

Deviation from the target capital structure and acquisition behavior - European evidence

Finance
Master's thesis
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2012

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Master's Thesis

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Abstract

July 15, 2012

DEVIATION FROM THE TARGET CAPITAL STRUCTURE AND ACQUISITION BEHAVIOR – EUROPEAN EVIDENCE

PURPOSE OF THE STUDY

The purpose of this study is to analyze how acquisition behavior is affected if the acquiring company has a capital structure that deviates from the optimal, i.e. the acquirer is either underleveraged or overleveraged. Despite that both capital structure choices and M&As have been vastly researched topics in financial economics, the studies combining these two fields are few. My study observes if the deviation from optimal capital structure increases or decreases the probability for making an acquisition, if it affects the method of payment, or if capital structure of the acquirer is reflected in the abnormal announcement return.

DATA

The data used in the study consists of acquisitions executed between 2000 and 2010 in EU15 countries with a value higher than €1 million. These 3,313 acquisitions were compared to 26,050 firm years having adequate financial information available to calculate the optimal capital structure and the deviation from it. The acquisition data was collected from Securities Data Company (SDC) while the sample for firm years was retrieved from Thomson One Banker.

RESULTS

I found evidence that companies near to the optimal capital structure are the most active acquirers. Acquisition probability declines especially if a company is highly overleveraged but also underleverage is associated with lower acquisition probability. Additionally, overleveraged companies are more likely to use equity as a consideration, especially in firm acquisitions. The difference in asset acquisitions is not significant, though. Overleveraged companies as well as highly underleveraged seem to make more shareholder value increasing acquisitions and are welcomed with above average abnormal announcement return.

KEYWORDS

Optimal capital structure, leverage deficit, mergers and acquisitions

Aalto-yliopiston kauppakorkeakoulu

Tiivistelmä

Rahoituksen laitos

15. heinäkuuta 2012

Pro Gradu -tutkielma

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MITEN POIKKEAMA OPTIMAALISESTA PÄÄOMARAKENTEESTA HEIJASTUU YRITYSKAUPPOIHIN – TUTKIMUS EUROOPPALAISISTA YRITYKSISTÄ

TUTKIELMAN TAVOITTEET

Tämän tutkielman tavoitteena on selvittää miten poikkeamat optimaalisesta pääomarakenteesta, eli yrityksen yli- tai alivelkaantuminen, heijastuvat yrityksen tekemiin yrityskauppoihin. Vaikka pääomarakenne sekä yrityskaupat ja -fuusiot ovat rahoituksen alalla erityisen tutkittuja aiheita, näiden kahden vaikutusta toisiinsa ei ole kuitenkaan laajemmin tutkittu. Tutkielmassa tarkastellaan miten poikkeama optimaalisesta pääomarakenteesta vaikuttaa tehtyjen yrityskauppojen määrään, niissä käytettyyn vastikkeeseen sekä julkistuksen kurssireaktioon.

LÄHDEAINEISTO

Tutkimuksen lähdeaineisto koostuu EU15-maisten yritysten vuosina 2000-2010 tekemistä yrityskaupoista, joiden arvo on ollut yli miljoona euroa. Näitä 3313 yrityskauppaa on verrattu 26050 yritysvuoteen joille on kyetty laskemaan optimaalinen pääomarakenne sekä poikkeama siitä. Tiedot yrityskaupoista on haettu Securities Data Companyn (SDC) tietokannasta. Yrityskohtaiset tiedot on puolestaan noudettu Thomson One Banker - tietokannasta.

TULOKSET

Löysin todisteita, että yritykset joiden pääomarakenne on lähellä optimaalista ovat kaikkein aktiivisimpia yrityskauppojen tekijöitä. Ylivelkaantuneet tai selvästi alivelkaantuneet yritykset sen sijaan tekevät huomattavasti vähemmän yrityskauppoja. Ylivelkaantuneet ostajat käyttävät niin ikään useammin omia osakkeitaan vastikkeena, varsinkin kun ne ostavat kokonaisia yrityksiä. Omaisuuseriä ostettaessa ero käytetyssä vastikkeessa ei ole merkittävä. Ylivelkaantuneiden tai selvästi alivelkaantuneiden yritysten julkistaessa yrityskauppojaan markkinareaktio on selvästi keskimääräistä korkeampi.

AVAINSANAT

Optimaalinen pääomarakenne, pääomarakenteen poikkeamat, yrityskaupat

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1. Introduction

1.1 Background of the study

How a company should finance its operations? This is a question that has been addressed ever since Modigliani and Miller published their article addressing the question of optimal capital structure in 1958. This topic has been vastly researched during the past decades since there is no absolutely right answer. Additionally, capital structure is highly conditional to firm specific characteristics. Despite the complexity of the question, academics have been able to find somewhat good consensus on the main factors determining the equity-debt choice. Based on the research made so far, we can form an estimate on the optimal capital structure for each firm that would maximize the equity value. Another question concerns what are the implications if a company has a capital structure that deviates from the optimal. If a company is highly overleveraged or underleveraged, it has an effect on the day-to-day operations the company is running. But especially it has an effect when the company is making long term strategic moves.

Mergers and acquisitions have attained a lot of interest in financial economy and been a continuous topic for studies. This is logical taking into account the importance of these events for the success of companies. Mergers and/or acquisitions are perhaps the most important decisions that company management has to make determining if the company will be successful in the future or not. Therefore, motives that drive to these major corporate events and also the benefits acquisitions yield have been vastly studied. However, we cannot say that academics have found clear answers on the main questions related to M&A. Most argued question is if acquisitions really increase shareholder value of the acquiring company. Several studies have actually noticed that acquisitions quite often are bad deals for the acquirers' shareholders. This has most likely been the reason why M&As continue to be one of the most researched topics in financial literature.

Capital structure choices and acquisitions behavior are topics that have been under scrutiny, but their combination is a field that has not researched that vastly. Only recently has this raised more discussion within academics. My study will now continue to observe the overlap of capital structure choices and M&A activity. In this study I will focus on how M&A behavior is affected by the capital structure. This will be done by analyzing the recent

acquisitions that companies operating in Europe have made. The inspiration for this study is derived from an article by Uysal (2011) who studied how the deviation from the optimal capital structure is affecting the acquisition choices by U.S. companies between years 1990-2007.

I will focus on three different topics relating to leverage deficit¹ and acquisition behavior. Firstly, I will observe if the deviation from the optimal capital structure is reflected in the likelihood of a company making acquisitions. Secondly, how the method of payment is affected by overleverage or underleverage of the acquiring company. And thirdly, if abnormal announcement return differs based on if the acquirer is either over- or underleveraged.

1.2 Limitations of the study

The main limitation of this study relates to the quality of data. The financial data which was received from Thomson One Banker may contain errors which can be reflected in the final results as well. The previous studies have found several factors that have been observed to have an effect on the capital structure choices companies make. However, some of this financial information was not available in Thomson One Banker which limited the number of variables that were used to determine the optimal capital structure. Therefore, there can be inaccuracies in the calculated target leverage ratios. Due to the large sample size I had neither a possibility to reassure the quality of the data that Thomson One Banker provided. However, the clearest outliers were removed by winsorizing the tails of the sample. The data is collected from the beginning of year 2000 to the end of 2010. Quality and availability of data is markedly weaker during the early 2000s which means that relatively the sample is biased towards last few years of the sample.

Other notice is related to the M&A data retrieved from Securities Data Company (SDC). Deal announcement dates as well as deal values and other information are taken as given thus I am not able to control any inaccuracies. The two samples, from Thomson One Banker and SDC, are matched by using company specific SEDOL codes as well as creating an individual code for each of the companies which was a combination of the name and SIC codes. However, this left vast amount of acquisitions unidentified which may have an effect on the final results.

¹ With leverage deficit I am referring to the deviation from optimal capital structure which is modeled by utilizing the existing literature made on the topic. Further on in this study if the sign of the leverage deficit is negative, it refers to overleveraged company, while positive sign refers to underleveraged company.

Companies from the United Kingdom are over-presented in the sample. This is due to the fact that the data quality is significantly better in UK than in other EU15 countries. As a result, I was able to calculate the leverage deficit for more UK companies. Additionally, the process of combining these two samples left less UK deals out of the final sample. As a result, the comparison between United Kingdom and Ireland versus rest of the EU15 countries may become biased, especially when observing the acquisition probability.

1.3 Main findings

When modeling the optimal capital structure I noticed that companies on average are slightly underleveraged and they could increase the shareholder value by increasing their leverage ratio modestly. However, the fluctuation between companies was vast and the sample included highly overleveraged as well as well underleveraged companies. The density distribution of leverage deficits² is presented in Figure 5. The figure gets a clear bell shape, albeit being slightly skewed to right meaning that number of underleveraged companies is higher than overleveraged. However, firm years are quite normally distributed between leverage deficit tranches.

The first part of the study was to observe if leverage deficit affects the acquisition probability. I found strong evidence that companies that are near to their optimal capital structure are the most active acquirers. When a company is either overleveraged or underleveraged its probability of making an acquisition starts to decline markedly. This phenomenon is even more significant when observing overleveraged companies that tend to be less active acquirers in all acquisition categories, within industry acquisitions being the only exception. However, relative size³ tends to increase when the deviation from the optimal capital structure increases. Especially this applies to overleveraged companies tending to make relatively larger acquisitions the further they deviate from the optimal leverage ratio. Hence, the total deal value does not differ that much between leverage deficit tranches as the lower acquisition probability is offset by higher average deal values. The results for acquisition probability and relative deals size are presented on more detailed level in Chapter 5.1.

Secondly, I am studying if leverage deficit is reflected in the method of payment. I did not find strong evidence that overleveraged companies would be less likely to do pure cash

² Leverage deficit being the difference between modeled optimal leverage ratio and actual

³ Relative deal size is calculated by dividing the total deal value within the a fiscal year by the year end market capitalization of the acquirer

acquisitions. What comes to asset acquisitions, the more a company is overleveraged the more likely it is to do pure cash acquisitions. This result is not statistically significant, though. I observed that underleveraged companies are more frequently using pure cash to pay their asset acquisitions. Same kind of behavior was not perceived in firm acquisitions. When the approach was extended and studied if the relative proportion of cash used as a consideration changes along with the leverage deficit, I noticed that overleveraged companies are significantly less likely to use cash in firm acquisitions but not in asset acquisitions. For underleveraged companies the results didn't differ substantially. Leverage deficit and method of payment is addressed further in Chapter 5.2.

The third part of the study focuses on abnormal announcement returns. Overleveraged companies were on average welcomed with above average announcement returns. The more a company is overleveraged the higher the announcement return tends to be. Underleveraged companies performed worse in this comparison on average. However, it seems that companies that are slightly underleveraged are especially underperforming while the announcement return improves the more a company is underleveraged. Announcement returns are addressed in Chapter 5.3.

1.4 Structure of the study

The paper is organized as follows. In Chapter 2 I address the literature related to this topic. Firstly, I take a look on the literature on mergers and acquisition, reasons behind why companies acquire or merge with other companies and if they really create value. Secondly, I will introduce the readers with the topic of optimal capital structure and what effects previous studies have found the capital structure to have. In Chapter 3 I describe the data gathering process and give more detailed information about the sample. Chapter 4 is reserved for the calculation of optimal capital structures and leverage deficits. The results of the empirical analysis made on leverage deficit and acquisition behavior are presented in Chapter 5. In this chapter I will also analyze the results and link it to existing literature and give alternative explanations if results differ from the expected. Chapter 6 summarizes the results and concludes the study.

2. Literature review and hypotheses

During the past decades a vast number of studies have been made on mergers and acquisitions. Due to their importance in company life cycles the topic has raised a lot of questions among academics. Under vivid discussion has been the question whether acquisitions really create value for the acquiring firm. The lack of clear consensus has resulted in the topic being studied from different perspectives. In this literature review I will give an overview on the motives behind mergers and how the existing literature has addressed the successfulness of acquisitions and which are the main factors behind merger success or possible failures.

In the second part of the literature review I will focus on the firms' capital structures and introduce the readers with the research that has been made on the question of optimal capital structure. This topic has been much discussed after the study made by Modigliani & Miller, released in 1958. Ever since, several academics have addressed the same question from different angles. I will briefly go through this discussion that has been made during the past decades. After that I shall continue with the literature addressing the effect of capital structure on the M&A behavior and successfulness.

After the literature review I will state my hypotheses for this study and briefly explain how they have been chosen.

2.1 M&A motives and outcomes

In the first part of this literature review I will address the motives for acquisitions that the academics have pointed out and then how acquisitions have observed to create value. After that I go through the discussion whether acquisitions create value for shareholders of the acquiring company. The first part of the literature review will be ended by presenting the factors that have noticed to result in better post-acquisition performance.

2.1.1 Reasons behind M&As and M&A successfulness

Besides of organic growth, acquisitions are the other way for companies to expand their operations. Additionally, an acquiring company may seek to improve its operating efficiency through acquisitions. Every acquisition has its own motive but usually the benefits that

companies are striving for through acquisitions can be divided into three categories (Devos et al., 2009): First and foremost are the productive synergies accounting for most of the benefits. Other merger benefits arise from favorable changes in taxation, while the third one, increased market power, is not considered to yield any significant benefits due to the existence of competition authorities who would block the deals resulting in too high market dominance. This outcome is in line with study by Healy et al. (1992) who were one of the first academics to research if the post-merger performance of the acquiring company really improves. In their paper they also underlined operational synergies and tax saving as the two most significant benefit sources. When a merger is announced the combined equity value of the merging companies tends to increase. This reflects the fact that investors expect that the companies are worth more together than separately. This kind of market reaction proves that mergers are really value creating assuming that the semi-strong market hypothesis holds and stock prices ought to reflect all the publicly available information (Jensen (1978)). Based on the existing research the combined equity value can increase quite significantly. In the study from Devos et al. (2009), it was calculated that on average the combined equity value increases by 10.03 per cent when a merger is announced. The same applies for smaller acquisitions as well.

However, a topic where a clear consensus has yet to be reached is if shareholders of the acquiring company really benefit from an acquisition. When acquisition is announced the shareholders of the target company will enjoy a significant positive cumulative abnormal return (CAR) as the return for the acquiring company's shareholders remain more modest. This question has been studied by various academics. A consensus seems to be that the CAR for acquirers' shareholders remains more or less flat. E.g. Campa et al. (2004), Healy et al. (1992) and Loughran et al. (1997) has observed that on average shareholders of the acquiring company get a zero return during the announcement window, while shareholders of the target companies get significantly positive abnormal returns. Especially larger firms tend to make acquisitions that destroy shareholder value. Moeller et al. (2004) observed a value-weighted CAR of -1.18 per cent in their study that included acquisitions with a value over \$1 million between years 1980 and 2001, the equally-weighted CAR being 1.1 per cent positive. In the following study Moeller et al. (2005) noticed that during the merger wave between 1998 and 2001 the wealth destruction was especially high as on average acquirers lost 12 cent per dollar they had spent on acquisitions. Thus it seems that in short-term the acquisitions do not pay off for the acquirers' shareholders and the benefits of the synergies are distributed to the target company's shareholders in form of premiums.

This leaves us with a question that why acquisitions are done overall if the abnormal announcement return for the acquirers' shareholders is negative, or at least not positive. Healy et al. (1992) sums up that shareholders of the acquiring company benefit in form of company's post-merger operational improvements. The academics have not found a consensus if the long term performance really improves. Healy et al. examined 50 largest U.S. mergers completed between 1979 and mid-1984, and observed a significant improvement in the operating cash flow during the 5 post-merger years when the comparison was made in the peer group of companies operating in the similar industries. However, when Ghosh (2001) observed acquisitions completed between 1981 and 1995 and compared their post-merger performance to companies that were similar by size and past performance he found no improvements in operating performance. When examining UK takeovers completed over the period of 1985 and 1993, Powell & Stark (2005) found a modest improvement in operating performance.

