Capital Structure and Stock Returns
A Study on The Dutch Market

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Under the supervision of Professor Sebastian Pfeil

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Abstract

This study aims to show the effect of stock returns on the capital structure of Dutch firms operating in the Dutch market. Welch's (2004) theory that stock returns are the key determinant of capital structure is reexamined on a different market. This thesis tests whether firms in the Netherlands adjust their debt ratio following a change in stock returns in the period of 2007-2017. The firms are shown to have a position between the static trade-off theory and the pecking-order theory that also affect their readjustment decision. Corporations readjust their capital structure but not yearly following stock returns, they also take into account past debt ratios. The main factors that are shown to affect the companies' decisions are adjustment costs. This drives to a conclusion that firms in the Netherlands do not issue debt and equity merely to correct the effect of stock returns on their debt ratios. Firms in the Netherland and the US have close results but their interpretations differ due to market differences.

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Chapter 1 - Introduction

The first chapter will introduce the topic of capital structure and the aim of this research. It will further show a background of how this thesis can contribute to explaining the effect of stock returns on capital structure and why it can be relevant today. The introductory chapter will also present the central question of this research. At the end of this chapter an outline of the study will be presented.

"The Capital Structure Puzzle" as referred to it by Myers (1984) has been a subject of interest in corporate finance for years. Capital structure is the amount of debt or equity used by a firm to finance its activities and assets. It is typically expressed in terms of debt-to-equity or debt-to-capital ratios (Corporate finance institute). What determines a firm's choice of its debt ratio? Several determinants and drivers of capital structure have been proposed throughout the years. Different theories have been suggested proposing that the choice of debt or equity financing depends on different attributes determining their costs and benefits (Titman & Wessels, 1988). Past literature analyzed the relationship between capital structure and firm performance (Margaritis and Psillaki, 2010;) and the effect of capital structure on profitability (Abor, 2005; Gill, Biger & Mathur, 2011). However, very fewer papers focused on the direct relationship between stock returns and capital structure (Welch, 2004; Masulis, 1983). These two are determined simultaneously but it is interesting to ask whether there is a causal effect between the them. In his paper, Welch (2004) stated that past studies examine the effect of factors such as profitability, market-to-book ratio, earnings and tax costs to explain the capital structure dynamics but he suggests that they were subject to an omitted variable, which is stock returns. This brings us to the central question of this thesis:

To what extent do stock returns affect capital structure in the Dutch market?

It is widely considered that every firm focuses on, what it considers, the optimal (target) capital structure taking into account its costs and benefits and tries to maintain it. When taking into account market values, the optimal capital structure outlook implies that firms should adjust their debt ratio to stock price movements (returns). To test the strategy that firms actually follow, Welch's (2004) paper focused on firms in the United States (US) between 1962 and 2000, other studies followed the same reasoning testing for the listed companies in the European market from 1990 to 2005 (Drobetz & Pensa, 2007). This thesis uses the methodological framework used by Welch (2004) to analyze the reaction of the firms to changes in their stock returns in the Dutch market.

The aim of this research is to investigate whether firms allow their capital structure to fluctuate (in market terms) with the changes in the stock prices or offset the effect of the stock return on the debt ratio by issuing activities to keep their capital structure at their target value.

Following the introduction, this study is constituted of four sections. Chapter two presents the theoretical framework and a background to the main theories that will be tackled throughout the paper. Subsequently, chapter three shows the data used and the transformations that have been executed to test the hypotheses. Chapter four demonstrates the results found followed by the analysis and the explanation of the findings. The last chapter outlines the important theoretical and empirical grounds. The conclusion also illustrates the implications of the findings, shows the limitations of the study and proposes a discussion for future research in this area.

Chapter 2 - Theoretical Framework

This chapter will introduce the main focus of this paper; firms' capital structure. Then the fundamental theories proposed to explain the decisions on capital structure. After that Welch's theory will be presented followed by the hypotheses developed.

2.1. Capital Structure

Capital structure is simply defined as the choice between debt and equity to finance a company and its projects. There are several ways to measure capital structure, Koller, Goedhart and Wessels (2010) measure it as the ratio of debt to total enterprise value. Welch (2004) measures it through the debt ratio, which is the ratio of total debt to total assets and this is the formula that will be used in this study. It will be explained in more details in chapter 3. A higher debt ratio implies that the firm raises more debt proportionally to issuing equity. When taking market values, it is important to note that a change in the debt ratio could also result from a change in the market valuation of equity (Brealey, Myers & Allen, 2011).

Deciding on the optimal capital structure for the firm is a challenging choice for managers even if the costs and benefits of such a decision is clear (Koller, Goedhart & Wessels, 2010). An important factor when deciding on financing activities and change in capital structure is investors' perception. Investors do not always have all the information needed and this leaves them to interpreting managers' activities and taking them as signals (Myers, 1983). When a firm is highly financed with debt, it exposes investors to more risk. The following sections will elaborate more on how the managers' decisions on capital structure takes into account investors' judgments.

2.2. Capital Structure in Theory

2.2.1. Modigliani and Miller

Going back to the 1950s, Modigliani and Miller developed their famous theory about capital structure. The theory states that in perfect markets the capital structure of a firm is irrelevant and that earnings are the essence of company value. This theory is based on several assumptions, namely: no taxes, no transaction costs, no bankruptcy costs, equivalent borrowing costs for companies and investors, symmetry of information and no effect of debt on earnings (Modigliani & Miller, 1958). However, the theory fails to apply since markets are not perfect. Several theories were proposed to explain the drivers of management's decisions on capital structure. In their second proposition, Modigliani and Miller suggest that a firm's returns increase with its leverage until it reaches the optimal capital structure. Unlike the first theory, this theory does not assume the absence of taxes, therefore it shows the benefits of debt through tax advantages (Modigliani & Miller, 1958).

There was several past research made on this topic to understand first the factors affecting capital structure and why the Modigliani-Miller theorem does not hold. Myers (2003) explained in his paper several theories that affect capital structure, he explains the trade-off theory, in which companies' choice of borrowing is affected by the potential tax advantages, the agency theory, in which managers choose their financing strategy to maximize their own benefits and the pecking-order theory, which states that information asymmetry results in a necessity of adapting financing to investors' preferences.

2.2.2. Trade-off Theory

According to Myers (1984; Myers, 2003), this theory suggests that a firm decides the optimal financing based on two factors. On one hand, the tax benefits it could get by financing through debt and on the other hand the firm considers the costs it incurs by borrowing such as bankruptcy costs or financial distress. This implies that the debt ratio varies from firm to firm since each firm has to evaluate its costs and benefit and decide on the value it would want to keep. Companies with large safe assets are more likely to have higher debt ratios than companies with high business risk, numerous growth opportunities and intangible assets. Managers will choose the debt ratio that will maximize firm value (Brealey, Myers & Allen, 2011). The trade-off theory then suggests that firms have a target value of debt-ratio that they consider as optimal, this holds for instance for firms in the US (Graham & Harvey, 2001). However, according to Brealey, Myers and Allen (2011) the trade-off theory falls short to explain the actual capital structures of firms and how they behave. In this study, the importance of target debt-ratio for firms in the Dutch market will be tested to know if the trade-off theory applies to the firms in the chosen sample.

2.2.3. Agency Theory

In 1976, Jensen and Meckling introduced the concept of agency costs as a driver to explain the capital structure. The authors state in their paper that if the principal (i.e. manager) and the agent (i.e. shareholders) maximize their utility, there are costs that are going to arise since their interests are not necessarily aligned. Shareholders know that managers will act in favor of their private benefit even if this can affect the firm's performance. Shareholders also know that they cannot verify and measure managers' complete performance. This arises as a result of ownership separation. The implication is that if a firm needs financing, debt is better than equity since by issuing equity the private benefits are carried by new shareholders but with debt the cost of these benefits stays internalized (Myers, 2003). Additionally, with debt there will be a third party (creditors) that will have power and that can help decrease the agents' egotistical actions and potentially improve firm performance.

2.2.4. Pecking-Order Theory

Myers and Majluf (1984) assume perfect markets except for information asymmetry. Information asymmetry means that managers know more about their company's risk, operations, activity and the true value of the shares more than their external investors do (Brealey, Myers and Allen, 2011). Asymmetric information has an impact on a company's financing decision. If a company decides to issue equity, on one hand, it could be considered as good news for investors and a sign of growth opportunities with positive NPVs. On the other hand, it could be bad news and show that managers are trying to issue overvalued shares (Myers, 2003). The Pecking Order suggests that firms start by internal financing using their retained earnings, the external financing by issuing debt and the last option is the new issue of equity. In cases where external financing is needed (the firm does not have enough internal funds to finance its own project) debt is preferred over equity. The reason for this is that according to this theory issuing equity can give bad signals such as managers pessimism to the investors, which will consequently cause the stock price to decrease (Brealey, Myers & Allen, 2011). The results of this paper can give a closer view of the impact of this theory on Dutch markets.

