAIN SA	20.33%	12.14%	-8.19%	1	0
ORBIS AG	6.67%	7.68%	1.01%	0	1
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	10.42%	7.52%	-2.90%	1	0
PGE Polska Grupa Energetyczna S.A.	9.23%	9.56%	0.33%	0	1
PLAMA-PUR, D.D. PODGRAD	5.45%	9.81%	4.36%	0	1
POUJOULAT	7.99%	12.19%	4.20%	0	1
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	19.03%	23.78%	4.75%	0	1
PSI AKTIENGESELLSCHAFT	13.14%	0.54%	-12.60%	1	0
RAFAKO S.A.	9.00%	-6.36%	-15.36%	1	0
RATIONAL AKTIENGESELLSCHAFT	26.60%	38.06%	11.46%	0	1
Recordati Industria Chimica e Farmaceutica S.P.A	14.28%	17.27%	2.99%	0	1
RED24 PLC	18.49%	24.11%	5.62%	0	1
Resilux	12.57%	11.01%	-1.56%	1	0
Retail Partners Colruyt Group	15.37%	11.27%	-4.10%	1	0
Rosetti Marino S.P.A.	15.44%	11.92%	-3.52%	1	0
ROTALA PLC	5.42%	8.53%	3.11%	0	1
RWS HOLDINGS PLC	19.95%	18.52%	-1.43%	1	0
SDL PLC	11.44%	9.16%	-2.28%	1	0
SMA SOLAR TECHNOLOGY AG	30.28%	21.04%	-9.24%	1	0
Societe Financiere des Caoutchoucs SA Soparfi	3.33%	0.42%	-2.91%	1	0
SODEXO	16.05%	14.87%	-1.18%	1	0
SOFTWARE AKTIENGESELLSCHAFT	15.30%	15.54%	0.24%	0	1
TALLINNA VESI AS	16.81%	22.48%	5.67%	0	1
TOD'S S.P.A.	16.96%	16.73%	-0.23%	1	0
TURISTHOTEL D.D.	11.74%	16.02%	4.28%	0	1
VIDRALA, SA	12.63%	13.70%	1.07%	0	1
VIRBAC	17.66%	18.47%	0.81%	0	1
VISCOFAN SA	17.95%	19.46%	1.51%	0	1
VITEC SOFTWARE GROUP AB (PUBL)	14.09%	17.82%	3.73%	0	1
ZYTRONIC PLC	16.13%	10.32%	-5.81%	1	0

Table 65- Calculation of DFE0 for the model that compares Dividend Changes with Future Asset-Scaled Earnings Changes (part 1)