Agrawal et al. (1992) studied extensively all the acquisitions made between 1955 and 1987 by NYSE⁴ listed companies. After adjusting their results for the firm size effect and beta risk they observed that acquiring companies suffer a statistically significant 10 per cent loss in shareholder wealth during the five year time period after the merger is completed. This strongly indicates that the materialized synergies are markedly lower than expected by the acquirer. Additionally this is a sign that investors aren't either able to estimate the possible synergies.

Based on the existing literature it is difficult to say how acquisitions are creating value for the acquirer. More evident is that acquisitions are a risk for the acquirer and are not always beneficial for the shareholders. Due to the lack of common understanding, the existing literature does not provide us a very strong foothold to evaluate the successfulness of the acquisitions from the acquirers' point of view. However, the factors that tend to lead to more successful acquisitions have been able to identify. By knowing these factors, it enables me to continue to analyzing how acquirer's leverage ratio can affect the success of an acquisition, which is one of the main questions studied in this thesis.

⁴ New York Stock Exchange

2.1.2 Factors associated with merger success

Various academics have found certain patterns that tend to lead to more successful acquisitions. It is widely recognized that acquisitions paid with cash lead to higher performance/return improvements than acquisitions where equity is used as payment. (e.g. Fuller et al. (2002), Ghosh (2001), Loughran et al. (1997), Myers & Majluf (1984) and Powell et al. (2003)). Myers et al. found out that cash flows following cash acquisitions increase on average by 3 per cent, which was mostly due to reduced costs and not to increased sales. The result is similar to what Linn & Switzer (2001) observed. In their study Linn & Switzer present a 3.14 per cent improvement in pretax operating performance for cash offers which is significantly higher than 0.77 per cent noticed for stock offers.

However, stock offers can still create value for acquirers' shareholders. Moeller et al. (2005) underline that amount of stock offers is associated with high stock valuations. Additionally, stock mergers do create value in situations where the acquirer is more overvalued than the target company (Savor & Lu (2009)). Thus a stock merger may increase shareholder value even though there were no synergies available, if the acquirer is heavily overpriced, i.e. the overvalued assets are transferred to assets with lower (over)valuation. When evaluating stock mergers, an important question is whether the acquirer would have performed better without the merger. Devos et al. (2009) underline that the performance of a merging firm may deteriorate compared to the industry benchmarks after the merger. However, the performance may still be superior compared to the performance without the merger. Comparison of stock and cash mergers is, therefore, not so straightforward. As stock offers tend to take place when the acquirer is overvalued and cash offers when undervalued, the comparison is modestly biased. High valuation is often related to above industrial benchmark performance and therefore, a comparison to the same benchmark tend to indicate a poorer performance. While cash offers are usually executed when managers of the acquiring company think that the company is undervalued or trading at fair value.

When a merger is announced it always contains new information about the company. Managers have an incentive to work in a way that is beneficial for the existing shareholders. Therefore, it is widely acknowledged that managers are willing to issue equity whenever it considers the stock to be overvalued. Thus whenever a stock merger is announced, it is also a statement from the management. Myers et al. (1984) and Savor et al. (2009) have addressed this matter and have concluded that overvalued companies want to exploit the misvaluation

by using their equity as a currency in mergers. Hence when investors are given such a strong indicator on the company valuation, it will for sure be reflected in the share price negatively.

Along with the type of payment also other factors affect the future performance of merging companies. Moeller et al. (2004) found correlation between firm size and the post-merger performance development. According to Moeller et al. acquisitions made by smaller companies are profitable, while acquisitions made by larger companies result in large losses on average. They examined acquisitions made between 1980 and 2001 during which time period profits from acquisitions made by small companies amounted to \$9 billion whereas acquisitions by large companies resulted a staggering loss of \$312 billion.

Fuller et al. (2002) observed that acquisitions of private targets in general lead to significantly positive results while acquisitions of public companies yield negative return for acquirers. One reason provided is that private companies are more difficult to sell than public companies and that the lack of liquidity declines the value of a private company.

The size-effect also clarifies why acquisitions made by smaller companies result in better performance than by larger companies. Moeller et al (2004) documented that only about 25 per cent of the public companies acquired, are acquired by small companies. While on the contrary about half of the private companies acquired are acquired by small companies. Additionally, the form of payment doesn't seem to have a significant effect on the post-merger performance when acquiring a private company. Fuller et al. (2002) however noticed that when the relative size of a public target increases the post-acquisition return increases when cash is used as a payment. Additionally, Loughran et al. (1997) noticed that tender offers are more beneficial for the acquirers' shareholders compared to other, thus also the type of merger has an effect on the post-acquisition performance.

2.2 Optimal balance sheet structure and main drivers

The existing literature has found several factors affecting the M&A behavior and successfulness. As this study focuses on the effect of the capital structure on the M&A behavior and success, I will next address the literature related to the topic of capital structure. The question of optimal capital structure has been constantly present ever since Modigliani and Miller in 1958 released the first study addressing this question. I will go through the history of literature related to the optimal capital structure and the decision whether to finance

operations either with equity or debt. I continue by addressing if the capital structure has an effect on M&A activity. Towards the end of the literature review I will address the literature related to my topic and briefly present how the deviation of the optimal capital structure has observed to affect the M&A behavior.

2.2.1 Optimal capital structure

Defining the optimal capital structure has been a question addressed for several decades but still lacking the absolutely right answer. Perhaps the first and the best known study that started the vivid discussion about the optimal capital structure was the article written by Modigliani and Miller (1958). According to their study, the value of the corporation is not affected by the way it is financed – debt finance, equity finance or retained earnings. Basically, all the investments that yield a return higher than the current return requirement of the company should be executed. However, this theorem holds only in the perfect market environment, e.g. there is neither corporate tax levy for corporate earnings nor a possibility for a firm to go bankrupt. Modigliani and Miller revised their study afterwards (Modigliani & Miller 1963) by stating that due to tax deductibility, the optimal capital structure would prefer debt against equity.

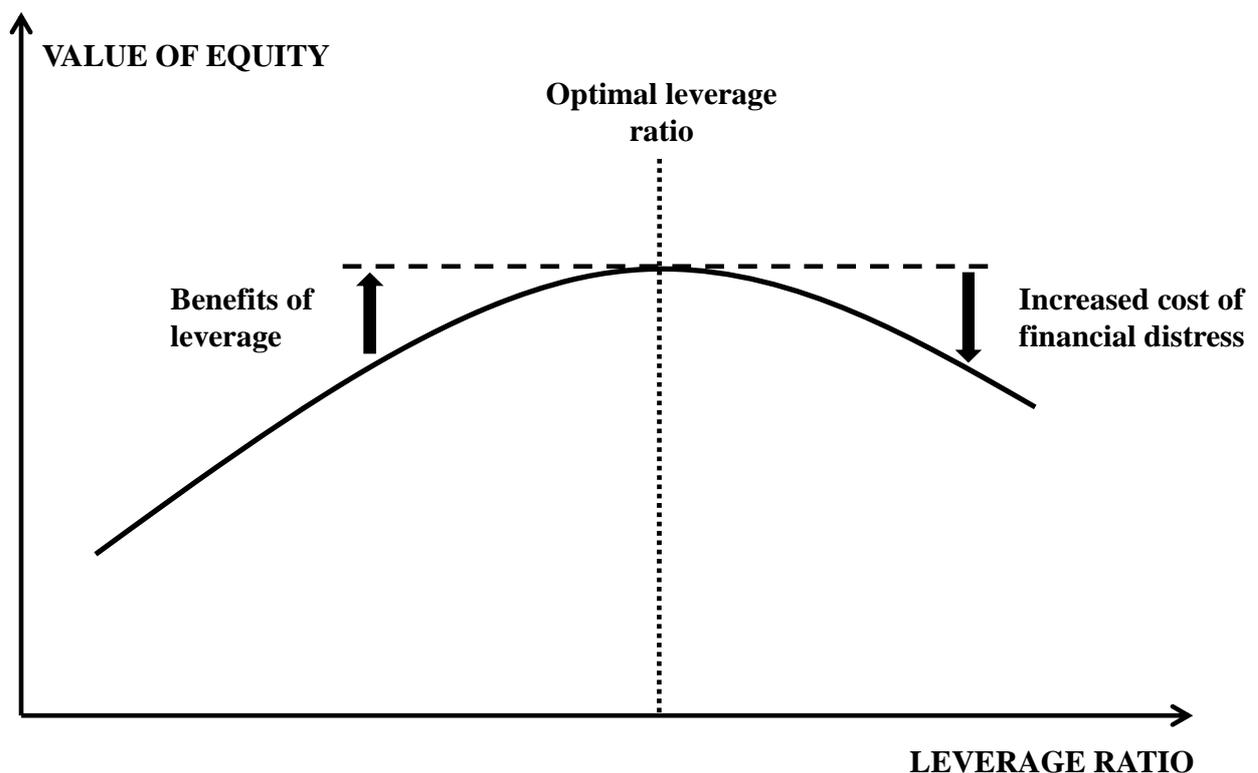
The research made by Modigliani and Miller was followed by several other studies that were questioning as well as completing the very theoretical approach of Modigliani and Miller. For instance Robichek and Myers (1966) stated that some leverage is good for a company if corporate income is taxed and interest expenses can be deducted from the taxable income. However, they also argue that if the company leverage becomes too high it will eventually become disadvantageous to the shareholders. Therefore, the equity value will increase when a company increases its leverage if a company has little or no debt, but decline if a company is already highly leveraged. Thus a company can find an optimal level of leverage where its equity value is maximized and increase or deduction in debt would be unbeneficial for the shareholders.

In the following studies the theory of optimal capital structure has deepened the study of Modigliani and Miller. Several researchers have provided their own point of view on the matter and completed the research on this specific area. For instance Stiglitz (1974) states that if the assumptions made by Modigliani and Miller hold, neither does the dividend-retention ratio, maturity structure of debt nor firms' security holding affect the valuation of the

company. Han Kim (1978) launched the concept of corporate debt capacity, meaning the maximum amount of debt that a company may borrow from the financial markets. Han Kim found out that the optimal capital structure is not determined by the lenders willingness to provide finance. He stated that by offering a higher interest rate for lenders a leveraged company can further increase its leverage to relatively high level before reaching the ceiling of the debt capacity. However, he proves that the optimal capital structure from the investors' perspective is reached before than financial markets start to refuse to lend. Towards the late 1970s, after 20 years of vivid discussion on different aspects affecting the balance sheet structure, academics were to find a consensus that an optimal capital structure can be determined. The common agreement seemed to be that optimal leverage ratio is reached when the tax deductibility of interest rate costs is just enough to offset the cost of financial distress.

Figure 1 – Optimal capital structure

Figure 1 illustrates how the value of equity changes when leverage ratio increases. Benefits of debt, e.g. tax deductibility, increases the equity value as long as the benefits of debt offset the increased cost of financial distress.



2.2.2 Factors affecting the optimal capital structure choice

During the following 20 years from the publishing of Modigliani and Miller's capital structure hypothesis, discussion was mostly focused on the tax-deductibility of interest payments and the costs of financial distress, and how those two factors are determining the optimal leverage ratio. However, as companies tend to have quite marked differences in their capital structures, academics started to pay more attention on the factors causing such differences. During the 1980s the research on this topic was focusing on the firm level attributes that are reflected in the capital choice. Several academics began to employ empirical data to be able to define in more detail how the companies, as well as, investors are addressing this topic.

Bradley et al. (1984) noticed that regulated industries in general seem to have higher leverage ratios, at least so was the situation during 1960s and 1970s from which time frame the sample was collected from. The other observation by Bradley et al. was that companies with higher R&D and advertisement costs tend to be less leveraged. Titman (1984) researched how the industry affects the capital structure and especially if some specific industries are more vulnerable for overleverage. However, it was not until 1988 when Titman & Wessels took a more empirical approach on the matter and widely covered the different factors that have either positive or negative effect on the leverage ratio. Harris & Raviv (1991) summed up the research made during the 1980s and also found common ground between the various studies. These both two studies had quite a similar outcome. Size of the company, amount of fixed assets and non-debt tax shields were considered to be factors increasing the possibility for raising debt. E.g. growth, volatility of cash flows, and uniqueness of products, on the other hand, were observed to be factors declining the debt capacity. These two studies, along with other relevant ones, are addressed in more detailed level in Chapter 4.1 where the methodology for the optimal capital structure calculation is presented.

Every firm has a capital structure that maximizes the value of the firm. Despite being difficult to very precisely define the optimal ratio for each individual firm, we may still, based on the existing academic research, relatively well estimate what the leverage ratio should be. Despite that there ought to be some variation in capital structures based on the company profiles, there are relatively vast differences even between companies with similar kinds of profiles. Thus the reason for such a fluctuation cannot be only due to randomness. Graham (2000) says that on average companies are underleveraged and could increase their value by taking more debt.

Several academics have addressed the question that if companies could increase their value by optimizing their capital structures why do they not do that (e.g. Myers (1984), Shyam-Sunder & Myers (1999), Frank & Goyal (2003), Ju et al. (2005)). Literature acknowledges two theories that have been seen as reasons for the deviation from the optimal capital structure; *Pecking order theory* and *Trade-off theory*.

Pecking order theory, which has been the traditional model for analyzing the formation of firm capital structure, is based on the observed financing pecking order that firms tend to follow. Based on the pecking order theory, when financing their investments and operations, companies tend to prefer (1) *internally generated funds* and adjust their dividend payout ratios in a way that they do not have to rely on external sources of finance. If there is not enough internally generated funds available, companies will first rely on (2) *secured external finance, i.e. debt*. (3) *Equity* is only the final source of finance that is raised (e.g. Myers (1984), Frank & Goyal (2003)). Myers and Majluf (1984) stated this is mostly due to asymmetries of information between the management and investors which limits the possibility for management to issue information sensitive securities. Pecking order theory assumes that companies optimize their capital structure by making independent financing decisions that at that precise moment are the most beneficial. According to Shyam-Sunder & Myers (1999) this means that under pecking order theory companies do not have well defined optimal capital structure but is rather a result of several independent financing decisions.

Trade-off theory takes a different perspective for the optimal capital ratio. Contrary to the pecking order theory, the trade-off theory assumes that each company has an optimal capital structure and that the company management also knows that. Based on the trade-off theory, companies make their financing decisions so that they always move towards the optimal capital structure. Thus they are always trying to balance the value provided by interest tax shields with the costs of financial distress that arise along with the higher leverage ratio (e.g. Myers (1984) and Hovakimian et al. (2001)). In the real life there are different boundaries that make it more difficult to reach the optimal capital ratio. According to Myers (1984), the adjustment costs are the main reason for non-optimal capital structures. If there were no costs to adjust the capital structure according to trade-off theory, most of the companies would have a capital structure more close to the optimal one. Thus companies adjust their capital structure towards the optimal whenever it makes financially sense. Ju et al. (2005) studied in more detailed the adjustment costs. They argue that a deviation even as high as 10 percentage

points from the optimal leverage ratio can be accepted before the gains from adjustment exceed the costs.

Despite having different approach to the matter, both pecking order theory and trade-off theory can be used to explain why companies' leverage ratios differ that vastly. These two theories and their applications are widely research but more detailed discussion of the topic is out of the scope of this thesis.

2.3 Balance sheet structure and M&A behavior

Despite the vast amount of research that has been made both on the capital structure and acquisition behavior studies combining these two areas are relatively few. Only recently this topic has gained more attention among academics. However, Harford et al. (2009) and Uysal (2011) were one of the first academics to carry out a more thorough research on how capital structure can affect the acquisition behavior. Related research has been made quite extensively, though. When Jensen published his first paper on agency problems in 1986 the effect of cash reserves on acquisitions has been a much discussed topic ever since. Another relatively common topic to be researched is how leverage is related to successfulness on competed takeovers, how leverage affects the method of payment, and how the capital structure changes post-acquisition. In this part of the literature review I will present the most relevant literature from these topics described above in chronological sequence.