2.3. Capital Structure and Stock returns

2.3.1. Relationship Between Stock Returns and Capital Structure

Past research was conducted to analyze the relationship between stock returns and capital structure. Some authors believe that there is a positive relationship between leverage and stock returns (Hamada, 1969; Baker & Martin, 2011; Masulis 1983; Bhandari, 1988). Furthermore, Penman, Richardson & Tuna's (2007) reason that higher leverage drives the risk factor up, consequently increasing the stock return. However, they find a negative relationship between leverage and stock returns. The authors explain the failure to find the relationship they expected by a potential measurement error in the leverage figures, an omitted variable bias that is negatively affecting leverage or a mispricing of leverage by the market. Adami et al. (2015) conducted an empirical research in the UK market between 1980 and 2008 and found that a firm's debt financing affect negatively its stock returns. The authors explain this by investors' preference for relatively more financially flexible firms, therefore, with lower leverage. This leads these companies to have excess returns.

2.3.2. Stock Returns' Effect on Capital Structure

As mentioned in the introduction, companies try to maintain a certain level of debt ratio that they perceive as optimal. This, consequently, requires that they respond to disruptions by rebalancing their structure. However, some empirical studies disagree with the idea that firms rebalance their structure dynamically. For instance, Baker and Wurgler (2002) suggest in their paper that there is no optimal capital structure and that firms issue equity when their market-to-book value is high. Their results show that a firm's current capital structure is a cumulative result of past attempts of market timing efforts (i.e. issue stocks when markets values are high). The authors suggest that firms issue shares when they are perceived to be overvalued and repurchase their shares when they think they are undervalued. Their theory, therefore, implies that capital structure is strongly related to historical market values.

On the other hand, Welch (2004) perceives capital structure as a result of dynamic adaptation to the past stock returns. Welch starts by stating that if firms are inactive and do not rebalance their debt ratio based on market fluctuations, stock returns will be negatively correlated market-based debt ratio. This derivation can be described by the matter that if the market value of equity increases and the debt is kept fixed, the whole ratio will decrease. His paper shows evidence that debt ratios decrease (increase) following a stock price increase (decrease). The results of his analysis show that firms in the US do little to adjust their capital structure following stock prices movements. Welch states that while 40% of capital structure dynamics can be explained by the stock-return equity growth, 60 to 70% can be explained by corporate issuing activity. US firms issuing activity could be considered large enough to offset of return induced variations in the capital structure. Nevertheless, these issuing activities are not used for that.

2.4. The Debate

Other than the theories explained in the previous section, as already mentioned in the introduction, several research was conducted to explain firms' capital structure. The determinants of capital structure are an intriguing matter to most authors. Each of them took an approach to find the drivers of capital structure. Several explanatory variables were previously proposed such as volatility, firm size, market to book value and growth rates.

The main reason this study is focusing on the effect of stock return on debt ratios is that, according to Welch (2004), the impact of returns on capital structure in the US market is bigger than the impact of any other proxy and that all other variables are correlated to stock returns. He also states that some past studies focused solely on issuing activities while ignoring the market valuation effect on the debt ratio. Welch adds that proxies used in past studies fail to explain capital structure variation since they were correlated to the omitted stock return caused dynamics. His study thus concludes that past returns are a primary explanatory variable of debt ratios and potentially the only well understood one. This leaves actual corporate issuing motives as a mystery.

This thesis will test Welch's theory to conduct a similar analysis for the Dutch firms. The study will show whether public firms in the Netherlands re-adjust for changes induced by stock returns or leave room for their debt ratio to fluctuate accordingly. This way, this study will test the relationship from another perspective than the numerous studies testing the effect of debt ratio on stock returns. Additionally, such a study can help Dutch investors perceive issuing activities differently.

2.4.1. The difference between the Dutch and the US markets

US market

The US market is known to be “highly information efficient” (Brealey, Myers & Allen, 2011). This, however, does not mean that information asymmetry is non-existent. It is still an important factor that affects firms’ decisions on capital structure. The US market is, therefore, considered one of least imperfect markets (Rajan and Zingales, 1996).

Hovakimian, Opler and Titman (2001) focused their study on the importance of target ratios in the firms of the US market. Their results suggest that firms tend to move towards their target debt ratio instead of following the Pecking-Order theory considerations. Furthermore, as stated in chapter 2, Graham and Harvey (2001) concluded in their survey that the majority of large firms in the US and Canada follow the Trade-Off theory and have a target debt ratio. In the survey, CFOs add that this is especially the case when their firm is highly levered since they care mainly about their credit ratings. Conversely, the authors also illustrate that their survey findings show that US firms do not re-adjust their debt ratios following changes in their market value of equity. These findings are in line with what Welch (2004) concluded in his analysis about US firms. For this Fisher, Heinkel and Zechner (1989) provide an explanation that these firms face high transaction costs that do not encourage them to adjust their capital structure (by issuing or retiring debt) unless they hit their upper or lower limit. It should be noted that direct transaction costs in the US are not the leading reason for slow readjustment since Graham and Harvey’s (2001) survey states that such costs are considered small by practitioners.

Lemmon, Roberts and Zender (2008) developed a theory suggesting that firms in the US have a time invariant leverage target that it they seek to revert to. This admits the idea of an optimal capital structure. The authors show that the main factors responsible of debt ratio variations are stable over a period of around two decades. This is in line with Welch’s analysis of non-readjustment in the US market.

Dutch market

According to the Netherlands Bureau of Economic Policy (CBP), the adjustment process of capital structure for Dutch firms is slow. The reasons that the study suggests is that adjustment costs can be high. The CBP finds that taxes in the Dutch market affect capital structure and that they follow the Trade-Off theory in the sense that the costs of issuing are taken into account. The study also states that the Pecking-Order theory has a role in the firms' debt ratio decisions since the found that profitability and debt ratio are negatively correlated. This means that when firms find profitability increasing they would use their retained earnings rather than choosing external financing. The study by CBP thus concludes that the companies Dutch market does not follow a certain theory as a determinant for capital structure. The authors blame the instability of capital structure on policy makers since it shows their inability to act on short term changes.

2.5. Hypotheses

The hypotheses that are presented in this section are based on the theory proposed by Welch (2004) that stock returns affect capital structure. There will be two hypotheses, the decision on whether they will be rejected or not will be based on the analysis conducted and the statistical results.

The first hypothesis suggests that companies will dynamically change their debt ratios following stock returns. This is based on the assumption that companies in the Dutch market, as is the case with other corporations, have defined target leverage ratios that they consider optimal for them. They therefore actively modify their debt / equity structure to reflect stock price movements in order to maintain the target leverage ratio.

H1: Companies in the Dutch market constantly adjust their capital structure according to changes in stock returns.

The second hypothesis proposes that the stock returns and capital structure have a positive relationship. Under the assumption of firms' preference to maintain a defined debt ratio (e.g. optimal structure or industry average), firms tend to move debt in the same direction as equity returns. These adjustments will allow firms to stick to the debt / equity ratio that is considered best for the company and not let the market valuation change it.

H2: Stock returns and debt ratio are positively correlated in the Dutch market.

Chapter 3 - Data and Methodology

In this chapter, the data and the methodology used to test the above stated hypotheses will be presented. First, the sample chosen will be presented then the methods and the necessary formulas will be shown. The descriptive statistics of the data will also be demonstrated to give a general insight about the sample's characteristics.

3.1. Sample

Desktop research indicates that there are no studies testing the effect of stock returns on capital structures in the Netherlands. This is the goal of this paper. This thesis focuses on the Dutch market for several reasons; first, the research is focusing on a different economy from the US. This is important since, as mentioned in the introduction, similar studies have been conducted on a continental scale (the European market) and a country level (the US market). This research also focuses on one country. However, the US and the Dutch market have different characteristics that can lead to different results or interpretations (more on that in chapter 5). The reason behind the choice of a developed country is that it helps to minimize the noise in the data and the likelihood of having an omitted variable bias in the results. This could be a potential issue in developing countries going through crises that have other factors influencing capital structure than stock returns. Additionally, companies from the same country are put under the same conditions and are subject to the same environmental factors, which makes the analyzes less prone to biases.

The analysis will contain data from the past ten years (2007-2017), This specific period was chosen to include the global financial crisis where all prices were driven down due to the circumstances that affected all companies. This will help observe companies' reactions throughout time under different market conditions. Additionally, in 2017 the Dutch economy reached its highest growth rate (3.1%) in the last 10 years. The biggest growth boom was in 2007 when the growth rate was of 3.7% (Dutch News, 2017). This means that the 10 years chosen for this research will regroup several events that affected all the companies in the Dutch market and the economy as a whole.