Company Name	E(ROA0)	ROA0	DFE0	NDFED0	PDFED0
ACCELL GROUP N.V.	6.17%	3.85%	-2.32%	1	0
AF GRUPPEN ASA	6.50%	5.14%	-1.36%	1	0
AGGREKO PLC	10.22%	12.46%	2.24%	0	1
Aixtron SE	14.00%	10.23%	-3.77%	1	0
AMADEUS FIRE AG	13.47%	21.74%	8.27%	0	1
ASSECO POLAND S.A.	3.37%	5.77%	2.40%	0	1
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	2.50%	1.19%	-1.31%	1	0
ATOSS SOFTWARE AG	10.68%	13.14%	2.46%	0	1
BETSSON AB	12.06%	15.99%	3.93%	0	1
BIOGAIA AB	29.61%	16.74%	-12.87%	1	0
BRAINJUICER GROUP PLC	10.65%	9.07%	-1.58%	1	0
BUDIMEX S.A.	7.23%	5.73%	-1.50%	1	0
CARILLION PLC	5.27%	3.73%	-1.54%	1	0
ČEZ, A.S	7.89%	8.67%	0.78%	0	1
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	5.85%	3.75%	-2.10%	1	0
CTS EVENTIM AG & CO. KGAA	9.22%	7.49%	-1.73%	1	0
DELKO S.A.	5.19%	4.98%	-0.21%	1	0
DELTICOM AG	14.74%	14.17%	-0.57%	1	0
DIASORIN S.P.A.	12.21%	16.70%	4.49%	0	1
Duni AB	10.76%	7.09%	-3.67%	1	0
DURO FELGUERA SA	7.76%	8.40%	0.64%	0	1
ELECNOR SA	4.73%	3.91%	-0.82%	1	0
ENERGOAQUA, A.S.	3.34%	2.15%	-1.19%	1	0
EUTELSAT COMMUNICATIONS	7.87%	6.56%	-1.31%	1	0
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	5.63%	3.74%	-1.89%	1	0
Flughafen Zürich AG	4.68%	3.94%	-0.74%	1	0
Fugro N.V.	9.22%	9.07%	-0.15%	1	0
GIORGIO FEDON & FIGLI SPA	2.22%	4.22%	2.00%	0	1
Goodwin PLC	6.88%	4.39%	-2.49%	1	0
GROUPE MINOTERIES SA	5.71%	4.44%	-1.27%	1	0
HARGREAVES SERVICES PLC	6.59%	7.57%	0.98%	0	1
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PLC	9.05%	5.12%	-3.93%	1	0
Indra Sistemas, Sociedad Anonima	7.22%	6.32%	-0.90%	1	0
INTERPARFUMS	12.46%	8.06%	-4.40%	1	0
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	2.86%	0.29%	-2.57%	1	0
IZOSTAL S.A.	5.36%	5.44%	0.08%	0	1
James Halstead PLC	12.07%	17.41%	5.34%	0	1
JOURNEY GROUP PLC	4.62%	0.65%	-3.97%	1	0
KINEPOLIS GROUP	8.16%	10.90%	2.74%	0	1

Table 66- Calculation of DFE0 for the model that compares Dividend Changes with Future Asset-Scaled Earnings Changes (part 2)

Company Name	E(ROA0)	ROA0	DFE0	NDFED0	PDFED0
KONČAR, D.D.	5.38%	5.05%	-0.33%	1	0
KONINKLIJKE VOPAK N.V.	8.30%	7.36%	-0.94%	1	0
Krka, Tovarna Zdravil, D.D.,	8.84%	11.47%	2.63%	0	1
LEDO D.D.	10.13%	9.77%	-0.36%	1	0
M&C Saatchi PLC	3.49%	1.66%	-1.83%	1	0
MARR S.P.A.	5.91%	6.24%	0.33%	0	1
Miquel Y Costas & Miquel SA	5.85%	8.11%	2.26%	0	1
MOURY CONSTRUCT	4.24%	5.80%	1.56%	0	1
NCC Group PLC	7.23%	6.82%	-0.41%	1	0
NETENT AB (PUBL)	21.45%	26.13%	4.68%	0	1
O2 CZECH REPUBLIC, A.S.	8.36%	9.76%	1.40%	0	1
OBRASCON HUARTE LAIN SA	5.43%	2.96%	-2.47%	1	0
ORBIS AG	4.00%	4.83%	0.83%	0	1
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	4.88%	2.62%	-2.26%	1	0
PGE Polska Grupa Energetyczna S.A.	5.85%	7.00%	1.15%	0	1
PLAMA-PUR, D.D. PODGRAD	3.58%	6.58%	3.00%	0	1
POUJOULAT	3.83%	4.78%	0.95%	0	1
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	7.15%	5.37%	-1.78%	1	0
PSI AKTIENGESELLSCHAFT	6.14%	0.21%	-5.93%	1	0
RAFAKO S.A.	3.83%	-2.09%	-5.92%	1	0
RATIONAL AKTIENGESELLSCHAFT	15.98%	27.81%	11.83%	0	1
Recordati Industria Chimica e Farmaceutica S.P.A	8.13%	11.39%	3.26%	0	1
RED24 PLC	10.01%	14.55%	4.54%	0	1
Resilux	5.67%	4.50%	-1.17%	1	0
Retail Partners Colruyt Group	8.21%	6.84%	-1.37%	1	0
Rosetti Marino S.P.A.	6.59%	5.77%	-0.82%	1	0
ROTALA PLC	2.60%	3.87%	1.27%	0	1
RWS HOLDINGS PLC	13.09%	15.36%	2.27%	0	1
SDL PLC	6.98%	6.07%	-0.91%	1	0
SMA SOLAR TECHNOLOGY AG	15.61%	12.08%	-3.53%	1	0
Societe Financiere des Caoutchoucs SA Soparfi	2.85%	7.42%	4.57%	0	1
SODEXO	6.41%	3.48%	-2.93%	1	0
SOFTWARE AKTIENGESELLSCHAFT	8.09%	9.29%	1.20%	0	1
TALLINNA VESI AS	8.26%	8.98%	0.72%	0	1
TOD'S S.P.A.	9.95%	12.11%	2.16%	0	1
TURISTHOTEL D.D.	7.65%	12.69%	5.04%	0	1
VIDRALA, SA	5.83%	6.27%	0.44%	0	1
VIRBAC	9.17%	9.77%	0.60%	0	1
VISCOFAN SA	9.96%	12.84%	2.88%	0	1
VITEC SOFTWARE GROUP AB (PUBL)	5.81%	7.79%	1.98%	0	1
ZYTRONIC PLC	9.72%	8.01%	-1.71%	1	0

