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How do markets react on stock and bond issuance and on loan origination?

An event study for France & Germany 2010 – 2015

Jury

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This thesis is dedicated to my parents

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Abstract

This study investigates the effects of capital change announcements on a firm's stock price, using data for the French and German market in the period between January 2010 and December 2015. Unlike previous studies that mostly focus on one single form of capital change announcements, this paper investigates the market reaction to announcements of offering additional equity and bonds as well as announcements of loan origination in one concise paper. The empirical analysis shows that offerings of additional equity are related to a statistically significant decrease in the stock price of firms. The decrease in the stock price is more pronounced in France than in Germany. I also find that announcement effects of loan origination are associated with statistically significant positive abnormal returns, indicating that financial markets do value external debt financing by loans. In the case of announcements of bond issuance, I cannot find any statistically significant stock market reaction. The results of the event studies are consistent with most of the empirical literature.

Furthermore, this paper employs a cross-sectional analysis to get insights about which firm characteristics are related to the abnormal returns. The results of the cross-sectional regression revealed some interesting statistical relationships of the company variables and the announcement period returns. However, the overall explanatory power of the cross-sectional regression is limited, which is also in line with most previous research.

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List of abbreviations

AAR	Average abnormal return
AG	Aktiengesellschaft (public limited company)
AR	Abnormal return
CAAR	Cumulative average abnormal return
CAC40	Cotation Assistée en Continu (French stock market index)
CAR	Cumulative abnormal return
DAX	Deutscher Aktienindex (German stock market index)
EBITDA	Earnings before interest, tax, depreciation, amortization
EU	European Union
EUR	Euro
IPO	Initial public offering
NPV	Net present value
NYSE	New York stock exchange
OLS	Ordinary least square
SD	Standard deviation
SEO	Seasoned equity offering
UK	United Kingdom
U.S.	United States of America
VIF	Variance Inflation Factor
XETRA	Trading system at the Frankfurt stock exchange

List of symbols

α	Constant in the regression
β	Coefficient in the regression
ε	Error term
i	Firm
N	Total number of observations / events
$P_{i,t}$	Daily stock market closing price for firm i at time t
$r_{i,t}$	Observed return on stock i over period t
$r_{m,t}$	Observed return on the market index over period t
σ^2	Variance

Part A – Motivation

1. Introduction

Along their expansion path, corporations finance investments by retained earnings as well as by raising additional funds.[1] The new capital received can be seen as an advance on future growth as the money can be used for investments that optimally increase the company value. Firms that need additional funds can draw from a menu of many possibilities of how they want to raise new capital, ranging from equity offerings to different debt instruments. However, financing decisions should be considered carefully as they may also be harmful for the company's stock price and hence the company value might decrease. Therefore, managers of listed firm should be well aware of the different instruments they have at hand when changing the capital structure of a firm because each financing channel potentially leads to different effects on the performance of the firm's stock. This paper tries to empirically measure the short-run economic impact that announcements of additional equity and debt offerings have on the company value. Considering debt instruments, this paper focuses on announcement effects of bond issues as well as on announcement effects of bank loan origination on the announcing firm's value. In a nutshell, this paper addresses very practical issues as it helps managers to understand how different capital change decisions affect the company value.

The large body of empirical literature on the short-run market reactions to capital change announcements motivated many researchers to develop theories about how these stock price movements can be explained. Based on these theories, I formulate hypotheses that will be tested for a sample of German and French firms for a period of 6 consecutive years between January 2010 and December 2015. Applying the event study methodology, this paper aims at contributing to our understanding of why companies and financial markets behave the way we observe it. Additionally, in the cross-sectional analysis, I investigate whether the stock price reactions around the announcement day are related to selected firm characteristics, applying a multivariate OLS regression model. In particular, I will control for (1) the retention ratio, (2) the free cash flow available to firms, (3) the leverage ratio and (4) the profitability of firms.

This paper contributes to scientific research, as there is, to the best knowledge of the author, no empirical study that examines the announcement effects of seasoned equity

[1] Word count: 17,676

offerings (SEOs), bond issues and loan origination in one concise paper. Additionally, there is a lack of recent research on the effects of loan origination for the German economy.

The remainder of this paper is organized as follows. The next chapter reviews some of the most prominent theories about the effects of changes in a firm's capital structure before an overview about the empirical literature is presented. The introductory part A closes with hypotheses that are derived from the theories and which will be tested in part C of this paper. The data and methodology are described in chapter 4 and 5, respectively. After that, the stage is set to investigate the results of the event study and the regression results of the cross-sectional analysis in part C. Finally, part D concludes the paper with a summary of the analysis and fields for further research are presented at the end of the paper.

2. Background

2.1 Theory review

2.1.1. Capital structure theories

Corporate finance theories about a firm's optimal capital structure date back to the capital irrelevance theorem of Modigliani/Miller (1958). Assuming frictionless capital markets, the authors suggest that the value of a firm is not affected by its capital structure.[2] The authors develop their argument as follows: by increasing the amount of debt, equity holders of the firm will demand a higher return due to an increased level of risk. Therefore, the total company value does not change because the overall cost of capital remains the same (Modigliani/Miller 1958).[3]

The strong assumptions of Modigliani/Miller (1958) made their initial theory quite attackable, which is why the authors extended their model by the incorporation of corporate taxes (Modigliani/Miller 1963). In the extended model, debt has the advantage that the firm's interest payments are deductible from the tax bill. This creates a tax shield, which favors equity holders as the payments to the government are reduced, leaving more revenue to be distributed across shareholders. In the extended model, the capital

[2] Modigliani/Miller (1958) abstract from taxes, bankruptcy costs, transaction costs, information asymmetries and agency costs.

[3] In the words of Brealey *et al.* (2011), the "size of the pie" (the company value), does not depend on how it is sliced between equity holders and debt holders (Brealey *et al.* 2011, p. 440).

structure now matters to determine the company value and one would expect to see an increase in the company value after a debt issuance announcement due to the benefits of the corporate tax shield. However, real life financing decisions are still not captured properly by the extended theory of Modigliani/Miller (1963). The reason is that their suggested level of debt is close to 100 percent (see Brealey *et al.* 2011, p. 444 and Brennan/Schwartz 1978, p. 103).[4]

A step towards a theory that fits real-world financing problems more adequately was developed by Brennan/Schwartz (1978), who extended the model of Modigliani/Miller (1963) by bankruptcy costs. This model is known as the static trade-off theory of capital structure. According to this approach, there exists an optimal capital structure that maximizes firm value. Figure 1 illustrates the argument of this theory: for low levels of debt, the bankruptcy costs are negligible. For moderate debt-levels, an increase in debt leads to an increase in the company value.

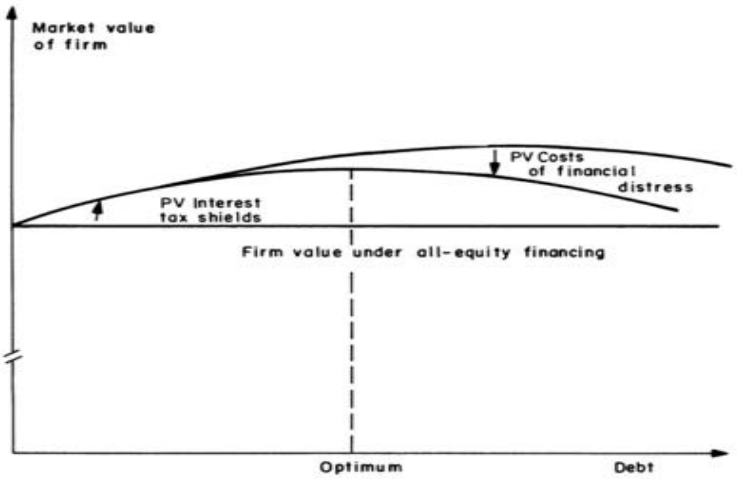

Figure 1 The static trade-off theory of optimal capital structure[5]

However, the probability of financial distress increases with the amount of debt, which leads to a decrease in company value for high levels of debt. The reason is that with increased debt, equity holders will demand higher returns because the company is more risky and more likely to go bankrupt (*ceteris paribus*). The higher the levels of debt, the higher are the costs of financial distress. In the optimum, the marginal benefit of the tax shield and the marginal cost of financial distress are equalized. The static trade-off the-

[4] In their concluding remarks, Modigliani/Miller (1963) explain that they are well aware of the fact that there are limitations to the tax advantages of debt financing and one should also consider other sources of financing and other costs of debt that cannot be captured with their static model (Modigliani/Miller 1963, p. 442).

[5] Source: Shyam-Sunder/Myers (1999, p. 220).

ory suggests that there exists a target leverage ratio for each firm and the theory avoids extreme predictions about the optimum level of debt. Yet, if one has a closer look on the leverage ratio of companies in real life, one notes that the companies with the highest earnings often have the lowest level of debt. This is at odds with the trade-off theory which suggests a higher level of debt as these companies have a big potential for a corporate tax shield and also face a low probability of financial distress (Brealey *et al.* 2011, p. 459 and Shyam-Sunder/Myers 1999, p. 221). In the following, alternative theories about factors that influence the decision-making of the capital structure are presented.

2.1.2. Pecking order theory

In contrast to the theories presented above, the pecking order theory of Myers/Majluf (1984) explains capital structure decisions without taking into account taxes and bankruptcy costs.[6] Their theory builds on the concept of asymmetric information, which leads to an adverse selection dilemma based on Akerlof (1970). The asymmetric information situation in this context is characterized in a way that managers of a firm have better information about the company's current and future financial situation compared to outside investors. The pecking order of financing choices is obtained as follows: first, a firm prefers internal financing generated through earnings as there are no costs of information asymmetries. Second, if additional funds are needed, firms prefer debt financing to equity financing. The reason for this order is that the costs of asymmetric information are greater for equity issues than for debt financing. As outside investors have less information about the company's financial situation, their best guess about the true firm value is that the firm has an average value (the true firm value can be higher or lower). Assuming that firms know their true value, managers compare the market price to the true value and act as follows: if the firm is currently undervalued, the company will issue debt because the market is likely to correct the undervaluation in the future (and *vice versa* a firm will issue equity if the stock is overvalued). A rational investor anticipates this behavior and interprets an issue of debt as good news because it implies

[6] Myers/Majluf (1984) assume that firms know their true value and act in the best interest of their existing shareholders. Another assumption of the authors is that there are only NPV positive projects. From this follows that, if a firm takes care of its shareholders, the company can rationally turn down NPV positive projects if existing shareholders would suffer from the SEO that finances the NPV positive project (Myers/Majluf 1984, p. 219).

that the firm delays raising funds through equity to the future, when the stock market price rises to the true value.[7]

2.1.3. Signaling theory

A similar but different approach to the pecking order theory is the signaling model by Miller/Rock (1985) who suggest that outside investors can learn about the firm's future performance by interpreting the capital change announcements correctly. The authors' theory is that by paying dividends to their shareholders, the firm expects generating sufficient cash flows in the future to finance investments. This policy sends a strong positive signal to the market in the sense that the firm is confident about the future performance. However, if a firm retains earnings rather than paying dividends, investors should be cautious because this could signal that the firm expects to have a lack of internal earnings to finance projects in the future. Announcements of additional equity or debt offerings can also be an indicator for a lack of future internal financing.

The signaling theory of Leland/Pyle (1977) states that if managers of a firm hold equity in the firm, information asymmetries can be reduced, as managers are concerned about their own wealth. Leland/Pyle (1977) argue that, *ceteris paribus*, a SEO dilutes the share of manager ownership in the firm. This sends a negative signal to the market, as managers do not seem to be confident about the firm's performance.

Besides focusing on SEOs, the concept of signaling can also be used to derive theories about the effects of an increase in debt. Ross (1977) argues that debt can be used as an instrument to signal strength. For example, if a bank decides to grant credit to a firm, the bank expects that the firm is able to meet the interest obligations and also to repay the principal at the end of the term. This information is received by investors and interpreted as a positive signal for the firm's future prospects, which should drive the firm value upwards (Ross 1977, p. 23). Diamond (1984) argues in a similar way and states that banks provide special services when lending money to firms. This is why bank loans differ from other types of borrowing because banks provide screening and monitoring services that are beneficial especially for small firms (Diamond 1984, p. 409).

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[7] Firms can mitigate the information asymmetry by releasing more information to the market, showing that the stock is currently undervalued. However, as Brealey *et al.* (2011) state, firms may be reluctant to release inside information as competitors can also make use of this data.

2.1.4. Agency theory

Jensen/Meckling (1976) introduced principal-agent conflicts to financing theories. These agency conflicts are more severe when the company has a large free cash flow (Jensen 1986, p. 323).[8] In contrast to Myers/Majluf (1984) the authors build their theory on the thesis that managers of a firm (the agents) do not necessarily act in the interest of the investors (the principals). As the principals do not know the managements' intentions, they bear agency costs in order to bridge the information gap. These costs can be in the form of monitoring firm executives in order to check for potential moral hazard behavior of managers. According to this approach, an increase in equity, *ceteris paribus*, increases the free cash flow, which in turn increases the risk of opportunistic behavior and the principals need to increase their spending for monitoring.