The sample regroups 86 companies with different sizes and operating in different industries. The companies are chosen through the sorting of the Datastream database available through the Erasmus Data Service Centre. First, the data has been filtered for all equities that were part of the Dutch market in the chosen time frame. The number of firms is not constant throughout the years since some of the firms joined the market later than 2007. After that, all active companies were chosen to make sure they still operate and to avoid noise caused by firm-specific issues. The active status assures that the firm is not liquidated for reasons of bankruptcy, merger or take-over. Banks and insurance companies are removed from the sample since they have specific forms of leverage such as investor insurance, which is not comparable to non-insurance firms (Rajan & Zingales, 1995). The aforementioned criteria set to focus on one market resulted in a small sample of companies. This limitation can lead to larger standard errors and, accordingly, wider confidence intervals (Brooks, 2014). However, Welch (2014) advises the reader in his paper to ignore statistical standard errors and focus more on the economical than the statistical significance of the coefficients.

Panel data

In this study, panel data is the most suitable type of data since it provides information about all firms throughout time. It helps analyze how each firm reacts to changes in its stock returns over time. Panel data controls for unobserved individual factors that vary between different firms and can affect the debt ratio but do not vary across time. This, consequently, shows the aggregate effect of stock returns on capital structure in the Dutch market. Nevertheless, the panel obtained is unbalanced (i.e. some companies have fewer observations than others for each year) but Stata automatically accounts for this and deals with missing variables to estimate the models. The methodology used for this analysis is explained in the following section.

3.2. Methodology

3.2.1 Formulas of The Model Variables

In his paper, Welch (2004) decomposed capital structure changes into two effects, one caused by issuing activities of the firm and the other by stock returns. He investigates if firms try to keep their debt ratio at a certain static target and behave accordingly or whether they let their debt ratios fluctuate with stock prices. To measure these effects Welch used two main terms ADR and IDR, which stand for Actual Debt Ratio and Implied Debt Ratio, respectively.

Welch (2004) uses the market value of equity in his paper. Past literature used the book values of equity to conduct the same analysis. However, using book value has some shortcomings. First, the book value of equity is determined by the difference between left-hand and right hand side of the balance sheet, which does not reflect the firm's actual condition. For this reason, Welch (2004) refers to it it a "plug number" and this means that it can even be negative. Another limitation that Welch (2004) stated in his paper is that the book value of equity, following accounting rules, can increase with historical cash flow and shrink with asset depreciation. This means that book values do not correlate enough with market values, especially for small firms. Additionally, as expected, the book-value based debt ratios are affected by the profitability and the change in tangible assets of the firm (this is the case in Shyam-Sunder & Myers, 1999). On the other hand, Welch (2004) chose to use the book value of debt because of the lack of availability of market data. According to Koller, Goedhart and Wessels (2010), the book value of debt is a fair approximate to its market value.

The main regression of this paper is the following:

(1) $ADR_t = \beta_0 + \beta_1 \cdot ADR_{t-k} + \beta_2 \cdot IDR_{t-k,t} + \varepsilon_t$

Where ADR is defined by

(2) $ADR_t = \frac{D_t}{D_t + E_t}$

With D as the total book value of Debt and E as the market value of Equity.

On the other hand, IDR is defined by the following formula:

(3) $IDR_{t,t+k} = \frac{D_{t-k}}{D_t + E_t \cdot (1 + x_{t,t+k})}$

The formula shows that IDR is a ratio of a firm in the case where it does not issue any debt or equity and lets its capital structure fully capture the stock returns' effects. Here x represents the stock returns net of dividends.

In his paper, Welch proposes two hypotheses:

1. A perfect readjustment hypothesis where β_1= 1 and β_2 = 0

In this case, the company will always maintain a certain debt ratio and will adjust its capital structure post a stock price change.

2. A perfect non readjustment hypothesis where β_1=0 and β_2 = 1

Under this scenario, the firm is flexible to changes in its debt ratio and allows it to adapt to changes in stock prices and capture the effects of returns. If no issuing activity takes place, this leaves the ratio without any kind of adjustments.

In equation (1) when β_0 is included, it is a term that can captures a constant target debt ratio.

To be able to measure the yearly change in new debt issue, debt retirements, coupon payments and debt value changes, the following formula is presented:

(4) $D_{t+k} = D_t + TDNI_{t,t+k}$

Where TDNI is the total debt net issuing activity (formula in Appendix A). This means that if TDNI is of a positive (negative) sign, there was a net debt issue (retirement) from t-k to t.

Similarly, corporate equity evolves from t-k to t and is measured by:

(5) $E_{t+k} = E_t \cdot (1 + x_{t,t+k}) + ENI_{t,t+k}$

Here ENI represents equity issuing and stock repurchasing activity (formula in Appendix A). The formula measures the changes in equity taking into account the changes with stock returns (net of dividends).

All the above definitions show that debt ratio evolves as

$$(6)\ ADR_{t+k} = \frac{D_{t+k}}{D_{t+k}+E_{t+k}} = \frac{D_t+TDNI_{t,t+k}}{D_t+TDNI_{t,t+k}+E_t\cdot(1+x_{t,t+k})+ENI_{t,t+k}}$$

For ADR to remain perfectly constant throughout periods (ADR_t=ADR_{t+k} and β_1=1, β_2=0), mathematically the following equation should hold:

$$(7)\ \frac{ENI_{t,t+k}}{E_t} = \frac{TDNI_{t,t+k}}{D_t} - x_{t,t+k}$$

On the other hand, if the corporation decides to issue debt and equity in a way that it permits the variation of its capital structure, this equation will then hold:

$$(8)\ \frac{ENI_{t,t+k}}{E_t} = \frac{TDNI_{t,t+k}}{D_{t.t+k}} + x_{t,t+k} \cdot \frac{TDNI_{t,t+k}}{D_t}$$

In this case, IDR perfectly predicts the debt ratio of the firm ($IDR_{t,t+k}$=ADR_t and β_1=0 and β_2=1).

Equations (7) and (8) do not hold for the direct cross-section estimation since some firms have very low or zero levels of debt.

3.2.2 Regression Model

To test the for the regression mentioned above, the statistical tool Stata is used in this paper. The main regression used in this paper is the pooled regression as recommended by Welch (2004) in his paper. Welch (2004) used the Fama-Macbeth method in his paper but made a clarification on one of the appendices that the pooled regression does not change coefficient estimates. According to Brooks (2014) pooled regression can be used when the data being tested has time series and cross-sectional dimensions (i.e. panel data). In this analysis the time series is the data on different years (from 2007 to 2017) and the cross-sectional is the comparison between different companies. A pooled regression estimates all the data together so that the dataset for the dependent variable is all grouped into one column for both dimensions (cross-sectional and time series). Similarly, the dataset for the independent variables will all be grouped together into one column. OLS is then used to find a suitable equation (Brooks, 2014). Nonetheless, the drawbacks of pooled regressions need to be mentioned. Brooks (2014) adds that this method assumes that the mean values of the variables and the relationships between them are fixed over time and across all the firms.

Another possible model for testing the relationship between different variables in the case of panel data is the fixed effects model. In this model it is possible to fix the effect of the entity or the time effect, it is a way to see how the non-fixed effects (e.g. time or company) affects the data over time (Brooks, 2014). However, the fixed effects model is not recommended in the case of this study since it causes the loss of more degrees of freedom and this study is based on a small sample. Additionally, Welch (2004) stated in his paper that this model gives a very close estimate for the IDR coefficient but shrinks the ADR coefficient (Table B.2, Appendix B). As shown in Appendix B, in the fixed effect regression, all coefficients shrank and the model has relatively very low adjusted $R^2$and a negative adjusted R^2 for ADR_{t+10}. Consequently, this model is not considered as explanatory for the purpose of this paper.

Regression Assumptions

According to Brooks (2014), OLS regressions have five necessary assumptions for the regression to be considered a valid estimation for the relationship between variables.

1. One of OLS' assumptions is homoscedasticity, this assumption implies that the error terms have a zero mean. If this does not hold, the estimator can potentially be biased. To test for it a White test can be done (Brooks, 2014).
2. A violation of the first assumption results in errors that said to be heteroscedastic. An example of this case is that the variance of error terms increases for bigger values of x. In such cases the default standard errors are not valid. Therefore, every regression in this paper, a robustness check has been added through the option "robust" in Stata, this option allows to display the standard errors following White (1980).
3. The third assumption states that the error terms have a covariance of zero. This implies that the errors are not correlated over different years or between

firms. To detect autocorrelation tests such as Breusch-Godfrey[1] test is conducted. If this assumption does not hold, just like for the assumption before, the standard error will not be valid.