Jensen (1986) published a path breaking research on agency costs of free cash flow. The main argument Jensen stated was that corporate management tend to make investment decisions that are not in line with shareholders' interests. Thus companies with higher cash reserves are more likely to make bad investment choices. Ten years later Martin (1996) observed that companies with higher valuation are more likely to use equity to finance acquisitions but reported also that the probability decreases with higher cash reserves. This area of studies was continued by Harford in 1999 when he studied the relation of cash holdings and acquisition behavior. Harford noticed that cash rich companies are more likely make non-competed, value-destroying cross-industry acquisitions, signaling severe agency problems. Mikkelson & Partch (2003) also found out that larger cash reserves are related to unusually high investment and R&D expenditure. Since investors are familiar with the agency problems, companies with excess cash reserves are trading on discount against its peers with lower cash reserves, especially in countries with weaker investor protection (Kalcheva & Lins (2007)).

Previous studies have shown that companies do take into account their capital structure when making acquisitions. Morellec & Zhdanov (2008) pointed out that companies with below industry average leverage ratio are more likely to win the acquisition bids, albeit they should lever up once the acquisition is made. Their results are similar to Clayton & Ravid (2002) who said that companies with higher leverage ratio tend to make lower bids thus being less likely to win. Ghosh & Jain (2000) had addressed the same issue as well when they noticed that post-acquisition leverage ratios tend to be clearly higher than before acquisition. They assumed the increased debt capacity to be the main driver for the increase in leverage ratio but didn't address how the pre-acquisition leverage ratio could contribute to the successfulness of the bid. It seems that this phenomenon enhances along with the industry competitiveness. Almazan et al. (2010) reported that companies located in industry clusters with higher competition on possible acquisition targets have larger cash balances and more financial slack, and those companies also execute more acquisitions than their peers. Uysal (2011) also pointed out that overleveraged companies tend to move towards their target capital structures by issuing equity if they are anticipating acquisitions in the near future. Underleveraged companies seem to increase their leverage after acquisitions, but Harford et al. (2009) observed that also overleveraged companies will move towards their target capital structure after the acquisition. Harford et al (2009) noticed that during the 5 year time period after the acquisition overleveraged companies have heavily cut their debt ratios. It seems that companies do follow trade-off theory but may differ from the optimal capital structure if needed to secure the success in acquisitions.

Two recent studies from Harford et al. (2009) and Uysal (2011) have taken a more detailed view on how the deviation from optimal capital structure is reflected in acquisitions. Harford et al. (2009) found clear evidence that in spite of acquisitions companies do not want to deviate from their target capital structure due to the costs of readjustments. They state that companies tend to tailor the consideration in a way that it would help them to reach the target leverage ratio or at least not to deviate more from it. Thus overleveraged companies are more likely to use equity as a consideration and underleveraged cash. Uysal (2011) additionally found interesting results that overleveraged companies are less likely to make acquisitions, which is not surprising taking into account the discussion in the previous chapter, but that those acquisitions are also more value-enhancing and receive higher abnormal returns at announcement. Uysal also reported lower premiums paid on targets in acquisitions where acquirer is overleveraged and lower probability of using cash as a consideration. It seems that

despite overleveraged companies are less likely get their bids accepted they are still able to capture the value better than underleveraged companies.

2.4 Hypotheses

My study will observe three main hypotheses which are based on the existing academic research. The study can be divided into two broad categories. First, I will study how the deviation from the target capital structure affects the likeliness of making acquisitions. The second category consists of three different hypotheses that will take a closer look on how the deviation from the optimal capital structure will affect the acquisition behavior when a company has decided to enter the acquisition market. Now I will present the three hypotheses that act as a backbone for this research.

Hypothesis 1: Companies with higher leverage deficit are less likely to do acquisitions

The first hypothesis observes how the leverage deficit affects the probability of a company to make acquisitions. The existing literature has a clear consensus that the amount of deficit affects the acquisition activity. Myers (1977) for instance says that leveraged companies find it more difficult to gather finance for investment purposes. Additionally, agency problems are more likely for companies not bound on external finance. Jensen (1986) addressed this issue by stating that management tends to engage in investments that are not beneficial from shareholders perspective if company has internal financing available. If company must rely on external capital it becomes under deeper scrutiny which most likely is negatively reflected in acquisition activity. Also Harford (1999) observed that company cash reserves can be result in acquisitions which are not thoroughly planned.

Therefore, I expect that companies that are overleveraged are less likely to make acquisitions. Firstly their balance sheet does not enable the management to execute acquisitions without external financing. Furthermore, it is more difficult to raise external finance for unbeneficial acquisitions which eventually results that fewer acquisitions are done.

Hypothesis 2: Overleveraged firms are less likely to use cash as a consideration in acquisitions

Overleverage is often related to weak financial performance. When company cannot internally generate funds to finance its operations it must rely on external finance, which most

likely is debt due to lower asymmetries of information compared to equity. If overleveraged company wants to make an acquisition it has to rely on external finance. When the leverage ratio is high enough company cannot raise debt to finance its acquisitions but must rely on equity finance.

In addition to this traditional approach, recently has been studied in more detailed level how companies determine the consideration they eventually use to finance acquisitions. Harford et al. (2009) observed that acquisitions are good possibilities for companies to approach the optimal capital structure. They noticed that company management does acknowledge the optimal capital structure of their companies or at least the range where it ought to be. Therefore, overleveraged companies are less likely to move further away from their target capital structure by making acquisitions which are mostly paid with cash/debt.

Hypothesis 3: Overleveraged companies enjoy higher cumulative abnormal return during the announcement window

Due to the external valuation that overleveraged companies face when raising finance for acquisition, they are less likely to involve in acquisitions that are unbeneficial for the shareholders. This solves the agency problem of free cash flow and prevents the management from attending bad acquisitions. Several studies, e.g. Agrawal et al. (1992) and Moeller et al. (2005), observed poor post-merger stock performance for acquiring firms. Often this is due to agency problems and overestimation of synergies. However, I expect that overleveraged companies are due to financial restrictions less likely to suffer from agency costs and thus make fewer acquisitions which are unbeneficial for the shareholders. As a result, I expect that the abnormal return for overleveraged companies is higher during the announcement window than it is for underleveraged companies.

3. The samples

There are two samples that have been used to analyze the three hypotheses presented in the previous chapter. The first sample consists of firm years between years 2000 and 2010 for which the leverage deficit has been able to be calculated. These firm years are then compared to the second sample that includes all the acquisitions done by companies from EU15 countries⁵.

3.1 Construction and description of Sample 1

Sample 1, collected from Thomson One Banker, includes all the public companies from the EU15 countries with annual sales over €10 million in year 2000. Companies operating in the financial sector (SIC codes 6,000-6,999) are excluded from the data due to the uniqueness of their balance sheet structure compared to other companies. The balance sheet structure of financial companies are highly affected by the regulation, thus the company itself has less power to determine its balance sheet structure. Additionally, I exclude companies from the regulated utilities sector (SIC codes 4,900-4,999). This has been the normal procedure in the previous studies, e.g Uysal (2011) as these sectors are not compatible with rest of the sample.

I am eventually left with a sample of 3,750 companies which form the Sample 1 of my study. When the required financial information was retrieved from years 2000-2010 I am left with 26,050 firm years that have all the financial data available needed to calculate the optimal capital structure. The required financial figures used for determining the optimal capital structure have been presented in Chapter 4.1.

⁵ EU15 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom

Table 1 – Summary of main financial figures in Sample 1

Variable	Obs.	Average	Median	St.dev	Min**	Max
Sales	26,050	1,952.0	145.6	9,155.8	-0.4	278,427.1
Total Assets	26,050	267.5	11.8	1,457.2	-2,869.3	40,176.9
Total Liabilities	26,050	1,526.2	77.1	7,784.4	-23.3	252,363.0
Current assets	26,050	882.1	71.1	4,185.8	0.01	242,731.0
Net PPE	26,050	678.7	27.6	3,697.6	0.00	106,756.0
EBITDA	26,050	267.5	11.8	1,457.2	-2,869.3	40,176.9
EBIT	26,050	166.2	7.0	1,106.3	-23,835.5	36,329.1
EBITDAtoTA*	26,050	0.09	0.09	0.12	-0.30	1.00
EBIT%*	26,050	0.05	0.06	0.14	-0.30	0.50
MarketCap	26,050	1,613.5	86.6	8,098.9	0.00	239,578.9

*EBITDA to Total assets winsorized to -0.30/1.00 and EBIT% winsorized to -0.30/0.50

** Due to data issues Min column not reliable

3.2 Construction and description of Sample 2

Sample 2 consists of M&A transactions in EU 15 countries between years 2000-2010 with a value higher than €1 million. Additionally, I have set a requirement of a public acquirer, while the target company can be either private or public. Between 2000 and 2010 8,675 acquisitions larger than €1 million have been announced where both the acquirer and the target are companies located in EU15 countries, of these 6,467 have been completed. Additionally, I set a requirement that stake acquired must be 100%, which leaves me with 4,234 acquisitions. After I have excluded the financial sector (SIC codes 6,000-6,999) and regulated utilities (4,900-4,999) the sample size has declined to 3,313 deals. Source for the M&A sample has been retrieved from Securities Data Company (SDC).

Figure 2 presents the total value and number of deals announced during the time frame of my study. The number of acquisitions has been extremely intense in 2000 declining rapidly until the year 2004 when the M&A market began to pick up again. The latest financial crisis can be well seen from the slide that began in 2008. Table 2 and Table 3 present a more detailed division on industry level, divided based on acquirers' SIC codes. By deal value the manufacturing industry has by far been the most active, while services accounting the largest number of deals albeit with lower average value. Transportation has also been active especially when calculated by the total deal value.

However, the number of acquisitions declined heavily when combined with Sample 1. These two samples were primarily combined using SEDOL codes to match the companies. Those

deals that were not possible to identify with SEDOL I also established a unique code constructed from company name and SIC code. I also required that leverage deficit must have been calculated for the acquiring company and identified only the deals where that variable had been calculated for the bidder. Eventually I was left with 1,358 acquisitions I was able to match with the sample of 26,025 firm years which had leverage deficit calculated.

Figure 2 – Number of acquisitions and total deal values per announcement year

Figure 2 shows how the deals and deal values are divided between the years under study. Data includes all acquisitions made between years 2000 and 2010 with value above €1 million. Financial and utility sectors are excluded from the data. The total number of acquisitions made within the time frame was 3,313 with total worth of €426 billion.

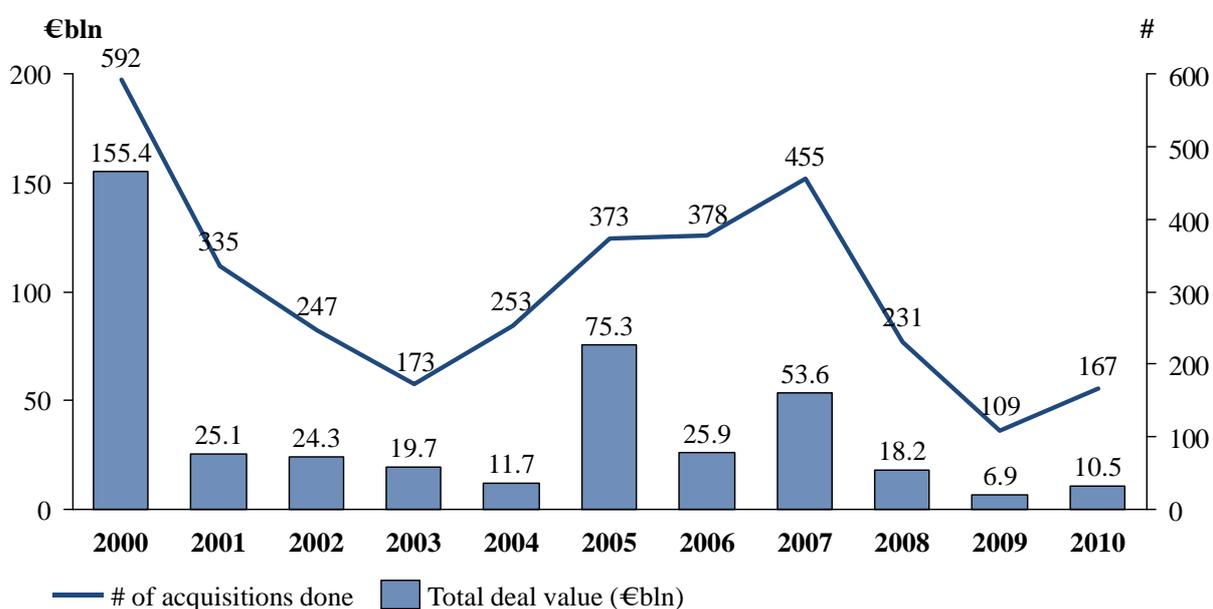


Figure 3 shows how the 26,025 firm years were divided between the EU15 countries. As we can see from the graph United Kingdom is strongly represented and also being homeland for the most active acquirers. Altogether UK accounts almost 60 per cent of the total deal flow. This can be partly explained by the limitations of the data availability which was already addressed in Chapter 1.2. Especially when compared to two other major countries, Germany and France, the acquisition probability is extensively higher. The average probability being 5.2 acquisitions per 100 firm years UK exceeds this fairly while Germany and France staying below the average.

Figure 3 – Firm years and acquisitions per EU15 country

Figure 3 shows how firm years and identified acquisitions are distributed between EU15 countries. Figure contains all 26,050 firms years for which the leverage deficit has been able to calculate and the 1,358 that have been able to match with the acquirer with leverage deficit.

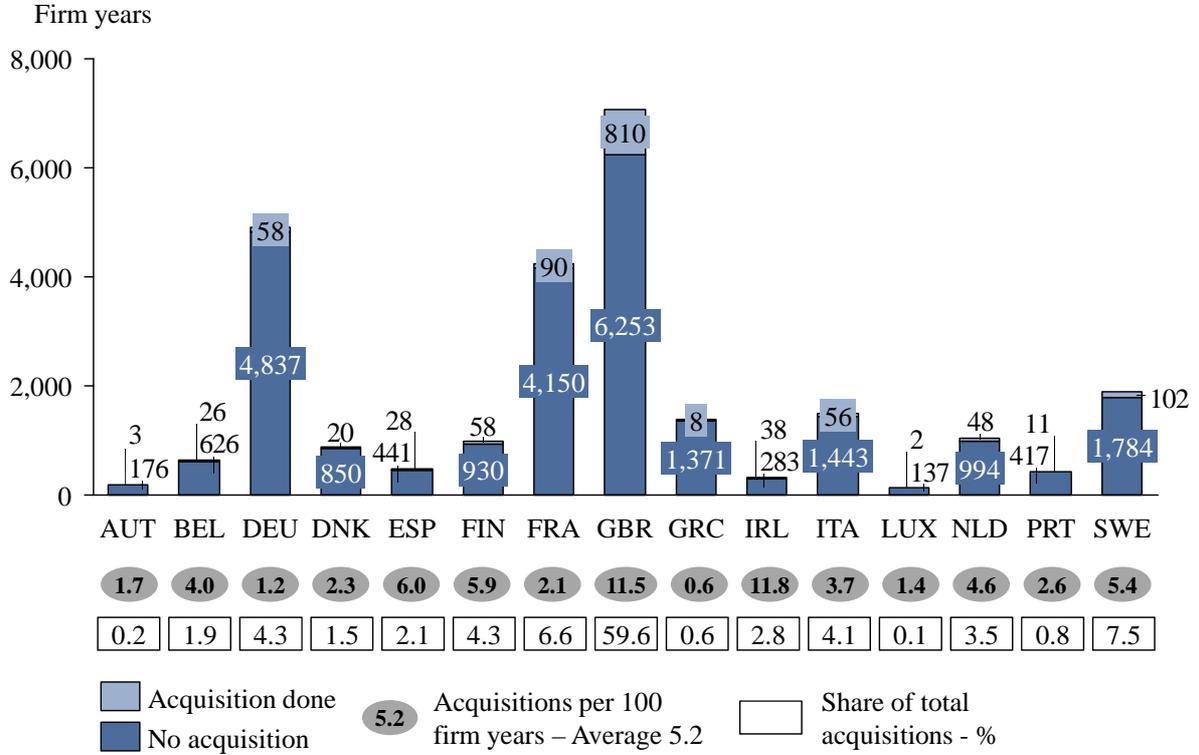


Table 2 – Number of acquisitions per industry and announcement year

Table 2 includes the number of acquisitions and how they are split between years and industries. Industries are categorized based on their SIC codes.

Industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Acriculture	3	2	4	0	3	1	1	0	1	0	2	17
Construction	13	13	12	4	4	13	13	35	7	2	5	121
Manufacturing	126	94	55	56	80	95	86	113	56	28	48	837
Mining	5	2	2	1	2	5	7	7	5	3	6	45
Retail	33	19	17	10	19	20	17	21	7	8	4	175
Services	329	161	115	83	111	174	209	225	124	58	78	1,667
Transportation	51	29	26	10	21	44	27	41	21	5	15	290
Whole sale	32	15	16	9	13	21	18	13	10	5	9	161
TOTAL	592	335	247	173	253	373	378	455	231	109	167	3,313

Table 3 – Total value of acquisitions per industry and announcement year

Table 3 includes the value of acquisitions and how they are split between years and industries. Industries are categorized based on their SIC codes. Values in €million.

Industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Acriculture	193	30	24	0	12	274	2	0	5	0	13	554
Construction	595	2,092	1,890	30	43	1,662	482	5,645	3,336	34	103	15,913
Manufacturing	94,045	9,379	5,548	3,155	6,318	17,670	18,360	31,598	3,189	5,357	6,152	200,769
Mining	5,762	7,411	34	62	26	366	440	115	166	459	828	15,670
Retail	4,327	783	1,338	4,353	922	5,382	998	1,710	93	127	21	20,055
Services	36,133	4,243	2,564	2,285	2,247	4,562	4,631	8,959	10,668	825	2,584	79,701
Transportation	13,415	996	12,539	9,528	1,654	44,620	724	5,457	474	88	108	89,604
Whole sale	896	181	383	315	518	757	268	103	223	36	690	4,369
TOTAL	155,367	25,114	24,321	19,729	11,739	75,292	25,906	53,589	18,154	6,926	10,499	426,636

4. Leverage deficit – methodology and results

Due to the two-stage approach of this study, I will also divide the methodology and results into two separate parts. Firstly I will address the methodology that will be used to determine the leverage deficit which will be then utilized in the second part of the study. In order to be able to calculate the leverage deficit for each of the companies in the Sample 1, I have to first determine the optimal capital structures of these firms. Definition of the optimal capital structure is based on the existing literature on the topic (e.g. Harris & Raval (1991), Rajan & Zingales (1995), Lemmon et al. (2008)). The leverage deficit is calculated as the deviation from this optimal capital structure similarly than what Uysal (2011) and Harford et al. (2009) have done.

In this chapter I will go through the definition of optimal capital structure and which factors the existing literature has recognized to affect the optimal level.

4.1 Optimal capital structure – methodology building and calculation

4.1.1 Methodology

As addressed already in the literature review, it is extremely difficult to determine what the optimal capital structure for every individual company precisely is. Harris & Raval (1991) collected all the studies that have explored the question of optimal capital structure and strived to form a consensus on the various determinants affecting the capital structure. As they put it, it is relatively difficult to find factors that are generally recognized as the main balance sheet structure drivers. However, based on the existing literature they have been able to identify several different factors that are widely acknowledged to have an effect on the balance sheet structure. According to the observation of Harris & Raval (1991) the previous studies have found out that leverage ratio increases along with the (1) firm size, (2) amount of fixed assets, and (3) non-debt tax shields. Similarly they have addressed the previous studies which have found that leverage has a negative correlation with (4) growth/investment opportunities, (5) profitability, (6) probability of bankruptcy, (7) volatility, (8) free cash flow, (9) R&D costs, (10) advertising expenditure, and (11) uniqueness of the product. In the following paragraphs I will explain in more detail why these factors are seen to determine the capital structure.

(1) Firm size is widely acknowledged to increase the leverage ratio of a firm. Various studies (e.g. Titman & Wessels (1988) and Rajan & Zingales (1995)) have observed that firm size increases the leverage ratio and stated that the main reasons for this phenomenon is that larger companies are more diversified into different products and also operating in more than one country spreading the business risks and resulting in less volatile cash flows. Therefore, the firm size can be seen as an inverse proxy for the probability of bankruptcy. Opposing opinions have been stated as well. According to Titman & Wessels (1988), smaller companies face relatively higher cost to access the financial markets should which is reflected in increased short term bank borrowing and thus, as a higher leverage ratio. Rajan & Zingales (1995) address the same issue by saying that in theory, larger firms should be able to issue more information sensitive financing, i.e. equity due to lower information asymmetries. However, based on the studies, it seems that the larger the firm, the more inactive it is to issue equity. As a result it can be assumed that firm size actually has an increasing effect on the leverage ratio of a firm. As a proxy for firm size I will use the *natural logarithm of sales* which is used also in the previous studies by both Uysal (2011) and Harford et al. (2009).

The amount of (2) fixed assets to total assets (i.e. tangibility) is across studies recognized as a leverage increasing factor. Titman & Wessels (1988) say that due to the asymmetries of information creditors increase the threshold for debt holders to lend more money for a company. Harris & Raviv (1991) address this problem by saying that leveraged equity holders have an incentive to sometimes choose risky projects with negative net present value. Due to the option-nature payoff structure, these may be very profitable for equity holders if successful, but unbeneficial for the debt holders. Debt holders tend to solve this conflict of interest by demanding collateral for the money they are about to lend, and usually preferring collateral against tangible assets. The reason for this is that tangible assets can be more easily valued than intangible assets, and are also easier to liquidate in a case of bankruptcy. Collaterals decline the agency costs of debt and enable the firm to borrow more (Rajan & Zingales (1995)). The ratio of *tangible assets*⁶ to *total assets* is used to capture the tangibility of assets in the regression model.

The third factor to increase the leverage ratio are (3) non-debt tax shields. In addition to normal tax shields, e.g. deductibility of interest costs, also non-debt tax shields seem to have an effect on the capital structure. With non-debt tax shields are mostly referred to depreciation

⁶ Tangible assets have been calculated as a sum of PPE and Current assets

deductions or investment tax credits (DeAngelo & Masulis (1980)). However, the linkage between non-debt tax shields to firm leverage is weaker than the firm size and tangibility of assets, and existing literature has stated arguments both for and against. Therefore, I decided not to add a variable to capture the effect of non-debt tax shields into the regression model. Also the lack of proper data prevents from utilizing this in regression model.

The existence of (4) growth and investment opportunities are widely acknowledged as a leverage decreasing factor. The existing literature recognizes two reasons why firms with higher growth expectations and investments opportunities ought to have lower leverage ratios. Firstly, if a company has a possibility to make positive NPV investments, it should always make them in order to increase the shareholder value of the company. Therefore, a highly leveraged balance sheet may prevent companies from making these value enhancing investments. Myers (1977) stated that the “most firms are valued as going concerns, and that this value reflects an expectation of continued future investments by the firms”. Thus company valuation should decline if it is not able to make these investments. Myers continues that if a firm is financed with risky debt, it may need to pass some NPV positive investments, i.e. investments that would increase the market value of the company, just because it is unable to raise finance. Therefore, companies with higher investment opportunities should be less leveraged. Secondly, the firms with better growth prospects also have higher asymmetries of information between the company and debt holders, which results in lower leverage ratios (Titman & Wessels (1988)). However, the asymmetry of information is mostly related to long-term debt issuance and Titman & Wessels point out that growth and investment opportunities may increase the short-term borrowing, but in general it is a leverage decreasing factor. In order to be able to spot companies with higher growth expectations and investment opportunities *market to book –ratio* is used in the regression model. Companies with higher growth prospects are trading with higher multiples as value companies which tend to trade near parity on market to book –terms. *R&D expenses to sales –ratio* is commonly associated with strong growth prospects. However, due to the limitations related to the data I am not able to use R&D expenditure in my regression model.

(5) Profitability has been observed to be negatively correlated with debt. According to Rajan & Zingales (1995) firm’s investment opportunities and dividend payments are fixed in the short-term. Therefore, higher profitability will lead to a lower leverage ratio since a company can finance its operations with internally generated funds and decline borrowing. This is also in line with the pecking order theory, according to which firms prefer internally generated

funds ahead of debt and equity issuance. Additionally, profitable companies tend to be involved in riskier projects which will reduce debt holders' willingness to borrow (Harris & Raviv (1991)), and have higher asymmetries of information (Titman & Wessels (1988)). Both of these factors lead to lower borrowing capacity. The profitability of a company is linked to (8) free cash flow, which is also observed to have a negative effect on the leverage, and can be addressed in this context as well. Additionally, profitability is often related to uniqueness of products. Companies are often able to maintain higher profitability only if their product differs from its competitors; thus, profitability can be linked to competitiveness as well. Neither Uysal (2011) nor Harford et al. (2009) had an indicator for profitability in their regression model. However, since profitability and cash flow are in several studies observed to have a negative effect on the leverage (Harris & Raviv (1991)), I find it justified to add a variable to capture both profitability and cash flow. For this purpose, I will add *EBIT to sales –ratio*, which will capture profitability and cash flow. *EBIT to sales –ratio* is not the best possible proxy for cash flow, *EBITDA to total assets –ratio* being a better one, but due to the high correlation between these two variables, I will use only *EBIT to sales –ratio* to avoid multicollinearity in the model.

If the (6) probability of bankruptcy increases, it will for sure cut off the lending. As already discussed previously, the probability of bankruptcy is expected to be lower for larger companies due to the (product, geographic, etc.) diversification. The size of the company (natural logarithm of sales) is assumed to be an (inverse) variable for the probability of bankruptcy. (7) Volatility of income and cash flow is also related to lower leverage figures (Titman & Wessels (1988)). This is rational as lenders want to make sure that the company has sufficiently cash flow for the interest and capital payments. Volatility is observed by adding the prior *4 year standard deviation of net cash flow to sales –ratios* for each firm year.

The last three factors observed to affect the balance sheet structure – (9) R&D costs, (10) advertising expenditure, and (11) uniqueness of the product – are quite closely linked to each other and basically they tell about the product portfolio of the company. The uniqueness of the product can be approximated by observing the R&D and advertising expenditure, so basically those latter two factors can be utilized as a proxy for the product uniqueness evaluation. Titman & Wessels (1988) point out that the costs of bankruptcy for customers, suppliers and workers are higher if the company has produced unique products. As I was not able to receive data from R&D or advertising costs, I cannot use *R&D costs to sales* or *advertising expenditure to sales –ratios* in my regression. However, I am using profitability

for measuring the same effect. Existing literature acknowledges that profitability is often linked to unique products and lower competition. So these all factors are quite tightly linked to one another.

As different industries have different characteristics also the industry a company is operating in can have an effect on the optimal leverage ratio. Therefore, I will also observe if an industry categorization improves the fit of my model. The existing literature has also observed this. According to Titman & Wessels (1998), in some industries the indirect cost of financial distress is higher than in other, which should be reflected in leverage ratios. Uysal (2011) and Harford et al. (2009) have both used the Fama & French industry classification which divides industries into 48 different categories. However, I decided to classify the industries based on their SIC codes. The reason for this is that some categories would become too small and lose part of its reliability and information value. In the following chapters I will further analyze if there are significant differences in capital structures between industries⁷.

The general economic situation can also make companies prefer either equity or debt. The ongoing market situation can e.g. limit the possibilities for raising debt when companies are more dependent on internally generated funds or equity. In order to be able to observe if general economic fluctuation affect the debt/equity choice I will be adding *a year dummy* for years with above average economic growth⁸. Figure 4 will show the years which have had an above average growth in EU15 member countries.

The country of origin may also have an effect on the capital structure choices companies do. Therefore, I will also take a closer look if I can improve the fit of the model by adding country dummies⁹ to the equation. Several factors related to the country of origin may be related to the financing choices. In the existing literature Rajan & Zingales (1995) address three country specific factors that may change the optimal capital structure. (1) The first one is the effect of taxes to leverage. Logically, the higher the corporate tax rate in a specific country the higher is the tax shield that is reached by taking more debt. Additionally, they point out that also personal taxation is reflected in the optimal capital structure. Despite the common tax legislation within the EU15 countries, there are differences in both corporate and personal

⁷ Eventually I left the industry dummy out from my model as it had an insignificant effect on capital structure. This issue will be more closely addressed in the following subchapter.

⁸ An individual year is considered to be a financially good year when the weighted EU15 GDP growth rate has exceeded the average growth rate between 2000 and 2010.

⁹ Eventually country dummies didn't have significant effects on the model. I have briefly addressed the country level differences in the next subchapter, but from the final model that has been used to calculate leverage deficits, country dummies are excluded.

taxation between countries. (2) Bankruptcy legislation is the second factor Rajan & Zingales have raised. In some countries the costs of bankruptcy are higher than in other which provides companies an incentive to be less leveraged. This naturally decreases the benefits of debt if company is highly leveraged. Despite that the EU wide legislation has diminished the differences between the 15 member countries the legislation is not totally harmonized. (3) Additionally, some countries are more bank-oriented as some are more market oriented. Anglo-American countries (in this sample UK and Ireland) are widely recognized as market oriented. The rest of the countries are often regarded as continental countries which in this case are more bank-oriented. This might also have an effect on capital structure. Rajan & Zingales say that it has more effect on whether to raise financing (equity or debt) from the markets or use banks as a source of finance.

By utilizing the determinants that have been derived from the existing literature and taking into account the limitations caused by the data I am using in this study, I may run a regression to estimate the optimal capital structure. The fitted value of the regression is assumed to be the target capital structure for each company. Thus the equation used for the optimal capital ratio is the following¹⁰:

$$\begin{aligned} & \textit{Target capital structure}_{i,t} \\ &= \alpha + \beta_i * \ln \textit{Sales}_{i,t-1} + \beta_i * \textit{Tangibility}_{i,t-1} + \beta_i * \textit{MtoB}_{i,t-1} + \beta_i * \textit{EBITtoS}_{i,t-1} \\ &+ \beta_i * \textit{VOLofNCF}_{i,t-1} + \beta_i * \textit{Industry}_j + \beta_i * \textit{Year}_j + \beta_i * \textit{Country}_j + \varepsilon_i \end{aligned}$$

Results from this equation are addressed in the previous subchapter.

4.1.2 Results for target capital structure calculation

The results from the optimal capital structure calculation are well in line with the existing literature. As expected, company size, asset tangibility, and strong macro-economic situation all had a positive effect on the leverage ratio. In the meanwhile, market to book, EBIT to sales, and Volatility of net cash flow to sales ratios all had a negative effect. As presented in Table 4, the coefficients for the variables are all significant at 1 per cent level, thus this further confirms the findings of the previous studies. Therefore, we can assume that some company

¹⁰ Eventually industry and country dummies were not included to the regression model as these variables were not significant and did not improve the fit of the model.

characteristics have a relatively strong link to capital structure choices. Some of the variables discussed in the Chapter 4.1.1 are not eventually included in the model. I observed that neither the industry nor the country of origin have a significant effect on the capital structure choices, thus they were eventually left out. The minor differences observed between the countries are further analyzed with other results in the in following subchapters.

Table 4 – Coefficients for target capital ratio calculation

Table 4 shows the coefficients from the OLS regression that has been run to calculate the optimal capital structure. Results are based on 26,050 firm years that form Sample 1 of this study. Asterisks ***, **, and * indicate the significance on 1%, 5% and 10% level respectively.