Jensen (1986) offers a possible solution for the principal-agent conflict by arguing that debt can be used as a tool to discipline opportunistic managers. In contrast to equity financing, debt is characterized by scheduled payments to the investors. This leaves less space for opportunistic behavior.

To sum up, most theories predict a decrease of the firm's stock market price when new equity is issued. In contrast, financial markets might interpret an increase in debt positively, but also negative market reactions are possible as it is suggested in the trade-off theory. To get a better overview about the effects of capital change announcements, the following section reviews existing empirical literature on announcement effects of equity and debt issuance.

2.2 Literature review

Short-term market reactions to changes in the capital structure are studied extensively in financial literature. Most research is done for the U.S., but especially in recent years the number of event studies for European, Asian as well as for South American economies increased.

2.2.1. Empirical literature on SEOs

The 1980s can be seen as the heyday for event study analyses on stock market reactions in response to capital change announcements. One of the first, and also one of the most cited event studies on SEO announcement effects, is the study of Asquith/Mullins

[8] Jensen (1986) defines free cash flow as the remaining cash flow after all projects with positive net present values are financed (Jensen 1986, p. 323).

(1986). The authors examine 266 common stock offerings of U.S. industrial firms in the period 1963 – 1981 and find that, on average, markets react with a significant decrease in the average firm's stock price of 2.7% for the two-day announcement period (Asquith/Masulis 1986, p. 85). In the sample of Asquith/Mullins (1986), more than 80% of the firms under investigation are subject to a negative announcement-day abnormal return. The results show that investors interpret the information that is conveyed in a SEO as a negative signal for the issuing firm's current performance and future prospects. These findings are in line with the theories of Modigliani/Miller (1963), Myers/Majluf (1984) and Leland/Pyle (1977).

Masulis (1980) studies the effect of capital structure change announcements on security prices by looking at a sample of exchange offers in the U.S. market between 1962 and 1976.[9] He finds that announcements that increase leverage lead to a positive abnormal return in the two-day announcement period, whereas announcements that decrease leverage come with a decrease in the abnormal return (Masulis 1980, p. 159). The statistically significant results are in line with the corporate tax shield effect and the findings further indicate that the management does not always act in the best interest of stockholders who are adversely affected in the case of a leverage decrease.

Similar results can also be found in Masulis/Korwar (1986). The authors find a statistically significant average fall in the stock price of 3.25% for industrial firms around the announcement date for a sample of U.S. firms in the period 1963 – 1980. Additionally, the authors conduct a cross-sectional regression in order to determine which firm characteristics drive the abnormal stock price performance. Their findings show that if management shareholdings decrease, the decrease in stock prices is amplified. This supports the signaling hypothesis of Leland/Pyle (1977).

Loughran/Ritter (1997) also investigate announcement effects of SEOs in the U.S. market and use a classic event study methodology, which is additionally complemented by a matching-firm technique in order to check for the robustness of results. Their sample consists of 1,338 SEOs in the period 1979 – 1989 and their results show that the average annual return of issuers underperforms both, the firm's benchmark index and the matching non-issuing firm. Irrespective of whether the event study or the matching-firm

[9] In an exchange offer, investors of one security class receive the right to exchange their securities for another class of securities of the same firm (e.g. selling common stock for debt).

technique is chosen, the authors find an underperformance of the issuing firms by about 7% per year for the five years after the announcement (Loughran/Ritter 1997, p. 1841).

Studies conducted for other markets than the U.S. report similar effects of SEO announcements. Medeiros/Matsumoto (2005) find an abnormal return on the announcement day of -2.4% for a sample of 80 SEOs of Brazilian firms between 1992 and 2003. The authors also cumulate the abnormal returns for an event window [-14; +15] which leads to a CAAR of -4.6% (Medeiros/Matsumoto 2005, p. 43).[10] A recent study by Do (2009) on the Finnish market reports similar empirical evidence as on the U.S. market. The author finds a significant abnormal return of -3.6% for a sample of 93 announcements in Finland in the period 1996 – 2003 (Do 2009, p. 38). Furthermore, Do (2009) finds that the more levered a company is, the more negative is the reaction on the stock market.

Gajewski/Ginglinger (2002) examine SEOs in France for the period 1986 – 1996 and find that the market reaction to announcements of equity issues is significantly negative. For their sample of 278 SEOs, they observe a statistically significant negative abnormal return of 0.58% on the announcement day for rights issues. Another study by Ginglinger/L'her (2011) examines announcements of stock repurchases in France and finds a positive average market reaction.

Existing literature for the effects of SEOs in the German market is rare and not very recent. In fact, the contributions of Brakmann (1993) and Padberg (1995) are among the only ones that examine the short-run effects of additional rights issue announcements. Both authors find positive abnormal returns for Germany, which is in contrast to most of the empirical studies presented above. Many papers that investigate the market reaction in Germany focus on the long-term effects rather than on the short-run reaction, which is at the heart of this paper.[11]

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[10] Additionally, the study conveys the existence of market inefficiencies in the Brazilian stock market as the authors find statistically significant negative abnormal returns 14 days prior to the announcement. This is an indicator of insider information, as one would expect the negative reaction only around the announcement date.

[11] For an analysis of the long-run SEO effects on the stock price, please refer to Stehle *et al.* (2000) or Bessler/Thies (2006).

2.2.2. *Empirical literature on bond issuance*

Empirical studies of stock market reactions to bond announcements come to conflicting results. Antweiler/Frank (2006) come to the result that for their sample of U.S. firms, announcements of straight bond issues do not affect the stock price of the issuing firm.[12] The results of Antweiler/Frank (2006) are confirmed by Shyam-Sunder (1991) as well as by Eckbo/Masulis (1995) who also find neither positive nor negative effects on the stock market when straight bonds are issued. Shyam-Sunder (1991) additionally controls for different bond ratings, but finds no statistically significant effect of ratings on the stock market effects (Shyam-Sunder 1991, p. 557).

A more recent event study by Chin/Abdullah (2013) investigates abnormal returns in response to straight bond issues in Malaysia as well as the company characteristics that influence that effect. Based on the sample of 100 bond issuers between 2000 and 2007, the authors report a positive and significant CAAR for the 21 days that surround the event.[13] Considering firm characteristics, they report an insignificant relationship of the control variables on the abnormal returns.

Besides solely analyzing straight bonds, Eckbo/Masulis (1995) also look at the issue of convertible bonds and here the authors find negative effects on stock market prices, which is due to the fact that convertible bonds have debt and equity components. Eckbo/Masulis (1995) find that the stock market reaction is most negative for common stock issues, less negative for convertible bonds and zero for straight debt issues (Eckbo/Masulis 1995, p. 1042). Most studies carried out on the U.S. market find these negative effects when convertible bonds are issued.[14]

Ammann *et al.* (2006) conduct a study on the German and Swiss market in the period 1996 – 2003 and find similar results to Eckbo/Masulis (1995). The authors report that the announcement of convertible bonds causes a significant negative abnormal return of -2.43% for the German sub-sample in the two-day event window (Ammann *et al.* 2006,

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[12] The same study also investigates the effect of additional equity issues and the authors report a statistically significant negative stock price reaction. This result is in line with most of the empirical research presented in section 2.2.1.

[13] The study of Chin/Abdullah (2012) uses the bond issue day as the event date rather than the bond announcement day. The authors justify this approach by arguing that if one takes the announcement day, there is comparably more uncertainty whether the bond will be finally placed in the market or if the company ultimately decides to withdraw the bond issue. They base this reasoning on Kapoor/Pope (1997). This paper, in contrast, will analyze the stock market effects on the announcement day. The argument for this procedure will be discussed in chapter 5.

[14] An extensive recap of studies on announcement effects on convertible bonds can be found in De Roon/Veld (1998).

p. 6). Burlacu (2000) studies 141 issues of convertible bonds in France between 1981 and 1998. The research shows that, on average, there is a negative stock market response to convertible bond issues in France and the reaction is more negative, the higher the equity component in the convertible bond is (Burlacu 2000, p. 457).[15]

2.2.3. Empirical literature on loan origination

One of the first event studies that are concerned with the effects of bank loan announcements is the paper of Mikkelson/Partch (1986) for firms listed in the U.S. The sample on which they base their analysis consists of 155 credit lines and 61 term loans in the period 1972 – 1982. The authors find that the average price response on stock markets is positive when firms announce to sign a credit agreement. Furthermore the authors conduct a cross-sectional analysis to control for different credit or firm characteristics that might influence the stock price behavior around the announcement day. Their findings suggest that none of their control variables has a significant effect on the market reaction around the announcement day (Mikkelson/Partch 1986, p. 59).

A study by James (1987) *inter alia* investigates how publicly announced bank credits affect the stock price around the announcement day. The bank credits under consideration are either bank loan renewals or new credit agreements which in total amounts to 80 events for non-financial firms in the U.S. for the period 1974 – 1983. The results of James (1987) are similar to the results of Mikkelson/Partch (1986). In particular, James (1987, p. 227) finds a positive two-day announcement period return, which is highest if the credit is used for general corporate purposes (CAAR = 4.67%).

Up to this point, it appears that empirical studies for the U.S. market report positive effects of bank loan announcements. Similar positive effects in response to bank loan announcements for the U.S. economy can be found in Preece/Mullineaux (1994). Billett *et al.* (1995) additionally control for the credit rating of lenders and find that the higher the credit rating of lenders, the greater are the stock market returns for the borrower. Slovin *et al.* (1992) find positive share price effects for small firms, whereas large borrowers exhibit a negligible stock market response (Slovin *et al.* 1992, p. 1070).

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[15] Interestingly, there are also several other papers that find positive effects on stock markets when firms announce to issue convertible debt. A study on the Dutch market by De Roon/Veld (1998) detects positive abnormal returns in response to convertible bond announcements and Kim/Stulz (1992) report positive stock market effects for a sample of Japanese firms.

Having a look on studies outside the U.S., Kang/Liu (2008) find positive abnormal returns for a sample of Japanese firms. Aintablian/Roberts (2000) also discover a positive perception by markets in response to bank loan announcements for a sample of companies listed in Canada.

A more recent analysis that also looks on markets other than the U.S. economy is the paper of Godlewski *et al.* (2010), which consists of a sub-sample of 38 syndicated loan announcements of Russian listed firms in the period 2004 – 2008. In contrast to the studies presented above, Godlewski *et al.* (2010) find a negative stock market reaction on average. The five-day announcement period CAAR for syndicated loans amounts to -5.5% which is statistically significant at the 5% level (Godlewski *et al.* 2010, p. 19). In this case, the negative effects of debt outweigh the positive effects of debt like signaling financial strength and disciplining managers. Other studies that also focus on less developed capital markets come to similar results. For example, a negative stock price reaction can also be found in the Chinese capital market (Huang *et al.* 2012).

Considering previous research on the effects of bank loan announcements in Germany and France, there is a recent study of Godlewski (2014) that examines 253 loan announcements by French borrowers. For the whole period 2000 – 2009, the author finds a significant negative stock market reaction to bank loan announcements. Godlewski (2014) then divides the sample in a pre-crisis sub-sample and a sub-sample during the recent financial turmoil and discovers that the overall negative stock market reaction is mainly driven by the stock market response during the crisis between 2007 and 2009. The pre-crisis sub-sample does not show any significant effects on stock markets.

In conclusion, many empirical studies find positive market reactions to bank loan announcements. However, the examples of Godlewski *et al.* (2010) and Huang *et al.* (2012) show that the characteristics and development status of each capital market have to be taken into account because the stock market reaction to capital change announcements might differ with the development status of the financial system in a country.

The review on empirical literature in this section showed mixed results for the market perception of different capital change announcements, depending on various security and market characteristics that are important to determine the stock market response to capital change announcements. This is why the following chapter briefly presents the background about the stock market indices in Germany and France, which are the benchmark indices for the stocks in the respective country.

2.3 Overview about the German and French stock market indices

Conducting an event study analysis in two different countries requires having a brief look on the different characteristics of the market indices in each country. It is important to benchmark each stock to the index of the home country (the performance of a French stock necessarily has to be compared to the performance of the CAC40). One reason for this procedure is that festive holidays, that cause closed stock exchanges, vary in each country.[16] Additionally, each index is designed differently in order to reflect the trading trends in both markets in the most appropriate way.

In Germany, 90 percent of all shares are traded on XETRA, which is the trading system of the Frankfurt stock exchange (Deutsche Börse 2016). Owner and operator of the Frankfurt stock exchange is the Deutsche Börse AG. The DAX index is calculated from the 30 largest and most liquid companies listed in the prime segment at the Frankfurt stock exchange (Stoxx 2017).[17] One of the requirements to be incorporated in the DAX is that the company has its registered office in Germany.[18] The DAX index is composed on an annual basis and no component can weigh more than 10 percent in the index in order to avoid a domination of one single component (*ibidem*).

Euronext Paris is part of NYSE Euronext and operates the stock exchange in Paris. The CAC40 index measures the performance of the 40 largest equities (by market capitalization) that are most actively traded (Euronext 2009, p. 2). In contrast to the DAX, which is a performance index and reinvests dividend payments, the CAC40 does not incorporate dividends and is a pure price index. Another difference between both indices is that the weigh of a single component is capped to 15 percent in the CAC 40 index (*ibidem*).