4. This assumption requires the independent variables to be non-stochastic, which implies that the x variables and the error terms need to be uncorrelated. This will mean that this will result in an inconsistent regression. A violation of this assumption also results in biased coefficients since a change in y as a result of a change in x whereas it is the error term that is affecting x in this case.
5. The last regression assumption is that the residuals of the model parameters are normally distributed (Appendix A shows the histograms of residuals of this paper's regressions, which are shown to be slightly skewed). However, if there is evidence of non-normality, there is no obvious way to deal with it.

Model Fit

The model fit is shown by the value of R^2 and adjusted R^2. R^2 is defined by Brooks (2014) as the square of the correlation between the fitted values from the model and the dependent variable. R^2 lies between a value of 0 and 1. A high value of R^2 indicates a well fit of the model to the data. Contrarily, when the R^2 value is close to 0, this means that the model does not fit the data well. On the other hand, adjusted R^2 is refinement of R^2 that applies more penalties, it permits the comparison between models (Formula A.1 in Appendix A). Adjusted R^2 is used in this paper as the model fit criteria since it provides more accuracy. Adjusted R^2 increases only when a relevant explanatory variable is added to the regression and can fall with an irrelevant additional regressor. Nonetheless R^2 can increase even an irrelevant variable is added. Adjusted R^2 can take negative values if the model fails to fit the data (Brooks, 2014). Therefore, model fit here aims to maximize adjusted R^2.

Statistical significance

In each regression conducted in this paper, the p-value indicates the statistical significance of the coefficient of each independent variable. The significance level indicates the

[1] However, this test could not be conducted for the variables of this paper.

area where the null hypothesis will be rejected or not. For instance, a significance level of 5% shows that the results that fall as extreme as this or more extreme than that will be expected only 5% of the time. The conventional significance used is 5% (Brooks, 2014). Brooks (2014) adds that although the 5% significance is widely used, in finance it still presents a potential issue in case of a big sample. That is, using 5% significance in such large samples can result in rejecting any null hypothesis. This is a consequence of the decrease in standard errors with the increase of the sample, consequently, an increase in the t-values. Therefore, econometricians suggest using lower significance levels for such samples (Brooks, 2014). In this paper, the statistical significance will be based on a 5% level but other significances (1% and 10%) will also be presented. On the other hand, economic significance lies in the size of the coefficient.

3.3. Data

3.3.1. Variables

A description of the calculations and the transformation made to the data will be provided to give a better understanding of the findings and the analysis. The market value of Equity is calculated by multiplying the share price to the number of outstanding shares (also referred to as Market Capitalization) (Koller, Goedhart & Wessels, 2010). The market value of the companies in this study is calculated by the sum of market value of equity and the book value of debt. TDNI and ENI are calculated as indicated by Welch (2004) following the dynamics of D and E, respectively. The variables here are "net", which means that there is no separation of issuing or retiring activity. The dividends are calculated through the difference between the stock returns and the net stock returns then multiplied by the equity of the corresponding year.

(9) $Total\ DIV_{t,t+k} = \left(r_{t,t+k} - x_{t,t+k}\right) \cdot E_t$

3.4. Descriptive Statistics

The sample chosen is very diverse with firms with all sizes, the minimum market value of equity is of €646.1 and the maximum market capitalization is of €201 million. The median company has a market value of equity of €0.5 million and the mean is of €5.8 million. This observation shows that there are more small firms or more years where firms had a relatively small market capitalization in the sample than large ones. It is important to note that such differences can result not only from the difference in size of the firm but also the firm's choice of when to join the market and how many shares to issue. Other reasons could be firm specific such as bankruptcy or withdrawal from the equity market[2], which leads to a very small market capitalization. The whole market value of the firms can also reflect their sizes but does not give a clear insight of the market's valuation of debt in the case of this study. The dispersion of firm sizes is also shown in the difference in firms' total assets. The average of firms' assets is €8.6 million whereas the median is of €0.7 million and the maximum value is of €376 million. This confirms that smaller firms are more numerous in the sample.

The actual debt ratio has a mean of 25% of firm market value and a median of approximately 21%. The implied debt ratio has a mean slightly higher than the ADR's, of 26% and a median of around 21% too. The two ratios have very close values. The Dutch firms have average returns of 13.9% and their median returns are of 6.5%, these returns represent the total euro returns. The net returns (resulting from stock price change) have a mean of 6.8% and a median of 3.4% in capital gains. This difference between the two types of returns result from the dividends, dividends per share have a mean of €0.79 and a median of €0.33. Dividends per share have a standard deviation of 1.88, which shows that dividends are not an important factor to account for cross-sectionally since they are not considerably dispersed within the sample.

Firms, surely, differ in their issuing activities. Additionally, due to differences in sizes, taking the ratio compared to market value of the firm seems more suitable. The net debt issuing mean is of -2.72% of the market value and a median of 0%. On the other hand, the net equity issuing activity, reflecting the growth of equity without capital gains or dividends' effect, has a mean of -64.18% of market value and a median close to 0%. For both activities, the median is higher than the mean. This means that the data is skewed to the left (shown in Table A.2 and Table A.3 and Histograms A.5 and A.6, Appendix B). This suggests that most Dutch firms still issue debt than they payoff and issuing shares is more common than repurchasing.

In order to have an insight about the relative frequency of issuing equity and equity growth induced by the market valuation, a comparison between these two values is necessary.

[2] Example: Alumexx in 2016 where the number of shares shrunk from 88,847 in 2015 to 994 in 2016 resulting in a decrease in market capitalization from €897,355 in 2015 to €646 in 2016.

The induced equity growth has a mean of 6.44% of the market value and a median of 2.2%. This shows that, unlike the net issuing activity, the data is skewed to the right (Table A.4 and Histogram A.7, Appendix B). The standard deviation of the net equity issuing is of 12.21 whereas it has a value of 0.38 for the market induced equity growth. This shows that the market valuation matters considerably in firms' equity value in the Dutch market. The comparison also suggests that the net equity issuing is less important on average.

Chapter 4 - Results and Analysis

In this chapter, all results of the tests conducted will be presented and interpreted. The main objective of this part is to understand how Dutch firms adjust their capital structure to movements in stock returns. Different factors can affect the firms' decision, all these will be included and their importance will be shown. This chapter will also help show whether the Dutch and US markets are similar.

4.1 Regression Estimation

4.1.1. Deviation Between ADR and IDR

The first regression to test the effect of stock return on capital structure flexibility is the pooled regression.

$$ADR_t = \beta_0 + \beta_1 ADR_{t-1} + \beta_2 ADR_{t-3} + \beta_3 ADR_{t-5} + \beta_4 ADR_{t-10} + \varepsilon \quad (10)$$

Table B.1 in Appendix B illustrates the lags of ADR to show their effect on ADR_t. A lagged value is the value of the variable in past periods (Brooks, 2014). Here, k represents the number of lags used in the regression. The use of lags here[3] is to show how the past ADR value can affect the current one. The importance of the lags' coefficient is to show the emphasis of the managers to readjust their capital structure and revert to the company's past debt ratio. The table shows two regressions; the first regression includes a constant that has been removed to conduct the second one. In both regressions, only the first lag of ADR is statistically significant at 5% in explaining the current debt ratio. It suggests that the previous year's debt ratio allows the current year's ratio to drift by 74.2% to 76.8%. The striking results here are the coefficients of the fifth lag. This explanatory variable has a negative effect on the current ADR. However, it is not statistically significant so it can be ignored. The intercept is a representation of the target debt ratio of the firm. In the first regression, the constant is statistically insignificant. This implies that

[3] With the method of trial and error the lags of k=1, k=3, k=5 and k=10 are shown to be the most relevant and significant. Taking an interval of two years shows the rapidity of reactions of the firms to changes in returns. However, it is not needed to have yearly lags since this study is interested in capturing the readjustment effect rather than the specific timeliness of this adjustment.

the decision of firms' capital structure does not depend on sticking to a target value of debt ratio and adjust to it yearly. The second regression is more relevant since it has a better model fit its adjusted R^2 has a value of 0.857 instead of 0.706 for the first regression. This means that it has higher explanatory power since it explains about 15% more than the previous model. The results then suggest that historical ratios of the year before are the only important explanatory variable to the current decisions.

The above regression did not include the returns' effect (represented by IDR), only the historical effects were considered. To test for the main factor in this paper and to recreate Welch's analysis for the Dutch market, the basic regression (formula (1)) is conducted to test for the effect of IDR over time.