Table 67- Calculation of CE0 for the model that compares Dividend Changes with Future Asset-Scaled Earnings Changes (part 1)

Company Name	CE_0	ROA(-1)	ROA(0)	$PCED_0$ (Eq.1)	$NCED_0$ (Eq,1)
ACCELL GROUP N.V.	-5.51%	9.36%	3.85%	0	1
AF GRUPPEN ASA	-1.50%	6.64%	5.14%	0	1
AGGREKO PLC	-0.54%	13.00%	12.46%	0	1
Aixtron SE	-13.15%	23.38%	10.23%	0	1
AMADEUS FIRE AG	-3.10%	24.84%	21.74%	0	1
ASSECO POLAND S.A.	-0.64%	6.41%	5.77%	0	1
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	-0.37%	1.56%	1.19%	0	1
ATOSS SOFTWARE AG	-4.11%	17.25%	13.14%	0	1
BETSSON AB	-2.54%	18.53%	15.99%	0	1
BIOGAIA AB	-47.06%	63.80%	16.74%	0	1
BRAINJUICER GROUP PLC	-6.37%	15.44%	9.07%	0	1
BUDIMEX S.A.	-0.85%	6.58%	5.73%	0	1
CARILLION PLC	-1.12%	4.85%	3.73%	0	1
ČEZ, A.S	-1.11%	9.78%	8.67%	0	1
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	-2.19%	5.94%	3.75%	0	1
CTS EVENTIM AG & CO. KGAA	-2.94%	10.43%	7.49%	0	1
DELKO S.A.	-3.17%	8.15%	4.98%	0	1
DELTICOM AG	-7.49%	21.66%	14.17%	0	1
DIASORIN S.P.A.	-4.31%	21.01%	16.70%	0	1
Duni AB	-1.69%	8.78%	7.09%	0	1
DURO FELGUERA SA	-1.84%	10.24%	8.40%	0	1
ELECNOR SA	-0.73%	4.64%	3.91%	0	1
ENERGOAQUA, A.S.	-4.87%	7.02%	2.15%	0	1
EUTELSAT COMMUNICATIONS	-0.56%	7.12%	6.56%	0	1
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	-1.88%	5.62%	3.74%	0	1
Flughafen Zürich AG	-1.42%	5.36%	3.94%	0	1
Fugro N.V.	-4.24%	13.31%	9.07%	0	1
GIORGIO FEDON & FIGLI SPA	-0.89%	5.11%	4.22%	0	1
Goodwin PLC	-6.45%	10.84%	4.39%	0	1
GROUPE MINOTERIES SA	-2.62%	7.06%	4.44%	0	1
HARGREAVES SERVICES PLC	-1.13%	8.70%	7.57%	0	1
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PLC	-7.74%	12.86%	5.12%	0	1
Indra Sistemas, Sociedad Anonima	-1.63%	7.95%	6.32%	0	1
INTERPARFUMS	-17.40%	25.46%	8.06%	0	1
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	-2.35%	2.64%	0.29%	0	1
IZOSTAL S.A.	-1.79%	7.23%	5.44%	0	1
James Halstead PLC	-1.43%	18.84%	17.41%	0	1
JOURNEY GROUP PLC	-8.58%	9.23%	0.65%	0	1