Figure 2 gives an impression about the performance of the DAX (orange locus) and the performance of the CAC40 (black locus) for the period January 1, 2010 to December 31, 2015. The overall development of both indices is characterized by an increase in the price. At the beginning of 2010, both indices were about the same price. Starting in May 2010, the DAX began to be priced higher than the CAC40 and the gap between both

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[16] For example, October 3rd is a public holiday in Germany whereas in France trading continues on that very day.

[17] The weigh of each component is determined by the market capitalization of free float shares of a firm (Stoxx 2017, p. 2).

[18] Alternatively, a company also qualifies for the DAX if a significant portion of the trading in the firms stock is on the Frankfurt stock exchange and the firm has its registered office in a member state of the EU (Stoxx 2017, p. 2).

indices widened until the end of the period under consideration. However, what also becomes obvious when analyzing the chart below is the observation that both indices move more or less in tandem with each other, even though the DAX outperforms the CAC between 2010 and 2015.

Figure 2 Performance of the DAX and CAC40 indices 2010 - 2015[19]

After this brief presentation of the DAX and the CAC40, the following section 3 introduces the hypotheses I want to investigate in the remainder of this paper.

3. Hypotheses

The previous chapters introduced the reader to existing theories and empirical evidence about market reactions to capital change announcements. This chapter presents the hypotheses to be tested, which are based on the theories presented in Chapter 2.1. Hypotheses H1 – H4 below are related to the short-term announcement period effects:

H1 According to Modigliani/Miller (1963), an increase in equity is related to a negative stock market reaction because it decreases the benefits of the tax shield (*ceteris paribus*) and *vice versa* for an increase in debt.

H2 According to the pecking order theory of Myers/Majluf (1984), asymmetric information is associated with a negative stock market response when additional equity is issued (and a positive reaction should be observable if debt is issued).

H3 According to Leland/Pyle (1977) a SEO dilutes the share of management ownership in the company and should be related to a negative stock price reaction (*ceteris paribus*).

H4 According to Jensen (1986), debt can be used to discipline opportunistic managers and therefore new debt is related to a positive stock market reaction.

[19] Source: Börse Frankfurt, 2017.

For the cross-sectional analysis in chapter 7, the following hypotheses are formulated:[20]

H5 Based on the pecking order theory by Myers/Majluf (1984), the profitability of a company should have positive effects on the abnormal returns of capital change announcements because the higher the profitability, the lower the likelihood to need additional capital in the future as the firm can finance investments from internal funds.

H6 Based on Miller/Rock (1985), the retention ratio is associated with a negative impact on the abnormal returns around a capital change announcement because if the firm paid out more dividends, this would be a strong positive signal about the firm's future performance.

H7 Based on Jensen/Meckling (1976), free cash flow is associated with a negative impact on abnormal returns because it increases the agency costs and a SEO further increases the cash available for managers, making them tempted to undergo NPV negative projects.

H8 Based on Ross (1977), an increase in leverage is related to a positive effect on the abnormal returns because it signals strength to financial markets.

This introductory part A familiarized the reader with theories and empirical evidence about capital change announcement effects. Additionally, the French and German stock market indices, that serve as a benchmark in the event study, were introduced before the hypotheses that are to be tested in chapters 6 and 7 were presented. The following part B describes the data sample and the methodology of the analysis, which is the basis for the discussion of the results in part C.

Part B – Data sample and Methodology

This part of the paper contains a description of the underlying dataset that will be employed for the event study and the cross-sectional analysis. The data selection criteria and the resulting descriptive statistics will be discussed in chapter 4. Furthermore, the methodology of the event study as well as of the cross-sectional OLS regression will be described in chapter 5.

[20] Please note that the explanatory variables profitability, retention ratio, free cash flow and leverage are lagged by one year. A more detailed description of the setting for the cross-sectional analysis is discussed in chapter 5.

4. Data sample

The dataset of this event study consists of firms that are incorporated in Germany and France and which have the primary listing in their country of incorporation. Following Fama/French (1992), financial firms are excluded from the dataset due to the fact that financial institutions generally have higher levels of leverage. The differences of leverage levels for financial and non-financial firms could lead to twisted results. On top of that, financial institutions like banks and insurance companies have to comply with very strict legal requirements and are more regulated than industrial firms. By only allowing for non-financial firms, I can make more precise statements about the effect on industrial firms (Fama/French 1992, p.429).

Corporate news about announcements of additional equity offerings, bond issuance and loan origination as well as the stock prices were obtained from the Bloomberg terminal. I investigate capital change announcements that were made publicly available between January 1, 2010 and December 31, 2015. The matching historical stock market prices for the event firms as well as the quotation for the market indices are the closing prices on each day. By making use of daily stock market data, one can make more precise statements about abnormal returns of a specific event as the likelihood of other corporate events, that potentially affect the firm's stock price, is reduced (Kothari/Warner 2007). According to Brown/Warner (1985), the use of daily stock market data is acceptable for conducting event studies (Brown/Warner 1985, p. 25).

It is noteworthy that announced offers, which were ultimately withdrawn, are also kept in the dataset as it is also done in Masulis (1980), Masulis/Korwar (1986) and Mikkelson/Partch (1986). The reason is that in an event study, I assume to observe a stock market reaction at the day of the announcement. Therefore, even if the capital change was not executed in the end, the stock market reaction on the day of the announcement can give insights about how markets perceive the information.

In the case of loans and bonds, the dataset contains securities that were announced between 2010 and 2015 and which were still active when the data was downloaded from the Bloomberg terminal. Additionally, debt securities that were announced and already matured in the period 2010 – 2015 are also contained in the data.

In the case of SEO announcements, there are several additional equity offer announcements with an offer price of zero. These observations were deleted from the dataset because this study is mainly interested in the effect of additional capital on the firm value.

In total, 91 announcements were deleted according to this criterion before any further analysis was conducted. A problem arose when I double-checked for the offer type of the additional equity offering: even though I used a filter in Bloomberg to exclude IPOs, some equity offerings were still classified as an IPO or the offer type contained IPOs and other offers at the same time. The offer types containing IPOs in any form were eliminated from the final dataset of SEO announcements as the focus of this paper is on the effect of additional equity offerings (193 announcements were deleted after this screen).

For all security types in the sample, the EUR is the currency in which most securities are issued. In the case of bond issues, almost ¾ of all issues are denominated in EUR. Considering loans, 72% of all announcements in the dataset are denominated in EUR. These findings are not very surprising given the fact that France and Germany are both members of the Euro-area. However, firms also issue securities in other currencies than the EUR in order to mitigate the currency risk of their operations. The second most popular currency that firms use when issuing debt is the USD. This results from the circumstance that the USD still is the world's most important currency in the sense of stability and liquidity and the U.S. are an important trade partner for many firms in Germany and France. In the underlying dataset, 18% (26%) of all bond issues (loan agreements) are denominated in USD. The third most frequently used currency for bonds and loans is the British Pound, which accounts for a share of 5.4% and 1.23%, respectively. The remaining securities are denominated in various other currencies and do not amount to a notable share in the dataset compared to the currencies described above. For the sake of comparability and consistency, all amounts were converted into EUR by employing the respective EUR exchange rate of the different currencies at the date of the issue.

The following Table 1 gives an overview about the distribution of capital change announcements, separated by the type of security, year and country. In total, there are 742 SEO announcements in the underlying dataset. The sub-total shows that firms Germany (405 additional equity offers) announced more SEOs than firms in France (337 additional equity offers) in the period 2010 – 2015. Interestingly, in the period 2010 – 2013, the number of additional equity announcements is higher for German firms, whereas in the period 2014 – 2015, the reverse is true.

Turning the focus to bond issues, it should be mentioned that I do not distinguish between different bond characteristics (straight/convertible). Referring to the data in Table 1, there is a remarkable difference in the popularity of this security type between both countries. The sub-total shows that the number of bond issue announcements is almost twice as high in France than in Germany. It is also observable that the number of bond issue announcements increases in the period 2010 – 2012 in both countries before a decrease in bond announcements starts in 2013.

Calendar year	Country	SEO announcements	Bond issue announcements	Loan origination announcements
2010	Germany	89	36	117
	France	59	91	98
2011	Germany	80	32	142
	France	37	91	162
2012	Germany	55	84	118
	France	43	131	94
2013	Germany	62	80	118
	France	60	117	117
2014	Germany	63	72	114
	France	70	125	142
2015	Germany	56	41	103
	France	68	100	113
Sub-total	Germany	405	345	712
	France	337	655	726
Total		742	1,000	1,438

Table 1 Number of capital change announcements[21]

The table also reports that loans are the most popular source of re-financing for firms in both countries with the total number of loan agreements amounting to 1,438 in the period 2010 – 2015. The dataset contains both, bilateral and syndicated loans. The latter type of loans is used more often in the underlying dataset and in the following, no distinction is been made between both loan types. Loan announcements are almost equally distributed between French and German firms. The highest number of loan origination can be observed in 2011, when the total number in France and Germany peaked at 304 loan issues. In 2012, loan announcements dropped to 118 in Germany and fluctuated slightly around this number until 2015. In France, the fluctuation of loan announcements is much bigger for the period 2012 – 2015.

Comparing the total amount of all capital change announcements between both countries in the period 2010 – 2015, one can observe that firms in France had more capital change announcements compared to firms in Germany. In detail, French (German) firms announced 1,718 (1,462) changes in their capital structure in the period of inter-

[21] Source: Bloomberg and author's computations.

est. If one is interested in the year with the highest number of capital change announcements, there were 586 announcements in 2014, whereas the year with the lowest number of announcements is the year 2015 with 481 announcements in Germany and France.

After having an overview about the distribution of the capital change announcements in the dataset, the following Table 2 allows insights in the offer characteristics of the securities in the sample, again separated by security type and country. For SEOs in Germany, the mean amount is equal to EUR 184 million with a SD of EUR 431 million. The largest amount of additional equity offerings can be observed in France with an offer size amounting to EUR 4.7 billion, which is about EUR 1 billion higher than the largest SEO offer announcement in Germany.

Security type	Country	Min	Max	Mean	SD
SEOs	Germany	150,000	3,700,000,000	184,172,832	431,004,649
	France	54,217	4,732,810,000	188,639,163	435,441,179
Bonds	Germany	818,658	1,750,000000	310,104,321	325,515,363
	France	300,000	2,885,796,000	467,207,371	418,790,022
Loans	Germany	3,533,172	20,000,000,000	1,156,482,159	1,893,022,721
	France	1,700,000	11,091,600,000	1,028,793,027	1,379,845,958

Table 2 Descriptive statistics on the capital change amount in EUR[22]

In Table 1 it was reported that bonds are more popular in France than in Germany. From Table 2 one can now infer that also the mean amount of bond issues as well as the maximum amount of a bond issues is greater in France than in Germany. It is also noteworthy that the smallest amount of bond issues is larger in Germany compared to France, which, taking also the mean and maximum EUR amounts into account, translates into a higher SD in France.

Table 1 reported that loans are the most popular source of re-financing for the firms in our dataset. This observation is complemented be the data from Table 2 in which is stated that the mean loan amount in both countries is higher than the mean amount for the other security types. In Germany, the mean loan amount is equal to EUR 1.1 billion with the largest loan amounting to EUR 20 billion. In France, the mean amount as well as the minimum and maximum amounts are smaller than in Germany, resulting in a lower SD for this country.

[22] Source: Bloomberg and author's computations.

For the final analysis of the event-study, the dataset of non-financial event firms was cleaned up. The final sample for each security class satisfies the following criteria:

(a) The issuing company's daily stock market closing prices are available
(b) The announcement date is exactly identifiable

Both of these criteria reduced the number of firms that enter the event study. The final number of event firms per security type and country that enter the event study analysis will be stated in chapter 6 when the results of the event study are presented. With this information about the underlying dataset at hand, the reader is now well equipped to have a close look on the methodological framework that will be applied on the dataset in the remainder of this paper.

5. Methodology

The following section describes the methodology on which I base the event-study. The methodological analysis is based mainly on the concept of MacKinlay (1997).[23] By employing the event-study methodology, I assume sufficiently efficient capital markets in Germany and France that immediately react to new publicly available information. This semi-strong form of market efficiency allows measuring the economic impact of new publicly available information as soon as the news reach the capital markets (Fama 1970, p. 404). In this paper, the focus is on the short-run effects on the stock price of the announcing firm. The long-run consequences of the capital change announcement on the firm's stock price are beyond the scope of this paper.

The first step is to identify the event of interest, which, for the purpose of this study, is defined as the announcement day (= event day or day 0) on which the firm publicly communicates the capital change. The exact identification of the event date together with the use of daily stock market data increases the statistical power of the event study (Brown/Warner 1985, p.12). After identifying the event day, the next step is to define the event window in which I want to study the abnormal stock returns. It is common to use event windows with multiple days to account for potential imprecision in announcing the event.[24] This paper uses the symmetric three-day event window [-1; +1] as it is also employed in Campbell *et al*. (2010), Huang *et al.* (2012), Kang/Liu (2008), Miya-

[23] For the implementation of the event study analysis with STATA, support was received by the data and statistical services department of the Princeton University Library website (Princeton 2008).