In this regression, the IDR's coefficient reflects the flexibility of the firms to let their capital structure vary with the change in stock returns of the year before. Table 1 shows that in all regressions, that is using different number of lags, the IDR coefficient is considerably higher that the coefficient of the ADR lag (except for k=10). In addition, all IDR coefficients are statistically significant except for IDR from t to t+10. The effect of past ADR increases and becomes significant for more distant lags, β_1=0.289 for k=5 meaning that only 28.9% of year t+5's capital structure depends on year t's debt ratio. The tenth lag has a lower effect than the fifth one with a β_1=0.254. This shows that companies start Dutch companies start to adjust after five years and continue to do it until ten years but the its importance decreases. These results are similar to what Welch (2004) found for the US. In the regressions, the constant is a representation of the target debt ratio. The intercept has a value close to 5.6% on average for all the regressions presented. This proposes that the decision of firms' capital structure does not depend considerably on sticking to a target value of debt ratio and adjust to it yearly. Additionally, although historical ratios play a role in the current decisions, the most important independent variable is IDR. $IDR_{t,t+k}$ has an effect of 80.2% for k=1, 65.1% for k=3, 58.3% for k=5 and 12% for k=10. This shows that the past stock returns are important for the actual debt ratio until over five to ten years where the past debt ratios start to have a bigger effect.

Table 1: Pooled Regression Explaining the Effect of ADR_t and $IDR_{t,t+k}$ on ADR_{t+k} With Constant for k=1, k=3, k=5 and k=10

	ADR_{t+1}	ADR_{t+3}	ADR_{t+5}	ADR_{t+10}
ADR_t	0.0497 (0.61)			
ADR_t		0.0497 (0.66)		
ADR_t			0.289*** (9.03)	
ADR_t				0.254** (2.46)
$IDR_{t,t+1}$	0.802*** (10.04)			
$IDR_{t,t+3}$		0.651*** (9.45)		
$IDR_{t,t+5}$			0.583*** (20.57)	
$IDR_{t,t+10}$				0.120 (1.28)
Constant	0.0318*** (5.41)	0.0631*** (6.68)	0.00387 (0.73)	0.124*** (5.18)
Observations	828	667	516	143
Adjusted R^2	0.780	0.570	0.790	0.147

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

The following table (Table 2) shows the effect of the same independent variables but without the intercept. All the ADR coefficients increased showing more tendency of firms to go back to their previous debt ratio not to a target value. However, the IDR coefficients also increase, meanings that the firms leave more room for their debt ratio to fluctuate. This shows that the constants were biasing the coefficients making them lose economic significance. Additionally, the adjusted R^2 is considerably higher for all k. This implies that these regressions have higher explanatory power than the ones with the constant (target debt ratio).

Table 2: Pooled Regression Explaining the Effect of ADR_t and $IDR_{t,t+k}$ on ADR_{t+k} Without Constant for k=1, k=3, k=5 and k=10

	ADR_{t+1}	ADR_{t+3}	ADR_{t+5}	ADR_{t+10}
ADR_t	0.101 (1.26)			
ADR_t		0.153** (2.18)		
ADR_t			0.295*** (10.64)	
ADR_t				0.455*** (4.85)
$IDR_{t,t+1}$	0.822*** (10.28)			
$IDR_{t,t+3}$		0.686*** (10.08)		
$IDR_{t,t+5}$			0.586*** (19.76)	
$IDR_{t,t+10}$				0.209** (2.26)
Observations	828	667	516	143
Adjusted R^2	0.901	0.797	0.905	0.511

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

The regressions in Table 2 include the coefficient of ADR_t and $IDR_{t,t+k}$ coefficients for different horizons to see their effect on the IDR from t to t+k, without including the constant. The results show positive and significant coefficients for all independent variables except the first lag of ADR. The highest coefficient is the coefficient of the IDR from t to t+1. The coefficient implies that an increase in last years returns by 1% affects the current debt ratio by 82.2%. Additionally, the stock returns in the past three and five years have higher coefficients than the ADR lags except for k=10. After ten years, the ADR at time t becomes more important than stock returns from t to t+10 in decision making. Nevertheless, the IDR coefficients remain more important throughout time.

4.2. Analysis

All the above regressions imply that in the Dutch market both, past debt ratios and stock returns, are significant in the decisions of managers. Past stock returns are shown to have a positive effect on current debt ratios, which means that the companies let their capital structure vary and issue more debt later in time when they find their returns increase in the past years. The most recent changes in returns are the ones which are the most impactful on capital structure but more distant returns play a role in the decision too. The results then suggest that companies in the Dutch market leave room for their debt ratios to fluctuate with stock returns up until three years then start readjusting afterwards to stick to past debt ratios. Starting 10 years, the effect of past debt ratios becomes more important on the current one than the stock returns' effect. It is also shown that Dutch companies do not seek to stick to a target debt ratio value throughout time. A potential reason for choosing not to fix the capital structure to a target value could be the uncertainty of firms about its benefits and accuracy. Another interpretation of what the results show can be that it depends considerably from an industry to another, which did not lead to a significant average value in the regression when pooled together (Brooks, 2014). This hints that businesses are not reluctant towards issuing activities but they do not focus primarily on reacting instantly to market factors that affect their capital structures. The positive correlation found between ADR and IDR should not distract us from the fact that negative returns will push managers to pay-off debt to stay within their upper debt ratio limit. These findings prove that the theory of persistence proposed by Lemmon, Roberts and Zender (2008), does not apply to Dutch firms since they do not seek to keep the same ratio level fixed for long as mentioned in their paper (two decades).

Firms do not only consider their capital structure and take decisions about how to change it. Corporations take into account their investors and how they would perceive an issuing activity of debt or equity. Due to information asymmetry, investors consider such activities as signals. If the company decides to increase debt as a reaction to its increase in past stock returns, this can cause uncertainty to investors. Additionally, when debt increases, the risk of the company increases. Dutch companies can be conservative in reacting to market value fluctuations to avoid frequent movements in the debt ratio and refrain from giving wrong signals to their investors (Myers, 1983). Furthermore, in case of bankruptcy, creditors have the priority in reimbursement. For this reason, investors do not like when debt increases and the involvement of more parties, which is in agreement with the suggestions of the agency theory (Myers, 2003). Some investors are risk averse and can decide to sell their shares, causing the price to fall and decrease returns. Therefore, this infers that agency costs can play a role in firms' decisions as well.

4.2.1. Differences Between US and Dutch Markets

A possible way to explain the difference between the two markets and the reason behind the non-readjustment evidence for the Netherlands is that the Dutch market prefers internal financing over external financing. Additionally, if a firm decides to use external financing, bank loans are the most important source of financing for them (Haan & Hinloopen, 2002). This means that even if firms find their stock returns increasing and resulting in a decrease in their debt ratio, they will not choose to issue more debt immediately. However, if they choose to react to these changes years later, as shown by the statistical results, they will use bank borrowings to do so. This indicates that the Pecking-Order theory is of significant importance in the Dutch market. Nevertheless, Haan and Hinloopen (2002) add to their result that the Dutch firms prioritise shares to bonds as a second choice for external financing, which is not strictly in line with the Pecking-Order theory. They propose that the lack of development of Dutch corporate bonds as a reason for this. Leary and Roberts (2004) suggest another explanation, that firms indeed intend to respond to changes in equity price and that these changes have a continual effect on debt ratios. However, the authors conclude that firms do not react immediately because of the adjustment costs. Consequently, firms rebalance their capital structure from one to four years later to behave optimally and minimize these costs. The results show that the static Trade-Off theory does not fully hold in the case of the Dutch market. The Dutch market is, therefore, in the middle between the Pecking-Order theory and the static Trade-Off theory since it does not let its debt ratio stick to a target value but corporations do not let it fluctuate one to one with returns either.

These explanations apply to this paper's findings but might apply to the US market as well since the results of the two countries differ slightly from each other. Nevertheless, it is important to note some major characteristics that can be considered as potential reasons for the two markets to differ; the two markets differ in size and the US market is known to be heavily dependent on the equity market. The US financial market's is amongst the most advanced markets in the world, which implies that the access to external financing is easier and, therefore, meets the demand of managers when in need for external financing (Rajan & Zingales, 1996). On the other hand, the explanation stated above suggests that the Dutch market has opposite preference. Therefore, similar results are likely to have different drivers in each of the two markets.

Chapter 5 - Conclusion, Limitations and Recommendations

This chapter will present a summary of all the important points and findings of this paper that help draw a conclusion and answer the research question. After that, the limitations of the study will be illustrated followed by some recommendations for future studies on this topic.

5.1. Conclusion

The main goal of this study is to answer the previously stated question: *To what extent do stock returns affect capital structure in the Dutch market?* The aim of this is to contribute to past research that analyzed other samples or countries. In order to achieve this, some theories were presented to back-up the possible ways that Dutch managers choose to decide their financing strategy. To support these theories, the regressions show the 86 selected companies react to stock returns in the period between 2007 and 2017.

