Corporate Financing Choices: New Ideas and Revisited Common Themes

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List of Abbreviations

CDS	Credit default swap
CFO	Chief financial officer
CR-CS hypothesis	Credit rating-capital structure hypothesis
EBIT	Earnings before interest and taxes
EBITDA	Earnings before interest, taxes, depreciation, and amortization
EMEA	Europe, the Middle East, and Africa
IPO	Initial public offering
NPV	Net present value
PTP transaction	Public-to-private transaction
R&D	Research and development
ROCE	Return on capital employed
S&P	Standard and Poor's
SDC	Securities Data Company
SEO	Seasoned equity offering
SIC	Standard Industrial Classification
UK	United Kingdom
US	United States of America

1 Introduction

1.1 Problem Statement

How do managers fund their firms? How should managers fund their firms? What are the determinants of these decisions? The irrelevance theorem of Franco Modigliani and Merton Miller (1958) started an intense discussion on how firms choose their capital structure and what the optimal balance between debt and equity is. In fact, the debate can be regarded as the starting point of modern financial theory, and motivated numerous seminal studies on the topic. But even more than 50 years after this first paper, these basic questions regarding corporate finance have still not been answered (Neus and Walter 2008). Therefore, Stewart Myers's 1984 insight, "How do firms choose their capital structures? … We don't know." is still compelling today (Myers 1984).

Observed industry-specific leverage ratios in and across financial systems imply the relevance of capital market imperfections (Elsas and Florysiak 2008). This severely questions the validity of the irrelevance of capital structure decisions for firm value. Moreover, survey studies of CFOs suggest that managers have some target debt ratio or range, which also refutes the irrelevance of capital structure (Brounen et al. 2004; Graham and Harvey 2001). The number of studies on capital structure is enormous, but to date no universal theory has been formulated for capital structure.[1] It has even been argued that there might not be any reason to expect a universal theory of capital structure (Myers 2003). Instead, "different theories apply to firms under different circumstances." (Frank and Goyal 2009). For that reason, this dissertation on empirical capital structure research aims to discuss and investigate two specific "firm circumstances" that influence coporate financing choices and seem promising for future research.

First, I investigate a determinant of capital structure that has so far received little attention in literatue – credit ratings by the external agencies Standard & Poor's and Moody's. Rating agencies play an eminent role in today's capital markets. It is likely that firms under the scrutiny of such strong external "supervisors" may follow a different leverage policy to non-rated firms. However, rating agencies' renowned importance is so far not reflected in the capital

[1] Harris and Raviv (1991) provide an overview of capital structure research through 1990.

structure research. Therefore, I thoroughly investigate the financing choices of externally rated firms for managers' rating considerations. The number of research pieces on the topic is still limited and the methodology of single studies is debatable. The first paper that initiated the discussion on credit ratings' influence on capital structure decisions is Kisgen (2006). The fundamental hypothesis of the study is that "concern for the impact of credit rating changes directly affects capital structure decision making, with firms near a ratings change issuing less net debt relative to net equity than firms not near a ratings change" (Kisgen 2006). As an operationalization, he regards plus or minus ratings (e.g. A+ or A-) as near an upgrade or downgrade, while the credit ratings in the middle of a broad rating category (e.g., A) are treated as not near a rating change. As a second proxy, his study calculates a firm-specific credit score based on ratios commonly used by rating agencies. This credit score is applied to rank firms of one rating category into thirds. The highest and lowest third are treated as near an upgrade or downgrade. However, both proxies are rather uninformative regarding the likelihood of a rating change (Elsas and Florysiak 2008). The rating agencies apply plus or minus notching on the corporate rating scale to signal the relative standing of the credit within the major rating categories (Standard&Poor's 2009). This is associated with discrete default and recovery rates for plus or minus credit ratings. In other words, the plus or minus credit ratings are not meant to deliver information on the future development of the credit rating. Furthermore, managers are not aware of the firm's credit score and therefore cannot take it into account if they decide on capital structure. In fact, Kisgen (2006) reports that the percentage of firms experiencing rating changes hardly differs if the above-mentioned two proxies are applied as distinguishing features. Consequently, this dissertation develops the methodology of Kisgen (2006) further, but sticks to the above-mentioned fundamental hypothesis. Accordingly, I apply the rating outlook and the watchlisting as appropriate new proxies for the likelihood of a rating change. This credit outlook "assesses the potential direction of a long-term credit rating over the intermediate term (typically six months to two years)" (Standard&Poor's 2009). The focus of my study is both on providing a more informative measure for nearness to a rating change and extending the sample by international firms. Generally speaking, this work provides valuable novel findings on the capital structure decisions of an internationally capital-markets-oriented firm sample.

Raising equity is an obvious way to bolster credit ratios and please rating agencies in case of negative rating momentum. Managers can increase the firm's equity share via internal sources (i.e. retained earnings and depreciation) or external sales of securities. While retained earnings are crosssectionally the dominant source of funding, "the economics of security offerings has generated considerable empirical research interest over the past two decades" (Eckbo and Masulis 2005). Survey evidence and stock price dynamics around seasoned equity offerings (stock price run-ups prior to the offering and low abnormal returns after the offering) indicate that managers exploit temporary overvaluations of the firm's stock and therefore time the equity offering. These efforts are possible because of the information asymmetry between managers and investors and the associated incentives for managers to exploit this infomational advantage. In fact, Chang et al. (2006) find that firms marked by a high degree of information asymmetry are especially prone to timing the market. Externally rated firms, on the other hand, reduce adverse selection problems with the information gathering process of the rating agencies (Frank and Goyal 2009; Frost 2007). Therefore, it is questionable if the *market timing hypothesis* still holds for externally rated firms' seasoned equity offerings. Accordingly, I contrast the market timing explanation of seasoned equity offerings with an alternative *credit rating-capital structure hypothesis*. Also the characteristics, i.e. the number of shares issued and the offer price of the seasoned equity offerings are examined with respect to the pre-offer credit rating status. In addition, I expand the analyzed financing decisions to debt/equity reductions and repurchases. This allows a clearer distinction to be drawn regarding how managers alter the debt ratio if the firm's credit rating is about to change.

As a second "firm circumstance" that may alter the composition of the balance sheet, I examine managers' weighting of public versus private equity in the decision to opt out of the public markets and go private. Such a public-to-private transaction (PTP) is an important step in the corporate life cycle, and modifies the capital structure of the firm significantly. However, consensus has not been reached in the literature on the underlying motives, and accordingly the relevant financial theories. Therefore, I investigate the characteristics of German firms that opted out of the public equity markets with the help of a hand-collected sample of 52 German PTP transactions between 1995 and 2004. There is a wide

strand of literature on the associated motivation and respective costs and benefits of PTPs for the US equity market. The transferability of these findings to non-Anglo-Saxon countries is difficult, as the structure of the financial and legal system is known to have a strong influence on corporate decisions.[2] However, evidence in this respect regarding Continental European capital markets is very limited. Studying the public-to-private decision in Germany is of particular interest, because Germany can still be regarded as a prime example of an insider-controlled and relationship-based financial system. This is important, as the PTP transactions can be regarded as a corporate governance transaction. It is the transition from the external capital markets' arm's-length financing and control to a small number of shareholders' more relationship-focused financing. Prior evidence of German PTP characteristics and motives is sparse, primarily due to the limited number of transactions before 1995 and the lack of a central PTP transaction database.[3] Moreover, most of the studies are of a descriptive nature or focus on single motives or aspects of PTPs. This study mainly contributes to the existing literature by increasing the number of observations, the consideration of the introduction of the squeeze-out regulation, and the test for low stock market liquidity as a potential motive in PTPs. The up-to-dateness of the studied topic is underlined by the observation that going private papers are still being published in highly ranked finance journals (e.g., Bharath and Dittmar 2010; Wright et al. 2006)

1.2 Research Structure

The above-mentioned two areas of corporate finance research are covered in three self-contained chapters. While the second chapter develops the basic sample for the overall analysis of the first part, the dataset is considerably enlarged in terms of types of variables in chapter 3. Chapter 4, on the other hand, uses an independent and specific dataset.

In chapters 2 and 3 I examine the role of credit ratings in managers' capital structure decisions. The *credit rating-capital structure hypothesis* is a reasonable extension of both *trade-off* and *pecking-order theory* and was first postulated by

[2] The transferability of these insights is, in addition, restricted by the observation periods of these studies, which is mainly in the 1980s.
[3] Other German studies on the topic include Zillmer (2002; 2003) and Eisele et al. (2003).

Kisgen (2006).[4] The static *trade-off theory* has a corporate target debt structure that balances the costs and benefits of debt and equity (Myers 1984). In general, the associated benefit of debt is mainly its function as an interest tax shield and related costs are dominated by the costs of financial distress. The *dynamic trade-off theory* acknowledges that the target capital structure of firms may fluctuate over time. Furthermore, firms show an adjustment behavior towards their target mix of debt and equity. The *trade-off theory* helps explain the higher debt ratios of companies with safe, tangible assets and considerable taxable income. On the other hand, unprofitable firms with more risky, intangible assets have to rely more on equity financing if they follow the *trade-off theory*. However, there is an alternative capital structure theory that reflects the empirical finding that profitable companies borrow less (Myers 1984). The *pecking-order theory* also considers the agency costs of equity financing and consequently develops an ordering of the financing alternatives. Firms prefer internal finance as this avoids adverse signals to investors, which could lower firm values (Myers and Majluf 1984). Furthermore, the *pecking-order theory* states that managers prefer debt to equity financing if internal resources are insufficient to cover investments. Consequently, this theory has no specific target debt ratio, and interest tax shields or financial distress arguments are only of second-order importance in the capital structure decision making.

Cross-sectionally, the most reliable factors to explain market leverage are the following: median industry leverage (+ effect on leverage), market-to-book assets ratio (−), tangibility (+), profits (−), the log of assets (+), and expected inflation (+) (Frank and Goyal 2009). When book leverage is considered, more or less similar factors are identified. However, firm size, the market-to-book ratio, and inflation are not reliable drivers of book leverage. So far, an external debt rating has largely been seen as a supply-side factor explaining variation in leverage (Faulkender and Petersen 2006). If a firm has a restricted access to debt markets, and all else is equal, financing may take place through equity markets. The proxy for unlimited access to debt markets is an external debt rating by S&P and/or Moody's. Ceteris paribus, externally rated firms are expected to have higher debt ratios due to their unrestricted access to debt markets.

[4] Other studies on the topic include Kisgen (2009), Kisgen and Strahan (2010), and Hovakimian et al. (2009).

In terms of the *pecking order theory*, a higher credit rating should help – by means of the information-gathering process by the agency – reduce adverse selection problems, and allow for a higher share of equity on the balance sheet (Frank and Goyal 2009).[5] Consequently, most studies only distinguish between firms with or without external credit rating and between investment and non-investment grade credits. However, different corporate credit-rating levels are associated with different discrete costs and benefits to the firm. In general, both *trade-off* and *pecking-order theory* build on the assumption that the capital structure depends on the (marginal) costs and benefits of debt and equity. If the credit-rating effect is material, also the marginal costs and benefits of debt and equity may change (Kisgen 2006). Regarding the *trade-off theory*, this translates into a different target debt ratio.[6] In terms of the *pecking-order theory*, the relative advantage of debt versus equity may shift. Under certain circumstances, the credit-rating effect outweighs the traditional implied costs and benefits of debt and equity. In other cases, vice versa may occur.

Credit rating costs and benefits for the firm can be clustered along the following lines: First, regulations regarding bond investments may restrict the potential investor pool of a specific rated security. The capital requirements of Basel II and III increase the regulatory costs of lower rated securities for banks, which, in turn, also add to the required yield on the investment. Furthermore, certain funds and insurance companies are restricted to solely investing in investment-grade credits. This may lessen the liquidity of lower-rated bonds, which generally decreases prices (Patel et al. 1998). Firms will therefore try to avoid these rating classes. Second, credit ratings are a key source of information on financial risk for investors. Accordingly, firms of the same credit quality are pooled together and secondary market spreads reflect this financial risk. Consequently, an upgrade or downgrade translates into higher or lower costs of funding. Third, direct costs imposed on the firm can come through rating grids or investor put rights included in the bond indenture if there is a material downgrade (Koziol and Lawrenz 2010). All in all, there are numerous channels through

[5] Alternatively, lower information asymmetries could increase the frequency of external capital markets financing, which would tend to increase debt ratios (Faulkender and Petersen 2006; Sufi 2009).

[6] Essentially, the rating-dependent cost (benefit) is just in another factor associated with debt and equity issuance.

which credit ratings can impose direct or indirect costs (benefits) on a firm. Consequently, managers are concerned about their firm's credit ratings because of these associated costs (benefits) with different rating levels.

The following are the main research questions of chapter 2: Is the credit rating's influence on capital structure decision making still evident if a more informative measure of nearness to a rating change is applied? Is the behavior of managers symmetrical to potential upgrades and downgrades in the credit rating? Does S&P's watchlist also affect subsequent security issuance and repurchase decisions? Is the credit rating effect stronger for potential changes in broad rating categories? Is the borderline between investment and sub-investment grade incrementally more important in the capital structure rationale? Do the credit ratings affect US and EMEA firms differently?

Chapter 2 shows that firms indeed follow a more conservative leverage policy if their credit rating is about to be raised or lowered, which is measured by a positive/negative rating outlook at the beginning of the fiscal year. The subsequent net debt relative to the net equity issuance of negative outlook firms is 2.1 percent lower than that of firms not near a change in rating. On the other hand, the prospect of an upgrade, measured by a positive rating outlook, induces a statistically and economically smaller reduction in net debt issuance. It appears that managers do not react fully symmetrically to potential upgrades or downgrades. Apparently, a negative outlook serves as a stronger signal to managers to restrict net debt issuance. However, the results also show that firms generally near a change in rating (i.e. a positive or negative outlook) issue 1.8 percent less net debt relative to net equity in the subsequent financial year than firms with a stable rating outlook. The credit rating effect is statistically and economically even stronger for a US sub-sample (-3.0 percent). As expected, the borderline between investment grade and non-investment grade is incrementally more important in capital structure decisions. Also credit-rating hurdle levels, which are crucial for access to the commercial paper market, have additional explanatory power regarding leverage behavior.

Beside a more informative measure for the likelihood of a rating change, chapter 2 contributes to the literature by enlarging the dataset to an international sample (i.e. Europe, Middle East, Africa, and the US) instead of US firms only.

Also the magnitude of the measured credit-rating effect on capital structure is economically larger compared to previous studies. In addition, in contrast to Kisgen (2006), the results are robust regarding the inclusion of large debt and equity offerings. Generally, chapter 2 helps validate the results of Kisgen (2006), which is a valuable contribution to the ongoing empirical capital structure discussion.