[24] For example, it is nearly impossible to check whether the information was released before or after the closing of the stock markets.

jima/Yafeh (2007) and MacKinlay (1997). In order to check whether the results change if the event window is altered, the regression results for the eleven-day event window (formally: [-5; +5]) are also reported. Other studies that also use the [-5; +5] event window are Brown/Warner (1985), Campbell *et al.* (2010), Ginglinger/L'her (2011) and Miyajima/Yafeh (2007). As Antweiler/Frank (2006) point out, the choice of the event window is important and the magnitude and/or the sign of the CAAR may change with the length of the event window (Antweiler/Frank 2006, p. 10). To account for this issue, I compare the two previously mentioned event windows in order to check for the robustness of results.

As already stated before, this study analyzes firms in both, the German and the French market. Therefore, the benchmark for German (French) stocks is the DAX (CAC40) index, respectively. In other words, each stock is benchmarked against it's national stock market index as it is also suggested in Campbell *et al.* (2010).

From the daily stock market closing prices for each stock and index, I calculate the daily return on each stock and index from the previous day with a non-missing price to the current day. In this paper, trading days are used instead of calendar days and the normal return is calculated by

$$return = \frac{P_{t+1} - P_t}{P_t} \tag{1}$$

where

P_t and P_{t+1} are the stock market closing prices of firm i on day t and day $t+1$, respectively.

There are several ways in determining the abnormal return of a stock and this paper employs the market-adjusted model, also called the beta-one model. Other event studies use the market model instead of the market-adjusted model. The market model estimates the predicted return of each stock based on the firm's historical stock return and the historical market return. Here I sidestep the discussion of whether the market model or the market-adjusted model is more suitable in determining abnormal returns. I place on record that the methodology of the market-adjusted model is well established in the empirical literature and several papers find that the results of the market-adjusted model are not altered if one compares the results to the market model (e.g. Brown/Warner 1985, Chin/Abdullah 2012). Furthermore, it should be mentioned that the methodology of the market-adjusted model is supported by Brown/Warner (1985), who find that the

results derived from the market-adjusted model are not qualitatively inferior to results derived from the market model (Brown/Warner 1985, p. 246).

The reason why the market-adjusted model is also referred to as the beta-one model can be understood best if one briefly has a look on the market model. The latter model estimates each firm's return with the following OLS linear regression model:

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \varepsilon_{i,t} \tag{2}$$

where

t is the time index, $i = 1,2,...,N$ is a event firm with N being the total number of events, $r_{i,t}$ is the observed return on stock i over period t, $r_{m,t}$ is the return on the DAX (for Germany) and the CAC40 (for France) over period t, β_i is defined as $\text{cov}(r_{i,t} r_{m,t}) / \text{var}(r_m)$, α_i is defined as $E(r_i) - \beta_i E(r_m)$ and $\varepsilon_{i,t}$ is the unexpected, abnormal component for security i over period t

with

$E(\varepsilon_{i,t}) = 0$ and $Var(\varepsilon_{i,t}) = \sigma^2_{\varepsilon_i}$ (MacKinley 1997, p.18).

The regression of equation (2) over the estimation window delivers the estimates $\hat{\alpha}_i$ and $\hat{\beta}_i$. With this information at hand, the market model estimates the expected return on each firm's stock conditional on the event not taking place

$$E(r_{i,t}) = \hat{\alpha}_i + \hat{\beta}_i r_{m,t} \,. \tag{3}$$

In contrast to equation (3), the market-adjusted model that is employed in this paper, does not estimate the coefficients $\hat{\alpha}_i$and $\hat{\beta}_i$, but rather sets $\hat{\alpha}_i = 0$ and $\hat{\beta}_i = 1$. This leads to a simplified version of the market model, which is more suitable for the purpose of this analysis given the fact that there are multiple issues of the same issuers in the underlying dataset. If one employed the market model, there would be the danger that a capital change event takes place in the estimation period of the same issuer. A possible consequence could be that the normal performance of a stock is not estimated correctly and biased by an event taking place in the estimation window. The market-adjusted model is a frequently used technique to circumvent the possible bias as no estimation is required and the normal return is defined as

$$E(r_{i,t}) = r_{m,t} \,. \tag{4}$$

The abnormal return for each individual event then is simply defined as the residual between the realized return and the predicted return

$$AR_{i,t} = r_{i,t} - E(r_{i,t}) \tag{5}$$

or reformulated

$$AR_{i,t} = r_{i,t} - r_{m,t}. \tag{6}$$

Equations (5) and (6) show how to compute the abnormal return for each individual event firm i. In order to draw general conclusions about the effects of the capital change announcement under consideration, one has to aggregate the abnormal returns of the event firms and divide the sum by the number of events N (MacKinley 1997, p. 21). Therefore, the average abnormal return (AAR) on the event day t is defined as

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} \quad . \tag{7}$$

As the event window in this paper is wider than just one day, I calculate the abnormal return in the three-day and eleven-day event window in order to obtain the cumulative abnormal return (CAR) by summing over the abnormal returns in the event window

$$CAR_i(t_1,t_2) = \sum_{t=t_1}^{t_2} AR_{i,t} \tag{8}$$

where

t_1 and t_2 are the lower and upper bounds of the event window (*ibidem*).

The CAR is suitable to test whether the impact of an event is persistent over a period t_1 to t_2. On top of aggregating across time, I also aggregate across two dimensions – time and events. Therefore, I define the cumulative average abnormal return (CAAR) as

$$CAAR_i(t_1,t_2) = \frac{1}{N}\sum_{i=1}^{N} CAR_i(t_1,t_2). \tag{9}$$

After having presented the procedure to calculate the AAR, AR, CAR and CAAR, the final step is to define the testing framework with which I want to test whether the abnormal returns are statistically different from zero. I test the null hypothesis that there are zero CAARs around the announcement of capital change events. The alternative hypothesis therefore states that there are CAARs that are statistically different from zero. To test these hypotheses, I use a parametric t-test, which can be obtained directly

from STATA. The CAAR can be calculated by regressing the CAR of each event firm in STATA and as this paper is particularly interested in the average stock market reaction of all firms, the CAAR will be reported in the tables in chapter 6. Robust standard errors are employed throughout the event study analysis. Standard empirical literature suggests significance levels of 1%, 5% and 10%. These levels are also employed in this paper and indicated by three asterisks (***), two asterisks (**) and one asterisk (*), respectively.

In a last step, I define the cross-sectional regression framework on which I rely on when examining the different firm characteristics that are assumed to impact the cumulative abnormal returns. The data on firm characteristics is also extracted from the Bloomberg terminal. For the regression analysis, each firm characteristic is lagged by one year when being regressed on the CAR.[25] This procedure is inspired by Fama/MacBeth (1973) and by Fama/French (1992). According to Fama/MacBeth (1973, p. 618), the use of explanatory variables from the period preceding the announcement allows to make predictions about the returns in the period of interest. This adds a normative element to the regression analysis as past data can help people adjusting their future actions (*ibidem*). The use of lagged explanatory variables can be also found in other studies that are interested in the factors that influence returns (Chin/Abdullah 2012; Cooper *et al*. 2005, Ikenberry *et al*. 1995; Loughran/Ritter 1995; Shyam-Sunder 1991, Rajan/Zingales 1995).

In this paper, the cross-sectional analysis employs a set of different explanatory variables that are supposed to influence the CAR based on the hypotheses in chapter 3. In particular, the variable profitability is measured by

$$profitability = \frac{EBITDA}{total\ assets}. \tag{10}$$

This proxy for profitability can also be found in Gaud *et al.* (2005) and Rajan/Zingales (1995). Other proxies that measure profitability that are common in literature are the operating margin and profit margin as it can be found for example in Godlewski (2010). *Ceteris paribus*, the higher the profitability, the lower the likelihood for additional capital in the future because the firm can finance investments from internal funds. Furthermore, if past profitability is a good measure for future profitability, then profitable firms

[25] For example, if I am interested in the effect on the CAR of an announcement in 2011, the explanatory variables are taken from the firm's balance sheet in 2010.

can borrow more as the likelihood of financial distress decreases (Gaud *et al.* 2005, p. 54).

To test H6, I need a variable that measures the percentage of income that is not distributed to shareholders. The retention ratio is a suitable instrument to capture the percentage of earnings that is kept in the firm rather than being paid out in dividends to shareholders. The ratio is proxied by

$$retention\ ratio = \frac{net\ income - dividends}{net\ income}. \tag{11}$$

Derived from Miller/Rock (1985), an increase in the retention ratio (i.e. a decrease in dividends) is supposed to have negative effects on the CAR because investors may interpret this as bad news for the firm's future financial situation.

Additionally, I include a free cash flow variable to test hypothesis H7. Remember that this hypothesis states that, derived from Jensen/Meckling (1976), an increase in free cash flow should lead to a negative effect on the CAR because managers may be keen to invest in projects with a negative NPV.[26]

On top of that, the variable leverage is used to test hypothesis H8, which is based on Ross (1977). Keep in mind that according to this theory, larger leverage levels are considered to be related positively to firm value because these levels signal strength to financial markets. I proxy leverage by

$$leverage = \frac{total\ debt}{total\ assets}. \tag{12}$$

This proxy for leverage can also be found in Rajan/Zingales (1995) as well as in Eckbo/Masulis (1995).

To further increase the reliability and explanatory power of the regression, I add two additional independent variables that may also have an effect on the CAR of companies from a theoretical point of view.

[26] The free cash flow variable extracted from Bloomberg is defined as: Free cash flow = Cash flow from operating activities from the statement of cash flows of the firm + after-tax interest expense – capital expenditures (Lei/Li 2012, p. 22).

Inspired by Gaud *et al*. (2005), I include a control variable referring to asset tangibility in the regression, which is defined as

$$asset\ tangibility = \frac{fixed\ assets}{total\ assets}. \tag{13}$$

Tangible assets have the advantage that they can be used as collateral in the case of bankruptcy. An increase in tangible assets therefore should have a positive relationship with the CAR as tangible assets reduce the moral hazard behavior of firms because creditors can request to sell tangible assets when firms are subject to financial distress (Gaud *et al.* 2005, p. 55, Rajan/Zingales 1995, p. 1451).

On top of that, I include the natural logarithm of working capital in the cross-sectional regression. Working capital is defined as

$$working\ capital = current\ assets\ -\ current\ liabilities \tag{14}$$

and it may help to assess a firm's short-term financial health. In other words, working capital is a good proxy for the short-term liquidity of firms. Investors should be cautious if the value of current liabilities exceeds the value of current assets, as the company may slide into bankruptcy if a negative working capital is contained over a longer period.

Table 3 gives an overview about the firm characteristics, which will be used for the cross-sectional analysis.

	N	Min	Max	Mean	SD
RetentionRatio (%)	1508	0.12	100	69.49	25.55
FreeCashFlow (in Mio EUR)	2445	-6118	9645	230.06	942.32
Leverage (%)	2500	0	927.78	26.13	31.90
Profitability (%)	2506	-417	142	3	28
Tangibility (FA/TA)	2358	0	3.74	0.45	0.43
Ln_WorkingCapital	1922	-3.27	9.91	4.20	2.45

Table 3 Descriptive statistics of firm characteristics

As it is stated in Table 3, the retention ratio ranges from 0.12% to 100% with a mean of 69.49%. A retention ratio of 100% indicates that no dividends are paid out to shareholders. Free cash flow has the highest standard deviation, with a mean amount equal to EUR 230 million. The mean leverage is equal to 26.13%. The ratio of fixed assets to total assets has a comparably low SD of 0.43 and a mean value of 0.45. Finally, the natural logarithm of working capital has a mean of 4.20 and ranges from -3.27 to 9.91.

To check whether the variables in the model are subject to multicollinearity, I calculate the correlation matrix and the VIF scores for the independent variables before the cross-sectional regression for every type of capital change announcement. The correlation tables as well as the tolerance statistics and VIF scores are reported for each security type in the appendix. In the literature, tolerance statistics larger than 0.5 are generally considered to be acceptable and in the case of the VIF scores, some researchers use a critical value equal to five, whereas others use a threshold value equal to ten (Gaud *et al.* 2005, p. 60; Chin/Abdullah 2012, p. 12). Given these critical values, the issue of multicollinearity is checked for each type of capital change announcement in chapter 7. It turns out that multicollinearity shouldn't constitute a problem in the cross-sectional OLS regression.

I use a White test to check whether the error terms are homoscedastic or heteroscedastic. If the White test reports heteroscedasticity, I use robust standard errors for the cross-sectional regression of the company characteristics.

Based on the explanatory variables presented above, I suggest the following cross-sectional regression model

$$CAR_{i,t} = \alpha + \beta_{i1}\,\text{RetentionRatio}_{i,t-1} + \beta_{i2}\,FreeCashFlow_{i.t-1} + \beta_{i3}\,Leverage_{i,t-1} + \beta_{i4}\,\text{Profitability}_{i,t-1} + \beta_{i5}\,\text{Tangibility}_{i,t-1} + \beta_{i6}\,\text{ln\_WorkingCapital}_{i,t-1} + \varepsilon_{i,t} \quad (15)$$

where

> $CAR_{i,t}$ is the cumulative abnormal return for an event-firm i in year t and is defined as in equation (8).