The theoretical background and the empirical results suggest that Dutch firms are not likely to re-adjust their debt ratio immediately to stock returns but start to react to these changes starting 5 years after they occur. The findings imply that the actual debt ratio and stock returns are positively correlated. The regressions show that both: past debt ratios and stock returns impact the current debt ratio positively. The returns closer to time t affect the current debt ratio most. With time this effect weakens and the effect of past debt ratios becomes more influential. These results leave room for different theories to explain corporations' decisions on capital structure. To relate that to the theoretical framework given, it can be concluded that Dutch firms do not fully follow what the Pecking-Order theory nor the static Trade-Off theory suggest. The Dutch managers seem to have a strategy between these two theories. Results have shown that firms do not stick to a target or optimal value, as the Trade-Off theory suggests, but they still do not let their debt ratio fluctuate freely and consider the costs of issuing and the benefits of tax shields. Furthermore, Dutch firms prefer internal over external financing, which is in line with Myers and Majluf's (1984) Pecking-Ordering theory but the reasons behind these actions are not necessarily in line with the theory, institutional limitations and cultures play a role too. Moreover, the results shown in chapter 4 and the imperfections of markets show that Modigliani and Miller's theorem (1958) does not hold since markets are not perfect and managers actually take into account all the costs and benefits of financial activities to decide on their capital structure.

This conclusion then implies that the first hypothesis is rejected since Dutch firms do not adjust their debt ratios yearly to cancel-out the stock returns' effect. On the short term, firms seem to mostly let their capital structure fluctuate with the stock returns since they have higher effects (coefficients) than the effect of past debt ratios. On the other hand, the second hypothesis is not rejected considering that the actual debt ratio and stock returns move in the same direction in the short and long term. It can be considered that an important assumption for this correlation to hold is for the company to have a positive NPV project that it needs to finance and result in an increase in its enterprise value (Formula in Appendix A).

All of the above shows that corporations do not hesitate to issue debt in general but the extent to which the issuance activity is a response to stock returns is still unclear. The results suggest a slow adjustment of capital structure to changes in the Dutch market, which is in line with the study conducted by the CBP although this study used different explanatory variables. When compared to Welch's (2004) findings of his study on the US market, it can be seen that the Dutch and US markets have similar but not identical results. Consequently, it should be noted that both of Welch's (2004) hypotheses are rejected since the Dutch market does not follow a perfect readjustment nor perfect non-readjustment strategy. Additionally, the two markets, Dutch and US markets, have different interpretations of the results since they do not have the same banking system nor investors have the same preferences. For instance, the direct transactions costs can be lower in the US since they have a more established investment banking system. This suggests that the difference between markets can arise from institutional differences or cultures too.

5.2. Limitations

5.2.1. Sample Limitations

The biggest challenge faced when looking for the data points is the limited number of firms with available data. The sample is therefore subject to skewness or biases because of the small N (number of data-points). This is a limitation considering that OLS regression assumes normality and, here, as shown in the descriptive statistics the data is skewed. A larger sample can solve the issue according to the central limit theorem but it is not obvious how to solve it with small samples (Brooks, 2014). Another limitation caused by missing data is the non-applicability of some tests on unbalanced panels.

Moreover, only active firms were selected for this study. This can be considered as a survivorship bias since dead firms are excluded. This is a form of selection bias because some of the dead firms might have had to quit the market because of issues related to their capital structure.

Even though the debt ratio is widely used as a representation of capital structure, in the case of this study it can be argued that debt ratios are not representative of the current situation of the firm but rather a snapshot of the company's history. This means that the ADR can be criticized to be a limited illustration of the firm's reaction to stock return changes.

5.2.2. Potential Interpretations of Findings

A potential reason for the non-readjustment of ADR in the Dutch market is the high costs of issuing debt. Credit ratings can reflect the ease of issuing debt to the firm. The credit rating shows the amplitude of the chance of default, consequently, firm's risk. A high (low) rating reflects a low (high) chance of default and low (high) risk. Another suitable proxy that can be normally more available for firms is the cost of debt. The cost of debt has the following formula

$$(11) \qquad r_d = \left(r_f + Credit\ Spread\right) \times (1 - Tax\ Rate)$$

This shows that a firm's cost of debt can reflect the company's credit rating. A high cost of debt reflects a low credit rating. According to Sengupta (1998), firms with good disclosure quality and low risk are rewarded with a low cost of debt. Additionally, since all firms in the sample are operating in the Dutch market, they all have the same risk free rate and corporate tax rate (decided following the government policy), this means that the only varying factor across the firms is the credit spread. The credit spread is affected by two factors: the amount of company's debt and the credit rating. Therefore, by adding the cost of debt to the regression, its coefficient can show if costs are an important explanatory variable for firms' adjustment and issuing decision. However, the needed data for both variables is not available on the university databases used to conduct the tests of this thesis. If the results would have shown a negative relationship between the cost of debt and ADR, it could support the argument that issuing debt costs are an important reason for the non-immediate readjustment of the debt ratio following an increase in the market value of equity.

5.2.3. Causality Limitations

If investors follow the conventional CAPM required return on equity, they would perceive an increase in debt as an extra risk. Therefore, if we measure firms' reaction to stock returns by its effect on debt issuing, this does not take into account the effect that debt can have on returns. If corporations increase debt, they're choosing to increase risk too. This can consequently push investors to sell and returns to decrease. Therefore, this argumentation can be accused to be subject to reverse causality.

5.3. Recommendation for Further Research

Sample

Considering the limitations and the scope of this paper, some interesting areas have not been tackled. For further studies, it would be insightful to take a larger sample if available to avoid potential biases. Furthermore, integrating the credit rating of firms would give a clear reasoning whether issuing costs are an important factor for Dutch firms. Another good addition would be to divide the firms by their size and industry to be able to observe whether such factors differentiate companies' adjustment strategies. According to Brooks (2014) one of the limitations of a pooled regression is that it assumes that the relationship between averages in the regression is the same for all companies and over time. Therefore, if this is controlled for by dividing the data, such a limitation might be avoided.

One more proposition is to take a sample of different countries and use a fixed effect regression controlling for the country effect instead of taking a sample for only one country. This will help control for country specific factors (such as political or economical factors). In fact, Rajan and Zingales (1995) analyze firms' financing decisions to find the factors affecting their choice of capital structure in the G7 countries. Their study shows that firm leverage is similar across these countries and that there seems not to exist any significance institutional differences that affect structure.

Other Explanatory Variables

Additionally, it could be suggested to also test the effect that drive companies to issue equity in the market. This can show whether they could respond to returns increases by issuing shares, which normally leads to a decrease in price and consequently, decreasing returns instead of increasing debt.

Another interesting point to tackle is the investors' behavior in the Dutch market, which will help test to what extent it can affect managers' decisions. This will clarify the importance of agency costs on the market and its effect on capital structure.

Appendix A

Formula A.1 for Adjusted R^2:

$$Adjusted\ R^2 = 1 - [\frac{N-1}{N-k}(1-R^2)]$$

Where N is the number of data-points in the sample and k is the number of variables (regressors), a higher k will not cause adjusted R^2 to increase unless R^2 increases by a value that offsets the increase in k. otherwise $Adjusted\ R^2$ will actually fall (Brooks, 2014).

Variables

E = Number of Outstanding Shares × Closing Price per share

D = Long + Short Term Debt

$TDNI_{t-k,t} = D_{t+k} - D_t$

$ENI_{t-k,t} = E_{t+k} - E_t \cdot (1 + x_{t,t+k})$

$Total\ DIV_{t,t+k} = (r_{t,t+k} - x_{t,t+k}) \cdot E_t$

Debt and Equity Issuing = $TDNI_{t,t+k} + ENI_{t,t+k}$

Induced Equity Growth = $x_{t,t+k} \cdot E_t$

Total Euro Return = $r_{t,t+k} \cdot E_t$

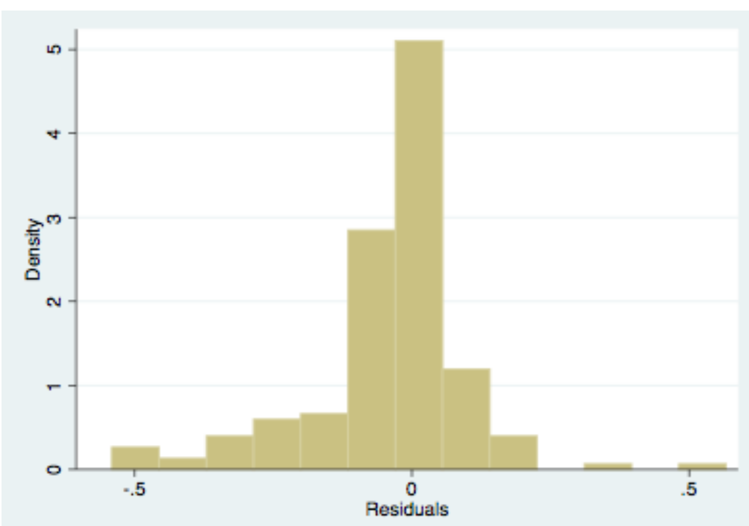
Market Value of Firm = $E_t + D_t$

Enterprise Value = Market Capitalization + Market Value of Debt – Cash and Equivalents