Table 68- Calculation of CE0 for the model that compares Dividend Changes with Future Asset-Scaled Earnings Changes (part 2)

Company Name	CE_0	ROA(-1)	ROA(0)	$PCED_0$ (Eq.1)	$NCED_0$ (Eq,1)
KINEPOLIS GROUP	-0.26%	11.16%	10.90%	0	1
KONČAR, D.D.	-4.87%	9.92%	5.05%	0	1
KONINKLIJKE VOPAK N.V.	-2.91%	10.27%	7.36%	0	1
Krka, Tovarna Zdravil, D.D.,	-1.54%	13.01%	11.47%	0	1
LEDO D.D.	2.71%	7.06%	9.77%	1	0
M&C Saatchi PLC	-3.15%	4.81%	1.66%	0	1
MARR S.P.A.	-0.55%	6.79%	6.24%	0	1
Miquel Y Costas & Miquel SA	-0.86%	8.97%	8.11%	0	1
MOURY CONSTRUCT	-2.54%	8.34%	5.80%	0	1
NCC Group PLC	-2.62%	9.44%	6.82%	0	1
NETENT AB (PUBL)	-13.13%	39.26%	26.13%	0	1
O2 CZECH REPUBLIC, A.S.	-3.47%	13.23%	9.76%	0	1
OBRASCON HUARTE LAIN SA	-6.06%	9.02%	2.96%	0	1
ORBIS AG	-0.60%	5.43%	4.83%	0	1
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	-1.98%	4.60%	2.62%	0	1
PGE Polska Grupa Energetyczna S.A.	-0.97%	7.97%	7.00%	0	1
PLAMA-PUR, D.D. PODGRAD	-1.74%	8.32%	6.58%	0	1
POUJOULAT	-1.99%	6.77%	4.78%	0	1
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	-0.58%	5.95%	5.37%	0	1
PSI AKTIENGESELLSCHAFT	-4.81%	5.02%	0.21%	0	1
RAFAKO S.A.	-6.36%	4.27%	-2.09%	0	1
RATIONAL AKTIENGESELLSCHAFT	1.71%	26.10%	27.81%	1	0
Recordati Industria Chimica e Farmaceutica S.P.A	-1.14%	12.53%	11.39%	0	1
RED24 PLC	-3.75%	18.30%	14.55%	0	1
Resilux	-2.98%	7.48%	4.50%	0	1
Retail Partners Colruyt Group	-1.98%	8.82%	6.84%	0	1
Rosetti Marino S.P.A.	-8.42%	14.19%	5.77%	0	1
ROTALA PLC	-0.59%	4.46%	3.87%	0	1
RWS HOLDINGS PLC	-9.34%	24.70%	15.36%	0	1
SDL PLC	-2.79%	8.86%	6.07%	0	1
SMA SOLAR TECHNOLOGY AG	-17.09%	29.17%	12.08%	0	1
Societe Financiere des Caoutchoucs SA Soparfi	0.00%	7.42%	7.42%	1	0
SODEXO	-0.63%	4.11%	3.48%	0	1
SOFTWARE AKTIENGESELLSCHAFT	-1.25%	10.54%	9.29%	0	1
TALLINNA VESI AS	-3.69%	12.67%	8.98%	0	1
TOD'S S.P.A.	-1.47%	13.58%	12.11%	0	1
TURISTHOTEL D.D.	-1.48%	14.17%	12.69%	0	1
VIDRALA, SA	-0.82%	7.09%	6.27%	0	1
VIRBAC	-2.11%	11.88%	9.77%	0	1
VISCOFAN SA	-0.67%	13.51%	12.84%	0	1
VITEC SOFTWARE GROUP AB (PUBL)	0.13%	7.66%	7.79%	1	0
ZYTRONIC PLC	-7.69%	15.70%	8.01%	0	1