The results of the Ramsey RESET test in appendix A-4, A-6 and A-8 indicate that the suggested model is adequately specified and the Null of no omitted variables cannot be rejected. If the model was specified incorrectly, the obtained t statistics would not deliver reliable results. The results of the Ramsey RESET test do not postulate that I found the best regression model, but rather the test results indicate that there is no functional form misspecification for the OLS regression. The complete results of the cross-sectional analysis for each type of capital change announcement can be found in chapter 7 of this paper.

Part B of this thesis presented the dataset of the analysis and introduced the reader to the methodological framework. Based on this background, the stage is now set to have a close look on the regression results of the event study and the cross-sectional analysis.

Part C – Results

Part C constitutes the heart of this paper and the aim of this section is twofold. First, the results of the event studies are presented in chapter 6, before the results of the cross-sectional regression are discussed in chapter 7.

6. Event study results

To start the analysis of the event study results, Figure 3 depicts the development of the CAARs around the announcement day for the whole sample. The solid line represents the CAAR for additional equity offers, whereas the dotted and dashed lines show the development of the CAAR for bonds and loans, respectively. The graphs can give a first impression of how the CAARs move in the 20 trading-day period surrounding the announcement and one can also get first insights in which effects the announcement has on the different CAARs.

For firms that issue additional equity, Figure 3 shows that these companies experience an increasing CAAR trend in the period between the days -10 and -2. After day -2, the CAAR starts to decrease sharply until it reaches a low at -0.7% one trading day after the announcement. From then on, the CAAR starts to recover, but remains in the negative area of the chart. The solid line fluctuates around a CAAR of around -0.5% until the end of the observations at day +10.

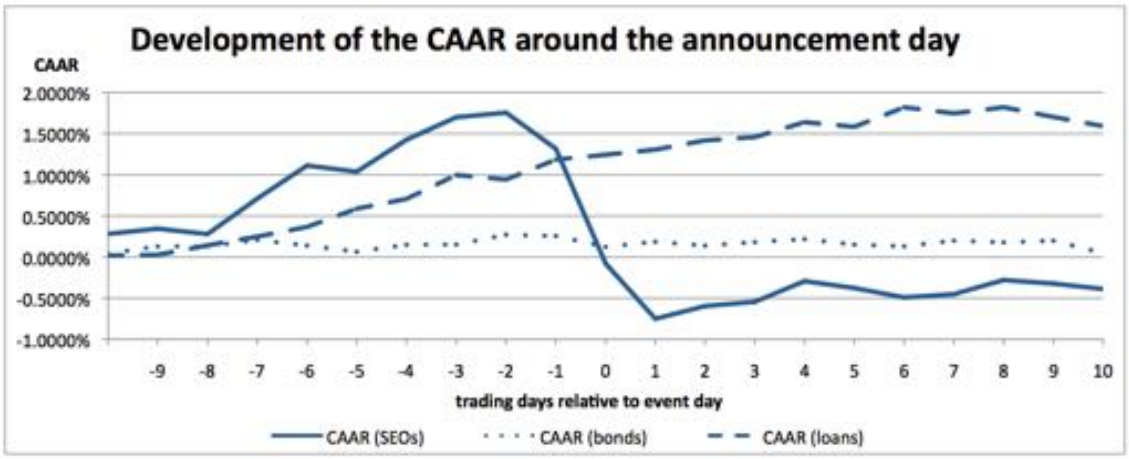

Figure 3 Graph of CAARs for the entire sample[27]

In the sample of firms that sign loan agreements, the graph of the CAAR starts at about 0.1% on day -10 and begins to increase until day +6. There is a slight decline observ-

[27] Source: Bloomberg and author's computations.

able on day -2, followed by a continuous increase until the peak is reached. After day +6, the CAAR for loans fluctuates around a value of around 1.7%. Referring to the dotted line in Figure 3, the development of the CAAR for bond issuers is not as strong as for equity issuers and loan originators. For the ten trading days before and after the bond issue announcement, the CAAR moves smoothly in the band of 0% and 0.4%. Overall, the chart suggests that firms that issue additional equity should experience a drop in their stock price whereas firms signing loan agreements enjoy positive effects for their stock prices. For bond issuers, the graph suggests that there is probably no remarkable effect on average.

With this introductory presentation of the development of the CAAR around the announcement day, the reader is now equipped to investigate how the CAARs are characterized in the two event windows this paper wants to analyze. Further, it will be checked if the CAARs in the event window are statistically significant. In the following, the results of the event study are separated by the type of capital change announcement. The CAARs are reported for the three-day and the eleven-day event-window for the sample of both countries together. On top of that, I segment the event firms in tertiles by their leverage levels to investigate whether the stock market reaction is different for firms with different levels of leverage. Additionally, the results for the German and French subsample are reported individually for the same event-windows in order to check if there is a difference in the stock market response in both countries.

6.1 Market reaction to SEOs

Table 4 summarizes the CAAR for the event windows [-1; +1] and [-5; +5] for the whole sample of additional equity offers. Due to a lack of stock price observations for some firms, the sample size is reduced to 599 and 598 event firms for the three-day and the eleven-day event window, respectively. For the three-day CAAR, I observe a negative stock market reaction equal to -2.45%, which is significant on the 1% level. 413 event firms exhibit a negative CAAR and 186 additional equity issuers are subject to a positive stock market reaction. The negative response to additional equity issues can also be found in the eleven-day event window. However, the market reaction is less negative and firms exhibit a decrease in the stock price of -1.43% on average in the eleven-day event window. Again, the stock market reaction is statistically significant, this time however at the 5% level. The less negative stock market reaction is underpinned by the observation that more firms have a positive CAAR (232 event firms) and

fewer firms have a negative CAAR (366 equity issuers), compared to the three-day event window. From Figure 3 one could have already guessed that the CAAR is less negative when the event window is extended. The results from Table 4 underpin this first guess.

Event study analysis for SEO announcements

	[-1; +1]	[-5; +5]
	CAAR	CAAR
All firms	-2.45%***	-1.43%**
	(0.00347)	(0.00596)
Observations	599	598
	Robust standard errors in parentheses	
	*** p<0.01, ** p<0.05, * p<0.1	

Table 4 Event study analysis for SEO announcements in the entire sample

In appendix A-1 I slice the dataset of SEOs into tertiles of leverage in order to check how the reaction of the stock market is for firms with different leverage levels. The 33.3% of announcing firms with the highest leverage levels are classified as the high-levered group and the low-levered group contains the 33.3% of firms with the lowest leverage levels. By sub-dividing the event firms by their leverage levels, I try to empirically capture the relationship between different leverage levels and the stock market response to the capital change announcement. Again, the differentiation was conducted for two event windows. The table in A-1 reports that in the three-day event window, the reaction on the stock market is most negative for firms that belong to the group with the highest leverage levels. These firms exhibit a negative CAAR of 3.73%, which is statistically significant at the 1% level. Firms that belong to the groups with medium and low leverage levels are subject to an average decrease in the stock price of 2.26% and 2.36%, respectively (again significant at the 1% level). These findings are consistent with the paper of Do (2009) and give support for the theory that a SEO increases the level of information asymmetry (Myers/Majluf 1984). Consequently, H2 can be confirmed from these results.

After this overview about the stock market reaction in the entire sample, I am now interested in the country-specific market reaction on the German and French market in order to check whether there are any different stock market reactions observable. Beginning with the investigation of the market perception of SEO announcements in Germany, Table 5 reports that the CAARs are negative for both event windows.

Event study analysis for SEO announcements in the German sub-sample

	[-1; +1]	[-5; +5]
	CAAR	CAAR
German firms	-1.53%***	-0.978%
	(0.00469)	(0.00760)
Observations	329	328
	Robust standard errors in parentheses	
	*** p<0.01, ** p<0.05, * p<0.1	

Table 5 Event study analysis for SEO announcements in Germany

Keep in mind that a negative relationship between additional equity issuance and stock market return implies that by issuing new shares, the stock price of a firm is decreasing on average. More specifically, the stock price of a German firm that issues additional equity drops by 1.53% on average in the three-day event window. This drop in the stock price is significant at the 1% level. 65% of the German event-firms in this event window exhibit a negative stock market response following a SEO announcement. For the [-5; +5] event window, the negative stock market reaction becomes less severe and is not significant. By extending the event window, the stock market reaction is negative for 60% and positive for 40% of German companies.

Analyzing the stock market reaction of the sub-sample of French firms that issue additional equity between 2010 and 2015, STATA reports that 73% (61%) of the firms in the French sample exhibit a negative stock market reaction in the [-1; +1] ([-5; +5]) event window. In Table 6 one can observe that the CAAR is equal to -3.58% for the three-day event window and equal to -1.97% for the eleven-day event window. The CAARs are statistically significant at the 1% and at the 5% level, respectively.

Event study analysis for SEO announcements in the French sub-sample

	[-1; +1]	[-5; +5]
	CAAR	CAAR
French firms	-3.58%***	-1.97%**
	(0.00510)	(0.00942)
Observations	270	270
	Robust standard errors in parentheses	
	*** p<0.01, ** p<0.05, * p<0.1	

Table 6 Event study analysis for SEO announcements in France

Comparing the reaction on the German and French stock market in response to SEO announcements, one can observe that in the [-1; +1] event window, the French market reacts more negatively than the German stock market. From this, one can infer that the French market regards SEOs, on average, more negatively than market participants in Germany. As illustrated in Table 1 in chapter 4, SEOs are less popular in France than in Germany. It is possible that the more negative reaction to SEO announcements in France that was found in chapter 4 is the reason why SEOs are less frequently observable in France than in Germany. It was also shown in chapter 4 that, compared to bond issuance and loan origination announcements, one observes less SEO announcements. This might be potentially due to the fact that managers anticipate the negative reaction on the stock market (however other factors beside the stock market response also influence the decision of how firms raise new capital).

The evidence of the calculations in this chapter shows that additional equity offers have a negative effect on the stock price of firms on average. As one could have already guessed from Figure 3, the negative reaction is more severe for the trading days directly surrounding the announcement day. By extending the event window, the stock price recovers and the overall reaction becomes less negative on average. The results from the event study support the theories of Modigliani/Miller (1963) and therefore H1 of this paper can be confirmed. The findings also give support for the theory of Myers/Majluf (1984) and the theory of Leland/Pyle (1977). The empirical results suggest that an increase in equity, *ceteris paribus*, is related to an increase in information asymmetry with a resulting drop in the stock price of the issuer. *Ceteris paribus*, a SEO also dilutes the share of management ownership, which amplifies the asymmetric information conflict. Consequently, I can confirm H2 and H3 from chapter 3 of this paper.

The statistically significant negative market reactions to SEO announcements that were presented in the tables above are consistent with the findings of earlier studies that were presented in the literature research chapter 2.2.1. In particular, my research supports the studies of Asquith/Mullins (1986), Masulis/Korwar (1986) and Loughran/Ritter (1997) that were performed on the U.S. market. The empirical results of this paper are also in line with the research of Do (2009), Gajewski/Ginglinger (2002) and Medeiros/Matsumoto (2005) who investigated market reactions outside the U.S.

6.2 Market reaction to bond issuance

Turning the focus to the analysis of bonds, Table 7 reports the average market reaction for bond issuance announcements in the entire sample between 2010 and 2015 for the event window [-1; +1] and [-5; +5]. Due to a lack of stock price observations for some event firms, the initial sample of 1000 bond issuers boils down to a dataset of 958 (956) event firms for the [-1; +1] window and [-5; +5] window, respectively.

The results show that, on average, the market reacts negatively to an announcement of bonds. More precisely, the CAAR of bond issuers amounts to -0.0949% for the three-day event window and -0.0041% for the eleven-day event window. This indicates that the market considers bond issues as rather unfavorable information.

However, I cannot detect any statistical significance in the market reaction. Besides the negative market reaction on average, there are also several firms that experience positive market reactions to bond issue announcements. More specifically, 454 event firms have a positive CAR whereas a slight majority of 504 firms is subject to a negative CAR in the three-day event window. Altering the window to eleven days gives 487 firms with a negative CAR and 469 bond issuers with a positive CAR.

Event study analysis for bond issuance announcements

	[-1; +1]	[-5; +5]
	CAAR	CAAR
All firms	-0.0949%	-0.0041%
	(0.00131)	(0.00200)
Observations	958	956
	Robust standard errors in parentheses	
	*** p<0.01, ** p<0.05, * p<0.1	

Table 7 Event study analysis for bond issuance announcements in the entire sample

Dividing the dataset of bond issuers into tertiles by leverage levels, the table in A-2 indicates that in the [-1; +1] event window, firms within the group of the highest leverage level in the year prior to the announcement have the most negative stock market reaction. Contrariwise, firms belonging to the group with the lowest leverage levels are subject to a positive stock market reaction. However, both reactions are not statistically significant. The only significant relationship can be observed for the group of medium levered-firms. The CAAR of these firms amounts to -0.224%, a decrease in the average stock price, which is significant at the 10% level. Hence, I cannot find a statistically

significant positive effect when debt in the form of bonds is issued in the sample of medium-levered companies and therefore, I cannot support the hypotheses H1, H2 and H4.