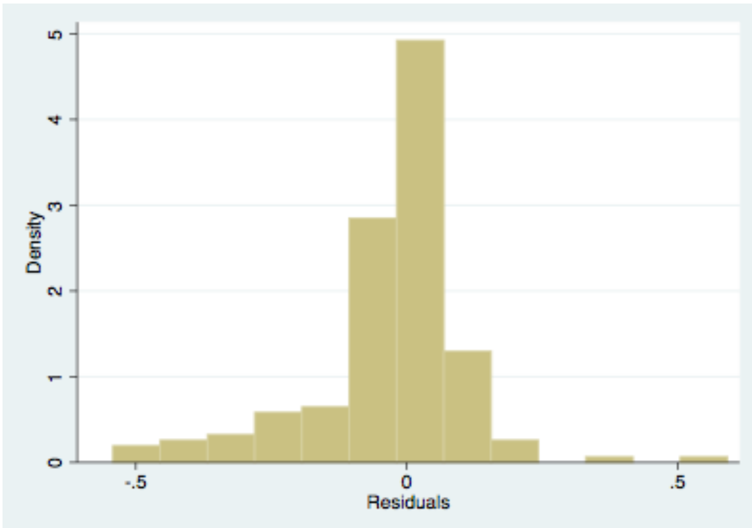
Table A.1: Descriptive Statistics of Key Variables

Variable	Minimum	Maximum	Mean	Median	Standard Deviation
Market Capitalization (in €)	646.1	201,453,756	5,778,506	573,085.5	16,700,000
Total Assets (in €)	0	376,213,800	8,590,837	749,600	31,100,000
Actual Debt Ratio	0	0.972	0.254	0.21	0.223
Implied Debt Ratio	0	0.981	0.260	0.208	0.231
Returns	-0.967	35.583	0.14	0.066	1.304
Net Returns	-0.983	4.061	0.068	0.034	0.445
Dividend Per Share (in €)	0	19.49	0.795	0.33	1.879
Net Debt Issuing (in €)	-16,222,638	33,900,819	130,892.7	0	1,677,198
Net Equity Issuing (in €)	-1,003,503,700	101,931,658	-907,374.4	0	34,800,000
Net Debt Issuing as a Percentage of Market Value	-14.695	0.773	-0.027	0	0.539
Net Equity Issuing as a Percentage of Market Value	-329.495	0.902	-0.642	0	12.212
Induced Equity Growth as a Percentage of Market Value	-0.983	4.019	0.064	0.022	0.377

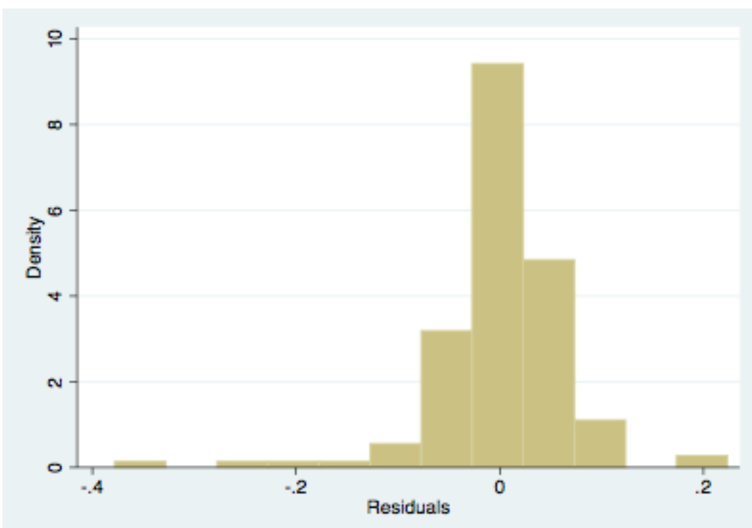
Histogram A.1: Residuals of Regression of ADR lags on ADR_t With Constant



Histogram A.2: Residuals of Regression of ADR lags on ADR_t Without Constant



Histogram A.3: Residuals of Regression of ADR lags and IDR for different k on ADR_t With Constant



Histogram A.4: Residuals of Regression of ADR lags and IDR for different k on ADR_t Without Constant

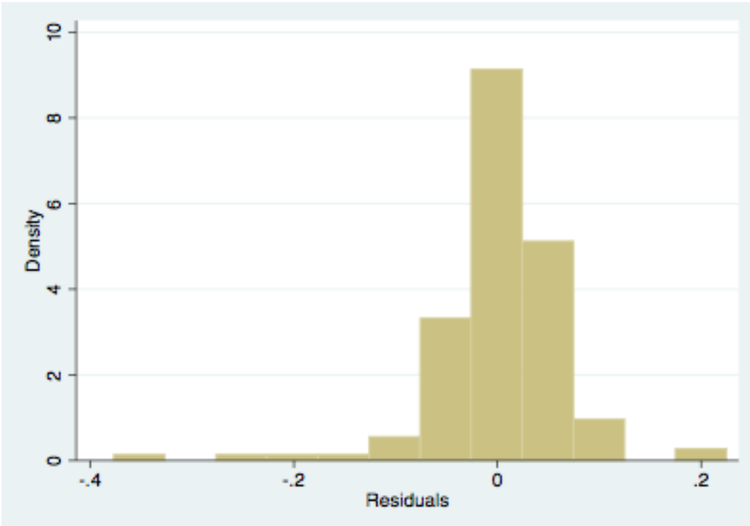


Table A.2: Skewness/Kurtosis for Normality for Net Equity Issuing Before Dividend

Variable	Observations	Pr (Skewness)	Pr(Kurtosis)	Adj Chi2(2)	Prob>chi2
Net Equity Issuing Before Dividend	926	0.000	0.000	.	.

H0: The data is normally distributed

Histogram A.5: Net Equity Issuing Distribution, Shown to Be Skewed

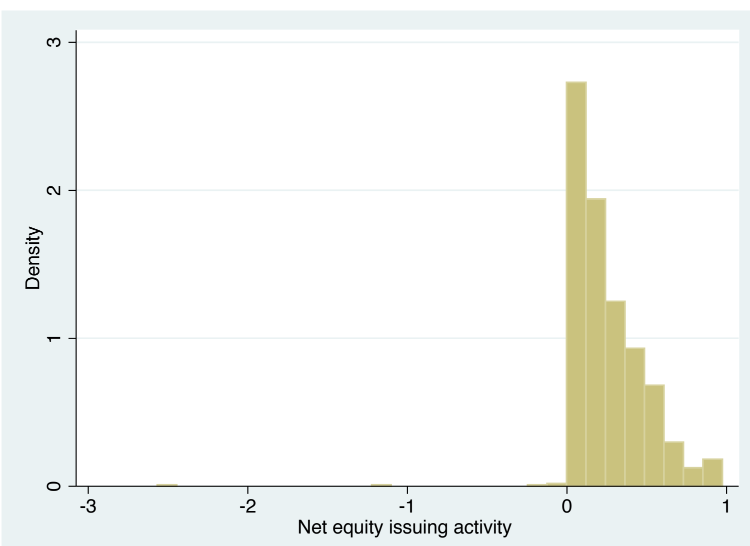


Table A.3: Skewness/Kurtosis for Normality for Net Debt Issuing

Variable	Observations	Pr (Skewness)	Pr(Kurtosis)	Adj Chi2(2)	Prob>chi2
Net Debt Issuing	928	0.000	0.000	.	.