Chapter 3 builds on the results of chapter 2 and further investigates the role of credit ratings in a firm's debt-equity choice. In particular, the chapter focuses on seasoned equity offerings and their prevailing explanation by means of the *market timing capital structure hypothesis* (e.g., Baker and Wurgler 2002; Marsh 1982). Managers are believed to use favorable equity market conditions or a mispricing of the company's stock to issue equity.

In chapter 3 I try to answer the following main research questions: Are manager's rating concerns a driver of externally rated companies' seasoned equity offerings? What is the relative importance of manager's rating considerations versus market timing efforts? What are the effects of losing an investment grade rating or access to the commercial paper market on the likelihood of a subsequent equity offering? How do potential changes in the credit rating affect the composition of seasoned equity offerings? Is the credit rating effect stronger if the decision to issue equity is contrasted with the option of further debt issuance? Does the incorporation of equity and debt repurchases/reductions change the results?

For this more thorough analysis, the sample from chapter 2 was considerably enlarged in terms of considered variables and also complemented with stock return data.

I find that seasoned equity offerings are indeed more often associated with prior negative credit-rating outlooks than with a positive outlook. Also in a multivariate context, a negative (positive) outlook increases (decreases) the probability of a subsequent equity offering. Furthermore, the evidence in this study indicates that both market timing opportunities and credit rating concerns are significant drivers of seasoned equity offerings. In most cases, the credit-rating effect is economically even larger. In terms of the debt-equity choice,

results show that the likelihood of equity issuance (rather than debt) increases (decreases) by 3.3 (6.1) percent if the issuer credit rating has a negative (positive) outlook prior to the offering. This clearly shows that the credit-rating effect is economically material. Both market-timing and credit-rating concerns are present if the equity issue characteristics are investigated. A negative rating outlook increases the total offering proceeds and the number of shares sold. Managers' market timing efforts – measured by the market-to-book ratio – are present in higher offering proceeds, a lower number of shares sold, and a considerably higher offer price. As expected, a prior negative rating outlook increases the probability of a debt reduction, while it reduces the likelihood of a debt issue. In this multinomial analysis, a prior positive rating outlook decreases the probability of a subsequent equity offering. Most of the reported findings are robust if alternative mispricing proxies are applied.

In summary, chapter 3 strongly supports the *credit rating-capital structure hypothesis* and delivers valuable further insights into the specific relevance of credit ratings for managers' capital structure decisions. It contributes to existing literature by examining a key item in corporate financial research, namely seasoned equity offerings. The results indicate that in equity offerings of externally rated firms, market timing is not the key driver, but rather the prevailing rating situation before the issuance. Consequently, based on my study, further research on the topic will have to reconsider some of the prevailing views on seasoned equity offerings and their motives.

All in all, the two studies together imply that any complete model of capital structure must include "credit ratings along with standard tax, information, agency, and financial distress factors" (Kisgen 2009).

The second part, chapter 4, comprises the second main topic of the research covered in this thesis, which is the public to private transaction in Germany. This strand of research is also closely connected to capital structure research, as the *trade-off theory* "also helps to explain what kinds of companies go private in leveraged buyouts" (Brealey and Myers 2003). Typical target companies in leveraged buyouts feature "mature, cash-cow businesses with established markets for their products but little in the way of high-net present value (NPV) growth opportunities." According to the *trade-off theory*, companies of this kind can and

should bear high debt ratios. This is in line with Jensen's (1986) *free cash flow hypothesis*, which posits a severe discrepancy in managers and shareholders' interests. Managers are rather willing to maintain the financial slack in the firm and use is it for value-reducing investments (e.g., negative NPV projects). Accordingly, financial slack increases agency problems and firm costs. Jensen (1986) calls this excess cash the "free cash flow." It is in the interest of investors that managers pay out the free cash flow rather than invest it in below average investment opportunities.

The firm's capital structure can serve as a strong measure to discipline managers. Additional debt on the balance sheet, through the interest and principal payments, helps reduce managers' discretionary cash flow, which may be used for value reducing activities. The problem with alternative but voluntary measures to pay out cash to shareholders, like dividends or share repurchases, is that shareholders cannot force payment. The *free cash flow hypothesis* is also connected to the third chapter of this thesis, as it predicts that the announcement returns of seasoned equity offerings are negative, since investors expect the raised funds to be used for poor investments (McLaughlin et al. 1996). In addition, the theory expects a negative relation between post-offering-operating performance and the amount of excess cash available for managers.

Although empirical evidence of the free cash-flow phenomenon is mixed, the 1980s in the US and the period 2000–2007 saw an unprecedented number of public companies acquired by private equity firms in acquisitions structured along these lines. Beside high percentages of debt financing, the deals featured incentives for managers, i.e. significant equity stakes in the firm and private ownership. The latter allows for close monitoring by the owning partnership and strong pressure to achieve improvements in operational efficiency.

The main research questions of chapter 4 are the following: What are the typical characteristics of German firms that opted out of the public equity markets? What are the main determinants of the likelihood of a public-to-private transaction? Which underlying motives are associated with these factors? Do these motives change over time and do they depend on the initiator of the transaction? Is the *free cash flow theory* a suitable explanation of German PTPs? Or are the transactions and their respective characteristics better explained by the

more basic *trade-off theory*? What are the key differences between German markets and the US equity markets?

Previous studies have shown that the characteristics and underlying motivations of PTPs are diverse and complex. Therefore, by drawing on earlier works on the going private phenomenon, chapter 4 condenses the different motives into six testable hypotheses. In the following, I describe the main insights of chapter 4 regarding these hypotheses. First, with regard to the *free cash flow hypothesis*, the evidence suggests that German PTP firms are not marked by a high degree of financial slack aimed at being paid out to new shareholders. This is consistent with previous research on the German market. Also Bharath and Dittmar (2010) support the idea that the free cash-flow rationale only applies to US firms taken private in the 1980s. The evidence supports a *leverage potential hypothesis*, which regards PTPs as under-levered before the transaction and sees additional firm value in a higher debt ratio. Cross-sectionally, German PTP firms have lower debt ratios than a control group. Regarding the *ownership concentration hypothesis*, I cannot find a lower number of free floating PTP shares. On the other hand, the evidence supports hypotheses positing the *decreasing benefits of a stock market quotation* and *limited capital market efficiency*. The former hypothesis is supported by the slow PTP growth rates and their mature industry background, which helps limit investment and financing needs. For these firm characteristics, the benefits of being a public firm no longer outweigh the costs. The latter hypothesis is supported by the low trading volumes of PTPs before taking private. It is obvious that this also has adverse implications for the firm's stock market valuation and therefore relative advantage of a quotation.[7] The *dividend payment hypothesis*, which states that PTPs have relatively higher payout ratios, is not supported by the evidence provided in chapter 4. Consequently, German PTPs are not aimed at collecting dividend payments privately.[8]

In summary, the going private companies originated from mature industries and, in the three financial years preceding the PTP transaction, their sales figures

[7] This is consistent with Bharath and Dittmar (2010) regarding the US equity market.
[8] Alternatively, PTPs could aim to increase the payout ratio in the aftermath of the taking private transaction. However, the dividend payments of private corporations are not publicly accessible. On the other hand, this alternative view has already been tested by the free cash flow hypothesis and the evidence is not supportive.

showed slow growth. Furthermore, the capital structure had a potential for further leveraging and the companies were marked by low profitability. Trading in the PTPs' shares was very sluggish, which limited the efficiency of capital markets.

On the whole, while chapters 2 and 3 investigate capital structure decisions by managers of capital-markets-oriented firms, chapter 4 analyzes managers' actual choice between public and private equity financing. Both streams contribute interesting new insights into manager behavior to corporate finance research.

2 Credit Ratings and Capital Structure Revisited

2.1 Introduction

The aim of this chapter is to provide a more precise test of whether and how credit rating concerns affect managers' subsequent capital structure decisions. The studies by Kisgen (2006; 2009) formally prove the relevance of credit ratings in determining capital structure. While the first study's empirical tests show that firms close to a downgrade or upgrade in credit rating follow a more conservative capital structure policy than firms not close to a change in rating, the second paper focuses on leverage behavior following rating changes. Our study refines Kisgen's (2006) approach by applying S&P's rating outlook as an appealing additional proxy for the proximity of a rating's change. As far as we know, we are the first to incorporate the credit rating outlook in empirical capital structure research. Our results confirm the importance of credit ratings in determining capital structure. Companies issue approximately 2 percent less net debt relative to negative equity in the following financial year, if their long-term credit rating is about to be raised or lowered. The effect is both statistically stronger and slightly economically larger if the rating outlook is "negative." The amount of leverage reduction is comparable if micro (e.g., A and A-) or broad rating (e.g., AA, A) categories are at risk.

The financial crisis has provided further evidence of the relevance of credit ratings for managers' capital structure decisions. The main reason for Rexam - Europe's biggest maker of cans for beer and soft drinks – conducting a GBP 350 million capital increase and scrapping its interim dividend in July 2009, was to bolster its credit rating, which S&P had reduced to BBB- in Q1 2009. In a press release, the company stated: "The loss of an investment-grade credit rating would be detrimental to the group, both in terms of the cost and the availability of future credit…." (Rexam 2009). Standard & Poor's said the moves would "more than offset the negative impact of the currently difficult trading environment" (White 2009). After the capital increase, Moody's also improved its view of the company's debt from "negative" to "stable." In July 2009, Reed Elsevier, the Anglo-Dutch publisher, also raised GBP 824 million in an equity offering, justifying its move as protecting its BBB+ credit rating (Costello and Sabbagh

2009). The majority of European corporate organizations that have recently issued equity had prior negative ratings events (i.e. a rating downgrade, a negative watch event, or a downgraded outlook). From October 2008 to August 2009, 58 rated issuers tapped the European equity markets, of which 46, i.e. 79 percent, had had a prior negative credit rating event (Stillit and Khabrieva 2009). Apparently, recent equity issuance is partly driven by negative rating actions. Consequently, the study by Stillit and Khabrieva (2009) utilizes credit rating indications as a method to identify "would-be" equity issuers. Graham and Harvey's survey (2001) of CFOs shows that credit ratings are the second most important consideration in their capital structure decision-making process.[9] This figure has very likely increased sharply over the course of the financial crisis, as the role of debt capital and convertible bond markets has increased due to the weak bank debt market.

This study tries to empirically provide answers to the following main research questions: Is the credit rating's influence on capital structure decision making still evident if a more accurate measure of rating change proximity is applied? Do managers response symmetrically to potential upgrades and downgrades in the long-term issuer credit rating? Does S&P's watchlist also have a measurable impact on subsequent net debt issuance? Do potential changes in broad rating categories lead to more pronounced effects in managers' leverage behavior? Is the borderline between investment and sub-investment grade incrementally important in the capital structure rationale? Do the credit ratings affect US and EMEA firms differently?

Credit ratings formally matter because they serve as a signal of firm quality for investors and therefore impact the company's cost of capital.[10] Rating agencies partly possess information, for example, on business plans, capital expenditures, or future dividend policy, which is unavailable to investors. Since most companies lack a liquid CDS market, rating events are a key source of information for capital markets (Stillit and Khabrieva 2009). By means of rating-triggered events, such as

[9] Recently, ThyssenKrupp, Germany's largest steel producer, which made notable asset disposals to maintain its investment-grade status, has also supported the view that managers care greatly about their companies' credit ratings, specifically in times of negative rating momentum (Hippe 2009).

[10] The study by Kisgen and Strahan (2010) empirically shows the economic relevance of ratings-based regulations on bond investments for a firm's cost of debt.

in step-up bonds, loss of access to the commercial paper market, and strategic advantages in bidding for contracts, ratings changes can indirectly induce discrete costs (benefits) for the firm (Koziol and Lawrenz 2010). Moreover, the regulation of banks, insurance companies and broker-dealers' bond investments drive the liquidity of a firm's bond market. In the new Basel II (BIS II) Accord, the capital requirements for banks are partly determined by external credit ratings (Boot et al. 2006). This approach also affects a company's potential investor pool and, thus, the cost of capital. On the whole, a firm's discrete costs (benefits) are associated with different rating classes (Kisgen 2006; Kisgen 2009).[11]

This chapter complements the study by Kisgen (2006) with a cleaner test of the so-called "credit rating-capital structure" (CR-CS) hypothesis. In order to analyze the response in leverage behavior, Kisgen (2006) regards plus or minus ratings as close to a rating change. As a second measure, the study applies a firm-specific "credit score" and accordingly classifies companies per rating category, which is also meant as a proxy for a rating change's imminence. The credit score approach is a rather noisy signal of an imminent upgrade or downgrade.[12] However, since managers are not aware of their companies' respective credit score and can therefore not incorporate it into their capital structure decision making. Since the "+" or "-" assigned to a credit rating is merely a "sign to show relative standing within the major rating categories" (Standard&Poor's 2009), rating agencies do not wish to convey information on the credit rating's likely future development. On the other hand, investors regard credit ratings assigned a "+" or "-" as separate rating categories with discrete default rates.

Consequently, our study develops this approach further and relies on the rating outlook as the measure of an imminent rating change. Rating agencies use the rating outlook to assess "the potential direction of a long-term credit rating over the intermediate term (typically six months to two years)" (Standard&Poor's 2009). Similar to the actual credit rating, the firm's economic and/or fundamental business conditions are also key determinants of the rating outlook. The study by Altman and Rijken (2007) shows that in addition to the actual credit rating, the

[11] For a complete overview of the practical significance of credit ratings for capital structure compare Kisgen (2006).

[12] Kisgen (2006) rightly points out that his approach has a potential errors-in-variables problem since the credit score is only measured by error.

rating outlook reveals supplementary and, specifically, timely credit risk information to financial markets. Moreover, Hamilton and Cantor (2004) demonstrate that the rating outlook is highly predictive of short to mid-term rating changes. Therefore, using the rating outlook allows us to measure the imminence of an upgrade or downgrade in credit rating more precisely.

While controlling for firm-specific factors and financial distress arguments, we find economically significant credit rating concerns in managers' capital structure decisions for a broad sample of S&P rated companies in Europe, the Middle East, Africa (EMEA) as well as the US. Companies which face an upgrade or downgrade of their issuer credit rating, issue 1.8 percent less net debt relative to net equity (as a percentage of total assets) in the subsequent financial year. A negative credit rating outlook is associated with an even more conservative leverage policy (-2.1 percent).