Variable	Exp. Sign	Indicator for	Coefficient	t-value
Natural logarithm of sales	+	Size Probability of bankruptcy	0.02448	38.43***
Tangible assets to total assets -ratio	+	Tangibility	0.06836	11.51***
Market to book -ratio	-	Growth	-0.03590	-33.22***
EBIT to sales -ratio	-	Profitability Uniqueness of the product	-0.23964	-25.89***
Volatility of net cash flow to sales -ratios	-	Volatility	-0.00599	-12.19***
Year (high growth)	+	Economic growth	0.00820	3.20***
Constant			0.42105	

By running a normal OLS regression we get coefficients for the control variables that will be used to calculate the optimal capital structure. These results are presented in more detail in Table 4. I get highly significant positive coefficients for control variables, *Natural logarithm of sales* and *Ratio of tangible assets to total assets*, both significant at 1% level. In my sample larger companies are able to borrow more and still maintain reasonable borrowing costs and risk level, enabling them to take full advantage of the financial benefits of debt. Additionally, creditors seem to be more willing to lend more when they can get tangible collateral to protect the loans. Other control variables, *Market to book –ratio*, *EBIT margin*¹¹ and *Volatility of cash flows*, are negatively associated with the leverage ratio with highly significant coefficients as expected. These variables that were added to the model to capture the effects of growth, profitability, and volatility of cash flows, as well as uniqueness of the products have a negative effect on the leverage ratio. Taking into account the very high t-values, these

¹¹ EBIT margin winsorized to level -0.30/0.50 to control possible outliers.

results will give a strong base to model the target capital ratios for each firm year we have in the sample.

The macro-economic situation must also be taken into account when observing the financing decisions companies make. Due to the positive sentiment companies make more investment decisions when economy is growing. Additionally corporate bond markets are more liquid enabling companies finance their investments more easily with debt. The situation is quite opposite during the downturns. Companies usually cut their investing expenditure at the same time when the debt markets become less liquid making borrowing more difficult. Companies tend to rely more on internally generated funds during the downturns as it gives them flexibility and buffer against unpredictable shocks.

Due to the economic fluctuation I added a dummy variable for the years with above average GDP growth. By doing this I am able to control the effect of economic upturn on capital structures. Based on the historical EU 15 countries' GDP data years 2002, 2003, 2008, and 2009 have been years with slower than average growth. Year 2009 the economic growth was actually highly negative. The economic growth within EU 15 countries is presented in more detailed in Figure 4.

Figure 4 – Average annual GDP growth rate in EU15 countries 2000-2010

Figure 4 presents the weighted GDP growth rate within the EU15 countries between 2000 and 2010. On average the growth rate has been 1.4 per cent annually. For years with higher than average GDP growth a dummy “High” has been established which is used in the regression models onwards.

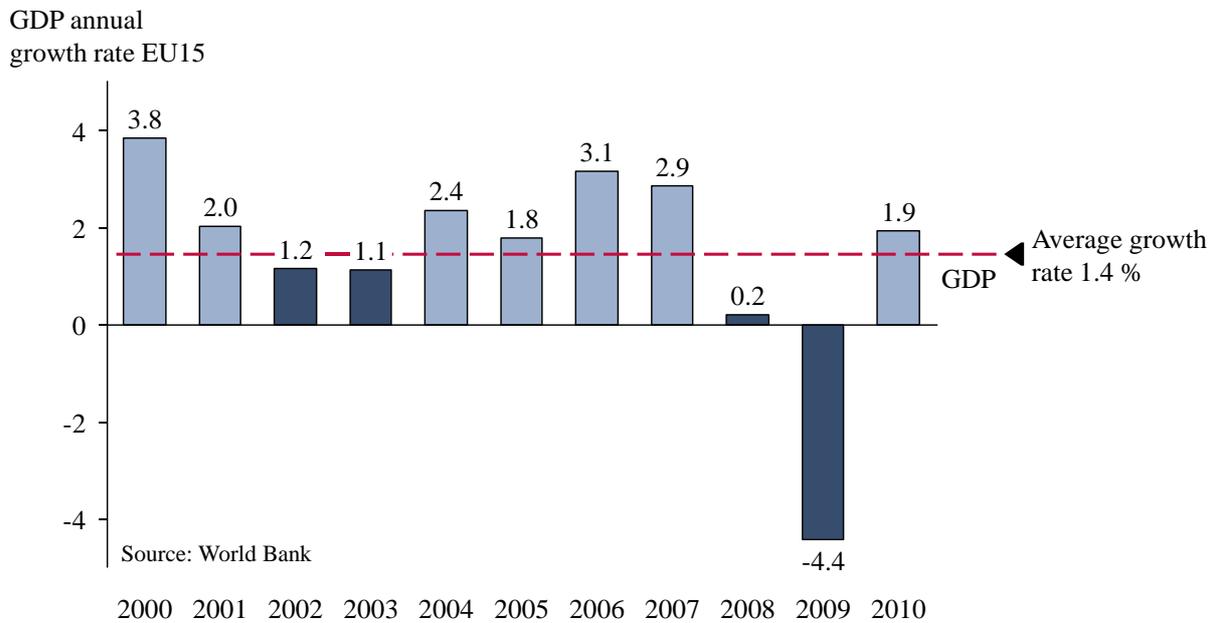


Table 5 shows the correlation coefficients for the variable used in the regression analysis. The correlation between variables is extremely modest thus it seems that the model and the received coefficients give us a reliable view on the factors having an effect on capital structure choices.

Table 5 – Correlation coefficients of the target capital ratio variables

	Ln Sales	Tangibility	Market to book	EBIT%	Volatility of cash flows	High GDP growth
Ln Sales	1.000					
Tangibility	-0.129	1.000				
Market to book	-0.141	0.044	1.000			
EBIT%	0.264	0.029	0.161	1.000		
Volatility of cash flows	-0.077	-0.023	0.101	-0.124	1.000	
High GDP growth	0.007	0.025	0.172	0.093	0.010	1.000

Both industry and country dummies are missing from the final model as they did not improve the fit of the model. The same regression was also run with different industries as dummy variables, though. I divided the companies into 9 different industry categories based on their

SIC codes. However, the coefficients for different industries were almost identical and statistically mostly insignificant (only construction sector having positive and significant coefficient). These results are somewhat surprising as one might have expected some differences based on the industry. Since there were no significant differences between the industries, I decided not to use industry dummies when determining the target leverage ratios and thus the leverage deficits for each of the sample companies.

When adding country dummies into the regression I was able to observe some differences between the companies from different European countries. Nordic countries (Denmark, Finland and Sweden) as well as Austria are slightly less leveraged than their peers in the Central Europe. Companies from the Southern Europe, especially Portugal but also France and Italy, were on the contrary more leveraged than the sample on average. The results for Austria, France, Italy and Portugal were statistically significant but the coefficients for other countries were mostly insignificant. These results does not confirm that companies originated in United Kingdom or Ireland, the two Anglo-Saxon and more market oriented countries, would have significant differences in their financing policies as was discussed in the previous parts of this study.

4.2 Leverage deficit – methodology and results from Sample 1

The calculation of leverage deficit is presented in several studies done before. Hovakimian et al. (2001) unambiguously states that leverage deficit is the “difference between the firm’s actual leverage and its estimated targeted leverage”. In the previous sub-chapter I have derived the formula for estimating the target capital structure. The following equation will be used to calculate the leverage deficit for each of the companies in Sample 1 during the time period under observation. Similar approached has been used in the studies by Kayhan & Titman (2007), Harford et al. (2009) and Uysal (2011).

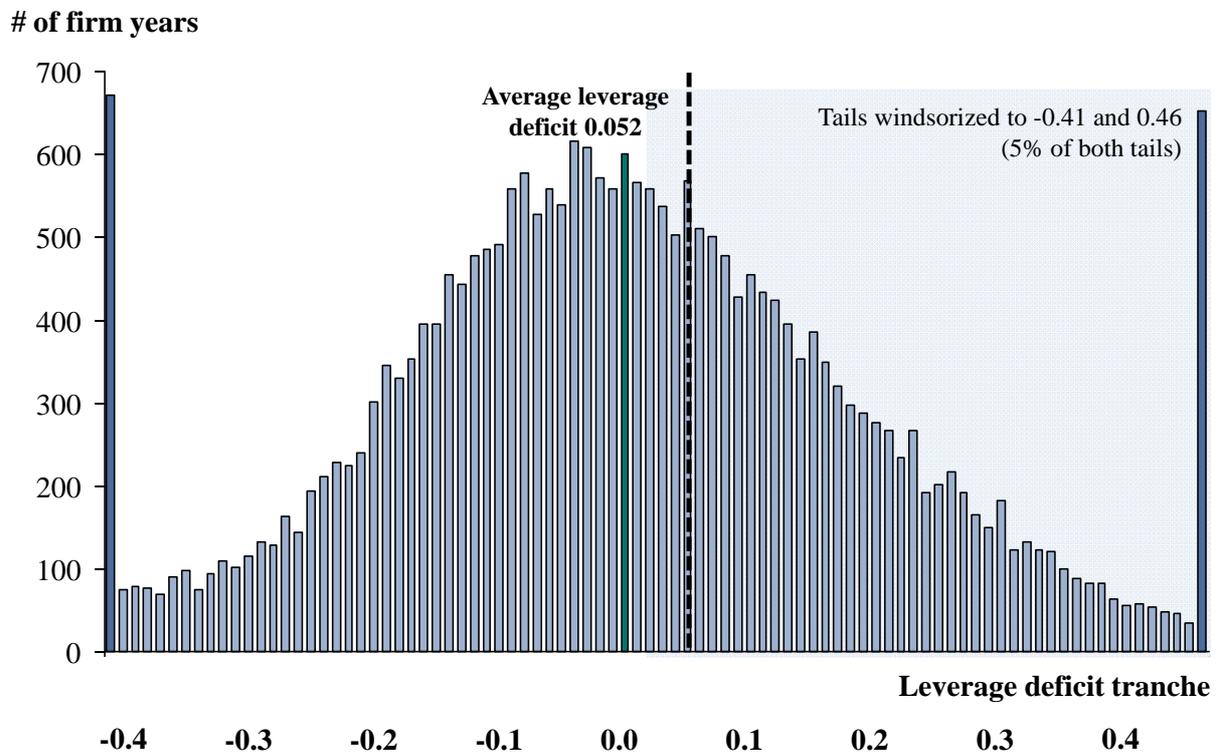
$$\textit{Target capital structure}_{i,t} = \textit{Actual leverage}_{i,t} + \textit{Leverage deficit}_{i,t}^{12}$$

¹² Due to the different calculation method the sign of leverage deficit used in the calculations is the opposite compared to the study of Uysal (2011). Company is assumed to be underleveraged when the leverage deficit is positive and overleveraged when negative.

After calculating the target capital structure based on the coefficients presented in Table 4 I calculated the leverage deficit for each firm year in my sample. As one can see from Figure 5 the deviation is vast. On average companies were underleveraged (5.2 %-points lower leverage ratio than the modeled optimal level) compared to the calculated optimal capital ratio. The deviation around the optimal range is markedly vast. This might be partly due to the data quality issues addressed previously, especially in the both end of the tails. I have winsorized the tails on -0.41/+0.46 level in order to be able to control the outliers (5% of both tails).

Figure 5 – Number of firm years per leverage deficit tranche

Figure 5 shows the distribution leverage deficit tranches. On average companies were slightly underleveraged. Data contains 26,050 firm years, 5% of both tails winsorized.



5. Leverage deficit and M&A behavior – Results and analysis

In chapter 5 I will examine how the deviation from the optimal capital structure is reflected in M&A behavior. Each of the hypotheses is addressed in an independent sub-chapter. In each sub-chapter I will present the methodology used for each of the hypotheses and the relevant literature on which the methodology is based on.

A summary of results presented in Table 6. Further analysis and alternative explanations are presented in the following sub-chapters.

Table 6 – Effect of leverage deficit on acquisition behavior – summary

Studied variable	Overleveraged company	Underleveraged company
Acquisition probability	Less likely to do acquisitions. High overleverage declines especially asset acquisitions but affects negatively also firm and cross industry acquisitions. No effect on within industry acquisitions. Relative size of the target increases the more the acquirer is overleveraged.	Underleveraged companies make less acquisitions than companies having an optimal leverage ratio. Strong negative effect especially on cross industry acquisitions. Relative size in asset acquisitions increases along with underleverage.
Method of payment	Share of equity used to as a consideration substantially higher in firm acquisitions. In asset acquisitions difference not statistically significant.	More likely to make pure cash asset acquisitions. Otherwise underleverage does not significantly contribute to the method of payment.
Announcement effect	Firm acquisitions welcomed with more positive announcement return. Differences in other acquisition types not as significant.	In general not marked differences in announcement returns. Highly underleveraged companies enjoy higher announcement returns than slightly underleveraged companies.

5.1 Is the likelihood of making an acquisition affected by the leverage deficit?

In this part of the study I will analyze how the deviation from the optimal capital structure affects the likelihood of a company to make acquisitions. Firstly I will go through the methodology, derived from the existing literature, and then I will present the results and related analysis

5.1.1 Methodology

In this chapter I am analyzing if overleveraged (underleveraged) are less likely (more likely) to do acquisitions. Firstly I will simply divide the sample into different leverage deficit quartiles to observe if there on average are differences between the quartiles. This basic analysis is done both on firm vs. asset acquisitions and within vs. cross industry acquisitions. However, as this is a very simple and somewhat even naïve approach I will also utilize the multivariate probit analysis to have a more accurate view on how the leverage deficit affects the probability of making an acquisition. Previous literature has observed different factors that have had an effect on the acquisition activity which are now used as control variables. Thus multivariate probit analysis¹³ enables us to have a more reliable view on the leverage deficit and its specific contribution to the acquisition probability.

Control variables are used to capture both firm specific but also industry and general market related attributes which likely have an effect on the acquisition behavior. For instance bigger and more profitable firms have been noticed to be more active acquirer than smaller and less profitable ones. Additionally, I want to extract the industry specific effect as well as the effect of general merger activity (i.e. hot vs. cold M&A market). The methodology and the literature which it is based on will be addressed in more detail later in this chapter. In this context I will also run OLS regression analysis in order to be able to see whether overleveraged companies are on average acquiring smaller companies (or less valuable assets) than underleveraged. I will be using the same controls variables than when estimating the acquisition probability with probit analysis.

¹³ Probit analysis was utilized e.g. by Harford (1999) when he analyzed if excess cash reserves have increase the probability of making an acquisition.

Next I will in more detailed level go through the methodology used in the multivariate analysis which is based on the existing literature made on the topic:

The first control variable used in the multivariate analyses is (1) *profitability*. Harford (1999) observed that cash rich companies are more active bidders and make more acquisitions. Adequate liquidity enables the company to make acquisitions even though it would be more difficult or unbeneficial to raise money from the financial markets. This flexibility also provides a company a possibility to react more quickly if some attractive acquisition possibilities arise in short notice. Since cash reserves and cash flows are tightly linked to the overall profitability of a company *EBITDA to total assets –ratio* will be used as a proxy for profitability and cash richness.

(2) *Size of a company* is acknowledged to increase the possibility of making acquisitions (e.g. Almazan et al. (2010) and Moeller et al. (2004)). As discussed already in the Chapter 4.1 larger companies have an easier access to financial markets and are able to raise financing in shorter notice than smaller companies (Titman & Wessels (1988)) and due to lower information asymmetries are also able to raise information sensitive financing more easily (Rajan & Zingales (1995)). Therefore, they are better positioned to make bids as they are more likely to get financing for the deal. Additionally, Moller et al. (2004) observed that larger companies are more likely to get their bids accepted, resulting in higher number of acquisitions. *Natural logarithm of sales* is used as a variable for firm size.

M&A activity differs quite substantially between different industries. Companies in more consolidated industries have less acquisition targets than firms operating in fragmented industries. I follow here Uysal (2011) when estimating (3) *the industry concentration* and use *Herfindahl Index*¹⁴ as a proxy. However, since it is impossible to get specific market shares for each of the companies in my sample, I will assume the market share of the company to be proportion if its sales out of the sales of the total industry.

¹⁴ In Herfindahl Index (or Herfindahl-Hirschman Index) companies are assumed to operate in the same industry if two first digits of their SIC codes match. Annual market share is calculated by dividing the company's yearly sales by the sum of the revenues of the companies operating in the same industry. This may cause some inaccuracies to the index as some industries are more local (or global) than others. However, due to the vast data base it is almost impossible to take a more detailed approach into the market shares.