Table 69- **Calculation of DFE0 for the model that compares Dividend Changes with ROE levels (part 1)**

Company Name	DFE0(Eq.3)	NDFED0	PDFED0
ACCELL GROUP N.V.	9.35%	0	1
AF GRUPPEN ASA	20.85%	0	1
AGGREKO PLC	21.58%	0	1
Aixtron SE	12.66%	0	1
AMADEUS FIRE AG	31.44%	0	1
ASSECO POLAND S.A.	7.69%	0	1
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	1.90%	0	1
ATOSS SOFTWARE AG	25.73%	0	1
BETSSON AB	27.66%	0	1
BIOGAIA AB	20.26%	0	1
BRAINJUICER GROUP PLC	14.14%	0	1
BUDIMEX S.A.	36.69%	0	1
CARILLION PLC	14.05%	0	1
ČEZ, A.S	20.77%	0	1
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	14.14%	0	1
CTS EVENTIM AG & CO. KGAA	31.10%	0	1
DELKO S.A.	11.51%	0	1
DELTICOM AG	35.38%	0	1
DIASORIN S.P.A.	23.82%	0	1
Duni AB	12.54%	0	1
DURO FELGUERA SA	32.99%	0	1
ELECNOR SA	19.06%	0	1
ENERGOAQUA, A.S.	2.42%	0	1
EUTELSAT COMMUNICATIONS	20.49%	0	1
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	6.29%	0	1
Flughafen Zürich AG	8.22%	0	1
Fugro N.V.	18.39%	0	1
GIORGIO FEDON & FIGLI SPA	11.38%	0	1
Goodwin PLC	9.50%	0	1
GROUPE MINOTERIES SA	6.10%	0	1
HARGREAVES SERVICES PLC	22.59%	0	1
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PLC	6.55%	0	1
Indra Sistemas, Sociedad Anonima	17.62%	0	1
INTERPARFUMS	9.82%	0	1
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	1.27%	0	1
IZOSTAL S.A.	8.14%	0	1
James Halstead PLC	32.07%	0	1
JOURNEY GROUP PLC	1.01%	0	1
KINEPOLIS GROUP	32.86%	0	1

Table 70- Calculation of DFE0 for the model that compares Dividend Changes with ROE levels (part 2)

Company Name	DFE0(Eq.3)	NDFED0	PDFED0
KONČAR, D.D.	8.63%	0	1
KONINKLIJKE VOPAK N.V.	18.77%	0	1
Krka, Tovarna Zdravil, D.D.,	15.68%	0	1
LEDO D.D.	13.77%	0	1
M&C Saatchi PLC	6.02%	0	1
MARR S.P.A.	20.94%	0	1
Miquel Y Costas & Miquel SA	12.84%	0	1
MOURY CONSTRUCT	11.32%	0	1
NCC Group PLC	14.67%	0	1
NETENT AB (PUBL)	48.58%	0	1
O2 CZECH REPUBLIC, A.S.	12.57%	0	1
OBRASCON HUARTE LAIN SA	12.14%	0	1
ORBIS AG	7.68%	0	1
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	7.52%	0	1
PGE Polska Grupa Energetyczna S.A.	9.56%	0	1
PLAMA-PUR, D.D. PODGRAD	9.81%	0	1
POUJOULAT	12.19%	0	1
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	23.78%	0	1
PSI AKTIENGESELLSCHAFT	0.54%	0	1
RAFAKO S.A.	-6.36%	1	0
RATIONAL AKTIENGESELLSCHAFT	38.06%	0	1
Recordati Industria Chimica e Farmaceutica S.P.A	17.27%	0	1
RED24 PLC	24.11%	0	1
Resilux	11.01%	0	1
Retail Partners Colruyt Group	11.27%	0	1
Rosetti Marino S.P.A.	11.92%	0	1
ROTALA PLC	8.53%	0	1
RWS HOLDINGS PLC	18.52%	0	1
SDL PLC	9.16%	0	1
SMA SOLAR TECHNOLOGY AG	21.04%	0	1
Societe Financiere des Caoutchoucs SA Soparfi	0.42%	0	1
SODEXO	14.87%	0	1
SOFTWARE AKTIENGESELLSCHAFT	15.54%	0	1
TALLINNA VESI AS	22.48%	0	1
TOD'S S.P.A.	16.73%	0	1
TURISTHOTEL D.D.	16.02%	0	1
VIDRALA, SA	13.70%	0	1
VIRBAC	18.47%	0	1
VISCOFAN SA	19.46%	0	1
VITEC SOFTWARE GROUP AB (PUBL)	17.82%	0	1
ZYTRONIC PLC	10.32%	0	1