Comparing our findings with those of Kisgen (2006) shows that our measured credit rating effect is both economically stronger and our model is robust even with the inclusion of large debt and equity offerings. Therefore, our study helps to put the *credit rating-capital structure hypothesis* on a firmer footing. Moreover, our results indicate that US firms and EMEA firms manage their issuer credit rating differently. We can only find evidence of a statistically significant leverage reduction following EMEA firms' positive/ negative credit rating outlook if large debt and equity offerings are excluded from the analysis. In addition, the credit rating effect is economically stronger for US firms (-3.0 percent). Regarding the potential loss of a broad rating category, our results indicate that while the subsequent leverage reduction is statistically significant as well, its effect is comparable to the coefficient for changes in micro credit ratings. We cannot find systematic leverage reduction following a placement of the companies' issuer credit rating on S&P's CreditWatch. Finally, concerns about losing or obtaining an investment-grade rating have, as expected, incremental explanatory power regarding subsequent net debt relative to net equity issuance.

Our study thus contributes to the still limited but growing literature on credit ratings and capital structure, and is the first study to incorporate the credit rating

outlook in the discussion.[13] Other corporate finance studies on credit ratings have examined their effects on IPO pricing or analyzed the relationship between access to public debt markets, approximated by an outstanding credit rating, and the corporate capital structure (An and Chan 2008; Lemmon and Zender 2010; Mittoo and Zhang 2008).

The rest of the chapter is organized as follows: The next section 2.2 briefly describes the *credit rating-capital structure hypothesis* in the context of traditional capital structure theories. Chapter 2.3 explains the empirical design for testing managers' capital structure decisions and shows our main results. Chapter 2.4 analyzes the credit rating effect per rating class and provides further robustness tests. The chapter is concluded in section 2.5.

2.2 Related Literature

To date, the research on credit ratings and capital structure is rather limited. The *credit rating-capital structure hypothesis* (CR-CS) formed by Kisgen (2006) states that "different credit rating levels are associated with discrete costs (benefits) to the firm." Depending on the importance of these costs and benefits, the CR-CS may outweigh the implications of traditional capital structure theories, i.e. the trade-off and pecking-order theories. This implies that, in certain cases, due to the discrete costs (benefits) anticipated by a rating change, the capital structure decision making differs from the traditional behavior implied by capital structure theories. In other cases, traditional capital structure theories overshadow the CR-CS. Beside firm and industry characteristics, which form the relationship between firm value and leverage, the proximity of a potential rating change is crucial for the credit rating effects' relative importance. In terms of the *pecking order theory*, CR-CS implies that firms may issue equity to avoid a possible downgrade despite the associated asymmetric information costs and available internal funds (Myers 1984). Furthermore, managers could opt for a more conservative net debt issuance despite the pecking-order theory's contrary implications. If the trade-off theory is considered, CR-CS entails firms being allowed to choose different firm-value-maximizing capital structure optimums. The discrete costs (benefits) cause jumps in the otherwise continuous relationship

[13] In addition to Kisgen (2006; 2009), other studies on the topic include Kisgen and Strahan (2010) and Hovakimian et al. (2009).

between firm value and leverage. The proximity to these firm value jumps determines the costs associated with moving to the new optimum and, therefore, this optimal capital structure's relative attractiveness for the respective firm.

The methodological set-up of Kisgen (2006) measures this imminence of a rating change in two ways:[14] The possible upgrade or downgrade to a higher / lower major rating category, i.e. BBB or BB, is approximated by the "+" or "-" assigned to a credit rating. The second approach measures changes in all rating categories with the help of a calculated "credit score".[15] The firm-year-specific credit score is used to rank firms of a specific micro rating, i.e. BBB- or BBB, in a high third, middle third and low third. Firms in the high or low third are treated as near a rating change.

Kisgen (2009) complements his earlier study on the *credit rating-capital structure hypothesis* by analyzing leverage behavior following ratings changes with the help of a partial adjustment model (per Flannery and Rangan 2006). He demonstrates that companies restrict their net debt relative to net equity issuance after a downgrade in credit rating. As the credit rating effect on upgrades is minimal, the results indicate "that mangers target specific minimum credit rating levels."

The study by Hovakimian et al. (2009) examines how firms target their credit ratings and how the ratings target feed-back to their capital structure decisions. The study shows that firms below their rating targets tend to decrease their leverage, while above-target firms "tend to repurchase equity rather than retire debt and tend to increase their dividends (Hovakimian et al. 2009).[16]

On the whole, the CR-CS is a reasonable extension of the existing capital structure hypotheses, which may help explain managers' deviations from the traditional theoretical implications.

[14] For a thorough description of the methodological set-up, see Kisgen (2006).
[15] This "credit score" is a measure of firm quality based on financial data regularly used by rating agencies, i.e. interest coverage, size, and leverage. The weightings of the individual data fields are determined by regressing observed ratings on these factors.
[16] Other studies on the topic include Faulkender and Petersen (2006) and Rauh and Sufi (2010).

2.3 Main Empirical Tests

2.3.1 Methodology

We follow Kisgen's (2006) general empirical set-up to determine the significance of credit ratings in capital structure decision making. The discussion in section 2.2 adds to the hypothesis that companies near a credit rating upgrade or downgrade issue less debt relative to equity than companies not close to a rating change. In other words, the management aims to increase the chances of an upgrade of the firm's credit rating or avoid the possible downgrade by the means of a more conservative net debt issuance (net debt minus net equity offerings). In order to test the postulated relationship, we need two dummy variables that distinguish between firms near a credit rating upgrade / downgrade and those that are not, as well as an adequate measure of debt relative to equity issuance.

In order to correctly test the credit rating effect discussed in section 2.2, we examine changes in micro rating categories, i.e. BB+ or BB and in the major rating categories, i.e. AA or A. We utilize S&P's Rating Outlook and Credit Watch (Moody's equivalent is the Watchlist) to measure the proximity of a change in credit rating. This credit outlook "assesses the potential direction of a long-term credit rating over the intermediate term (typically six months to two years)" (Standard&Poor's 2009) and is determined by the firm's economic and/or fundamental business conditions. It not only provides the actual credit rating, but also supplies investors supplementary credit risk information (Altman and Rijken 2007). Although corporate ratings are based on the through-the-cycle approach, which makes them stable but rather insensitive to short-term developments, the rating outlook delivers timely credit risk information. Therefore, investors, who are mostly short term oriented, rely heavily on rating outlooks in their credit risk assessment.

A study by Cantor and Hamilton (2005) demonstrates that rating outlooks explain the differences between actual ratings and implied ratings based on CDS data. A "positive" or "negative" outlook means that a rating may be raised or lowered, while a "stable" outlook indicates that a rating is not likely to change in the intermediate term. A "developing" outlook is assigned to ratings in "unusual situations in which future events are so unclear that the rating could be raised or

lowered" (Standard&Poor's 2008b). Using Moody's rating data, Hamilton and Cantor (2004) document that the likelihood that issuers with a negative outlook will be downgraded over a one-year horizon is seven times higher than their chances of being upgraded. The ratio is 2:1 for upgrades with a positive outlook versus a downgrade. Therefore, the rating outlook is highly predictive of future rating changes. The anecdotal evidence provided in the introduction and investors' intense reliance on the rating outlook support the assumption that most management teams pay close attention to not only the firm's rating, but also to its respective outlook. Since the rating outlook's time horizon is usually six months to two years, there is ample time for the management to alter the firm's capital structure in order to react to its current rating outlook.

The second measure of a close rating change is S&P's Credit Watch, which "focuses on identifiable events and short-term trends that cause ratings to be placed under special surveillance…" (Standard&Poor's 2009). The trigger events for placing a corporate rating on credit watch are mostly mergers, acquisitions, and recapitalizations. The likelihood of a change in rating must be "sufficiently high" for a placement on credit watch and the time horizon is much shorter than that of the rating outlook (Keenan et al. 1998; Standard&Poor's 2008b). Similar to the rating outlook, the credit watch / watchlist placement also supplies financial markets with information (Chung et al. 2008).

While the likelihood of a rating change is higher (typically at least 50 percent) when a credit rating is placed on credit watch than with a mere positive or negative outlook, the available time period for the management to react is considerable shorter (typically 90 days). This could reduce the precision of our tests, as we have to record the outlook/credit watch at the end of the firm's fiscal year and measure capital structure decisions over the subsequent 12-month period. Since the rating outlook has a mid-term perspective rather than a credit watch's short-term one, it could be more suitable for our subsequent analysis.

The dependent variable in our study is the difference between the net debt issuance and the net equity issuance (relative to the firm's total assets).[17] This factor allows us to correctly measure the management's actions to adapt the companies' capital structure to the respective credit rating situation. Furthermore,

[17] A similar measure is applied by Kisgen (2006; 2009) and Leary and Roberts (2005).

rating agencies regularly rely on book values in their credit risk assessment (Standard&Poor's 2008b). Therefore, the dependent variable is also based on book values. Consequently, we create dummy variables for the rating outlook/watchlisting at the end of the firm's fiscal year, thus measuring the companies' net debt relative to its net equity issuance over the subsequent 12 months. As mentioned before, this approach is likely to add noise to the empirical test because a company's rating outlook can change during the 12-month period. The change would make the measurement at the beginning of the year inaccurate. Other complicating factors are the significant transactions costs associated with debt and equity offerings and the time lag between decision making and execution (Lee et al. 1996). These make equity offerings especially irregular and rare (Eckbo and Masulis 2005). On the whole, all these constraining factors could impair the accuracy of our tests and, consequently, influence the measured credit rating effect.

Kisgen (2006) excludes very large offerings (debt and equity and debt only) from his analysis.[18] He argues that the postulated relationship between capital structure decisions and credit ratings is critical, especially for small and medium-sized offerings. While a small debt offering might result in a downgrade for a firm already close to a downgrade (in our study companies with a negative outlook assigned to their credit rating), it should not affect a firm not close to a downgrade (in our study companies with a stable or positive credit rating outlook). On the other hand, a large debt offering might also be followed by a down notching of firms previously not close to a downgrade. The significant shift in the capital structure leads to a major deterioration in credit quality that, in turn, makes a downgrade inevitable. Large equity offerings are mostly associated with management's major strategic decisions (e.g., reorganization, acquisitions, etc.) in which rating considerations play only a subordinate role. However, in contrast to Kisgen (2006), the main results of our study are robust regarding the inclusion of large offerings, i.e. offerings greater than 10 percent of the company's assets.[19]

[18] Large offerings are defined as greater than 10 percent of assets. However, the results are robust to hurdle rate of 5 percent or 20 percent.

[19] But the statistical significance is somewhat reduced. The results are qualitatively identical if the hurdle rate is changed to offerings greater than 5 percent of assets.

2.3.2 Sample Overview and Data Description

Our sample consists of firms that either have an outstanding or past issuer credit rating by Standard and Poor's, as well as firms that have withdrawn issuer credit ratings due to bankruptcy or termination of the agreement with the rating agency (e.g., due to a change in the funding strategy, or as a consequence of going private). Our analysis is geared to the Long-term Domestic Issuer Credit Rating by S&P. The sample is constructed from S&P's rated universe in Europe, the Middle East and Africa (EMEA), as well as in the US. Accordingly, the findings of our study are based on a very broad set of jurisdictions and capital markets.[20] We exclude financial firms (SIC codes 6000-6999) from the sample, as their capital structures are likely to differ substantially from industrial or service firms (for a similar approach, compare Hovakimian et al., 2001 and Baker and Wurgler, 2002). Similar to previous papers, we exclude firm years with missing values for commonly used variables.

For firm-level data, we use the Datastream and Worldscope financial databases by Thomson Financial.[21] For inclusion, we require that the firms have available accounting and financial data for the year subsequent to the cut-off date of the rating and the respective outlook. Therefore, our sample period is 1990 – 2008, as 1990 is the first year for which S&P's rating outlook is obtainable and 2008 is the last year for which full-year financials are available.[22] The rating outlook was first introduced in the US and subsequently applied to the whole S&P universe.

In order to derive the dependent variable net debt relative to net equity issuance for our empirical analysis, we identified equity offerings and repurchases from cash flow statements.[23] Another approach is to rely on balance sheet data (y-o-y change in book equity minus y-o-y change in retained earnings) in order to broaden the data set, as the cash flow data are not available for all firm years.[24]

[20] The robustness tests in chapter 2.4.3control for the different jurisdictions in our sample.
[21] The results of the analysis should be equivalent to those arrived at if the Compustat financial database by S&P had been used as a study by Ulbricht and Weiner (2005) finds no structural differences between Thomson Financial and Compustat.
[22] Standard and Poor's introduced reviews in 1981 and outlooks in 1986 (Micu et al. 2006).
[23] Kisgen (2006) and Hovakimian et al. (2001) follow a similar approach.
[24] Baker and Wurgler (2002) use this approach in their capital structure study. The indirect calculation of the variable also correctly excludes mere equity changes resulting from earnings for the year. Our study likewise aims at intentional capital structure decisions by the management and not mere changes due to firm performance.

The main findings of our study are qualitatively identical if the second approach is used. To calculate debt issuances and reductions, we tracked the change in total (short term plus long term) book debt, defined as the total liabilities and the preferred stock – replaced by the redemption value of the preferred stock if this is missing – minus the deferred taxes and convertible debt.[25] We relied on balance sheet data to calculate the net debt issuance, in order to obtain a broad as possible data set. Consequently, our net debt issuance variable comprises debt from public as well as private sources. This approach is valid, as the rating agencies do not distinguish between public or private debt (Standard&Poor's 2008b).

We largely follow the studies by Rajan and Zingales (1995) and Alti (2006) in our selection and definition of control variables that determine capital structure. The variables are defined as follows: *Book leverage* is the book debt divided by the total assets. The market-to-book ratio, *M/B*, is the same as the book debt plus the market value of the equity (common shares outstanding multiplied by the share price) divided by the total assets.[26]. *Profitability* is defined as earnings before interest, taxes, and depreciation/amortization divided by the total assets. Firm size, *size*, is the natural log of the total sales. *R&D/A* is the research and development expense divided by the total assets and replaced by zero if missing. *R&D/A* serves as a proxy for investment opportunities (Fama and French 2002). In conjunction with this, the dummy variable, *R&Dd*, takes a value of one in the regressions if *R&D/A* is missing and is, accordingly, replaced by zero (Alti 2006). The tangibility of the total assets, *tangibility*, is the net plant, property, and equipment over the total assets; and *financial slack* is the cash and equivalents divided by the total assets (Dittmar and Thakor 2007). Moreover, we added the *interest coverage* ratio to this list; *interest coverage* is defined as earnings before interest and tax over gross interest expenses, because it is one of the most important determinants of a firm's credit rating. *Industry leverage* is defined as the median industry total debt to assets ratio based on the two-digit SIC code (Hovakimian et al. 2001).

[25] Compare Hovakimian et al. (2001) for a similar approach.
[26] Consistent with previous studies on the topic, we drop observations for which M/B or its modifications exceed 10.0.

On the whole, the sample consists of 13,363 firm years and 1,298 firms. Excluding observations with missing values, leaves 11,308 firm years. Table 2-1 provides summary statistics on the overall sample and sub-samples.