During M&A waves acquisition activity tend to be much higher. In order to be able to capture the effect of (4) *general industry specific liquidity of corporate assets* I will add a factor of *Industry M&A Liquidity*. Uysal (2011) adopted this methodology from Schlingemann et al. (2002). The liquidity index is calculated by dividing the total value of transactions within a specific industry by the sum of the industry total assets, giving an indexed value higher than 0 for every industry. The industries will be divided based on their SIC codes¹⁵. As the numerator of this equation uses market values while the denominator book values it enables liquidity index higher than 1. The mix of market and book value might bring inaccuracy to the index. Shlingemann et al. (2002), however, calculated the same index on a market value basis and noticed that the possible inaccuracies are limited and the differences are very modest between the two methods. Therefore, I see no reason why not to use the market and book values mixed. In addition to the industry specific factors, also general (5) *macro-economic situation* has an effect on the M&A activity. I will also add a dummy for years with higher GDP growth rate into the regression model to observe how the general economic condition is affecting the probability for making acquisitions. The years are divided into high growth and low growth years similarly than in the Chapter 4.

(6) *Overvaluation* can also increase M&A activity. If managers notice that their companies are overvalued, they may want to exploit the situation and try to change the overvalued assets to less overvalued. When this kind of market misvaluation takes place a manager targeting to maximize the shareholder value ought to take advantage of it through stock acquisitions. Uysal (2011) has used the *Market to book –ratio* for as a proxy for misvaluation and I also find it a proper way to estimate the misvaluation.

As one purpose and contribution of this study is to observe if the acquisition behavior differs between EU15 countries I will also add a country dummy into the regression model as a control variable. However, I decided not to insert all 15 countries as a dummies but only a common dummy for United Kingdom and Ireland. As these two countries are operating under

¹⁵ Companies are divided into industries based on their first two digits of their SIC codes, similarly than when calculating the Herfindahl Index. This approach may be again vulnerable for some inaccuracies but I assume it to be the most adequate proxy for estimating the M&A activity within different industries.

common law and assumed to be more market oriented than their peers in the group of EU15 countries the country variation is observed only on this level.¹⁶

Compared to the equation that Uysal (2011) has used I decided to leave the trailing three-year average leverage out of the equation. However, Uysal does not provide any detailed justification for using that variable. Therefore, as I cannot find any backup from the existing literature for using that variable, I feel more comfortable when leaving it out.

Existing literature has also acknowledged some other factors that have a link to acquisition activity. Almazan et al. (2010) observed that also location can determine the M&A behavior. According to Almazan et al. companies located within industry clusters are more frequent bidders. The main reason for this is that acquirers have more opportunities and are also more familiar the acquisition targets when located near to each other. However, the competition on the target companies is also fiercer within clusters. Due to its difficult measurability I don't take this into account in the multivariate formula. Additionally, the Herfindahl Index already captures the same phenomenon, at least partly. The index does not take into account the location dimension but it does tell if an industry is fragmented and thus providing more acquisition opportunities.

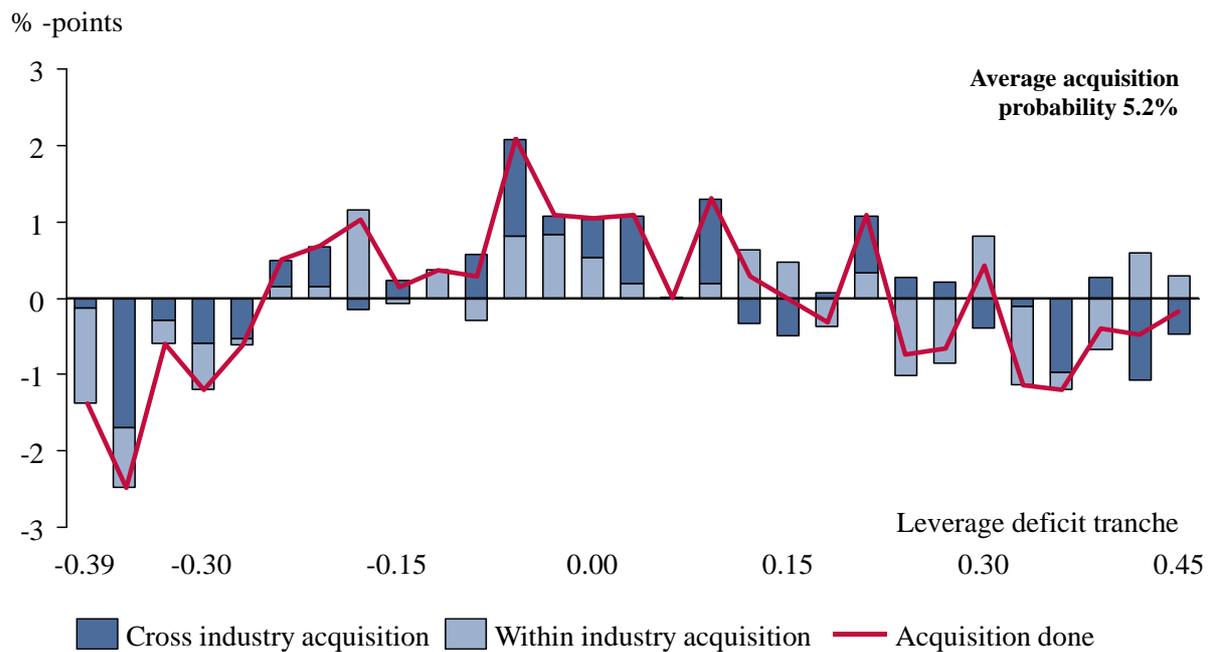
5.1.2 Results – general approach

Firstly I will provide some graphs where the acquisition probability can be observed on a general level. The probit analysis enables us to take a closer look if the leverage deficit affects the acquisition activity in general. Additionally I will take a look if overleveraged companies are less active firm or asset acquirers, or if they tend to do more or less within industry acquisitions. The sample will also be divided into two halves. First I will divide the sample based on the leverage deficit into overleveraged and underleveraged. Secondly, I will observe also observe separately cross industry and within industry acquisitions. The similar approach is utilized when analyzing the relative size of acquisitions and leverage deficit.

¹⁶ I also ran an analysis where all the 15 countries had an individual dummy. However, the coefficients of these dummies were mostly insignificant while dummies for United Kingdom and Ireland were highly significant. This refers that within other countries the changes in acquisition behavior are mostly due to random variation and not by continuous pattern. As a result I decided to combine a one country dummy only to capture the effect of UK and Ireland as a country of origin.

Figure 6 – Deviation from the average probability of making cross or within industry acquisitions

Figure 6 presents how the probability of making an acquisition in each leverage deficit tranche differs from the average probability. The red line shows how the overall probability differs from the average probability of 5.21% per firm year. Probability of making a cross industry acquisition or within industry acquisition is 1.92% and 3.29% respectively. Each of the tranches is an average from three individual leverage deficit tranches e.g. the figure of tranche 0.00 is the average of leverage deficits between -0.01 and 0.01.



When taking a very general view on the M&A activity, we can see that on average companies with relatively close to their optimal capital structure are the most active acquirers. As Figure 6 shows, the acquisition probability per firm year is about 1 percentage point higher on average if the leverage deficit is around zero. However, the acquisition probability declines intensively when companies become highly overleveraged (left-hand side of the graph) and the difference to companies with optimal capital structure is circa 4 percentage points, which is significant difference taking into account that on average the acquisition probability was 5.2% per firm year. The probability for acquisition declines also when company becomes more underleveraged. However, the change is less rapid than when moving towards companies which are overleveraged. It is interesting that underleveraged are not that active acquirers even though they would be financially better positioned to make acquisitions. To understand better it could be further analyzed the company profiles these underleveraged companies have and if some common explanations could be found. That would be out of the

scope of this study, thus I am not going to take a closer look on that. Figure 6 shows that cross industry acquisitions are more common when company does not significantly differ from its optimal capital structure but the probability declines intensely if the company becomes either overleveraged or underleveraged. It seems that the effect on cross industry acquisitions is more significant when company has a capital structure that differs from the optimal one than what is the effect on within industry acquisitions. However, as the graph presents the situation only on very general level, it is difficult to interpret the results very accurately. More realistic view is, though, able to get from the probit analysis where we can see if the probability of making a cross industry or within industry acquisition really changes when the capital structure differs from the optimal. Hence, we can further analyze this phenomenon after running the probit analysis and observe if the intuition is correct.

Figure 7 – Deviation from the average probability of making asset or firm acquisitions

Figure 7 presents how the probability of making an acquisition in each leverage deficit tranche differs from the average probability. The red line shows how the overall probability differs from the average probability of 5.21% per firm year. Probability of making an asset acquisition or firm acquisition is 3.12% and 2.09% respectively. Each of the tranches is a moving average from five individual leverage deficit tranches e.g. the figure of tranche 0.00 is the average of leverage deficits between -0.01 and 0.01.

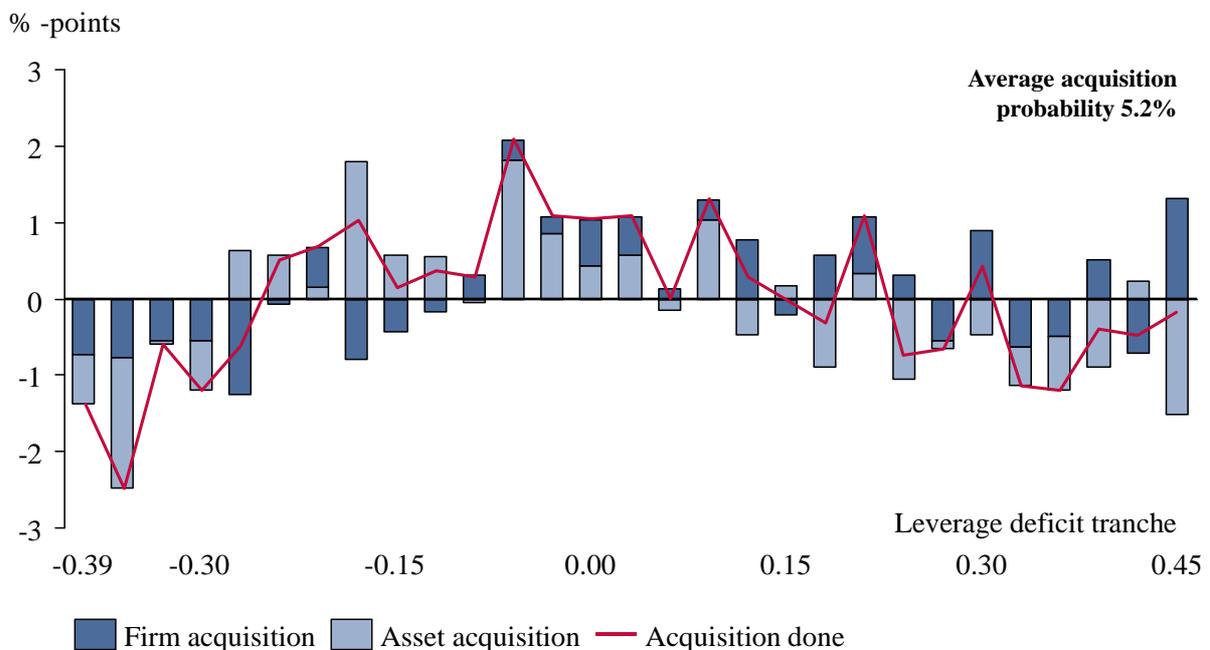


Figure 7 is similar to Figure 6 but it presents if the probability of making asset or firm acquisition changes along with the deviation from the capital structure. As can be seen from the graph, especially the probability for asset acquisitions declines significantly when capital structure differs from the optimal. For firm acquisitions the outcome is different. Overleveraged companies are still less likely to do firm acquisitions but the probability for firm acquisitions remains about the same even though the overall probability for making an acquisition declines when company becomes underleveraged. Once again we get a more reliable view through the probit analysis, which also contains the control variables that have been observed to have an effect on the acquisition likeliness. Based on this graph we can expect that overleveraged companies are less likely to do both firm and asset acquisitions while companies that are underleveraged are relatively more active firm than asset acquirers.

5.1.3 Results – probit analysis on acquisition probability

Table 8 collects the results from the probit multivariate analysis. When studying the sample I actually found evidence that overleverage is associated with higher M&A activity than underleverage. However, the result is insignificant and taking into account the discussion had in the previous sub-chapter we can easily say that this is not a feasible interpretation of the result. Like we have already observed companies which are near to their optimal capital structure are the most active acquirers. From this result we cannot say that the acquisition probability increases the more the company is overleveraged but it seems to be asymmetric. Acquisition activity does not linearly increase when company becomes underleveraged, but gets more or less a bell shaped probability distribution having a highest probability around the optimal capital structure. Therefore, this kind of approach does not provide very feasible results.

To be able to study this phenomenon in a more detailed level the companies/firm years were divided into two tranches, overleveraged and underleveraged, so that the analysis could capture the asymmetry we observed in Chapter 5.1.2. I found strong evidence that M&A activity markedly declines when company is underleveraged but also similar kind of observation can be done when company is overleveraged. Both of these results are statistically highly significant confirming the intuition presented already in the previous sub-chapter. Interestingly, my results slightly differ from what Uysal (2011) observed in his study. He noticed that acquisition activity declines when company becomes overleveraged but did

not find significant changes in acquisition activity when addressing the underleveraged companies compared to ones with optimal capital structure. In Uysal's results the acquisition probability peaks as well when companies are near to their optimal capital structure but the decline in underleveraged companies' acquisition probability is not as significant as in my study.

I extended the approach by observing if changes in leverage deficit are differently reflected in within industry and cross industry acquisitions, and firm and asset acquisitions. Like can be seen from the Table 8 changes in leverage deficit are especially reflected in cross industry acquisitions. Number of cross industry acquisitions decline when company's capital structure differs from optimal. What comes to the probability of making within industry acquisitions, they seem to be slightly more common when companies are underleveraged, albeit this result is not statistically significant. There seems to be no change in within industry acquisitions when company is overleveraged. When taking a look on firm and asset acquisitions overleveraged firms are less likely to do either of them. Especially the probability for asset acquisitions decline when company is highly leveraged. Underlevered companies are as well less active acquirers, but the difference to companies with optimal capital structure is not that significant.

My study also verifies the previous studies' observations on different factors affecting the acquisition activity. Larger companies, for which the natural logarithm of sales was used as a proxy, in general are more active acquirers. My findings show that the probability for cross industry (firm and assets) acquisitions increases especially the larger the company is. However, the size is not increasing the probability for within industry acquisitions. These results are well in line with the previous literature¹⁷ which widely acknowledges that larger companies are more active acquirers mostly due to the financial resources they have. EBITDA to sales – ratio is also associated with increased acquisition activity. The result is well aligned with Harford (1999) who observed the same phenomenon. Overvaluation (calculated with market to book –rate) increases the acquisition activity as expected¹⁸. Companies are, hence, taking advantage of the misvaluation and strive to increase the shareholder value by replacing overvalued assets with undervalued. Overvaluation increases

¹⁷ The relevant literature presented in Chapter 5.1.1

¹⁸ As discussed later, high market to book –ratio will also capture the differences between industries and therefore it is not only a proxy for overvaluation.

especially the probability for asset acquisitions thus while the effect on firm acquisitions is insignificant

Industry M&A liquidity in general increases acquisition activity significantly. This is well acknowledged among academics and was an expected result. More interesting finding is that industry M&A liquidity increases cross industry and firm acquisitions but is negatively correlated with within industry and asset acquisitions. Several reasons can explain such a behavior. Industry M&A liquidity is usually higher when economy is growing and/or the specific industry is performing well. These factors have a strong positive effect on the business sentiment. Companies are more willing to expand their operations and also to make slightly riskier acquisitions. Firm and cross industry acquisitions are related to higher asymmetries of information and typically require more extensive post-merger integration thus companies may want to avoid them when the sentiment is not so strong. Lack of financing can also play a role in such a behavior. Table 7 shows how the relative size of the acquisition differs between acquisition types. Especially firm acquisitions are relatively larger than asset acquisitions and require more complex financial arrangements which are usually easier to do if the economic situation is better. However, this explanation does not apply to within industry acquisition as their relative size is bigger than in cross industry acquisitions. Therefore, the risk aversion is the most logical explanation for such a behavior.