Table 71- Calculation of CE0 for the model that compares Dividend Changes with ROE levels (part 1)

Company Name	CE_0	ROE(-1)	ROE0)	$PCED_0$ (Eq.1)	$NCED_0$ (Eq,1)
ACCELL GROUP N.V.	-9.58%	18.93%	9.35%	0	1
AF GRUPPEN ASA	-2.07%	22.92%	20.85%	0	1
AGGREKO PLC	-4.84%	26.42%	21.58%	0	1
Aixtron SE	-19.40%	32.06%	12.66%	0	1
AMADEUS FIRE AG	-4.87%	36.31%	31.44%	0	1
ASSECO POLAND S.A.	-0.92%	8.61%	7.69%	0	1
ATHOS IMMOBILIEN AKTIENGESELLSCHAFT	-0.64%	2.54%	1.90%	0	1
ATOSS SOFTWARE AG	0.91%	24.82%	25.73%	1	0
BETSSON AB	-7.06%	34.72%	27.66%	0	1
BIOGAIA AB	-51.96%	72.22%	20.26%	0	1
BRAINJUICER GROUP PLC	-12.33%	26.47%	14.14%	0	1
BUDIMEX S.A.	-2.61%	39.30%	36.69%	0	1
CARILLION PLC	-3.61%	17.66%	14.05%	0	1
ČEZ, A.S	-4.32%	25.09%	20.77%	0	1
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, SA	-7.06%	21.20%	14.14%	0	1
CTS EVENTIM AG & CO. KGAA	-1.06%	32.16%	31.10%	0	1
DELKO S.A.	-5.96%	17.47%	11.51%	0	1
DELTICOM AG	-12.35%	47.73%	35.38%	0	1
DIASORIN S.P.A.	-4.54%	28.36%	23.82%	0	1
Duni AB	-2.83%	15.37%	12.54%	0	1
DURO FELGUERA SA	-3.90%	36.89%	32.99%	0	1
ELECNOR SA	-2.51%	21.57%	19.06%	0	1
ENERGOAQUA, A.S.	-5.42%	7.84%	2.42%	0	1
EUTELSAT COMMUNICATIONS	1.82%	18.67%	20.49%	1	0
FLEXOPACK A.E.B.E. ΠΛΑΣΤΙΚΩΝ	-2.51%	8.80%	6.29%	0	1
Flughafen Zürich AG	-3.71%	11.93%	8.22%	0	1
Fugro N.V.	-7.86%	26.25%	18.39%	0	1
GIORGIO FEDON & FIGLI SPA	-3.33%	14.71%	11.38%	0	1
Goodwin PLC	-13.73%	23.23%	9.50%	0	1
GROUPE MINOTERIES SA	-3.70%	9.80%	6.10%	0	1
HARGREAVES SERVICES PLC	-0.80%	23.39%	22.59%	0	1
IMMUNODIAGNOSTIC SYSTEMS HOLDINGS PLC	-11.00%	17.55%	6.55%	0	1
Indra Sistemas, Sociedad Anonima	-1.95%	19.57%	17.62%	0	1
INTERPARFUMS	-29.71%	39.53%	9.82%	0	1
ITAL TBS TELEMATIC & BIOMEDICAL SERVICES S.P.A.	-9.10%	10.37%	1.27%	0	1
IZOSTAL S.A.	-4.96%	13.10%	8.14%	0	1
James Halstead PLC	-6.35%	38.42%	32.07%	0	1
JOURNEY GROUP PLC	-13.47%	14.48%	1.01%	0	1