The table shows that the EMEA firms are larger – both in terms of the total assets and sales – than the US firms. This is not surprising, as the EMEA public debt markets are dominated by large firms, while the US debt market has traditionally also been open to smaller scale firms. The test statistics regarding the two sub-samples are based on simple two-sided t-tests of the differences in the means and non-parametric Wilcoxon signed rank tests of differences in medians. These statistics show that US firms have higher market-to-book and leverage ratios (not tabulated). We find no statistical difference in the research and development expenses. On average, EMEA firms have more tangible assets on the balance sheet and a higher percentage of financial slack. However, their interest coverage ratios are lower than those of their US counterparts. With regard to the different rating outlooks, the tests show that negative outlook firms have statistically significantly lower market-to-book ratios, higher leverage ratios, lower profitability, lower percentages of financial slack, and considerably lower interest coverage ratios. On the other hand, positive outlook firms exhibit higher market-to-book ratios, higher profitability, more tangible assets, a higher share of financial slack, and higher interest coverage ratios. In order to gauge on what dimension firms with a negative/positive outlook differ significantly from other firms with same rating, we have run a regression analysis of the credit rating level and outlook on various firm characteristics (not tabulated). The results confirm the abovementioned univariate analysis findings.

In terms of firm years, the sample is rather well distributed along rating classes. However, 84 AA+ firm years compare poorly with 1,524 firm years for BBB companies. Nevertheless, the findings of our study should not be driven by certain rating classes.

Figure 2-1 shows the average net debt minus the net equity issuance per rating category, while figure 2-2 divides the dependent variable into its two components and therefore depicts the average net debt and average net equity issuance per rating category.

Figure 2-1 shows that companies rated BB or better issue more net debt minus net equity over the sampling period. The average net debt relative to net equity issuance (as a percentage of total assets) ranges from 0.50 percent to 3.85 percent. While companies BB- or below issue more net equity than net debt. The respective offering range is from -4.98 percent to -0.99 percent. Lower-rated companies apparently try to prevent a further deterioration in credit quality and, therewith, credit rating by issuing more equity than debt. On the other hand, investment-grade and crossover firms use their rather good credit standing and, in turn, more attractive refinancing costs to alter their capital structure the other way. Interestingly, the boundary between positive and negative net debt minus net equity issuance does not seem to be the division between investment grade and speculative grade, but a bit below — around the rating classes BB and BB-.

The more thorough analysis of figure 2-2 shows that the strongest separating factor between higher and lower-rated companies is the average net equity issuance. While companies rated from AAA to BB have, on average, bought back parts of their equity, the lower-rated group has issued additional equity to strengthen its credit quality. Net debt issuance paints a similar picture, although the relationship is not as strong. Higher-rated companies have a positive net debt issuance, while the lower-rated group has, on average, redeemed outstanding debt or restricted debt issuance to a minimum. The two figures clarify that it is necessary to control for the firm's credit quality in the empirical tests, as higher-rated firms tend to issue more net debt relative to net equity. In order to separate the credit rating effect from a potential financial distress effect, we have selected the leverage ratio, and the company size as base case control variables. Investment-grade companies specifically must have a minimum sales figure to become and remain investment grade. Moreover, any financial distress arguments are likely to decrease with increasing firm size. As a third control variable, we have selected the firm's profitability. In order to have comparable results, we have followed Kisgen's (2006) approach when selecting control variables.[27]

We have now operationalized the *credit-rating effect hypothesis* by means of dummy and financial variables. This allows us to test the relationship between credit ratings and capital structure decision making in an empirical context.

[27] We added more control variables that are known as key determinants of capital structure in the robustness tests.

2.3.3 Main Empirical Results

First, we formally investigate managers' concern regarding a possible micro credit rating change, i.e. the change in any rating category. Our hypothesis states that firms with a positive or negative outlook will issue less net debt relative to net equity than firms with a stable outlook.

Figure 2-3 and figure 2-4 show the net debt (issuance of debt minus repurchase of debt) and the net equity issuance (issuance of equity minus repurchase of equity) individually per rating category and differentiate between firms with a positive/negative outlook and firms with a stable outlook. While firms close to a change in micro rating are expected to issue less net debt, they presumably issue more net equity than firms not close to a change in micro rating.

Figure 2-3 shows that in 13 of the 18 rating categories, net debt issuance is smaller for firms with a positive/negative outlook at the beginning of the period. As depicted in figure 2-4, the relationship is similar regarding net equity issuance. In 13 of the 18 rating classes, the amount of net equity issued is higher for firms with a positive/negative outlook. As a result, on an individual basis, the relationship between net debt and net equity issuance and close credit rating changes is as expected for the majority of the rating categories. Moreover, the relationship between net debt net equity issuance and the credit quality of the issuer, already displayed in figure 2-1 and figure 2-2, is also evident in figure 2-3 and figure 2-4. These first descriptive results strongly support our hypothesis regarding the relevance of credit ratings in capital structure decision making.

The following three equations allow us to formally test our hypothesis in a pooled time-series, cross-section framework. We use fixed-effects panel (within) estimators to control for firm heterogeneity in the panel context (Baltagi 2008; Greene 2003). This approach allows for time-omitted variables in the regressions, which, in turn, should help to limit endogeneity problems.[28] Moreover, we include year dummy variables in the analysis to allow for aggregate time effects.

[28] We have not applied an instrumental variable regression because of the weak instrument problem and the difficulty of identifying potential endogenous variables in our analysis.

$$NetDebtIss_{it} = \alpha + \beta_0\, PosNegOutl_{it} + \varphi\, K_{it} + u_i + \varepsilon_{it} \quad (1)$$

$$NetDebtIss_{it} = \alpha + \beta_1\, PosOutl_{it} + \beta_2\, NegOutl_{it} + \varphi\, K_{it} + u_i + \varepsilon_i \quad (2)$$

$$NetDebtIss_{it} = \alpha + \beta_3\, ChgeOutl_{it} + \varphi\, K_{it} + u_i + \varepsilon_{it} \quad (3)$$

While $PosOutl_{it}$ and $NegOutl_{it}$ are the credit rating outlook dummy variables for each individual firm *i* at time *t*, $PosNegOutl_{it}$ is an aggregate credit rating outlook dummy variable for positive or negative outlook, which is measured on a yearly basis at the end of the firm's financial year.[29,30] The aggregate dummy variable $ChgeOutl_{it}$ also codes companies with a "developing" rating outlook as "1" and accordingly includes them in $PosNegOutl_{it}$. The set of control variables described above are labeled K_{it}.[31] Our hypothesis implies that $\beta_i < 0$, i = 0, 1, 2, 3, i.e. firms close to change in rating issue less net debt relative to net equity. The null hypothesis is $\beta_i \geq 0$. The empirical results are shown in table 2-2. Panel A comprises the entire sample, panel B excludes very large debt offerings (> 10 percent of assets) and panel C excludes both very large debt and equity offerings from the sample.[32]

The null hypothesis that managers are unconcerned about ratings in their capital structure decisions can be rejected in all three panels. Looking at the broadest - panel A -, the coefficient of the *PosNegOutl* dummy variable has the expected negative sign and is statistically significant at the 5 percent level. Firms with a positive or negative outlook annually issue 1.8 percent less net debt to net equity as a percentage of total assets than firms with a stable outlook. Therefore, credit ratings' effect on the capital structure is not only statistically significant, but also economically significant. Consequently, in contrast to Kisgen (2006), we were able to prove credit ratings' influence on the capital structure without excluding large offerings from the sample. As the fixed-effects model relies solely

[29] The subscripts *i* and *t* are suppressed in the following for notational convenience.
[30] Introducing an aggregate explanatory variable for a positive or negative credit rating outlook implies that managers react symmetrically to both outlooks. The study by Kisgen (2006) proves this symmetric behavior. Alternatively, one could argue that managers are willing to rely more on debt financing than on equity financing when the credit rating outlook is positive. Splitting up the aggregate outlook variable allows us to test for this alternative explanation.
[31] We have selected the base case control variables consistent with Kisgen (2006): *book leverage*, *size*, and *profitability*.
[32] The results are robust regarding using 5 percent of assets as the threshold for excluding very large debt or debt and equity offerings.

on variance over time for each firm, the model fit, measured by the within R^2 of 0.0330, should be acceptable. Moreover, the coefficient of -1.8 percent is higher than the measured -0.9 percent by Kisgen (2006).[33] On the whole, although the study by Kisgen (2006) chooses a different approach to measure an imminent change in credit rating, the empirical results are comparable to our analysis. This clearly demonstrates the robustness of the *credit rating – capital structure hypothesis*.

Dividing the aggregate credit outlook dummy variable into the positive and negative outlook dummy variables reveals additional findings. With a coefficient of -2.1 percent, an assigned negative credit rating outlook has an even stronger economic effect on the capital structure, while a positive outlook has apparently no statistically significant influence on capital structure decision making in the broad sample. However, the coefficient of *PosOutl* in panel A is also negative. Including the "developing" credit outlook does not improve the results in panel A. With the exception of the company size in panel A, the control variables' coefficients have the predicted signs. All three control variables are statistically significant at the 5 percent level. A higher profitability specifically has an economically significant positive influence on net debt relative to net equity issuance, while a higher leverage ratio promotes, as expected, a more conservative capital structure policy.

As discussed above, it could make sense to exclude large offerings (debt only / debt and equity) from the analysis, as they are likely to have rating consequences for all firms whether these have an imminent change in credit rating or not. This approach significantly improves the fit – measured by the overall R^2 – of our regression.

In panels B and C, the credit rating effect on net debt relative to net equity issuance is smaller, ranging from -0.04 percent for the aggregate variable *PosNegOutl* in panel B to -0.9 percent for the *NegOutl* in panel B.[34] In both panels, the negative credit outlook has a highly significant (statistically significant

[33] The exact equivalent value for our study is -2.3 percent less net debt relative to net equity (as a percentage of the total assets), as Kisgen (2006) excludes the control variables from the regression in order to measure the unaltered credit rating effect.

[34] The results are robust if industry fixed effects – based on the two digit SIC code – are applied instead of the company fixed effects.

at the 1 percent level) influence on the managers' capital structure decision making. The findings of panel A that the positive outlook has no statistically significant effect on the mix of net debt to net equity issuance are affirmed. Interestingly, the coefficient of the *PosOutl* dummy variable is positive in panels B and C. It appears that managers do not react symmetrically to a positive or negative credit rating outlook. While managers adapt a more conservative capital structure policy if the company is close to a downgrade, the positive credit outlook has no such effect. This is in contrast to Kisgen (2006), who shows ex-ante leverage reduction behavior for plus ratings and credit scores on the upper end. Our findings are, however, consistent with the study of Kisgen (2009), which finds only little ex-post capital structure changes following upgrades, while managers reduce leverage significantly after downgrades. Our results could also imply that firms target minimum credit rating targets. Alternatively, a negative credit outlook might just be a stronger signal to managers than the positive credit outlook. In panels B and C, the credit outlook variable *ChgeOutl*, which includes the "developing" outlook, is also significant with the coefficient's predicted negative sign. The company size proxy variable has the coefficient's expected positive sign in both panels and is highly significant in panel B.

The statistically significant credit rating effects of all three panels are robust regarding dividing the dependent variables into its components, i.e. net debt and net equity issuance only (not shown). Second, our results for firms near a downgrade should be distinct from any financial distress arguments. We have included control variables like the profitability, the leverage ratio, and company size to control for the of firm's financial health. Generally, firms of increasing size should have a lower probability of experiencing distress. Therefore, the positive coefficients of the log of sales in panels B and C indicate that firms with lower probability of going bankrupt issue more debt relative to equity (Kisgen 2006). Accordingly, the credit outlook dummy variables should have further explanatory power in addition to mere financial distress effects.

Table 2-3 provides analyses along the lines of table 2-2 of the two sub-samples US and EMEA firms. Regarding the EMEA sample, potential robustness concerns are cross-country differences in the legal and regulatory framework of

the respective financial markets.[35] In order to address this set of problems, we added additional control variables to Panel B of table 2-3. First, we estimated equations (1) and (2) by including country dummies. Second, in unreported regressions, we included country-specific creditor and shareholder rights indices in the analysis (Demirgüç-Kunt and Maksimovic 2002; La Porta et al. 1998). In panel B, we used standard errors clustered by firms and years because time-invariant independent variables (e.g., country dummy variables) are lost in the fixed-effects panel model's within transformation due to their collinearity with the unit effect dummies (per Petersen 2009).

The results of panel A of table 2-3 show that the credit rating effect is even more pronounced for US firms. In addition, we find negative and statistically significant coefficients for both positive (-1.7 percent) and negative outlook firms (-3.6 percent).[36] Consistent with the findings of table 2-2, the rating effect of a negative outlook is economically and statistically larger, but also US firms with a positive rating outlook follow a more conservative net debt issuance in the following year. This is also in line with Kisgen's results (2006) and further supports the hypothesis that the measured credit rating effect differs from distress arguments. The descriptive statistics in table 2-1 clearly show that positive outlook firms are, on average, financially healthier and are thus less likely to default. Consequently, a financial distress rationale would argue for higher net debt issuance in the following year. However, the negative coefficient of the positive outlook dummy variable in table 2-3 indicates that US firms also follow a more conservative financial policy if their corporate rating is about to be upgraded.

In a further (unreported) analysis, we excluded actually downgraded firms from the sample.[37] This restriction allows us to test whether the leverage response is due to the mere anticipation of a downgrade, or to a concrete downgrade in the following year. We find that the estimated coefficient for negative outlook firms maintains its economic effect and significance level. This shows that firms restrict

[35] An established strand of literature covers the relationship between law and finance. See, among others, Antoniou, Guney and Paudyal (2009), La Porta et al. (1998), Demirgüç-Kunt and Maksimovic (1998) and Davydenko and Franks (2008).
[36] This results is robust if standard errors clustered by firms and years are applied instead of the fixed effects panel estimators (Petersen 2009).
[37] This examination was done on the back of a very thoughtful anonymous referee's comment.

net debt issuance in the following year even if they just expect a possible downgrade.

The results of panel B of table 2-3 show that EMEA firms are not subject to a direct credit rating effect. In fact, the estimated coefficients for the negative outlook and combined outlook dummy variables are positive. Conversely, the coefficients of the control variables are in line with the results of US firms. However, if we exclude large debt and equity offerings from the sample, we find negative and statistically significant coefficients for positive and negative outlook firms. The credit rating effect is economically smaller than in the US, but it is still measurable and differs from any distress arguments.[38] There are three possible explanations for EMEA firms' deviant result. First, the considerably smaller sample size of 2,086 EMEA firm-years compared to 9,218 US firm-years reduces the power of these tests. Second, as described above, EMEA firms' distinct nature in terms of size, tangibility, leverage, and market-to-book ratio. The US firms are also, on average, lower rated than their EMEA counterparts. Third, EMEA firms are less sensitive to corporate credit ratings. In fact, we find negative and – to some extent – statistically significant coefficients for positive and negative outlook firms in all three major capital markets in the EMEA sample: France, Germany, and the UK.