Event study analysis for bond issuance announcements in the German sub-sample

	[-1; +1] CAAR	[-5; +5] CAAR
German firms	-0.0454%	-0.183%
	(0.00302)	(0.00443)
Observations	319	319
	Robust standard errors in parentheses	
	*** p<0.01, ** p<0.05, * p<0.1	

Table 8 Event study analysis for bond issuance announcements in Germany

Having a look on the sub-sample of German bond issuers between 2010 and 2015 in Table 8, 26 bond issuance observations are lost due to missing stock prices of some firms. Even though the results are insignificant in Table 8, the market appears to react rather negatively on average when German firms issue bonds. The CAAR is equal to -0.0454% (-0.183%) for the three-day (eleven-day) event window.

Event study analysis for bond issuance announcements in the French sub-sample

	[-1; +1] CAAR	[-5; +5] CAAR
French firms	-0.120%	0.0856%
	(0.00126)	(0.00202)
Observations	639	637
	Robust standard errors in parentheses	
	*** p<0.01, ** p<0.05, * p<0.1	

Table 9 Event study analysis for bond issuance announcements in France

The sub-sample of French firms in Table 9 also indicates a negative perception of the market in response to bond issue announcements on average for the [-1; +1] window. The results for the French economy are also not significant at any of the three significance levels. Even though the average CAR of firms is negative in the three-day window, 297 event-firms exhibit a positive CAR (with 342 French bond issuers experiencing a negative CAR).

Also for the eleven-day event window of French bond issuers no statistical significance can be detected. Interestingly, the CAAR is positive for the French sub-sample and

amounts to 0.0856%. The positive reaction contrasts the findings from the German market and the entire sample and can be interpreted as a firm value increasing market reaction. The positive CAAR speak in favor of the beneficial effect of the interest tax shield (H1), the mitigation of the asymmetric information problem (H3) and the disciplining effect of debt (H4). However, due to the lack of statistical significance, no final conclusions about the hypotheses can be made.

Coming back to the analysis of the entire sample in Table 7, the CAAR in both event windows is not significant. However, the empirical results speak more in favor of a decline in firm value when firms issue bonds. Therefore, the results do not speak in favor of the positive effects of an interest tax shield as it was assumed in H1. The findings of this section also suggest rejecting the hypothesis of Myers/Majluf (1984) who expected a positive stock market reaction when debt is issued (H2 of this paper). Also the theory of Jensen (1986) is not confirmed by the data and the disciplining effect of debt cannot be supported by the event study results in this section. However, due to the fact that the results of the event study in this section are not statistically significant, I cannot ultimately reject or confirm any of the hypotheses from chapter 3. The negative sign of the CAARs in Table 7 only indicates that the average reaction is negative, but statements about systematical effects cannot be made due to the lack of statistical significance.

It is worth mentioning that the results of the event study on bond issuance are in line with some papers from the literature research in section 2.2.2. My results are in accordance with Shyam-Sunder (1991) who also finds negative, but statistically insignificant effects. Antweiler/Frank (2006) and Eckbo/Masulis (1995) also come to the conclusion that bond issues have no statistically significant market effect.

6.3 Market reaction to loan origination

Turning the focus to the market perception of loan origination announcements in both countries for the [-1; +1] event window, I observe 573 negative stock market reactions and 620 events with a positive CAR. As one can infer from Table 10, the CAAR amounts to 0.425%, which is statistically significant at the 1% level. Extending the event window to [-5; +5] leads to an even bigger positive stock market reaction, which is again statistically significant at the 1% level. For the eleven-day event window, the CAAR is equal to 1.22%. The positive market reaction indicates that, on average, the market perceives an announcement of loan origination as a positive signal.

Event study analysis for loan origination announcements

	[-1; +1]	[-5; +5]
	CAAR	CAAR
All firms	0.425%***	1.22%***
	(0.00120)	(0.00185)
Observations	1,193	1,180
	Robust standard errors in parentheses	
	*** p<0.01, ** p<0.05, * p<0.1	

Table 10 Event study analysis for loan origination announcements in the entire sample

To examine empirically the effect of loan origination announcements for firms with different leverage levels, the sample firms were again sub-divided into three equal groups by their existing leverage levels. The results from the table in A-3 show that in the eleven-day event window, the positive reaction is higher for the high-levered firms than for companies belonging to the medium-levered group. In detail, the former group has a positive CAAR of 1.36% whereas the latter group reports a positive CAAR of 1.14% for the eleven-day event window. The CAAR of the low-levered firms lays in-between those two values and amounts to 1.21%. As it is reported in A-3, all CAARs are statistically significant at the 1% level for the [-5; +5] event window.

Analogous to the investigation of SEOs and bonds before, I slice the dataset in a German and French sub-sample in order to investigate whether there are any differences in the CAARs in both countries. The regression results for the sub-sample of German loan origination event firms in Table 11 delivers similar results as I found for the entire sample in Table 10. However, the average market reaction in Germany is slightly higher. Again, the results are statistically significant at the 1% level for both event windows. The CAAR for the German sub-sample is equal to 0.644% and 1.52% for the three-day and eleven-day event window, respectively. As mentioned in the introductory chapter 1, the author of this paper is not aware of any event studies that are concerned with the effects of loan origination announcements for the German market. A major contribution of this paper therefore is the evidence for statistically significant positive stock market reactions surrounding the announcement of loan originations for German borrowers.

Event study analysis for loan origination announcements in the German sub-sample

	[-1; +1] CAAR	[-5; +5] CAAR
German firms	0.644%***	1.52%***
	(0.00188)	(0.00290)
Observations	593	589

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 11 Event study analysis for loan origination announcements in Germany

Table 12 shows that the positive CAAR found in the upper two tables can also be found in the French sub-sample. However, in contrast to the entire sample and the German sub-sample, the results for the three-day event window are not statistically significant. By extending the event window to [-5; +5], the results also become significant and the CAAR for French loan originations amounts to 0.9%. Comparing the results for the eleven-day event window between Germany and France, it is worth mentioning that the average market reaction in Germany is about 0.5 percentage points higher than in France. From this observation, one could conclude that markets in Germany value loan origination more than in France.

Event study analysis for loan origination announcements in the French sub-sample

	[-1; +1] CAAR	[-5; +5] CAAR
French firms	0.208%	0.919%***
	(0.00149)	(0.00230)
Observations	600	591

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 12 Event study analysis for loan origination announcements in France

Overall, the positive relationship between loan origination announcements and the corresponding market reaction together with the statistical significance of the results in all but one sub-sample implies that increasing the amount of loans can be beneficial for a firm's stock price on average. The significant results for the event of loan origination announcements allow to support some of the hypotheses from chapter 3. In particular, H1, which is based on the theory of Modigliani/Miller (1963), can be supported and

speaks in favor of positive effects of the interest tax shield when debt is issued. Additionally, H2 can be confirmed, indicating that loan origination is related to a decrease in the asymmetric information conflict between managers and investors. Another explanation for the positive market perception of loan origination announcements can be found in H4. The positive market reaction to loan origination confirms the hypothesis that debt has a disciplining effect on managers. The evidence of positive CAARs of borrowing firms in the presence of loan origination announcements supports previous empirical work by Aintablian/Roberts (1991), James (1987), Kang/Liu (2008), Mikkelson/Partch (1986), Preece/Mullineaux (1994) and Slovin *et al.* (1992).

Chapter 6 presented the results of the event study for three different forms of capital change announcements. The results showed that there is a negative and statistically significant market reaction when additional equity is issued and a positive and statistically significant market reaction when loans are issued. For bond issue announcements, no statistically significant effect on the CAAR was detected. In the following, I want to analyze the cross-sectional determinants that possibly influence the market reaction when new equity or debt is issued. Therefore, the results of the multivariate regression model of firm characteristics will be presented in chapter 7.

7. Cross-sectional regression results

The following chapter presents the results of the multivariate cross-sectional OLS regression. The regression analysis has the potential to shed light on the discussion about which firm characteristics influence the market reaction and to (in-) validate the hypotheses from chapter 3.

Due to a lack of accounting data for some event firms, the number of firms in the cross-sectional regression is reduced and will be reported in each table. The reason for the lower number of firms that enter the cross-sectional regression is attributable to the fact that STATA deletes firms from the dataset if only one value of the independent variables is missing in the dataset. Therefore, only firms that have a complete record of accounting data enter the cross-sectional regression analysis (Cooper *et al.* 2005; Frank/Goyal 2007; Preece/Mullineaux 1996).[28]

[28] An alternative approach to the complete case approach, which is a common tool to handle missing data and which is also employed in this study, would be a multiple imputation technique to predict missing data. However, the predicted data is less certain than the observed data (Frank/Goyal 2007).

For the sake of consistency, the results are presented for the entire sample as it was also done in chapter 6. Additionally, the cross-sectional regression results for each type of capital change announcement are reported separately for the groups of firms with high, medium and low levels of leverage in the appendix. The grouping of the firms by different leverage levels was done before the cross-sectional regression was executed. Missing accounting data for several companies leads to the circumstance that the observations for each group are not equally split. However, the intuition behind the regression of company characteristics on the CAR of firms with different leverage levels is unchanged.

7.1 Cross-sectional regression results for SEOs

First, I check whether the regression of company characteristics on the CAR is subject to multicollinearity by consulting the correlation matrix and the VIF scores of the control variables. As the results in annex A-4 indicate, multicollinearity should not constitute a major concern as the VIF scores are all close to one and below the critical values of five and ten. Additionally, the correlation matrix shows that the variables of the company characteristics have low correlation among each other. The highest correlation can be found between the proxies for the retention ratio and working capital (correlation coefficient -0.4508). All other variables appear to be subject to low correlation. Testing for homoscedasticity with the White test leads to the conclusion that robust standard errors will be employed in the regression analysis. The results of the Ramsey RESET test indicate that omitted variable bias should not constitute a major concern for the cross-sectional regression of company characteristics on the CAR of equity issuers.

For the [-1; +1] event window, Table 13 reports that the R^2 in the model is 7.1%, indicating that the regression model can explain 7.1% in the variation of the CAR of firms that issue additional equity. The coefficient on the retention ratio is positive and statistically significant at the 10% level. This indicates a positive relationship between the retention ratio and the CAR of companies when new equity is issued. This contradicts the hypothesis from H6 in which a negative relationship between the retention ratio and the CAR was assumed. The parameters for free cash flow and leverage both indicate a positive relationship with the CAR. However, no statistically significant effect is observable. The coefficients on the proxies for profitability, tangibility and working capital all suggest a negative and insignificant relationship with the CAR.

Cross-sectional regression results SEOs for the entire sample

Dependent Variable: CAR Independent Variables: Retention Ratio, free cash flow, leverage, profitability, tangibility of assets and natural logarithm of working capital (all independent variables are taken from the year before the announcement)		
	[-1; +1]	[-5; +5]
VARIABLES	CAR	CAR
RetentionRatio	0.0299*	0.0166
	(0.0157)	(0.0206)
FreeCashFlow	0.000272	-0.000177
	(0.000233)	(0.000319)
Leverage	0.0103	0.00327
	(0.0239)	(0.0384)
Profitability	-3.279	-0.492
	(4.323)	(7.431)
Tangibility	-0.906	-0.125
	(1.278)	(1.632)
ln_WorkingCapital	-0.203	0.0984
	(0.241)	(0.385)
Observations	182	182
R-squared	0.071	0.005
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

Table 13 Cross-sectional regression for SEOs

Turning the focus to the eleven-day event window in Table 13, the R^2 indicates that the model can explain 0.5% of the variation in the CAR. The low value of the R^2 is an indicator for poor explanatory power. The coefficient on the retention ratio becomes insignificant and one notes that no coefficient is statistically significant when the event window is altered. The sign of the coefficients for the retention ratio, leverage, profitability and tangibility is the same as we observed in the [-1; +1] event window. Contrariwise, the sign of the coefficient on the free cash flow variable and the working capital changes when the event window is extended. The insignificant results lead to the conclusion that the changes in the share price are not related to any of the company characteristics when SEOs are announced. It follows that the CAR is solely determined by the announcement itself, as none of the control variables is significant in Table 13.

In addition to the cross-sectional analysis presented above, I conduct the same regression analysis for each group of leverage levels. In accordance with the separation of leverage levels in chapter 6, I again group firms in three groups and I run the cross-sectional OLS regression on each of the groups with high, medium and low leverage. The results in appendix A-5 indicate that for the group of high levered firms, an increase in leverage is associated with a statistically significant negative effect on the CAR of equity issuers. One may interpret this result in a way that if the firm has a relatively high leverage level and conducts a SEO, an increase in leverage is not taken positively by financial markets. Therefore, the signaling effect of Ross (1977) does not seem to hold for the sub-sample of high-leverage firms that offer additional equity. For medium levered firms that issue additional equity, the coefficient on the proxy for profitability is negative and statistically significant at the 1% level, suggesting a negative relationship between profitability and the CAR of firms in this group. The negative relationship between profitability and the CAR does not support H5 for the group of medium levered firms.