Table 72- Calculation of CE0 for the model that compares Dividend Changes with ROE levels (part 2)

Company Name	CE_0	ROE(-1)	ROE0)	$PCED_0$ (Eq.1)	$NCED_0$ (Eq,1)
KINEPOLIS GROUP	5.63%	27.23%	32.86%	1	0
KONČAR, D.D.	-1.29%	9.92%	8.63%	0	1
KONINKLIJKE VOPAK N.V.	-4.93%	23.70%	18.77%	0	1
Krka, Tovarna Zdravil, D.D.,	-2.65%	18.33%	15.68%	0	1
LEDO D.D.	-1.75%	15.52%	13.77%	0	1
M&C Saatchi PLC	-6.39%	12.41%	6.02%	0	1
MARR S.P.A.	-0.88%	21.82%	20.94%	0	1
Miquel Y Costas & Miquel SA	-1.15%	13.99%	12.84%	0	1
MOURY CONSTRUCT	-5.58%	16.90%	11.32%	0	1
NCC Group PLC	-4.06%	18.73%	14.67%	0	1
NETENT AB (PUBL)	-11.70%	60.28%	48.58%	0	1
O2 CZECH REPUBLIC, A.S.	-4.21%	16.78%	12.57%	0	1
OBRASCON HUARTE LAIN SA	-27.55%	39.69%	12.14%	0	1
ORBIS AG	-0.55%	8.23%	7.68%	0	1
PBG S.A. W UPADŁOŚCI UKŁADOWEJ (PBG Griup)	-4.41%	11.93%	7.52%	0	1
PGE Polska Grupa Energetyczna S.A.	-1.60%	11.16%	9.56%	0	1
PLAMA-PUR, D.D. PODGRAD	-2.50%	12.31%	9.81%	0	1
POUJOULAT	-2.37%	14.56%	12.19%	0	1
PROSEGUR COMPAÑIA DE SEGURIDAD, SA	0.33%	23.45%	23.78%	1	0
PSI AKTIENGESELLSCHAFT	-12.17%	12.71%	0.54%	0	1
RAFAKO S.A.	-19.07%	12.71%	-6.36%	0	1
RATIONAL AKTIENGESELLSCHAFT	3.41%	34.65%	38.06%	1	0
Recordati Industria Chimica e Farmaceutica S.P.A	-2.19%	19.46%	17.27%	0	1
RED24 PLC	-5.16%	29.27%	24.11%	0	1
Resilux	-6.75%	17.76%	11.01%	0	1
Retail Partners Colruyt Group	-3.60%	14.87%	11.27%	0	1
Rosetti Marino S.P.A.	-19.74%	31.66%	11.92%	0	1
ROTALA PLC	-1.71%	10.24%	8.53%	0	1
RWS HOLDINGS PLC	-11.60%	30.12%	18.52%	0	1
SDL PLC	-2.66%	11.82%	9.16%	0	1
SMA SOLAR TECHNOLOGY AG	-29.08%	50.12%	21.04%	0	1
Societe Financiere des Caoutchoucs SA Soparfi	-9.79%	10.21%	0.42%	0	1
SODEXO	-2.43%	17.30%	14.87%	0	1
SOFTWARE AKTIENGESELLSCHAFT	-3.09%	18.63%	15.54%	0	1
TALLINNA VESI AS	-1.96%	24.44%	22.48%	0	1
TOD'S S.P.A.	-2.35%	19.08%	16.73%	0	1
TURISTHOTEL D.D.	-2.11%	18.13%	16.02%	0	1
VIDRALA, SA	-3.07%	16.77%	13.70%	0	1
VIRBAC	-2.66%	21.13%	18.47%	0	1
VISCOFAN SA	-1.61%	21.07%	19.46%	0	1
VITEC SOFTWARE GROUP AB (PUBL)	-2.76%	20.58%	17.82%	0	1
ZYTRONIC PLC	-10.84%	21.16%	10.32%	0	1