As discussed above, the S&P's watchlisting is a stronger and shorter-term indication of credit ratings changes. However, watchlisting is generally resolved by a rating's change or confirmation within 90 days. This makes the measurement of the watchlisting effect on capital structure decision making extremely difficult, as we have to measure the credit rating outlook/watchlisting on a cut-off date and have to rely on full-year financials for our analysis. Table 2-4 shows the results of the credit watchlisting dummy variables *WatchPos* and *WatchNeg* along the lines of equation (2) for the overall sample and US/EMEA firms.

Only the *WatchNeg* dummy variable of the broad data set in panel A and B is statistically significant, but has an incorrect sign of the estimated coefficient. In the other regressions, the credit watchlisting dummy variables have no significant influence on the net debt relative to the net equity issuance. The results indicate

[38] The credit rating effect has to be economically smaller, as the exclusion of large debt and equity offerings also decreases the average net debt issuance. The effect is comparable if large debt and equity offerings are also excluded from the US sample.

that the watchlisting period is too short to be measured correctly on a 12-month basis. We therefore exclude the watchlisting dummy variables from our further analysis.

Losing or obtaining a broad rating category, for example, A or BBB, might be an even stronger signal to investors than the change between micro rating categories, or may induce rating-triggered costs (benefits) for the firm. To facilitate a formal investigation of the relationship between changes in broad ratings and managers' capital structure decisions, we introduce three additional dummy variables. The dummy variable *BroadPos* takes the value "1" if the firm's rating is on the upper border of a broad rating, for example, BB+, and has a positive outlook.[39] The dummy variable *BroadNeg* takes the value "1" if the firm's rating is on the lower border of a broad rating, for example, BB-, and has a negative outlook. The aggregate dummy variable *BroadPosNeg* takes the value "1" if *BroadPos* or *BroadNeg* equals "1". The table 2-5 shows the results of the multivariate regressions along the lines of the previous section.

All three rating dummy variables have the expected negative coefficient in panels A and B. A broad rating category's potential imminent change induces a more conservative net debt relative to net equity issuance in the following year. The effect ranges from -2.4 percent for the positive outlook to -1.8 percent for broad ratings' negative outlook. Similar to our analysis of micro rating changes above, only the negative outlook dummy variable and the aggregate dummy variable are statistically significant at the 5 percent level for the capital structure decision making. In this analysis, this even holds true for US firms. We cannot find any systematic leverage reduction with regard to EMEA firms if potential changes in the broad ratings are examined. But with respect to the overall sample and the US sub-sample, the possibility of losing a broad rating level has a measurable influence on the decision to issue debt versus equity in the following financial year. The estimated effect is comparable to imminent micro rating changes' effect shown above. Looking at the magnitude of the relationship, a

[39] In line with the findings for micro rating changes, we have excluded watchlistings from our further analysis.

potential change in broad rating is not necessarily regarded more severe than a change in micro rating.[40]

On the whole, the credit rating effect is economically significant for both micro and broad rating changes. The magnitude of the effect of both types of rating changes is comparable. The discussion on rating concerns above implies that certain rating categories or rating border lines may have a stronger influence on the capital structure decision making than others. The following section 2.4, therefore, analyzes the credit rating effect per rating category.

2.4 Empirical Results per Rating Category and further Robustness Tests

As discussed above, we expect certain rating levels to be especially important in managers' financing decisions. On these rating borderlines, the costs (benefits) for the firm are particularly high. In the following, we further examine these rating categories.

2.4.1 Crossover Credits

Regulations on bond investments and coupon step-ups in bond documentations imply that the borderline between investment-grade and speculative-grade ratings is incrementally important for the corporate capital markets refinancing. In order to analyze so-called crossover credits' capital structure decision making, we define two additional rating dummy variables.[41] In panel A of table 2-6, the dummy variable investment grade/speculative grade ($IGSG_{PosNeg}$) takes the value "1" if the company is rated BBB- with negative outlook or BB+ with positive outlook. While in panel B, the dummy variable $IGSG_{PosNeg}$ takes the value "1" if the company is rated BBB, BBB- with negative outlook or BB+, BB with positive outlook. Owing to the importance of the distinction between investment-grade and speculative-grade ratings, this broader definition of crossover credits, which includes companies rated BBB or BB,

[40] In a further analysis, we split the effect into a firm on the upper/lower border of a broad rating category and one on a positive/negative rating outlook. We find that only the combined variable has explanatory power with regard to net debt issuance. A credit rating on the upper/lower border of a broad rating category has no statistically significant influence on leverage behavior.

[41] Other definitions imply that crossover credits have a split rating, i.e. are rated low investment grade by one rating agency and upper speculative grade by another.

makes sense. This approach is consistent with Kisgen (2006). The table 2-6 shows the results of the tests along the lines of the previous section with the two different definitions of the $IGSG_{PosNeg}$ variable.

The results of table 2-6 show that the coefficient on $IGSG_{PosNeg}$ is negative for both definitions of the rating dummy variable. The effect ranges between -1.1 percent to -2.8 percent less net debt relative to net equity (as a percentage of the company's total assets) if the firm is rated in the crossover area and has the respective rating outlook. However, the negative relationship between a crossover rating and the net debt relative to net equity issuance in the following year is only statistically significant in panel B.

The results imply that the distinction between investment-grade and speculative-grade ratings is indeed important for managers of rated companies.[42] The possibility of losing or obtaining an investment-grade rating has a significant influence on the decision to issue debt relative to equity.

2.4.2 Credit Ratings' Relevance for Access to the Commercial Paper Market

An analysis per broad rating categories shows that the credit rating effect is most prominent regarding rating classes, which are crucial for the access to the US commercial paper market. Table 2-7 depicts the multivariate regression results per broad rating categories.[43]

In panel A, the *PosNegOutl* variable has a negative coefficient in 4 of the 6 broad rating categories and differs significantly from 0 regarding BB-rated companies. The picture is similar for the negative outlook dummy variable. However, the *NegOutl* is statistically significant for A, BBB and BB-rated firms. Panel B, which excludes large debt offerings from the sample, improves the significance levels for A and BBB firm years, but does not change the qualitative proposition.

As discussed above, "there is a strong link between the short-term and long-term rating systems" (Standard&Poor's 2008a). Firms are likely to have their

[42] In fact, the credit rating effect on negative outlook firms rated in the speculative grade is comparably stronger than for investment-grade credits.
[43] The smaller sample sizes reduce the power of the tests somewhat.

commercial paper downgraded from A-1 to A-2 if their issuer credit rating is lowered from A to BBB.[44] Similarly, the short-term rating is likely to be lowered from A-2 to A-3 if the company's credit rating is downgraded from BBB to BB. Since the major part of the US commercial paper market is made up of tier-1 (rated at least A-1 by Standard and Poor's and P-1 by Moody's) and tier-2 (rated A-2 / P-2) securities, a downgrade to A-3 would have severe consequences for the company's short-term refinancing. A downgrade to A-2 also has adverse implications for the short-term funding, as 80 percent of the US commercial paper market is made up of tier-1 securities.[45] In contrast, tier-2 securities only make up 4 percent of the overall commercial paper market. Therefore, the results of panels A and B for A and BBB-rated companies might indicate that the access to the commercial paper market plays a crucial role in the rating and, thus, in the capital structure rationale.[46] In addition, the majority of pharmaceutical companies, utilities, and major oil corporate organizations "seek to keep an 'A' in their rating" (Stillit and Khabrieva 2009). Such a prime credit rating offers pharmaceutical companies protection in the case of litigation and guarantees oil majors a competitive funding advantage relative to emerging market sovereigns. This may also help explain the incremental relevance of the "A" rating category in managers' capital structure rationale.

Moreover, the statistically significant credit rating effect on BBB and BB-rated companies in panel B supports the above discussed relevance of the investment-grade speculative grade distinction. The comparatively strong effect of -2.3 percent and -4.8 percent less net debt relative to net equity of the two broad rating categories emphasizes the prominence of credit rating concerns regarding the change from investment grade to speculative grade.

2.4.3 Robustness Tests

In order to show the robustness of our results, we have added a number of additional control variables to table 2-3 that are known to be determinants of capital structure. Table 2-8 shows that the credit rating effect on both positive and

[44] However, there is a certain overlap of rating categories (Standard&Poor's 2008a).
[45] The figure refers to outstanding volume data as of September 2009 and is available from the Federal Reserve at www.federalreserve.gov.
[46] This is consistent with the study by Kisgen (2009), which analyzes capital structure decisions following actual downgrades or upgrades.

negative outlook firms persists in this alternative model specification. Regarding the additional control variables, the market-to-book ratio and the percentage of financial slack turn out to be statistically and economically significant determinants of net debt relative to the net equity issuance.

Moreover, we added the abovementioned controls for different countries and jurisdictions to table 2-2 and table 2-6.[47] The untabulated results show that the credit rating effect is robust with regard to these alternative model specifications.

In further (unreported) analyses, we test for business cycle or economic downturn effects in the net debt issuance.[48] The credit rating effect could possibly be driven by the overall economic situation in single years. We therefore run regressions of (1) and (2) on a year-by-year basis.[49] The *PosNegOutl* dummy variable has a negative coefficient sign in 10 of 18 individual years and is significant in four years.[50] The credit rating effect ranges from -0.02 percent to -3 percent less net debt relative to net equity annually as a percentage of the total assets. The *NegOutlook* has a negative coefficient in 11 of 18 individual years. It has a significant influence on the net debt relative to the net equity issuance in six years. The credit rating effect on the capital structure ranges from -0.33 percent to -3.8 percent annually. Accordingly, our empirical results could not have been driven by any business trends or economic shocks.

2.5 Summary and Conclusion

In this study, we analyze more precisely whether capital structure decisions are directly affected by credit rating concerns. Our hypothesis argues that managers account for credit ratings in their leverage setting, because of discrete costs (benefits) associated with different rating levels. The seminal study by Kisgen (2006) on the topic demonstrates this relationship by using dummy variables that account for a firm close to a rating change. Our study develops this approach further by using the credit rating outlook as an adequate measure of an

[47] This implies standard errors clustered by firms and time, instead of fixed-effects panel estimators.
[48] We have already allowed for aggregate time effects in our analysis above by including year dummy variables.
[49] The equations are identical except for the subscript t and the fixed-effect panel estimator.
[50] The distributions of *PosNegOutl* and *NegOutl* are already statistically significant using a simple binomial test.

imminent change in the issuer credit rating. The rating outlook "assesses the potential direction of a long-term credit rating over the intermediate term (typically six months to two years)" (Standard&Poor's 2009). Our results show that companies near a ratings change issue 1.8 percent less net debt relative to net equity (as a percentage of the total assets) over the subsequent period than firms not near a rating change. Therefore, the credit rating effect is economically stronger than the one measured by Kisgen (2006). Moreover, the effect is even evident if large debt offerings are not excluded from the analysis. The negative relationship between an imminent rating change and the net debt relative to net equity issuance is evident in both micro and broad rating changes. This supports the hypothesis that managers regard ratings as signals of firm quality (micro ratings) and are concerned about rating-triggered costs/benefits, as well as bond regulations (broad ratings). Managers' reaction to imminent upgrades and downgrades is not totally symmetrical. The prospect of a potential downgrade induces an economically more conservative capital structure policy. Nevertheless, the relationship is statistically significant for upgrades too. We find that US firms are more sensitive to their prevailing credit rating situation.[51] The credit rating effect on EMEA firms is only measurable if large debt and equity offerings are excluded. In addition, our results regarding different rating levels may indicate that the credit rating effect is very prominent in investment-grade credits, which are concerned with their access to the US commercial paper market. The borderline between investment-grade and speculative-grade ratings is, as expected, also very important.

This study adds to the growing literature on capital structure and credit ratings. By offering a more accurate and straightforward methodological set-up, it further strengthens the idea that managers are concerned with credit ratings and that this translates into real economic decision-making effects. In addition, this study broadens previous findings by postulating more precise propositions on upgrades vs. downgrades. Further research on the topic could include other major rating agencies' rating assessments in the analysis to provide an even more integrated model.

[51] However, this finding might be due to the smaller EMEA sample size.

Tables 2

Table 2-1 Summary Statistics

		(1) Overall Sample	(2) US Firms	(3) EMEA Firms	(3) Positive Outlook Firms	(4) Negative Outlook Firms	(5) Stable Outlook Firms
				Panel A: Summary Statistics on Firm-Specific Variables			
Total Assets	Mean	11,000,000	7,610,368	24,300,000	8,077,455	12,600,000	11,100,000
	Median	2,954,108	2,261,127	9,698,440	2,361,936	3,262,550	2,994,590
	Standard deviation	(27,100,000)	(21,300,000)	(39,900,000)	(21,200,000)	(32,400,000)	(26,300,000)
Total Sales	Mean	9,389,901	7,034,445	18,400,000	7,698,389	9,115,975	9,669,639
	Median	2,590,167	2,081,609	7,099,807	1,965,793	2,785,800	2,622,650
	Standard deviation	(23,600,000)	(19,300,000)	(34,200,000)	(21,600,000)	(19,500,000)	(24,800,000)
M/B	Mean	1.549	1.587	1.410	1.728	1.259	1.600
	Median	1.323	1.342	1.258	1.441	1.152	1.358
	Standard deviation	(1.099)	(1.136)	(0.936)	(1.322)	(0.757)	(1.128)
Book Leverage	Mean	0.520	0.531	0.476	0.505	0.604	0.501
	Median	0.461	0.467	0.442	0.450	0.511	0.446
	Standard deviation	(0.916)	(1.000)	(0.474)	(0.471)	(0.834)	(0.975)
Profitability	Mean	0.136	0.133	0.147	0.174	0.100	0.140
	Median	0.132	0.132	0.128	0.147	0.104	0.136
	Standard deviation	(0.236)	(0.221)	(0.287)	(0.329)	(0.195)	(0.231)
R&D/A	Mean	0.015	0.015	0.014	0.016	0.014	0.015
	Median	0.000	0.000	0.001	0.000	0.000	0.000
	Standard deviation	(0.032)	(0.033)	(0.028)	(0.033)	(0.032)	(0.032)
Tangibility	Mean	0.367	0.362	0.385	0.347	0.365	0.370
	Median	0.320	0.312	0.357	0.300	0.326	0.322
	Standard deviation	(0.240)	(0.240)	(0.239)	(0.238)	(0.230)	(0.243)
Financial Slack	Mean	0.082	0.079	0.091	0.092	0.075	0.082
	Median	0.047	0.040	0.068	0.054	0.044	0.047
	Standard deviation	(0.103)	(0.107)	(0.084)	(0.110)	(0.093)	(0.103)
Interest Coverage	Mean	7.456	7.531	7.021	8.496	3.627	8.230
	Median	3.684	3.516	4.257	4.295	2.351	3.993
	Standard deviation	(15.348)	(15.985)	(11.987)	(16.677)	(10.096)	(15.947)
				Panel B: Number of Firms and Firm-years			
Number of firms (n)		1,298	993	305	549	765	1,263
Number of firm years (N)		13,363	10,582	2,781	1,214	2,416	9,733

The table provides summary statistics (the mean, median, and standard deviation) of various firm characteristics for the overall sample and sub-samples. The overall sample consists of S&P-rated firms during the period 1990-2008. The US firm sample consists of firms incorporated in the US. The EMEA firm sample consists of firms incorporated in Europe, Middle East or Africa. Positive, Negative, and Stable Outlook firms are defined as firms with the respective rating outlook as the end of the fiscal year. *Total Assets* is defined as the book value of total assets. *Total Sales* are net sales. Market-to-book ratio, *M/B*, is defined as the book debt plus the market value of the equity divided by the total assets. *Book Leverage* is the ratio of book debt to total assets. *Profitability* is measured by earnings before interest, taxes, and depreciation divided by the total assets. *R&D/A* is the research and development expense divided by the total assets. *Asset tangibility* is defined as the net plant, property, and equipment divided by the total assets. *Financial Slack* is defined as cash and short-term investments divided by the total assets. *Interest Coverage* is defined as earnings before interest and tax over gross interest expenses. The financial information was obtained from the Thomson Financial database.