7.2 Cross-sectional regression results for bond issuance

To begin the cross-sectional analysis for bonds, I again conduct a series of statistical tests that can be found in annex A-6. The VIF scores are again substantially lower than the thresholds of 5 and 10, indicating that multicollinearity should not constitute a problem for the cross-sectional regression. Testing for homoscedasticity with the White test shows that I reject the Null of homoscedasticity. Consequently, robust standard errors are employed for the cross-sectional regression. In a last step, the results of the Ramsey RESET test speak in favor of the hypothesis that the underlying regression model is adequately specified.

After these technical checks, the results of the cross-sectional OLS regression for the sample of bond issues will be discussed. From Table 14 one can infer that for the [-1; +1] event window, the R^2 of 0.6% implies a lack of explanatory power of the company characteristics to explain variation in the CAR. Ones also notes that none of the explanatory variables has a statistically significant effect on the CAR and therefore the market reaction is solely caused by the announcement itself and not related to the firm characteristics presented in this analysis.

Cross-sectional regression results for bonds issuance for the entire sample

Dependent Variable: CAR Independent Variables: Retention Ratio, free cash flow, leverage, profitability, tangibility of assets and natural logarithm of working capital (all independent variables are taken from the year before the announcement)		
	[-1; +1]	[-5; +5]
VARIABLES	CAR	CAR
RetentionRatio	-0.000491	-0.000353
	(0.00563)	(0.0115)
FreeCashFlow	0.0000330	-0.0000133
	(0.0000426)	(0.0000813)
Leverage	0.00851	0.00289
	(0.0153)	(0.0250)
Profitability	3.146	12.38**
	(3.139)	(5.391)
Tangibility	0.0598	0.175
	(0.416)	(0.727)
ln_WorkingCapital	0.0635	-0.0835
	(0.0750)	(0.130)
Observations	488	487
R-squared	0.006	0.015
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

Table 14 Cross-sectional regression for bond issues

Turning the focus to the last column of Table 14, it is noteworthy that the R^2 increases from 0.6% to 1.5% when the event window is altered, indicating a small increase in explanatory power. For the eleven-day event window, all coefficients but one are not statistically significant. In particular, the coefficient for the proxy of profitability is positive and significant at the 5% level, indicating a positive relationship between profitability and the CAR of companies. Consequently, I can confirm H5 in which a positive relationship between CARs and profitability was expected. This finding is in line with the pecking order theory of Myers/Majluf (1984). Having a look on the coefficient of the retention ratio, I note that a negative relationship with the CAR is suggested. This would support H6 as an increase in retained earnings is considered bad news in this hypothesis. Referring to the sign of the coefficient for the leverage proxy, a positive relationship is observable in both event windows. A positive relationship between asset

tangibility and CARs is reported for the regression results of both event windows. This finding can be interpreted in a way that tangible assets can be used as collateral when debt is issued, therefore indicating a positive relationship between tangible assets and the stock market response. However, the lack of statistical significance for the parameters does not allow for any definite conclusions. The coefficients on free cash flow and working capital also show an insignificant effect on the CAR, with no consensus of a positive or a negative influence of the two parameters as the sign switches when the event window is altered.

In A-7, I slice the dataset of the cross-sectional regression for the three-day event window in three groups. The grouping is done with the leverage variable and the results show that for the group of low-levered firms, there is a positive relationship between the proxy for leverage and the CAR, which supports H8. Also the coefficient on the profitability variable is positive and significant at the 1% level, supporting H5. Hence, financial markets appear to value bond issues of profitable firms in the group of low-levered firms.

7.3 Cross-sectional regression results for loan origination

Again, I first check the regression model by having a look on the tables in appendix A-8. The VIF scores and tolerance levels are close to one. Also the correlation coefficients of the explanatory variables are low. The highest correlation can be observed between the proxies for free cash flow and working capital (correlation coefficient equal to 0.4109). Ramsey's RESET test shows that omitted variable bias should not be a major concern and the model should be specified adequately. The results of the White test suggest using robust standard errors in order to account for heteroscedasticity.

Having a look on the regression of company characteristics on the CAR for the [-1; +1] event window in Table 15, I note that the coefficients of two control variables are statistically significant. The retention ratio is related to a positive effect on the CAR, whereas tangibility shows a negative relationship with the CAR. Even though the R^2 is still small, these two variables help to explain some variation of CAR around the announcement of loan origination. In the case for the retention ratio, an increase in the retained income is related to a positive effect on the CAR whereas an increase in tangibility has a negative effect on the CAR. The positive parameter estimate for the retention ratio is inconsistent with the theoretical prediction that is underlying H6 as I expected a negative relationship between the retention ratio and the CAR. Also the nega-

tive coefficient for the proxy of tangibility is surprising, as theory suggests that investors should perceive the fast collateralization of tangible assets positively (Gaud *et al.* 2005, p. 55; Rajan/Zingales 1995, p. 1451).

Referring to the last column in Table 15, all explanatory variables are statistically significant for the event window [-5; +5]. Four out of six coefficients are statistically significant at the 1% level. The R^2 of 0.056 can be interpreted in a way that the model can explain 5.6% of the variation in the eleven-day CAR of loan originators. The parameter estimates for the retention ratio and tangibility have the same signs in the eleven-day window as in the three-day event window. The magnitude of the coefficient for the retention ratio increased to 0.0317 by extending the event window and the parameter estimate still is significant at the 1% level. The coefficient on the tangibility variable decreases to -1.652 and is now also significant at the 1% level. The interpretation of the sign of the coefficients for the retention ratio and asset tangibility is the same as discussed in the analysis of the [-1; +1] event window before. The coefficient on the free cash flow variable indicates that more free cash flow is related to an increase in the CAR. The sign of the coefficient is inconsistent with the theoretical predictions that are underlying H7, because Jensen/Meckling (1976) expect that an increase in free cash flow should have a negative impact on the stock price.

The coefficient on leverage is positive and significant at the 1% level. This observation allows the confirmation of the signaling hypothesis of Ross (1977), which is equivalent to H8 of this paper. The coefficient on the proxy for profitability is negative and significant at the 10% level. Interestingly, the sign of the coefficient switched from positive (in the [-1; +1] event window) to negative (in the [-5; +5] event window). The statistically negative coefficient in the latter event window can be interpreted as a negative relationship between profitability and the CAR. This finding contrasts the results from section 7.2, where I find a positive relationship between profitability and CAR when bonds are issued. Consequently, H5 cannot be confirmed for the announcement of loan originators in France and Germany.

Finally, the coefficient on the control variable for working capital is negative and significant at the 5% level, suggesting a negative relationship of working capital and the CAR.

Cross-sectional regression results for loan origination for the entire sample

Dependent Variable: CAR Independent Variables: Retention Ratio, free cash flow, leverage, profitability, tangibility of assets and natural logarithm of working capital (all independent variables are taken from the year before the announcement)		
	[-1; +1]	[-5; +5]
VARIABLES	CAR	CAR
RetentionRatio	0.0241***	0.0317***
	(0.00599)	(0.00994)
FreeCashFlow	0.0000985	0.000317***
	(0.0000850)	(0.000103)
Leverage	-0.00141	0.0578***
	(0.0108)	(0.0186)
Profitability	1.895	-8.239*
	(3.716)	(4.942)
Tangibility	-0.660**	-1.652***
	(0.315)	(0.507)
ln_WorkingCapital	-0.114	-0.349**
	(0.0927)	(0.144)
Observations	672	670
R-squared	0.034	0.056
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

Table 15 Cross-sectional regression for loan origination

Analogous to the cross-sectional analysis for SEOs and bonds, the cross-sectional regression results for the different leverage groups are presented in appendix A-9. For the group of high leverage firms, there is a statistically significant positive relationship between the CAR and the proxies for free cash flow and working capital. Additionally, there is a statistically significant negative relationship between the proxy for leverage and the CAR for the group of high leverage firms. In contrast, the relationship between leverage and the CAR is positive for firms with a low leverage level. Hence, H8 can be supported for the group of low leverage firms, but not for the group of high-leverage firms. Further, for the group of low leverage firms, the coefficient on the profitability proxy is positive and therefore supports hypothesis H5.

The purpose of part C of this paper was to present the results of the event-study and the cross-sectional regression of firm characteristics on the CAR. The interpretation of the results as well as the link to the hypotheses and theories was also provided in chapters 6 and 7. Overall, the comparably low values of the R^2s indicate that the explanatory power of the cross-sectional OLS regression is limited. However, the results show that some of the explanatory variables, especially for the sample of loan announcements, are statistically significant and consistent with some of the hypotheses from chapter 3. By sub-dividing the sample of each capital change announcement into different groups of leverage levels, I detected some interesting differences of how company characteristics seem to influence the CAR. For example, there is a statistically significant negative effect of leverage on the CAR of loan issuers in the group of high leverage firms whereas in the low-leverage group, leverage seems to have a positive effect on the CAR.

Part D now concludes the paper with a summary of the results and suggests fields for further research in the topic of the effects of capital change announcements on the stock price of companies.

Part D – Conclusions

8. Summary

This paper examines the stock market reaction to announcements of additional equity offerings, bond issues and loan origination. Since different forms of capital change announcements each have different characteristics, the effects on company value may also be different. To analyze the effects of capital change announcements, I used the event study methodology in order to quantitatively investigate the effect of the announcement on the share price of firms. I use a sample of German and French firms that increased their capital by equities, bonds and loans in the years 2010 – 2015. In a first step, the short-term market reaction on the share price was investigated for two commonly used event-windows. I calculated the average market perception of the announcement for the entire sample as well as for the German and French sub-sample in order to check whether there are any regional differences between both countries. Additionally, I checked whether there are any differences of the announcement period abnormal returns when I control for different leverage levels of firms. In a second step, the CAR of each issuer was used in a multiple regression analysis together with a set of company variables that are supposed to have an influence on the CAR from a theoretical viewpoint.

There are several important takeaways from this research: first, I find that when firms announce to issue additional equity, there is a statistically significant decrease in the stock price on average (CAAR = -1.53%). The decrease in the stock price is more severe on the French market (CAAR = -2.45%) than on the German market (CAAR = -3.58%). The results are consistent with previous empirical evidence and specifically with the theories of Modigliani/Miller (1963), Myers/Majluf (1984) and Leland/Pyle (1977) whose models suggest that a SEO conveys negative information about the future of the firm. High-levered firms experience a more severe negative stock market reaction than low- and medium-levered firms around the SEO announcement. I also find that the negative stock market reaction in response to announcements of additional equity is more pronounced in France than in Germany.

Second, I find that announcements of loans have a positive and statistically significant effect on the stock price of firms in France and Germany for the five trading days surrounding the announcement (CAAR = 1.22%). The statistically significant positive market reaction for the eleven-day window is larger in Germany (CAAR = 1.52%) than in France (CAAR = 0.919%). The sub-sample of high-leveraged companies experienced the most positive market reaction (CAAR = 1.36%) compared to the CAAR of 1.14% for the sub-sample of medium-levered firms. These results show that debt announcements can have a positive influence on a company's stock and the positive CAARs support the theories of Modigliani/Miller (1963), Myers/Majluf (1984) and Jensen (1986).

Conversely, the event study analysis for bond announcements did not deliver statistically significant results. However, the event study results suggest that the average market perception is rather negative for both event windows. The lack of statistical significance does not allow for any systematic statements though.

The third contribution of this study is to explain the reaction of markets to capital change announcements by employing a set of different firm characteristics that are regressed on the CAR of each event firm. The cross-sectional analysis for loan announcements revealed a statistically significant relationship between the eleven-day CAR and the proxies for (1) the retention ratio, (2) free cash flow, (3) leverage, (4) profitability, (5) tangibility and (6) working capital. The evidence of the cross-sectional regression on the CAR of loan origination announcements is consistent with the theory of Ross (1977) who argues that leverage signals financial strength to markets and therefore an increase in leverage should lead to an increase in the CAR. However, if I slice the

dataset into different leverage levels, the positive relationship between leverage and the CAR only holds for the group of low-levered loan originating firms. Contrariwise, the relationship between leverage and the CAR turns out to be negative for the group of high-levered loan originators.

The results of the cross-sectional analysis for SEO and bond issue announcements only revealed a statistically significant relationship for some parameter coefficients. For firms that issue additional equity, there seems to be a statistically significant positive relationship between the retention ratio and the CAR for the whole sample, which is inconsistent with the theoretical predictions underlying H6. An increase in retained earnings therefore should not be considered as an alarming signal for investors since an increase in this variable seems to influence the CAR positively.

In the case of bond issuing companies, there is a positive relationship between the proxy for profitability and the eleven-day CAR, which is in line with H5. In the sub-sample of low-levered bond issuers, there is a statistically significant relationship between the proxies for profitability and leverage with the three-day CAR. The regression results from this sub-sample confirm the hypotheses H5 and H8.