H0: The data is normally distributed

Histogram A.6: Net Debt Issuing Distribution, Shown to Be Skewed

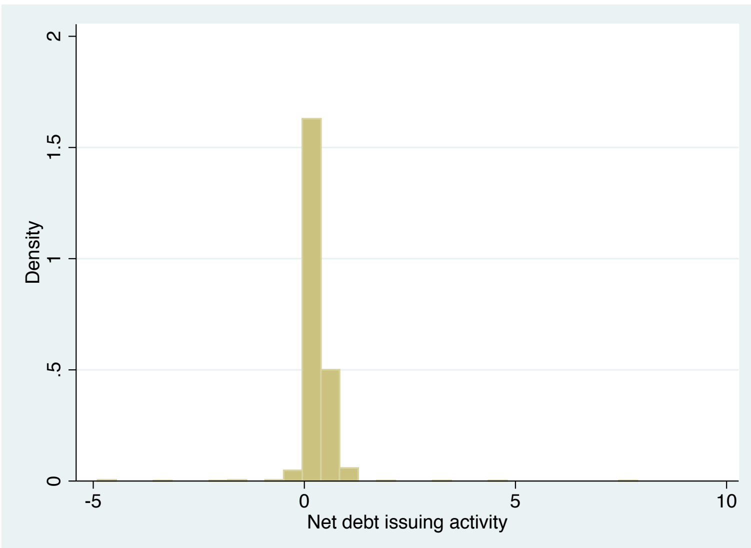
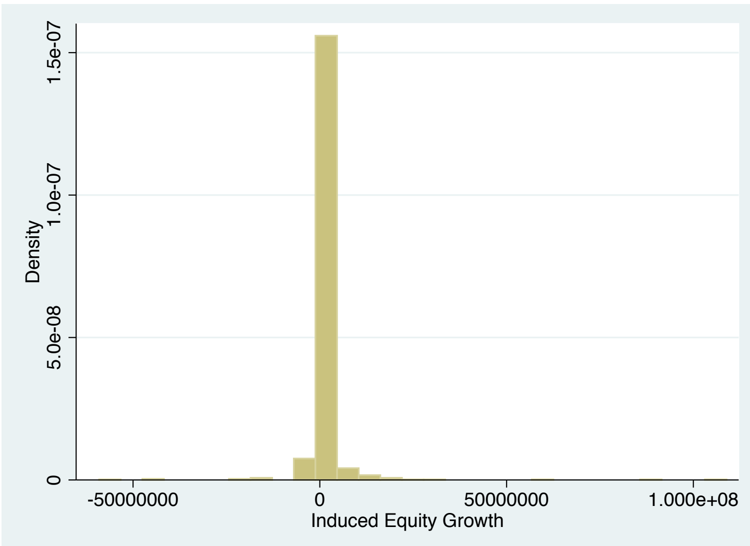


Table A.4: Skewness/Kurtosis for Normality for Induced Equity Growth

Variable	Observations	Pr (Skewness)	Pr(Kurtosis)	Adj Chi2(2)	Prob>chi2
Net Debt Issuing	920	0.000	0.000	.	0.000

H0: The data is normally distributed

Histogram A.7: Induced Equity Growth Distribution, Shown to Be Skewed



Appendix B

Table B.1: Regression Showing The Effect of The Lags on ADR_t With And Without a Constant

	ADR_t	ADR_t
ADR_{t-1}	0.742*** (7.32)	0.768*** (7.66)
ADR_{t-3}	0.143* (1.72)	0.135 (1.63)
ADR_{t-5}	-0.126 (-1.55)	-0.0984 (-1.31)
ADR_{t-10}	0.0924 (1.43)	0.112* (1.73)
Constant	0.0247 (1.47)	
Observations	145	
Adjusted R^2	0.706	0.857

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table B.2: Regression With Fixed Effects

	ADR_{t+1}	ADR_{t+3}	ADR_{t+5}	ADR_{t+10}
ADR_t	-0.169*** (-3.04)			
ADR_t		-0.385*** (-6.53)		
ADR_t			-0.00409 (-0.14)	
ADR_t				0.0939 (0.69)
$IDR_{t,t+1}$	0.777*** (14.56)			
$IDR_{t,t+3}$		0.578*** (10.37)		
$IDR_{t,t+5}$			0.487*** (27.96)	
$IDR_{t,t+10}$				-0.0356 (-0.27)
Constant	0.0945*** (12.10)	0.198*** (16.54)	0.109*** (9.74)	0.199*** (10.04)
Observations	828	667	516	143
Adjusted R^2	0.393	0.048	0.613	-1.064

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

References

Abor, J. (2005). The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. *The Journal of Risk Finance*,6(5), 438-445.

Adami, R., Gough, O., Muradoglu, Y. G., & Sivaprasad, S. (2015). How Does a Firm's Capital Structure Affect Stock Performance? *Frontiers in Finance and Economics*, 12(1), 1-31.

Baker, H K & Martin, G S 2011, *Capital Structure and Corporate Financing Decision: Theory, Evidence and Practise*, pp. 75-90, John Wiley & Sons, Inc, New Jersey

Baker, M., & Wurgler, J. (2002). Market Timing and Capital Structure. *The Journal of Finance,57*(1), 1-32.

Barclay, M.J. and C.W. Smith, 1995, "The maturity structure of corporate debt", *Journal of Fi*nance 50, pp.609-631.

Bhandari, L. C. (1988). Debt/Equity Ratio and Expected Common Stock Returns: Empirical Evidence. *The Journal of Finance*, 43(2), 507.

Brealey, R. A., Myers, S. C., & Allen, F. (2011). *Principles of corporate finance*. New York: McGraw-Hill/Irwin.

Brooks, C. (2014). *Introductory econometrics for finance*. Cambridge: Cambridge University Press.

Capital Structure - What is Capital Structure & Why Does it Matter? (n.d.). Retrieved from https://corporatefinanceinstitute.com/resources/knowledge/finance/capital-structure-overview/

Drobetz, W., & Pensa, P. (2007). Capital Structure and Stock Returns: The European Evidence. SSRN Electronic Journal.

Dutch economy expanded by 3.1% last year, highest in 10 years. (2018, February 14). *DutchNews.nl*. Retrieved May 15, 2018, from https://www.dutchnews.nl/news/2018/02/dutch-economy-expanded-by-3-1-last-year-highest-in-10-years/

Fisher, E., Heinkel, R., Zechner, J., (1989). Dynamic Capital Structure Choice: Theory and Tests. *Journal of Finance*, 44(1), 19-40.

Gill, A., Biger, N., & Marthur, N. (2011). The Effect of Capital Structure on Profitability: Evidence from the United States. *International Journal of Management,* 28(4), 3-15.

Graham, J. R., & Harvey, C. R. (2001). The Theory and Practice of Corporate Finance: Evidence from the Field. *Journal of Financial Economics*, 60(2), 187-243.

Haan, L. D., & Hinloopen, J. (2003). Ordering the Preference Hierarchy for Internal Finance, Bank Loans, Bond and Share Issues: Evidence from Dutch Firms. *Tinbergen Institute Discussion Paper*.

Hamada, R. S. (1969). Portfolio Analysis, Market Equilibrium And Corporation Finance. *The Journal of Finance*, 24(1), 13-31.

Harris, M., & Raviv, A. (1991). The Theory of Capital Structure. The Journal of Finance, 46(1), 297.

Hovakimian, A., Opler, T., & Titman, S. (2001). The Debt-Equity Choice. *The Journal of Financial and Quantitative Analysis,36*(1), 1.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics,3*(4), 305-360.

Leary, M. T., & Roberts, M. R. (2004). Do Firms Rebalance Their Capital Structures? *The Journal of Finance,* 60(6), 2575-2619.

Lemmon, M.L., Roberts, M.R. and Zender, J.F. (2008), Back to the Beginning: Persistence and the Cross-Section of Corporate Capital Structure. *The Journal of Finance*, Vol. LXIII, No.4, pp. 1575-1608.

Margaritis, D., & Psillaki, M. (2010). Capital structure, equity ownership and firm performance. *Journal of Banking & Finance,34*(3), 621-632.

Masulis, R. W. (1983). The Impact of Capital Structure Change on Firm Value: Some Estimates. The Journal of Finance, 38(1), 107-126.

Mocking, R., & Steegmans, J. (2017). Capital structure determinants and adjustment speed: An empirical analysis of Dutch SMEs. *CBP*.

Modigliani, F & Miller, M H 1958, The Cost of Capital, Corporation Finance and the Theory of Investment, *The American Economic Review*, 48, 261-297.

Myers, S. (1984). Capital Structure Puzzle. *The Journal of Finance*, 39(3), 574-592.

Myers, S. C. (2003). Financing of corporations. *Handbook of the Economics of Finance,* 1, 215-253.

Myer, S. C. & Majluf N. S. (1984). Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have. *Journal of Financial Economics*, 13(2), 187-221.

Penman, S. H., Richardson, S. A., & Tuna, A. I. (2007). The Book-to-Price Effect in Stock Returns: Accounting for Leverage. *Journal of Accounting Research, 45*(2), 427-467.

Rajan, R.G. and L. Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance,* 50(5), 1421-1460.

Rajan, R., & Zingales, L. (1996). Financial Dependence and Growth. *The American Economic Review,88*(3), 559-586.

Titman, S., & Wessels, R. (1988). The Determinants of Capital Structure Choice. *The Journal of Finance,43*(1), 1.

Welch, I. (2004). Capital Structure and Stock Returns. *Journal of Political Economy,112*(1), 106-132.

Sengupta, P. (1998). Corporate Disclosure Quality and the Cost of Debt. *The Accounting Review,73*(4), 459-474.

Shyam-Sunder, L., and S. C. Myers (1999). Testing static trade-off against pecking order models of capital structure, *Journal of Financial Economics,* 51, 219-244.