Table 7 – Relative deal value by acquisition type

Table 7 shows the relative deal size between different acquisition types. The relative deal value is calculated by dividing the value of done acquisitions by the market capitalization of the acquiring company, if acquisitions are done within the firm year.

Deal type	Firm acquisition	Asset acquisition	All
Within industry	0.398	0.256	0.317
Cross industry	0.261	0.166	0.205
All	0.345	0.220	0.273

In less competed industries (Herfindahl Index) acquisitions are less common. In concentrated industries there are less opportunities for making acquisition thus expansion is more difficult to do through acquisitions. Naturally this is reflected especially in firm acquisitions as there are fewer companies that could be acquired. Also the relative size of the possible targets is

higher further limiting the acquisition opportunities. Additionally, competition authorities set stricter limits for mergers and acquisitions if they see that such changes would decline the competition in the market. A natural response from the companies is to be more active asset acquirers as it is basically the only way for companies searching for external growth. Higher GDP growth is also associated with more active cross industry and firm acquisitions. As discussed with Industry M&A liquidity, the positive sentiment is a strong catalyst for riskier acquisitions.

An interesting result is that companies from United Kingdom and Ireland are far more active acquirers than rest of the EU15 member countries¹⁹. Especially this is reflected in more active cross industry acquisitions and firm acquisitions. As a more market oriented country it might be easier for companies in these two countries to raise money for acquisitions, but also most likely reflects the different business culture these two countries have.

¹⁹ Reason for such a significant difference can be also due to data issues. The data quality is better for companies from UK thus common law dummy may have a slightly too high coefficient. However, taking into account the differences between common law and code law countries this kind of result can be expected.

5.1.4 Results – OLS analysis on relative size of target

Table 9 contains the analysis on the leverage deficit and the relative size of the target. The relative size does not change linearly but there are asymmetries between over- and underleveraged companies. The relative size of the target company tends to be smallest when acquirer has a leverage ratio near to optimal. Size of the target increases especially when company becomes more overleveraged. This trend applies for all acquisition types but it is strongest in firm acquisitions. Underleveraged companies also tend to make larger acquisitions but difference is neither as strong nor significant as it is for overleveraged companies. The only exceptions are asset acquisitions where the relative size becomes larger when company is less leveraged. Even though especially overleveraged companies are less frequent acquirers, they make surprisingly on average bigger acquisitions. Harford et al. (2009) observed that overleveraged companies often used acquisitions as a method of approaching the optimal capital structure, and therefore use more often equity as a consideration. As the relative size increases especially in firm acquisitions, this can be a sign that overleveraged companies try to approach the healthier capital structure through larger firm acquisitions. We will get more back-up for this hypothesis in next chapter when we will observe what kind of consideration companies use to finance their acquisitions.

Previously we have observed that natural logarithm of sales, EBITDA to total assets –ratio and market to book –ratio increase the probability of making acquisitions but now they lead to relatively lower deal values as well. It is quite sensible that the relative size of the deals declines along with the company size since the group of potential targets with relatively high value also becomes smaller. Increased firm size has a negative effect on the relative size of the target company in all acquisition types. Profitability and/or cash richness has the same effect. The results as such might be a sign of agency problems. Companies with excess cash can more easily do acquisitions which are not necessarily optimally increasing the shareholder value. When analyzing the announcement returns we will get a better view if investors think that acquisitions made by cash rich firms destroy shareholder value or not. Market to book –ratio inclines smaller acquisition targets in all acquisition categories. High market to book –ratio is used as a sign of overvaluation but also it is a proxy for growth companies. Usually these companies are not involved in large acquisitions as they are mostly making smaller acquisitions to boost their future growth. Companies with lower market to book –ratios are

operating in more mature industries, thus they tend to do acquisitions in order to find synergies resulting in larger acquisitions.

Industry M&A liquidity increases the relative size of the acquisitions in general. The effect is strong and highly significant especially in within industry and asset acquisitions, but weaker (and also insignificant) in cross industry and firm acquisitions. The result is opposite compared to acquisition probability where we observed that higher industry M&A liquidity has a positive effect on cross industry and firm acquisitions and highly negative effect on within industry and asset acquisitions. When combining these two results it can be said that companies make less within industry and asset acquisitions but the size of those deals are larger. Therefore, the total value of the deals does not change that significantly. This observation is in line with the analysis that was made about the risk aversion of acquiring companies. As previously written, companies make less risky acquisitions, within industry and asset acquisitions, and also use less money on those if the sentiment is weak, i.e. industry M&A liquidity is low. However, when the sentiment is better they do larger acquisitions in these two categories where information asymmetry is lower, but are also more actively doing more risky acquisitions where information asymmetries are bigger.

Industry concentration does not have a significant effect on the on the relative size of the acquisitions. In consolidated industries the pool of target companies is smaller but most likely also the size of the targets varies more than if the industry is more fragmented. However, from this sample it cannot be further analyzed how the relative size differs and if there is more fluctuation. On general there seems to be no significant difference. Good GDP growth is reflected in lower relative size especially in firm acquisitions. When taking into account the increased acquisition probability at the same time, this result is most likely due to increased number of smaller acquisitions and not that much because lack of larger ones. In common law countries firm acquisitions are slightly higher than in other EU15 countries, but in general the effect is limited.

5.2 Is the leverage deficit affecting the method of payment?

In this part of the study I will analyze how the deviation from the optimal capital structure affects the method of payment used in acquisitions. In the sub-chapters I will present the methodology I am going to use for observing the method of payment. It will be based on the study made by Uysal (2011) but I will do some modifications into it if it seems sensible based on the existing literature. Similarly than in Chapter 5.1 I will analyze sample as a whole but also divide the firm years/companies to underleveraged and overleveraged based on their leverage deficit. Additionally, I will be observing firm acquisitions and asset acquisitions separately. Within and cross industry acquisitions will be controlled through dummy variables. I will study if the probability for cash acquisitions²⁰ increases or decreases along with leverage deficit, and also if the proportion of cash and equity changes when company is underleveraged or overleveraged.

5.2.1 Methodology

Both probit and OLS analyses are used to evaluate if the leverage deficit has an effect on the method of payment. The probit analysis is used to observe if leverage deficit increases or decreases the possibility for a firm to finance its acquisitions with pure cash. Additionally, I will extend the approach by running an OLS analysis. When the probit analysis observes how the probability of using pure cash to finance the deal changes, OLS analysis tests how much the ratio of cash and equity changes based on the acquirer's leverage deficit. Both probit and OLS analyses will be multivariable analyses with relevant control variables used to exclude the generally acknowledged factors affecting the payment method. Control variables are based on the existing literature and are explained in more detailed later in this chapter.

Previous studies have observed several factors that have an effect on whether cash or equity (or mix of those two) is used as a consideration in acquisitions. If the efficient market hypothesis holds the method of payment should be irrelevant. However, in practice several factors affect the type of payment. Asymmetries of information have been observed to have an effect on the payment. These asymmetries are often related to the valuation of the bidder. E.g. Myers and Majluf (1984) and Travlos (1987) have addressed the topic that the company managers usually want to act as it is beneficial for the old shareholders and thus evaluating

²⁰ With cash acquisition I am referring to acquisitions where only cash is used as a consideration

the method of payment. In practice this means that equity is used as a payment when a company is overvalued and cash if undervalued. To control these phenomena I am adding acquirer's (1) *Market to book –ratio* as a control variable. Along with the size the asymmetries of information have observed to decline (Rajan & Zingales (1995)) thus also (2) *Natural logarithm of sales* will be added to the equation.

Asymmetries of information can be also related to the target as well and not only on the bidder/acquirer. According to Eckbo et al. (1990) the probability of overpaying is higher if cash is used as a consideration. Therefore, higher asymmetries of information between bidder and target may result that the proportion of equity used as a consideration is higher. I will control this by adding dummy variable on the target's organization form (3) *public company* – into the equation. If the target is privately held the asymmetries of information can be considered to be higher.

Berkovitch & Narayanan (1990) observed that if the bid is competed, i.e. there are more than one company bidding on the target company, more cash is used as a consideration. Fishman (1989) says that target's management is more likely to accept a bid where cash is offered as a consideration. Cash as a consideration decreases the asymmetries of information between the bidder and the target. If the bidder wants to sweeten the deal and increase the possibility for its bid to get accepted, additional share of cash is often paid. Thus a dummy for (4) *competed deal* is added to the equation.

As already discussed earlier, agency problems can launch acquisition by the company management (e.g. Jensen (1986), Harford (1999)). Similarly than in the Chapter 5.1.1 (5) *EBITDA to total assets –ratio* is added to control if companies with better cash flow and profitability make more acquisition financed with cash. As previously I will also add (6) *Industry M&A Liquidity –index* and (7) *Herfindahl Index* to control the general M&A atmosphere within the industries in question.

(8) *Year dummy “High”* is added for to capture years with above average GDP growth like in the previous chapters. I will also add dummy (9) *Common law* for United Kingdom and Ireland to observe if these two countries prefer cash over equity (or vice versa) as a consideration. And Similar to Uysal (2011) I will also add a (10) *dummy variable on deals made within the same industry*. The industry division is based on 2-digit SIC codes as previously.

5.2.2 Results

Table 10 shows the results from the probit analysis while Table 11 contains results from the OLS analysis. I find evidence that leverage deficit does contribute to the decision related to consideration used in an acquisition. Based on the probit analysis deals which are financed only with cash are more likely executed by an underleveraged company, the result is even stronger when making asset acquisitions. The results are similar in the OLS analysis as well which shows that the proportion of cash used to pay for the acquisition declines when company becomes overleveraged. When overleveraged companies are making firm acquisitions I find strong evidence that they tend to use less cash and rely more on equity financing. However, when observing asset acquisitions the situation is the opposite, but the result is not as strong and statistically also insignificant. Underleveraged companies often have cash reserves that can be used to pay for acquisitions and additionally it is easier for them to raise debt. This is also in line with the pecking order theory causing companies to rely internally generated funds and debt financing ahead of equity finance. Harford et al. (2009) studied if the consideration used to finance acquisitions is related to the capital structure of the acquiring company. They found strong evidence that companies tend to use more equity if they are overleveraged. Additionally, if acquisition is financed with debt, companies tend to move towards their optimal capital structure during the post-acquisition years. I found evidence that this is case especially when overleveraged companies are making larger firm acquisitions.

Cash acquisitions and higher proportion of cash seems to be strongly related to the firm size as expected. Larger companies are able to have higher leverage ratios enabling them to rely more on debt financing, as discussed already in Chapter 4.1. The result differs when observing asset acquisitions, though. In OLS analysis is found no significant difference in the relative proportion of cash used to finance the acquisition when the company size changes. As observed in Chapter 5.1.3, high market to book –ratio tends to increase the probability for asset acquisitions. When one possible reason for this was that companies target to benefit from the misvaluation by changing their own overvalued assets to relatively undervalued, it explains why the proportion of cash does not change that much when assets are acquired. It seems that every company despite its size tries to take advantage of this overvaluation and therefore, the proportion of cash does not increase along with the firm size.

Stronger cash flow is, as expected, positively correlated with higher use of cash, especially in firm acquisitions. However, this effect is highly limited on firm acquisitions as with asset acquisitions the proportion of cash does not increase despite the company had very strong cash flow and/or excess cash. This result is very interesting and is not that well observed in the existing literature. Further analysis of this phenomenon is out of the scope of this study, but it would be an interesting topic to investigate further. As the result is similar with the size of the acquirer, the most likely explanation is that also cash rich companies tend to utilize their overvaluation by making equity financed asset acquisitions when being overvalued.

Surprisingly, high market to book –ratio is not really reflected as a higher proportion of equity, and in asset acquisitions the situation is actually opposite. As the normal market to book –ratio varies between industries the ratio does not only reflect overvaluation but also differences between industry valuations, this might explain such a result. Based on theory, overvaluation should be reflected as a higher proportion of equity. This study could be extended by taking a closer look on an industry level. That would show if such a result is due to the fact that industries with higher market to book –ratio use more cash in asset acquisitions, or if this is a more general phenomenon.

Both Industry M&A liquidity and above average economic growth increase the proportion of equity that is used as a payment in acquisitions. The effect is stronger and more significant in asset acquisitions. During the upturn investors are willing to hold larger proportion of their investments in equity. The situation is the contrary during the downturn when the sentiment deteriorates and people rely more on cash and other less risky assets. Hence, strong macro-economic situation as well as industry specific performance declines the usage of cash in acquisitions. It seems that market to book –ratio in this model captures more the industry specific differences and is not as much related to over-valuation of equity.

Competed deals however are sweetened with higher proportion of cash and being more significant when observing asset acquisitions. The situation in competed deals is the same than when public targets are acquired. Both observations are well in line with the existing literature. With within industry dummy the results are again asymmetric. When assets are acquired cash is more commonly used, proportion equity increasing when firm acquisitions are done. Two factors are most likely to explain such an outcome. Firstly, the relative size of asset acquisitions is smaller than what it is in firm acquisitions, see Table 7. Thus, asset acquisitions can more easily be covered with equity. Secondly, asset acquisitions are more

often done when the economic situation is not as strong, while firm acquisitions are more common during when the economy is performing better (see the discussion in Chapter 5.1.3). This naturally creates a situation where asset acquisitions are more likely paid with higher proportion of cash, as equity in general is more commonly used as a consideration when the market sentiment is strong.

In UK and Ireland acquirers use more cash than other EU15 countries. The difference to other EU15 countries remain strong and highly significant in both firm and asset acquisitions. Most likely this refers to the fact that these two countries are more market oriented enabling them to finance acquisitions more easily with cash. These extremely strong results might partly arise due to the data issues addressed already in the previous chapters. However, the results are very strong so it refers that companies from UK and Ireland do use relatively more cash to pay their acquisitions and cannot be explained with only with data issues.

5.3 Is the announcement effect affected by the leverage deficit?

In this part of the study I will analyze how the deviation from the optimal capital structure affects the bidder's cumulative abnormal return²¹ during the announcement window. I will first observe on general level if there are differences in abnormal returns depending on the leverage deficit quartiles and deal types. Acquirers' abnormal returns are observed on more detailed level by running OLS regression analysis with relevant control variable. Firstly, Chapter 5.3.1 presents the methodology and control variables while Chapter 5.3.2 includes the results and related analysis based on the existing literature.

5.3.1 Methodology

I will first study if acquirers' abnormal return varies between leverage deficit quartiles and acquisitions types. By doing this we can easily screen if there are some major differences in abnormal returns. However, as this is very general approach it will be expanded by multivariate analysis with related control variables. With control variables the target is to exclude the factors that have been noticed to have an effect on acquirers' abnormal return, and thus be able to analyze the effect of leverage deficit more explicitly. I will also take a look if there are differences between firm and asset acquisitions. The control variables are based on the literature. Since these variables are covered already in the previous chapters I will address them only briefly.

Moeller et al. (2004) stated that larger companies suffer from poorer abnormal return during announcement. Thus the first control variable will be (1) *Natural logarithm of sales*. Overvalued companies want to take advantage of their misvaluation by changing it into less overvalued assets through acquisitions financed with equity. However, this is a strong overvaluation message from the management often resulting in decrease in stock price (e.g. Travlos (1987), Schleifer & Vishny (2003)). To control the overvaluation (2) *Market to book –ratio* is added as a second control variable. In addition to market to book –ratio also form of payment give a strong message. Usually company is overvalued when it wants to use equity

²¹ Company specific CAR is for each of the sample companies within the -20/+2 days' time window. CAR is calculated by deducting the index return from the change in the company share price on a daily basis, from which the CAR has been calculated for the announcement window. For each of the companies the equity index of where the company is originated is used as a benchmark.

as a consideration, which is not the case with cash payment. A dummy variable for (3) *acquisitions paid with pure cash* is introduced. Cash richness may lead to agency problems when management makes acquisitions which are not on the shareholders interest (Jensen (1986)). Therefore, (4) *EBITDA to total assets –ratio* is also added. Asymmetries of information between bidder and target tend to be higher when a private company is the target. But, usually the lack of liquidity is reflected as a lower price. Dummy variables for (5) *public target* is also added.