9. Implications and further research

Referring back to the purpose of this paper, which was stated in the introductory chapter at the beginning, the research of this thesis aims at helping managers and investors interpreting capital change announcements and the resulting stock market reaction correctly. The results of the event study indicate that managers should be aware of the fact that the firm's stock market price will likely decrease when additional equity is issued and it will likely increase when a new loan is announced. The reaction on the stock market can differ according to the firm's past level of leverage. One of the results of this paper indicates that announcements of loan agreements are, on average, related to a positive market reaction. These positive effects distinguish loans from other forms of financing such as issuing new shares or bonds. The reason for the positive effects of loan announcements in contrast to other capital change announcements can be found in the characteristics of loan agreements. As literature suggests, loan agreements are subject to stricter monitoring by banks compared to market financing (Preece/Mullineaux 1994).

Limitations to my analysis are that the stock market reactions could be affected by other factors than the announcement of the capital change, for example if a firm releases additional news at the same day as the capital change was announced.

Another aspect that should be examined more carefully is that one could control for different characteristics of the financing instrument like the design of the bond (straight/convertible). The reason for the insignificant results in the event study for bonds in chapter 6.2 might be caused because I made no differentiation between the different types of bonds. Additionally, it should be checked whether the results of the cross-sectional analysis are substantially altered if one fills the missing observations for the variables by using an imputation technique that gives estimates for the missing values.

Due to the fact that I excluded financial institutions from the dataset and given the circumstances that these institutions account for a large part of the CAC40 and the DAX, one could argue that a one-to-one matching model or an industry-adjusted event study analysis might constitute a more suitable testing framework. Additionally, one could use different proxies for the different firm characteristics in the cross-sectional regression in order to check whether the results can be replicated with different proxies.

Further research should also analyze the long-run effects of capital change announcements. The focus of this contribution was more on the short-run market reactions in response to the announcement and long-run market effects were beyond the scope of this thesis.

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Statement under oath

I,

Max Haug

Matriculation number: 20165313 (HEC Liège)

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declare that I have followed the Principles of Good Scientific Practice while writing the present Master's thesis.

I have written the thesis independently and have used no other sources or aids than those given and have marked the passages taken from other works word-for-word or paraphrased.

Supervisor: Prof. Dr. Tereza Tykvová (University of Hohenheim)

Topic of the paper/thesis:

"How do markets react on stock and bond issuance and on loan origination – an event study for France and Germany 2010 - 2015"

Semester: Summer term 2017

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Stuttgart-Hohenheim, 31.05.2017

Max Haug

Appendix

A-1 Event study analysis for equity issuance separated by leverage tertiles of firms

	[-1; +1]	[-5; +5]
	CAAR	CAAR
High leverage firms	-3.73%***	-3.30%***
	(0.00683)	(0.00826)
Observations	188	187
Medium leverage firms	-2.26%***	-2.56%***
	(0.00490)	(0.00728)
Observations	188	189
Low leverage firms	-2.36%***	-0.227%
	(0.00566)	(0.0113)
Observations	189	188

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Leverage is defined as the ratio of total debt to total assets. The leverage levels are the issuing firm's leverage levels in the year before the announcement and categorized into tertiles. Tertile (high) contains the 33.3% of issuing firms with the highest leverage levels; tertile (low) contains the 33.3% of issuing firms with the lowest leverage levels.

A-2 Event study analysis for bond issuance separated by leverage tertiles of firms

	[-1; +1]	[-5; +5]
	CAAR	CAAR
High leverage firms	-0.25891%	-0.365%
	(0.00244)	(0.00385)
Observations	315	317
Medium leverage firms	-0.22429%*	-0.14659%
	(0.00123)	(0.00245)
Observations	315	311
Low leverage firms	0.05343%	0.38019%
	(0.00174)	(0.00315)
Observations	315	323

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Leverage is defined as the ratio of total debt to total assets. The leverage levels are the issuing firm's leverage levels in the year before the announcement and categorized into tertiles. Tertile (high) contains the 33.3% of issuing firms with the highest leverage levels; tertile (low) contains the 33.3% of issuing firms with the lowest leverage levels.

A-3 Event study analysis for loan origination separated by leverage tertiles of firms

	[-1; +1]	[-5; +5]
	CAAR	CAAR
High leverage firms	0.277%	1.36%***
	(0.00195)	(0.00322)
Observations	392	387
Medium leverage firms	0.355%**	1.14%***
	(0.00171)	(0.00297)
Observations	393	389
Low leverage firms	0.683%***	1.21%***
	(0.00255)	(0.00354)
Observations	394	390

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Leverage is defined as the ratio of total debt to total assets. The leverage levels are the issuing firm's leverage levels in the year before the announcement and categorized into tertiles. Tertile (high) contains the 33.3% of issuing firms with the highest leverage levels; tertile (low) contains the 33.3% of issuing firms with the lowest leverage levels.

A-4 Cross-sectional analysis for SEO announcements

The tables below were calculated for the [-1; +1] event window. Conducting the same calculations for the [-5; +5] event window leads to similar results.

Correlation matrix

	Reten-tionRatio	Free-CashFlow	Lever-age	Profitabil-ity	Tangibil-ity	Ln_Working Capital
RetentionRatio	1	-	-	-	-	-
FreeCashFlow	-0.1805	1	-	-	-	-
Leverage	-0.0409	0.2027	1	-	-	-
Profitability	-0.1787	-0.0515	-0.0935	1	-	-
Tangibility	-0.1313	-0.0395	0.2147	0.0901	1	-
Ln_WorkingCapital	-0.4508	0.2571	0.1424	-0.0829	0.1574	1

Multicollinearity test

Independent Variables	Multicollinearity Statistics	
	Tolerance Level	VIF
RetentionRatio	0.7415	1.35
FreeCashFlow	0.8843	1.13
Leverage	0.8954	1.12
Profitability	0.9171	1.09
Tangibility	0.9065	1.10
Ln_WorkingCapital	0.7249	1.38

Ramsey RESET test

Ramsey RESET test using powers of the fitted values of CAR H0: model has no omitted variables	
F(3,172)	0.94
Prob > F	0.4219

White's test for homoscedasticity

White's test for H0: against H1:	Homoscedasticity Heteroscedasticity
Chi2(27)	44.40
Prob > Chi2	0.0188

A-5 Cross-sectional regression analysis for SEO announcements separated by leverage levels of firms

Dependent Variable: CAR of the [-1; +1] event window
Independent Variables: Retention Ratio, free cash flow, leverage, profitability, tangibility of assets and natural logarithm of working capital (all independent variables are taken from the year before the announcement)

The leverage levels for grouping the firms are the issuing firm's leverage levels in the year before the announcement and categorized into three groups.

The grouping by leverage levels was done prior to the regression and due to the fact that some company characteristics are missing for several firms, these observations do not enter the regression. This is why the count on the observations is not equally distributed across the three groups. The intuition behind the regression remains unchanged from the circumstances.

	High leverage firms	Medium leverage firms	Low leverage firms
VARIABLES	CAR	CAR	CAR
RetentionRatio	0.0204	0.0381	-0.000643
	(0.0211)	(0.0332)	(0.0471)
FreeCashFlow	0.000111	0.00126	0.00115
	(0.000322)	(0.000767)	(0.00407)
Leverage	-0.195*	0.0989	0.212
	(0.0985)	(0.133)	(0.130)
Profitability	13.01	-17.62***	-4.874
	(9.203)	(5.464)	(7.119)
Tangibility	-0.471	-0.255	-1.607
	(1.833)	(1.997)	(2.445)
ln_WorkingCapital	0.265	-0.745	-0.618*
	(0.248)	(0.526)	(0.356)
Observations	55	72	55
R-squared	0.173	0.205	0.169

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

A-6 Cross-sectional analysis for bond issue announcements (-1;+1)

The tables below were calculated for the [-1; +1] event window. Conducting the same calculations for the [-5; +5] event window leads to similar results.

Correlation matrix

	Reten-tionRatio	Free-CashFlow	Lever-age	Profitabil-ity	Tangibil-ity	Ln_Working Capital
RetentionRatio	1	-	-	-	-	-
FreeCashFlow	-0.1764	1	-	-	-	-
Leverage	0.1248	-0.3092	1	-	-	-
Profitability	0.1916	0.2901	-0.1690	1	-	-
Tangibility	-0.1644	-0.2465	-0.056	0.0529	1	-
Ln_WorkingCapital	-0.3373	-0.0557	-0.1907	-0.1879	0.3096	1

Multicollinearity test

Independent Variables	Multicollinearity Statistics	
	Tolerance Level	VIF
RetentionRatio	0.7857	1.27
FreeCashFlow	0.7080	1.41
Leverage	0.8430	1.19
Profitability	0.7888	1.27
Tangibility	0.7899	1.27
Ln_WorkingCapital	0.7665	1.30

Ramsey RESET test

Ramsey RESET test using powers of the fitted values of CAR H0: model has no omitted variables	
F(3,478)	0.93
Prob > F	0.4261

White's test for homoscedasticity

White's test for H0: against H1:	Homoscedasticity Heteroscedasticity
Chi2(27)	74.21
Prob > Chi2	0.0000

A-7 Cross-sectional regression analysis for bond issuance announcements separated by leverage levels of firms

Dependent Variable: CAR of the [-1; +1] event window
Independent Variables: Retention Ratio, free cash flow, leverage, profitability, tangibility of assets and natural logarithm of working capital (all independent variables are taken from the year before the announcement)

The leverage levels for grouping the firms are the issuing firm's leverage levels in the year before the announcement and categorized into three groups.

The grouping by leverage levels was done prior to the regression and due to the fact that some company characteristics are missing for several firms, these observations do not enter the regression. This is why the count on the observations is not equally distributed across the three groups. The intuition behind the regression remains unchanged from the circumstances.

	High leverage firms	Medium leverage firms	Low leverage firms
VARIABLES	CAR	CAR	CAR
RetentionRatio	0.00237	0.000184	-0.0179
	(0.0151)	(0.00782)	(0.0115)
FreeCashFlow	0.0000765	0.000181**	-0.0000120
	(0.000101)	(0.0000772)	(0.0000837)
Leverage	0.00570	0.0372	0.127**
	(0.0550)	(0.0638)	(0.0535)
Profitability	-1.596	-11.29	16.45***
	(5.670)	(7.469)	(5.686)
Tangibility	-1.373	1.060	0.357
	(1.187)	(0.738)	(0.833)
ln_WorkingCapital	0.284*	-0.143	-0.242*
	(0.164)	(0.110)	(0.135)
Observations	130	157	201
R-squared	0.047	0.044	0.103

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

A-8 Cross-sectional analysis for loan origination announcements

The tables below were calculated for the [-1; +1] event window. Conducting the same calculations for the [-5; +5] event window leads to similar results.

Correlation matrix

	Reten-tionRatio	Free-CashFlow	Lever-age	Profitabil-ity	Tangibil-ity	Ln_Working Capital
RetentionRatio	1	-	-	-	-	-
FreeCashFlow	-0.1992	1	-	-	-	-
Leverage	-0.1082	-0.0401	1	-	-	-
Profitability	0.0179	0.0818	0.0716	1	-	-
Tangibility	0.0300	-0.1013	0.0385	0.1939	1	-
Ln_WorkingCapital	-0.2119	0.4109	0.0752	-0.1245	-0.0227	1

Multicollinearity test

Independent Variables	Multicollinearity Statistics	
	Tolerance Level	VIF
RetentionRatio	0.9289	1.08
FreeCashFlow	0.7784	1.28
Leverage	0.9680	1.03
Profitability	0.9127	1.10
Tangibility	0.9450	1.06
Ln_WorkingCapital	0.7792	1.28

Ramsey RESET test

Ramsey RESET test using powers of the fitted values of CAR H0: model has no omitted variables	
F(3,662)	2.00
Prob > F	0.1133

White's test for homoscedasticity

White's test for H0: against H1:	Homoscedasticity Heteroscedasticity
Chi2(27)	79.54
Prob > Chi2	0.0000

A-9 Cross-sectional regression analysis for loan origination announcements separated by leverage levels of firms

Dependent Variable: CAR of the [-1; +1] event window
Independent Variables: Retention Ratio, free cash flow, leverage, profitability, tangibility of assets and natural logarithm of working capital (all independent variables are taken from the year before the announcement)

The leverage levels for grouping the firms are the issuing firm's leverage levels in the year before the announcement and categorized into three groups.

The grouping by leverage levels was done prior to the regression and due to the fact that some company characteristics are missing for several firms, these observations do not enter the regression. This is why the count on the observations is not equally distributed across the three groups. The intuition behind the regression remains unchanged from the circumstances.

	High leverage firms	Medium leverage firms	Low leverage firms
VARIABLES	CAR	CAR	CAR
RetentionRatio	0.0114	0.0231**	0.0162
	(0.00783)	(0.00991)	(0.0135)
FreeCashFlow	0.000319***	0.000499**	-0.000116
	(0.00008.82)	(0.000195)	(0.000158)
Leverage	-0.105***	0.0648	0.0931**
	(0.0270)	(0.0796)	(0.0393)
Profitability	5.110	-6.517	12.84**
	(5.393)	(7.577)	(5.148)
Tangibility	-0.666	-0.352	-0.513
	(0.726)	(0.632)	(0.432)
ln_WorkingCapital	0.435***	-0.366***	-0.313
	(0.148)	(0.130)	(0.229)
Observations	187	222	263
R-squared	0.180	0.072	0.071

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1