Table 2-2 Multivariate regressions for credit rating influence on capital structure decision making

	Panel A: Including large offerings			Panel B: Excluding large debt offerings (> 10% of assets)			Panel C: Excluding large debt and equity offerings (> 10% of assets)		
	1	2	3	1	2	3	1	2	3
Intercept	1.2011 **	1.2000 **	1.1948 **	-0.1751 ***	-0.1781 ***	-0.1749 ***	-0.0281	-0.0300	-0.0283
	(0.5456)	(0.5466)	(0.5465)	(0.0457)	(0.0457)	(0.0456)	(0.0274)	(0.0275)	(0.0274)
$PosNegOutl_{t-1}$	-0.0181 **	-	-	-0.0040 **	-	-	-0.0041 **		-
	(0.0085)	-	-	(0.0019)	-	-	(0.0015)		-
$PosOutl_{t-1}$	-	-0.0125	-	-	0.0051	-	-	0.0022	-
	-	(0.0080)	-	-	(0.0036)	-	-	(0.0026)	-
$NegOutl_{t-1}$	-	-0.0212 **	-	-	-0.0086 ***	-	-	-0.0071 ***	-
	-	(0.0108)	-	-	(0.0020)	-	-	(0.0017)	-
$ChgeOutl_{t-1}$	-	-	-0.0041	-		-0.0048 **	-	-	-0.0048 ***
	-	-	(0.0062)	-		(0.0019)	-	-	(0.0014)
Book $Leverage_{t-1}$	-0.0163 **	-0.0163 **	-0.0165 **	-0.0067 *	-0.0065 *	-0.0067 *	-0.0058 *	-0.0057 *	-0.0058 *
	(0.0078)	(0.0077)	(0.0078)	(0.0040)	(0.0039)	(0.0039)	(0.0030)	(0.0030)	(0.0030)
$Profitability_{t-1}$	0.1821 **	0.1796 **	0.1850 **	0.0789 ***	0.0745 ***	0.0776 ***	0.0590 ***	0.0560 ***	0.0577 ***
	(0.0772)	(0.0761)	(0.0779)	(0.0206)	(0.0205)	(0.0205)	(0.0129)	(0.0128)	(0.0128)
$Size_{t-1}$	-0.0842 **	-0.0841 **	-0.0840 **	0.0112 ***	0.0114 ***	0.0113 ***	0.0013	0.0015	0.0014
	(0.0386)	(0.0386)	(0.0386)	(0.0031)	(0.0031)	(0.0031)	(0.0019)	(0.0019)	(0.0019)
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (within)	0.0330	0.0331	0.0322	0.0558	0.0578	0.0561	0.0483	0.0501	0.0487
R^2 (between)	0.0158	0.0150	0.0166	0.0591	0.0591	0.0593	0.0431	0.0405	0.0442
R^2 (overall)	0.0069	0.0068	0.0068	0.0676	0.0678	0.0680	0.0569	0.0570	0.058
N	11,308	11,308	11,308	8,672	8,672	8,672	8,053	8,053	8,053

The table shows coefficients (within estimator) and standard errors from pooled time-series, cross-sectional regressions (company fixed effects). The dependent variable is the net amount of net debt and net equity raised for the year, divided by the beginning of the year's total assets. *PosNegOutl* is an aggregate rating-outlook dummy variable equal to "1" if the credit rating outlook is "positive / negative". *PosOutl* and *NegOutl* are dummy variables for the rating outlook equal to "1" if the rating outlook is "positive" or "negative" and "0" otherwise. *ChgeOutl* is an aggregate rating-outlook dummy variable equal to "1" if the rating outlook is "positive / negative / developing". The control variables include *Book Leverage* (debt ratio), total book debt divided by total book debt plus total book equity, *Profitability*, previous year's EBITDA divided by total assets and *Size*, the natural log of total sales. The sample covers the period 1990 to 2008 and excludes observations with missing values for any of the variables. Standard errors (in parentheses) are White's heteroscedasticity consistent standard errors clustered by firm. The total variation (overall R^2) can be decomposed into within variation (within R^2) over time for each individual and between variation across individuals (between R^2). Year dummy variables (not shown) have been included to allow for aggregate time effects. *, **, *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 2-3 By Region: Multivariate regressions for credit rating influence on capital structure decision making

	Panel A: US Firms		Panel B: EMEA Firms		
	1	2	1	2	3
Intercept	0.6027 ***	0.6005 ***	0.2313	0.2469	0.0371 **
	(0.1337)	(0.1337)	(0.2120)	(0.2215)	(0.0139)
$PosNegOutl_{t-1}$	-0.0293 ***	-	0.0441	-	-
	(0.0058)	-	(0.0396)	-	-
$PosOutl_{t-1}$	-	-0.0169 **	-	-0.0215	-0.0070 *
	-	(0.0082)	-	(0.0145)	(0.0040)
$NegOutl_{t-1}$	-	-0.0364 ***	-	0.0729	-0.0066 **
	-	(0.0063)	-	(0.0546)	(0.0029)
Book $Leverage_{t-1}$	-0.0157 **	-0.0157 **	-0.0194	-0.0181	-0.0131 ***
	(0.0076)	(0.0076)	(0.0143)	(0.0154)	(0.0032)
$Profitability_{t-1}$	0.1765 **	0.1703 **	1.1544	1.1595 ***	0.1036 ***
	(0.0792)	(0.0790)	(0.1136)	(0.1092)	(0.0131)
$Size_{t-1}$	-0.0419 ***	-0.0418 ***	-0.0273	-0.0282	-0.0002
	(0.0095)	(0.0095)	(0.0184)	(0.0189)	(0.0012)
Year Dummy Variables	Yes	Yes	Yes	Yes	Yes
Country Dummy Variables	No	No	Yes	Yes	Yes
Fixed Effects	Yes	Yes	No	No	No
R^2 (within)	0.0367	0.0371	na	na	na
R^2 (between)	0.0009	0.0010	na	na	na
R^2 (overall)	0.0080	0.0081	0.3167	0.3184	0.0642
n	990	990	304	304	288
N	9,218	9,218	2,086	2,086	1,590

The table shows coefficients and standard errors from pooled time-series, cross-sectional regressions. Panel A applies (company) fixed effects (within) estimators. Panel B shows standard errors clustered by firms and years (Petersen 2009). The dependent variable is the net amount of net debt and net equity raised for the year, divided by the beginning of the year's total assets. Column 3 of Panel B shows estimates from regressions if large debt and equity offerings (greater 5 percent) are excluded from the sample. *PosNegOutl* is an aggregate rating-outlook dummy variable equal to "1" if the credit rating outlook is "positive / negative". *PosOutl* and *NegOutl* are dummy variables for the rating outlook equal to "1" if the rating outlook is "positive" or "negative" and "0" otherwise. The control variables include *Book Leverage*, total book debt divided by total book debt plus total book equity, *Profitability*, previous year's EBITDA divided by total assets and *Size*, the natural log of total sales. The sample covers the period 1990 to 2008 and excludes observations with missing values for any of the variables. Standard errors (in parentheses) are White's heteroscedasticity consistent standard errors clustered by firm (Panel A) and clustered by firm and time (Panel C). The total variation (overall R^2) can be decomposed into within variation (within R^2) over time for each individual and between variation across individuals (between R^2). Year dummy variables (not shown) have been included to allow for aggregate time effects. In panel B additional control variables for different countries and jurisdictions in the international sample have been included. *, **, *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 2-4 Credit Watch Dummy Variables: Multivariate Regressions for Credit Rating Influence on Capital Structure Decision Making

	Panel A: All Firms	Panel B: US Firms	Panel C: EMEA Firms
Intercept	1.1943 **	0.5909 ***	0.2394
	(0.5495)	(0.1317)	(0.2225)
$WatchPos_{t-1}$	0.0040	0.0219	-0.0846
	(0.0380)	(0.0401)	(0.0708)
$WatchNeg_{t-1}$	0.0421 ***	0.0490 ***	0.0544
	(0.0131)	(0.0131)	(0.0389)
Book $Leverage_{t-1}$	-0.0165 **	-0.0160 **	-0.0204
	(0.0079)	(0.0078)	(0.0145)
$Profitability_{t-1}$	0.1942 **	0.1925 **	1.1584 ***
	(0.0789)	(0.0805)	(0.1133)
$Size_{t-1}$	-0.0844 **	-0.0423 ***	-0.0263
	(0.0386)	(0.0094)	(0.0179)
Fixed Effects	Yes	Yes	No
R^2 (within)	0.0334	0.0361	na
R^2 (between)	0.0191	0.0024	na
R^2 (overall)	0.0075	0.0070	0.3162
n	1,295	990	304
N	11,308	9,218	2,086

The table shows coefficients and standard errors from pooled time-series, cross-sectional regressions. Panel A and B applies (company) fixed effects (within) estimators. Panel C shows standard errors clustered by firms and years (Petersen 2009). The dependent variable is the net amount of net debt and net equity raised for the year, divided by the beginning of the year's total assets. *WatchPos* is an aggregate rating-outlook dummy variable equal to "1" if the rating is on "watch positive" and "0" otherwise. *WatchNeg* is an aggregate rating-outlook dummy variable equal to "1" if the rating is on "watch negative" and "0" otherwise. The control variables include *Book Leverage*, the total book debt divided by the total book debt plus the total book equity, *Profitability*, previous year's EBITDA divided by total assets and *Size*, the natural log of total sales. The sample covers the period 1990 to 2008 and excludes observations with missing values for any of the variables. Standard errors (in parentheses) are White's heteroscedasticity consistent standard errors clustered by firm (Panel A and B) and clustered by firm and time (Panel C). The total variation (overall R^2) can be decomposed into within variation (within R^2) over time for each individual and between variation across individuals (between R^2). Year dummy variables (not shown) have been included to allow for aggregate time effects. In panel C additional control variables for different countries and jurisdictions in the international sample have been included. *, **, *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 2-5 Broad Rating Changes: Multivariate Regressions for Credit Rating Influence on Capital Structure Decision Making

	Panel A: All Firms		Panel B: US Firms	Panel C: EMEA Firms
Panel	1	2	1	2
Intercept	1.4931 **	1.4922 **	0.5966 ***	0.2411
	(0.6134)	(0.6129)	(0.1333)	(0.2160)
$BroadPos_{t-1}$	-0.0239	-	-0.0241	-0.0261
	(0.0189)	-	(0.0158)	(0.0317)
$BroadNeg_{t-1}$	-0.0175 **	-	-0.0173 *	0.0127
	(0.0086)	-	(0.0096)	(0.0142)
$BroadPosNeg_{t-1}$	-	-0.0196 **	-	-
	-	(0.0087)	-	-
Book $Leverage_{t-1}$	-0.0170 **	-0.0170 **	-0.0159 **	-0.0185
	(0.0083)	(0.0083)	(0.0077)	(0.0152)
$Profitability_{t-1}$	0.2677 **	0.2668 **	0.1838 **	1.1556 ***
	(0.0962)	(0.0965)	(0.0782)	(0.1149)
$Size_{t-1}$	-0.1055 **	-0.1055 **	-0.0421 ***	-0.0269
	(0.0434)	(0.0434)	(0.0095)	(0.0179)
Fixed Effects	Yes	Yes	Yes	No
R^2 (within)	0.0537	0.0536	0.0342	na
R^2 (between)	0.0258	0.0254	0.0014	na
R^2 (overall)	0.0137	0.0136	0.0067	0.3154
n	1,295	1,295	990	304
N	11,305	11,308	9,217	2,084

The table shows coefficient and standard errors from pooled time-series, cross-sectional regressions. Panel A and B applies (company) fixed effects (within) estimators. Panel C shows standard errors clustered by firms and years (Petersen 2009). The dependent variable is the net amount of the net debt and net equity raised for the year, divided by the beginning of the year's total assets. The dummy variable *BroadPos* takes the value "1" if the firm's rating is on the upper border of a broad rating and has a positive outlook and "0" otherwise. The dummy variable *BroadNeg* takes the value "1" if the firm's rating is on the lower border of a broad rating and has a negative outlook and "0" otherwise. The dummy variable *BroadPosNeg* takes the value "1" if *BroadPos* or *BroadNeg* equals "1"and "0" otherwise. The control variables include *Book Leverage*, the total book debt divided by the total book debt plus the total book equity, *Profitability*, the previous year's EBITDA divided by total assets and *Size*, the natural log of total sales. The sample covers the period 1990 to 2008 and excludes observations with missing values for any of the variables. Standard errors (in parentheses) are White's heteroscedasticity consistent standard errors clustered by firms (Panel A and B) and clustered by firm and time (Panel C). The total variation (overall R^2) can be decomposed into within variation (within R^2) over time for each individual and between variation across individuals (between R^2). Year dummy variables (not shown) have been included to allow for aggregate time effects. In panel C additional control variables for different countries and jurisdictions in the international sample have been included.*, **, *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 2-6 Crossover Credits: Multivariate Regressions for Credit Rating Influence on Capital Structure Decision Making