Synergies are expected to be higher when acquirer and target are operating within the same industry (e.g. Schleifer & Vishny (2003)). If the premium paid on the target company is reasonable also acquirer should benefit in a form of positive CAR. (6) *Within-industry acquisitions* are therefore taken into consideration with a dummy variable. If there are multiple bidders trying to acquire the same target company they may end to a bidding war resulting that higher premium will be paid. Acquirers may end up paying too much on the target, deteriorating the acquirers' abnormal return at announcement. Therefore, a dummy for (7) *competed deal* is added as a control variable. Additionally, I will add a dummy for (8) *relative deal value*²² to see if larger acquisitions are welcomed with higher CAR.

Similarly to the previous multivariate analyses I am adding control variables which capture the general M&A atmosphere, industry competition as well as the macro economic situation. For these three attributes I am adding (8) *Industry M&A Liquidity –index*, (9) *Herfindahl Index*, and (10) *Year dummy* for years above average GDP growth. (11) *Common law countries* are separated with a dummy as well.

5.3.2 Results

In Table 12 has on general level been presented the acquirers' abnormal returns divided in leverage deficit quartiles and different deal types. On average firm acquisitions are welcomed with slightly higher abnormal returns than asset acquisitions. The same seems to apply for within industry acquisitions which enjoy slightly higher announcement CARs than cross industry acquisitions. Cash acquisitions are welcomed by lower than average abnormal returns in all leverage deficit quartiles.

²² Relative deal value is calculated by dividing the reported deal value with acquirer's market capitalization.

The distribution of abnormal returns is strongly v-shaped as both extremes have above average announcement returns. Overleveraged companies enjoy on average higher abnormal returns than slightly underleveraged. Slightly underleveraged acquirers have almost 2 percentage points lower announcement returns than highly overleveraged companies. The abnormal return start to increase again the more the acquirer is underleveraged. On average the most underleveraged acquirers enjoy similar announcement returns than the most overleveraged. When observing only firm acquisitions the difference increases and announcement returns for overleveraged companies are significantly higher than for underleveraged. Slightly underleveraged acquirers underperform compared to other quartiles also in firm acquisitions. The difference in abnormal returns is almost 3 percentage points between quartiles 1 and 3,

There is not that marked difference between asset acquisitions and the average announcement returns. Quartile 3 underperforms again but the difference is not as high as it was when firm acquisitions were under surveillance. All in all, asset acquisitions receive lower abnormal returns than firm acquisitions. The main difference is that actually the most underleveraged companies get higher abnormal returns than most overleveraged. The v-shape remains, though, as quartiles 2 and 3 both have below average announcement returns.

Companies belonging to leverage deficit quartile 3, meaning companies that are slightly underleveraged enjoy lower than average abnormal announcement returns in all acquisition categories. This tendency continues also with within and cross industry acquisitions. Cross industry acquisitions have lower than average abnormal return while announcement returns for within industry acquisitions are basically similar to the overall sample. Abnormal returns for cash acquisitions are lower than in other acquisition categories but again the extreme ends are outperforming especially the modestly underleveraged.

On average I find that acquirers' shareholders receive a positive abnormal announcement return in all leverage deficit quartiles despite of the acquisition type. I do not find evidence that acquisitions would destroy shareholder value at least not during the announcement window. The average announcement return is slightly higher than 1.1% return Moeller et al. (2004) observed when they studied a sample of 12,023 acquisitions made between years 1980-2001. However, they underlined that large companies tend to do worse acquisitions and therefore, if value-weighted the announcement return actually is 1.18% negative causing on

average \$25.2 million loss for shareholders per acquisitions. As my sample does not take into account the size effect value-weighted comparison cannot be done²³.

Table 12 – Abnormal announcement return per leverage deficit quartile

Table 12 contains the average abnormal returns depending on the leverage deficit quartile and deal type. Asterisks ***, **, and * indicate if the differences between leverage deficit quartiles are significant on 1%, 5% and 10% level respectively.

Variable	Whole sample	Leverage deficit quartiles*				4-1	4-2	4-3
		1	2	3	4			
All acquisitions	2.48 %	3.17 %	2.87 %	1.24 %	2.76 %	-0.41 % ***	-0.11 % **	1.52 % ***
Firm acquisitions	2.99 %	4.20 %	4.27 %	1.22 %	2.73 %	-1.47 % ***	-1.54 % **	1.51 % ***
Asset acquisitions	2.10 %	2.63 %	1.93 %	1.26 %	2.78 %	0.15 % ***	0.85 % ***	1.52 % ***
Within-industry acq.	2.84 %	3.66 %	3.31 %	1.36 %	3.08 %	-0.58 % ***	-0.23 % *	1.72 % ***
Cross-industry acq.	1.94 %	2.38 %	2.26 %	1.08 %	2.21 %	-0.17 %	-0.05 %	1.13 % ***
All cash	1.73 %	2.29 %	1.91 %	0.90 %	1.83 %	-0.46 % ***	-0.08 %	0.93 % ***

*Note: The 1st quarter includes the companies which are most overleveraged, as the 4th most underleveraged

Table 12 contains the results from OLS analysis where has been observed if leverage deficit does have an effect on the announcement return. I do find evidence that leverage deficit is affecting the abnormal announcement returns. Again the announcement returns do not linearly change along with the leverage deficit but seem to be asymmetry. Overleveraged companies tend to enjoy higher abnormal returns especially in firm acquisitions but the difference in asset acquisitions is smaller and statistically insignificant. Underleverage doesn't seem to affect the abnormal announcement return markedly. However, as the sample is divided to over- and underleveraged it cannot capture the v-shape in announcement returns we were able to observe when studying returns for different leverage deficit quartiles. But from these results it can be said that more the company is leveraged the higher the announce return tends to be. Hence, overleveraged companies more often make shareholder value increasing acquisitions than underleveraged companies, and especially when firm acquisitions are observed.

Size of the firm is highly strongly related with lower announcement abnormal return which is in line with the recent literature (e.g. Moeller et al. (2004)). The larger the company the more negative is also the abnormal return, hence larger companies make more value destroying acquisitions. Large acquirers get smaller abnormal returns when making both firm and asset

²³ Later in this chapter one can notice that the abnormal announcement return declines along with the size thus the value-weighted abnormal announcement return would be lower than the equally-weighted.

acquisitions. This result is significant in all categories. Higher cash flow, estimated through EBITDA to total assets –ratio, is contributing negatively to the announcement returns in general and especially when addressing asset acquisitions. However, the result is not significant thus we cannot say that this is a generalized fact. Cash richness increases the probability that firms make investments that are not increasing shareholder value (e.g. Jensen (1986)). Harford (1999) noticed in his study that cash rich companies are more likely to do value increasing acquisitions. I get similar kind of results albeit they are not as strong. Explanation for such a difference can rise from the methodology. Harford measures cash richness as a ratio of cash reserves to sales, while I am using EBITDA to sales –ratio as a proxy for cash flow. Hence I am observing cash flow as Harford observes cash reserves. Variable for cash deal was also added to the model if companies being able to do pure cash acquisitions receive lower abnormal returns and thus reflecting agency problems. However, this dummy variable does not seem to have effect on abnormal announcement returns. Surprisingly higher market to book –ratio is contributing to the announcement return positively in general. This result is driven by asset acquisitions where higher market to book –ratio is associated with higher abnormal return. The effect on firm acquisitions is, however, insignificant. When companies use their equity as a consideration it sends a message of overvaluation which is usually reflected in negative announcement return. Even though the company is acting in shareholders' interest by trying to replace overvalued assets with less overvalued or undervalued, the overvaluation message tends to be stronger. Hence, my results differ from what e.g. Travlos (1987) and Schleifer & Vishny (2003) have observed. Again, reason for this might be that high market to book –ratio again captures better the differences between industry valuations and is not a the best possible proxy for overvaluation. To be sure if this is the case, this should be studied on industry level.

Companies operating in consolidated industries are welcomed with higher announcement returns when they are making firm acquisitions but there is no such effect in asset acquisitions. Successful acquisition for a company operating in consolidated industry will enhance its market power and is usually a factor of cost synergies. Apparently the premiums paid for the targets' shareholders are also lower leaving some benefits also for the acquirers' shareholders. Relative size also has a positive effect on announcement returns. This applies to all acquisitions but the effect is bigger in asset acquisitions, and also statistically significant.

As expected, I did not find evidence that competed deals would have a negative effect on announcement returns. Multiple bidders may increase the price and the premium paid on the

target and hence be reflected negatively in announcement returns. This was not, however, case in my sample. Neither did I find evidence that industry M&A liquidity nor above average GDP growth would be positively contributing to the announcement return. Public target or within industry acquisitions did not have a significant effect.

6. Conclusion

Capital structure choices as well as mergers and acquisitions have been topics that have attained a lot of interest from academics. From the late 1950's forward capital structure choices have been a continuously under discussion in financial economics. During the past 50 years academics have found a relatively good consensus on factors that explain why companies are operating with such capital structures they have. Based on these observations, it is possible to model what is the theoretically optimal capital structure for an individual company. Mergers and acquisitions have been an attracting topic especially because despite the vast research made on the topic, academics have yet to find a clear consensus if those really are beneficial for the shareholders of the acquiring firm. Despite that these two topics have been widely studied the current financial literature has not that vastly observed how these two areas affect one another.

I have taken a look how capital structure, and especially deviation from the theoretical optimal debt ratio, affects the acquisitions choices of a company. This study has had a twofold structure. I have firstly modeled the optimal capital structure for each firm year I have in my sample based on the existing literature. The second part of the study focuses on observing and analyzing how the deviation from optimal capital structure affects the acquisition behavior. Acquisition behavior is analyzed through three main variables: (1) How deviation from optimal capital structure affects the probability of making acquisitions and the relative size of the deals, (2) Does overleveraged companies use less cash as a consideration, and (3) Are overleveraged companies welcomed with higher abnormal announcement returns than underleveraged companies. The summarized results are presented in Table 14.

The sample that is used to calculate the optimal leverage ratio and leverage deficit consists of companies originated in EU 15 countries having annual sales over €10 million in financial year 2000. After excluding companies operating in financial industry or otherwise regulated sectors I was left with 3,750 companies. Eventually I was left with a sample of 26,050 firm years that had all the required financial information available from years 2000-2010. For each of these firm years I have calculated what the optimal capital structure²⁴ and the leverage ratio

²⁴ Model that is used to calculate is based on the existing literature and determinant that have been observed to have effect on the capital structure of a firm. Factors observed to affect the target capital ratio were firm size (+),

Table 14 – Summary of results

Hypotheses	Main findings
H1: Companies with higher leverage deficit are less likely to do acquisitions	Strong evidence that companies with higher leverage deficit, i.e. overleveraged companies are less likely to do acquisitions. The effect is strongest in asset acquisitions but is also significant in cross industry and asset acquisitions, while effect on within industry acquisitions remain limited. High underleverage has an negative effect on acquisition probability as well, mostly on cross industry acquisitions. Size of the company increases substantially the probability of making an acquisition, good economic sentiment having the same effect. Acquisitions Great Britain and Ireland are also more common. Industry consolidation has decreases acquisitions significantly. Companies with near to optimal capital structure are more frequent acquirers but the relative size of the target company tends to be smaller.
H2: Overleveraged firms are less likely to use cash as a consideration in acquisitions	Semi-strong evidence that overleveraged companies use less cash in acquisitions. Especially in firm acquisitions overleveraged companies use more equity as a consideration than underleveraged companies. Difference not significant in asset acquisitions or in pure cash deals. Underleverage companies more likely to do pure cash asset acquisitions while but otherwise underleverage has a limited effect on the proportion of cash used as a consideration. Firm size and cash flow increase the share of cash. Cash is more commonly used also in Great Britain and Ireland. Economic and industry specific sentiment increase the use of equity.
H3: Overleveraged companies enjoy higher cumulative abnormal return during the announcement window	Strong support that overleveraged companies enjoy higher abnormal announcement returns. Especially firm acquisitions are more positively welcomed by the investors. Underleveraged companies on average receive lower abnormal announcement returns albeit slightly underleveraged companies underperform compared to highly underleveraged. Abnormal return declines along with the size of the acquirer. Industry consolidation and relative deal value contribute positively to the return.

tangibility of assets (+), economic growth (+), market to book ratio (-), EBIT margin (-), and volatility of cash flows (-). Signs in parentheses indicate if they have leverage increasing or decreasing effect.

would be. On average, the firms in this sample were slightly (5.2 %-points) underleveraged, thus they would be able to increase the equity value by increasing their leverage ratio. However, the fluctuation in leverage ratios was extremely vast and the sample contained large number of highly overleveraged as well as underleveraged companies.

This sample of firm years was combined with a separate M&A sample that consisted of all the mergers and acquisitions that had been made in EU15 countries between years 2000-2010, and worth over €1 million. All in all this meant 3,313 deals that had been announced and completed. The firm year sample with calculated leverage deficits was then compared to the M&A sample.

The first part of the empirical analysis was to observe how deviation from the optimal capital structure affects the acquisition probability and relative size of the target companies. This analysis is done by running Probit and OLS regressions with relevant control variables. I found clear evidence that companies near to their optimal capital structure are more active acquirers than highly overleveraged companies. Overleveraged companies are especially less active asset acquirers but they make also fewer firm and cross industry acquisitions. The difference in within industry acquisition probability is insignificant, though. The same trend applies for underleveraged companies as well, as they make fewer acquisitions than the peers near to the target debt ratio. This occurrence is mostly limited to cross industry acquisitions. Additionally, I observed that firm size, economic sentiment as well as location in common law countries as acquisition probability increasing factors, while industry consolidation has a negative effect on acquisition probability. These findings are well in line with the research made on the topic. The relative sizes of the deals tend to increase especially when a company is overleveraged. Therefore, in terms of money the difference between leverage deficit tranches is not as vast as could have been interpreted from the acquisition probability analysis.

In the second part this study I focused to analyze if capital structure increases or decreases the probability of making pure cash acquisitions, or if it affects the proportion of cash that is used as a consideration in the deal. For this analysis Probit and OLS regression models were used respectively. The main finding was that underleveraged companies make more asset acquisitions that are paid with pure cash. Otherwise the results were not statistically significant. When studied how the proportion of cash changes along with the leverage deficit I observed that overleveraged companies use significantly less cash when paying for firm acquisitions. They clearly try to rebalance their capital structure by issuing equity that is used

to finance the deals. Size of the acquirer and strong cash flow increase the use of cash as expected. Common law countries have an easier access to debt markets which result in higher use of cash. Cash is more often used also when macro economy is in downturn.

Third and last part of this study was observing how the announcement returns change with the leverage deficit. The OLS regression showed that overleveraged companies enjoy higher abnormal announcement returns than companies on average. Investors appreciate especially firm acquisitions made by underleveraged companies as they tend to get the highest announcement returns. On average underleveraged companies receive lower announcement returns than overleveraged companies. However, I noticed that highly underleveraged companies outperform slightly underleveraged companies whose acquisitions are welcomed with lower than average abnormal announcement returns in all deal types. On average acquirers get a positive 2.48% abnormal gain when acquisition is announced. The figure is equally-weighted and thus does not take into account firm size effects. Also in my sample larger firms perform worse than smaller companies, a result presented in various studies before. Firm acquisition in consolidated industries and relatively larger asset acquisitions also get higher announcement returns.

In general it can be said that capital structure and especially deviations from the optimal do play a role in acquisition choices companies make. Based on the study by Uysal (2011) it was expected that overleveraged companies make fewer acquisitions, but surprisingly acquisition probability decreases also with underleverage. When acquisitions are evaluated in short-term, overleveraged companies are more likely to make shareholder value increasing acquisitions. This indicates that companies with financial lack are more vulnerable for agency problems. Slightly unexpected result was, however, that highly underleveraged companies are outperforming their slightly underleveraged peers. This indicates that agency problems are not only due to financial slack but also other internal factors. As this study has mostly focused on only short-term evaluation, it would be interesting to analyze what happens in the long run. This could be done evaluating both stock market performance and operational indicators. This is something that could be done in following studies.

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