	Panel A: BBB- and BB+	Panel B: BBB, BBB-, BB+ and BB
Intercept	0.7582	0.7555 **
	(0.3781)	(0.3783)
$IGSG_{PosNeg}$	-0.0112	-0.0275 ***
	(0.0109)	(0.0076)
Book $Leverage_{t-1}$	-0.0172 **	-0.0171 **
	(0.0080)	(0.0080)
$Profitability_{t-1}$	0.1972 **	0.1957 **
	(0.0821)	(0.0821)
$Size_{t-1}$	-0.0492 **	-0.0489 *
	(0.0251)	(0.0251)
Fixed Effects	Yes	Yes
R^2 (within)	0.0154	0.0159
R^2 (between)	0.0832	0.0825
R^2 (overall)	0.0131	0.0134
n	1,295	1,295
N	11,308	11,308

The table shows coefficients (within estimator) and standard errors from pooled time-series, cross-sectional regressions (company fixed effects). The dependent variable is the net amount of the net debt and net equity raised for the year, divided by the beginning of the year's total assets. In panel A, the dummy variable investment grade/speculative grade ($IGSG_{PosNeg}$) takes the value "1" if the company is rated BBB- with negative outlook or BB+ with positive outlook and "0" otherwise. In panel B, the dummy variable $IGSG_{PosNeg}$ takes the value "1" if the company is rated BBB (negative outlook), BBB- (negative outlook), BB+ (positive outlook)or BB (positive outlook)and "0" otherwise. The control variables include *Book Leverage*, the total book debt divided by the total book debt plus the total book equity, *Profitability*, previous year's EBITDA divided by total assets and *Size*, the natural log of total sales. The sample covers the period 1990 to 2008 and excludes observations with missing values for any of the variables and firm years with debt or equity offerings greater than 10 percent of the total assets. Standard errors (in parentheses) are White's heteroscedasticity consistent standard errors clustered by firms. The total variation (overall R^2) can be decomposed into within variation (within R^2) over time for each individual and between variation across individuals (between R^2). Year dummy variables (not shown) have been included to allow for aggregate time effects. *, **, *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 2-7 Analysis by Broad Rating Categories: Multivariate Regressions for Credit Rating Influence on Capital Structure Decision Making

Panel A: Including large offerings

	AA	A	BBB	BB	B	CCC
Regression 1						
$PosNegOutl_{t-1}$	0.00214	-0.0146	-0.0104 *	-0.0335 **	0.03596	-0.1360 *
	(0.0132)	(0.0079)	(0.0060)	(0.0109)	(0.0581)	(0.0747)
Regression 2						
$PosOutl_{t-1}$	-0.0086	-0.0061	0.01266	-0.0179	0.0410	-0.1531
	(0.0356)	(0.0160)	(0.0101)	(0.0147)	(0.0474)	(0.2305)
$NegOutl_{t-1}$	0.00364	-0.0169 *	-0.0232 ***	-0.0481 ***	0.03244	-0.1313
	(0.0131)	(0.0080)	(0.0071)	(0.0141)	(0.0687)	(0.0881)

Panel B: Excluding large debt offerings (> 10% of assets)

	AA	A	BBB	BB	B	CCC
Regression 1						
$PosNegOutl_{t-1}$	-0.0100	-0.0141 ***	-0.0033	0.0064	0.0089	-0.0383 **
	(0.0073)	(0.0037)	(0.0030)	(0.0047)	(0.0066)	(0.0147)
Regression 2						
$PosOutl_{t-1}$	-0.0173	-0.0035	0.01466 **	0.02135 **	0.01893 *	-0.2888
	(0.0251)	(0.0092)	(0.0047)	(0.0073)	(0.0098)	(0.1890)
$NegOutl_{t-1}$	-0.0090	-0.0171 ***	-0.0129 ***	-0.006	0.00276	-0.0263
	(0.0078)	(0.0039)	(0.0035)	(0.0060)	(0.0075)	(0.0192)

The table shows coefficients (within estimator) and standard errors from pooled time-series, cross-sectional regressions (company fixed effects). The dependent variable is the net amount of net debt and net equity raised for the year divided by the beginning of the year's total assets. *PosNegOutl* is an aggregate rating-outlook dummy variable equal to "1" if the rating outlook is "positive / negative" and "0" otherwise. *PosOutl* and *NegOutl* are dummy variables for the rating outlook, equal to "1" if the rating outlook is "positive" or "negative" and "0" otherwise. The control variables (not shown) include *Book Leverage*, the total book debt divided by the total book debt plus the total book equity, *Profitability*, the previous year's EBITDA divided by total assets and *Size*, the natural log of total sales. The sample covers the period 1990 to 2008 and excludes observations with missing values for any of the variables. Standard errors (in parentheses) are White's heteroscedasticity consistent standard errors clustered by firms. Year dummy variables (not shown) have been included to allow for aggregate time effects. *, **, *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

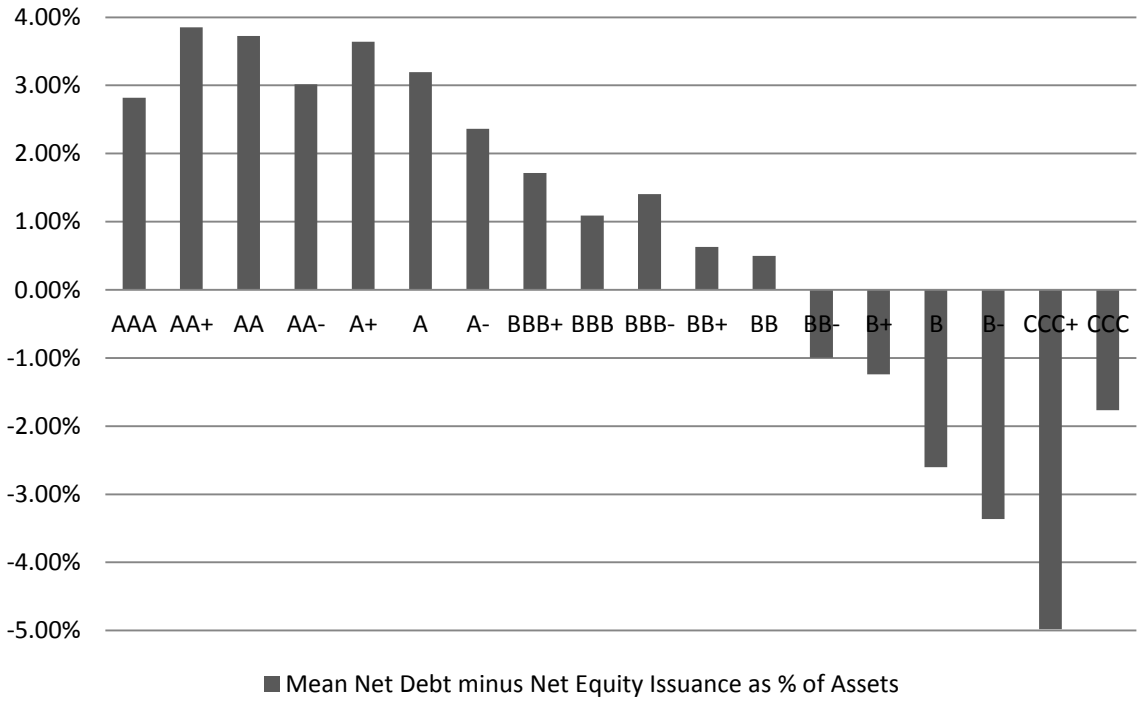
Table 2-8 Alternative Control Variables: Multivariate Regressions for Credit Rating Influence on Capital Structure Decision Making

	US Firms	
Intercept	0.5693	***
	(0.1309)	
$PosOutl_{t-1}$	-0.0193	**
	(0.0086)	
$NegOutl_{t-1}$	-0.0259	***
	(0.0059)	
Book $Leverage_{t-1}$	-0.0153	**
	(0.0070)	
$Profitability_{t-1}$	-0.0113	
	(0.0929)	
$Size_{t-1}$	-0.0420	***
	(0.0085)	
M/B_{t-1}	0.0409	***
	(0.0096)	
$R\&D/A_{t-1}$	0.2416	
	(0.2763)	
$R\&Dd_{t-1}$	-0.0113	
	(0.0086)	
$Tangibility_{t-1}$	0.0667	
	(0.0480)	
Financial $Slack_{t-1}$	0.1476	*
	(0.0780)	
Interest $Coverage_{t-1}$	0.0019	***
	(0.0003)	
Industry $Leverage_{t-1}$	-0.1678	
	(0.1336)	
Fixed Effects	Yes	
Year Dummy Variables	Yes	
R^2 (within)	0.0709	
R^2 (between)	0.0216	
R^2 (overall)	0.0320	
n	944	
N	8,858	

The table shows coefficients (within estimator) and standard errors from pooled time-series, cross-sectional regressions (company fixed effects). The dependent variable is the net amount of net debt and net equity raised for the year, divided by the beginning of the year's total assets. *PosOutl* and *NegOutl* are dummy variables for the rating outlook equal to "1" if the rating outlook is "positive" or "negative" and "0" otherwise. The control variables include *Book Leverage*, total book debt divided by total book debt plus total book equity, *Profitability*, previous year's EBITDA divided by total assets and *Size*, the natural log of total sales. *M/B*, is defined as the book debt plus the market value of the equity divided by the total assets. *R&D/A* is the research and development expense divided by the total assets. *Asset tangibility* is defined as the net plant, property, and equipment divided by the total assets. *Financial Slack* is defined as cash and short-term investments divided by the total assets. *Interest Coverage* is defined as earnings before interest and tax over net interest expenses. *Industry Leverage* is defined as the two-digit SIC industry median debt ratio. The sample covers the period 1990 to 2008 and excludes observations with missing values for any of the variables. Standard errors (in parentheses) are White's heteroscedasticity consistent standard errors clustered by firm. The total variation (overall R^2) can be decomposed into within variation (within R^2) over time for each individual and between variation across individuals (between R^2). Year dummy variables (not shown) have been included to allow for aggregate time effects. *, **, *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

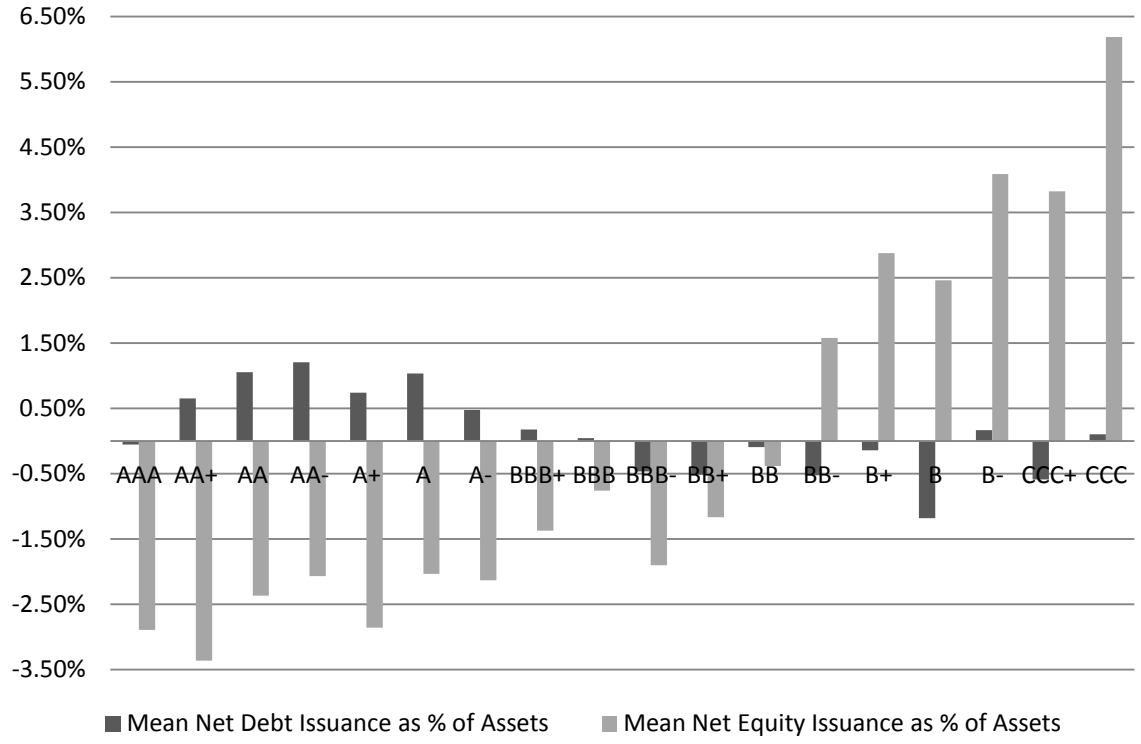
Figures 2

Figure 2-1 Average Net Debt minus Net Equity Issuance per Rating Category, 1990-2008



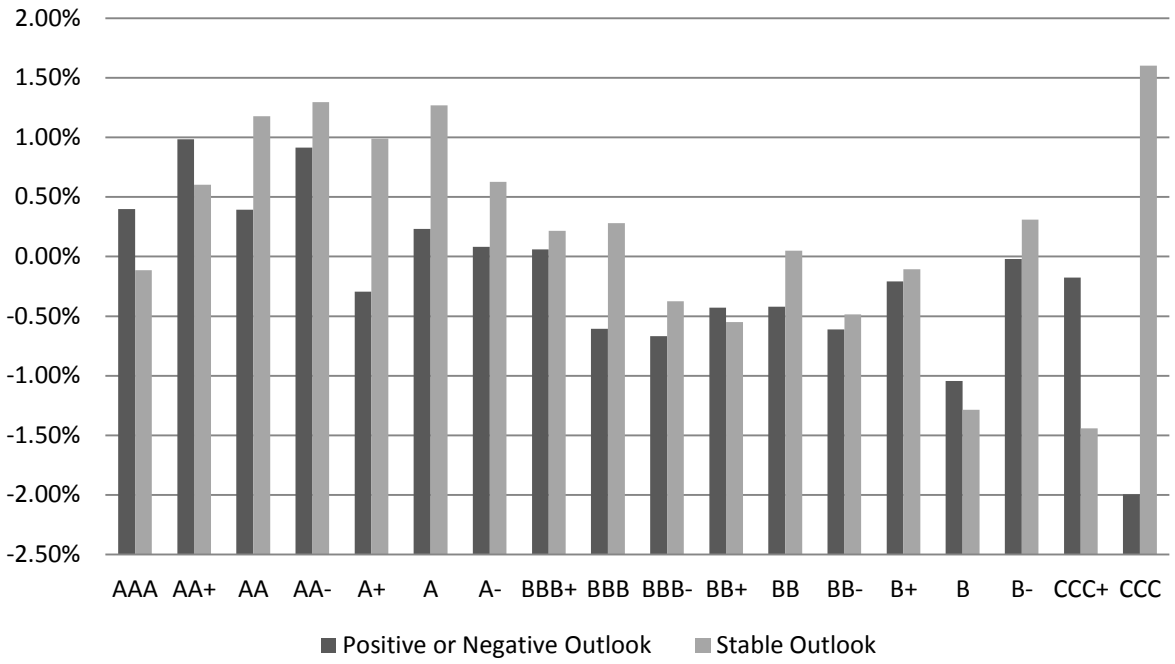
This figure depicts the average net debt minus net equity issuance (as a percentage of the total assets) by rating category. The sample consists of S&P-rated firms for the period 1990 to 2008. Firm years with very large debt offerings (>10 percent of assets) have been excluded from the statistics.

Figure 2-2 Average Net Debt and Average Net Equity Issuance by Rating Category, 1990-2008



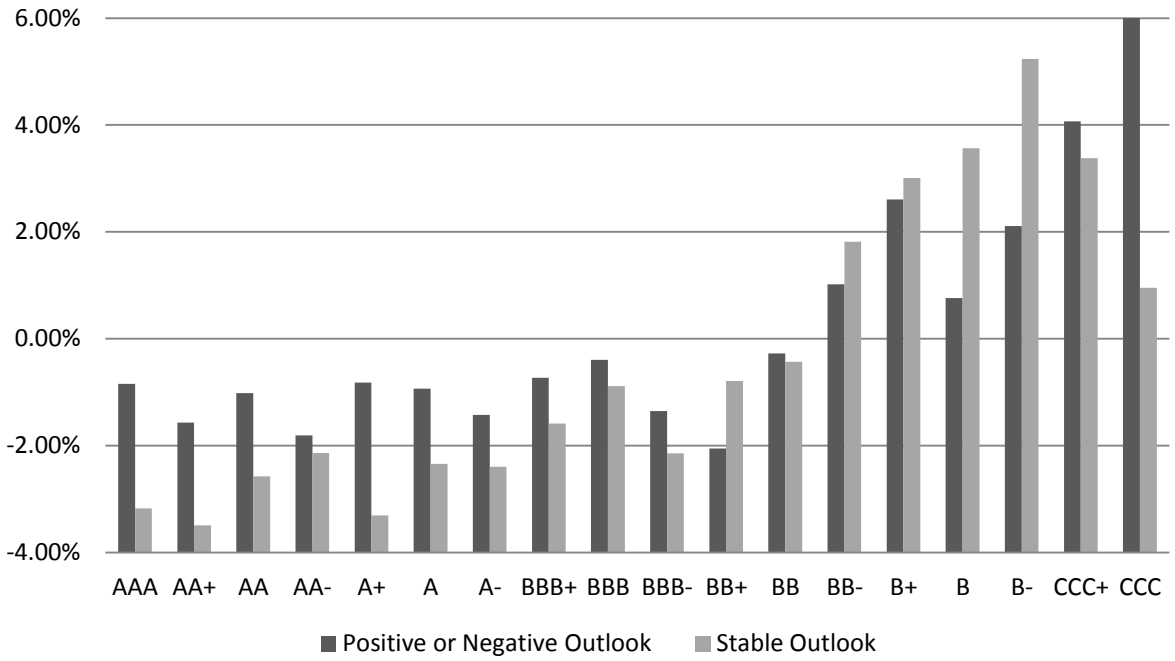
This figure depicts the average net debt and net equity issuance (as a percentage of the total assets) by rating category. The sample consists of S&P-rated firms for the period 1990 to 2008. Firm years with very large debt offerings (>10 percent of assets) have been excluded from the statistics.

Figure 2-3 Average Net Debt Issuance (issuance of debt minus repurchase of debt) by Credit Rating Outlook and Rating Category, 1990-2008



This figure depicts the average net debt issuance (as a percentage of the total assets) by rating category divided into firm years with a positive or negative outlook and those with a stable outlook. The sample consists of S&P-rated firms for the period 1990 to 2008. Firm years with very large debt offerings (>10 percent of assets) have been excluded from the statistics.

Figure 2-4 Average Net Equity Issuance (issuance of equity – repurchase of equity) by Credit Rating Outlook and Rating Category, 1990–2008



This figure depicts the average net equity issuance (as a percentage of total assets) by rating category divided into firm-years with a positive or negative outlook and those with a stable outlook. The sample consists of S&P-rated firms for the period 1990 to 2008.

3 Debt-Equity Choice: Credit Rating Concerns or Market Timing?

3.1 Introduction

This chapter examines the debt-equity choice of a rated company sample. Specifically, the aim is to contrast the market timing rationale and credit rating concerns of seasoned equity offerings (SEOs). Our empirical set-up allows for a more accurate test of rating concerns than has previously been provided in the literature. Our research is important because SEOs are widely believed to be due to managers' market timing efforts (e.g., Marsh 1982). However, Chang et al. (2006) find that specifically firms marked by a high degree of information asymmetry exploit favorable market conditions or the mispricing of the companies' stock if they issue equity. On the other hand, externally rated firms, i.e. firms that access public debt markets, tend to be larger, willing to comply with strict disclosure requirements, and show sufficient informational transparency (Lemmon and Zender 2010).[52] This helps limit potential mispricing by capital markets and suggests that rated firms should be less prone to market timing.[53] In addition, empirically, the studies by Kisgen (2006; 2009) show that credit rating considerations and concerns play an incrementally important role in determining a firm's financing policy relative to traditional capital structure policies. Our study develops this approach further and significantly refines the empirical methodology. Finally, corporate managers' survey reports suggest that credit rating concerns and market timing influence most capital structure decisions (Graham and Harvey 2001).

The purpose of this study is therefore to gauge the relative importance of market timing and credit rating considerations in a firm's debt-equity choice. Moreover, the chapter analyzes corporate financing decisions on a very broad scale, i.e. including also debt and equity reductions. Our results show that under certain circumstances credit rating concerns are indeed more important for the decision to conduct a seasoned equity offering than market timing. The effect is

[52] Lemmon and Roberts (2010) show that even speculative grade companies are larger and financially healthier than non-rated bank-dependent companies (measured by Altman Z-scores).
[53] Alternatively, fluctuations in adverse selection costs could be the driver of market timing (Wagner 2008). However, consistent with most previous works, our study focuses on mispricing as the main mechanism for market timing.

even greater if the decision to issue equity is contrasted with the choice to issue debt.

Owing to the financial crisis, negative rating momentum and covenant pressure induced strong equity issuance in 2009 (Stillit and Khabrieva 2009). Ratings-led issuers included Europe's biggest maker of beer and soft drink cans, Rexam (GBP 350mn), and the Anglo-Dutch publisher Reed Elsevier (GBP 800mn). In summary, 58 rated issuers tapped the European equity markets from October 2008 to August 2009, of which 46, i.e. 79 percent, had had a prior negative credit rating event. The "through-the-cycle" and therefore rather sticky nature of credit ratings means that they will lag behind any upturn in operational performance (Altman and Rijken 2006; Altman and Rijken 2007; Fons et al. 2002). Therefore, only additional equity to bolster credit ratios guarantees relief from credit rating and covenant pressure. But there are also examples of opportunistic equity issuance on the back of strong share performance in 2009: Global steel maker ArcelorMittal (USD 3.2 bn.) and the UK supermarket chain Sainsbury's (GBP 242 m.).

Managers' credit rating centricity can be formally explained by credit ratings' function as a signal of credit quality for investors and their impact on the firm's cost of capital (Boot et al. 2006). Kisgen and Strahan (2010) show the economic significance that ratings-based regulations have on bond investments and firm's cost of debt. This can be through direct rating-triggered costs (e.g., through step-up coupons or put rights for investors) or by restricting potential investor pools to certain groups (some pension funds are restricted in only being allowed to invest in high quality borrowers) (Billett et al. 2010; Koziol and Lawrenz 2010). Given that investors regard credit ratings as informative and a signal of firm quality, the loss of a certain rating level is associated with discrete costs for the firm (Kisgen 2006; Kisgen 2009). In the absence of a liquid CDS market, the firm's credit rating and particularly the rating outlook are investors' key sources of financial risk information (Altman and Rijken 2007). All this helps explain managers' sensitivity to the firm's credit rating and outlook.[54]

[54] For a complete description of the relevance of credit ratings for managers' capital structure decisions please see Kisgen (2006).

This study complements earlier works on credit ratings' relevance for capital structure decisions. Specifically, our study extends Kisgen (2006) and Michelsen and Klein (2010), who analyze the leverage behavior of firms close to rating upgrades or downgrades. In line with the two studies, we also want to measure security issuance and repurchase decisions in relation to imminent changes in the firm's credit rating. The methodology of Kisgen (2006) regards plus or minus ratings as being close to a rating's change. However, according to rating agencies, the "+" or "-" attached to a credit rating is only a "sign to show relative standing within the major rating categories" (Standard&Poor's 2009). Consequently, a "+" or "-" rating does not allow conclusions to be made on the future development of the issuer credit rating. [55]

Our study develops the approach further, while sticking to the fundamental hypothesis that firms issue equity rather than debt if their credit rating is about to be downgraded, and relies on the rating outlook to measure the likelihood of a change in the issuer credit rating in the following year (see Michelsen and Klein 2010 for a similar approach). Hamilton and Cantor (2004) show that over a one-year horizon "issuers with negative outlooks are seven times more likely to be downgraded than upgraded; issuers with positive outlooks are nearly twice as likely to be upgraded as downgraded; and issuers with stable outlooks have the highest probability of no rating change." Furthermore, the default rates within a rating class are systematically associated with the outlook status. In addition, the study provides evidence that the rating history is no longer predictive of future rating changes if the rating outlook is controlled for. In fact, rating agencies have introduced rating outlooks to balance rating stability ("through-the-cycle" approach) and timeliness, i.e. accuracy in default prediction. Standard&Poor's states that a rating outlook is meant to assess "the potential direction of a long-term credit rating over the intermediate term (typically six months to two years)" (Standard&Poor's 2009). Rating agencies further define outlooks as a response to changes in the economic and fundamental business conditions. A rating outlook therefore provides a signal of the probability and the direction of a rating's

[55] Alternatively, Kisgen (2006) introduces a firm-specific "credit score" that is meant to act as a proxy for a rating change's imminence. However, managers do not know their firm's credit score and therefore cannot take it into account if they decide on capital structure.

change.[56] Using credit scoring models, Altman and Rijken (2007) show that a rating outlook provides investors with additional information. In summary, the discussion illustrates that a rating outlook is an almost perfect proxy for the likelihood of a rating's change. As far as we know, we are, together with Michelsen and Klein (2010), the first to incorporate rating outlooks in the empirical capital structure and security issuance discussion. The study complements Michelsen and Klein (2010) by studying the security issuance decision (seasoned equity and debt) in more depth and by clearly differentiate the credit rating effect of seasoned equity offerings from market timing attempts by managers. Moreover, we track the leverage and market-to-book ratios in SEO time, i.e. relative to the offering year. Also the scope of control variables has been considerably enlarged compared to Michelsen and Klein (2010).

Consequently, our study tries to provide answers to the following main research questions: Are externally rated companies' seasoned equity offerings also marked by manager's market timing efforts, or are they instead driven by rating concerns? What is the relative importance of rating considerations versus market timing? Do potential rating downgrades have a stronger influence on subsequent equity issuance than potential upgrades? What is the relative importance of the two explanations if the debt-equity choice is considered? Does the incorporation of equity and debt repurchases/reductions change the results? Does the risk of losing an investment grade rating or access to the commercial paper market increase the likelihood of a seasoned equity offering even further?

We find that a negative rating outlook prior to the transaction is significantly more often found in respect of firms conducting SEOs than a positive rating outlook. Using logistic estimates and controlling for other firm characteristics suggest that a negative outlook increases and a positive decreases the likelihood of an SEO. The effect is both statistically and economically stronger if dual issues are excluded or the debt-equity choice is analyzed. On the other hand, the influence of market timing on the SEO decision is slightly less than rating concerns. Including equity and debt repurchases in the analysis provides further insights. As expected, negative rating momentum decreases the likelihood of equity repurchases and debt issues.

[56] Cantor and Hamilton (2005) show that outlooks partly explain the differences between actual ratings and ratings implied by CDS spreads.

The rest of the chapter is organized as follows: Section 3.2 outlines the empirical predictions regarding the questions of market timing's and credit rating's influence on capital structure. This section further describes the context of earlier studies on these two topics. Section 3.3 provides this study's empirical methodology and a summary of the statistics of the rated firm sample. Section 3.4 forms the main body of the univariate and multivariate analyses of the equity and debt issuance decision. Further robustness tests are described in section 3.5, while the chapter is concluded in section 3.6.

3.2 Related Literature and Hypotheses

Most studies on topics such as IPO underpricing or empirical capital structure only differentiate between firms with a public issuer credit rating and those that are non-rated (e.g. An and Chan 2008; Lemmon and Zender 2010). Lemmon and Zender (2010), for example, use an external credit rating as a proxy for unconstrained debt capacity, i.e. access to public debt markets.[57] None of these studies distinguish between different rating classes or between the respective rating outlooks.

Beside the seminal studies by Kisgen (2006; 2009), Hovakimian et al. (2009) focus explicitly on credit ratings in capital structure decision making. Kisgen's studies analyze net debt issuance prior to and following rating changes. While managers follow a more conservative leverage strategy if the firm's credit rating is about to be raised or lowered, they only reduce leverage following actual downgrades; rating upgrades do not induce significant subsequent capital structure activity. The study by Michelsen and Klein (2010) incorporates the rating outlook in the discussion and shows that the credit rating effect persists if this more accurate measure of the likelihood of a rating's change is employed. However, their results suggest that managers react not fully symmetrically to potential upgrades and downgrades. The credit rating effect of a negative rating outlook is both statistically and economically stronger. Together with Kisgen (2009), these findings are generally consistent with managers' targeting of minimum rating levels. This is supported by Hovakimian et al.'s (2009) study, which proves that firms reduce (increase) leverage if the actual credit rating is

[57] Bolton and Freixas (2000) also support the idea that access to public debt markets measures a firm's debt capacity.

below (above) the target rating. The empirical relationship holds if corporate payout policy or acquisitions are considered.

As our sample comprises US S&P rated companies, as well as European, Middle Eastern, and African, and we aim to compare rating concerns regarding SEOs with the market timing explanation, our research also relates to other international studies on market timing (e.g. Bie and Haan 2007; Kim and Weisbach 2008; Mahajan and Tartaroglu 2008; Sautner and Spranger 2009).

In the light of these prior studies, we expect that a negative (positive) prior rating outlook increases (decreases) the likelihood of a seasoned equity offering. The effect should be more pronounced if equity issuance is compared with debt issuance. Consistent with Baker and Wurgler (2002), we also expect that a higher market-to-book ratio increases the SEO probability.[58] Our study will contrast the influence of the two hypotheses on equity and debt issuance.

3.3 Data and Methodology

3.3.1 Sample Construction

The initial sample consists of US and EMEA firms that either have an outstanding or past (long-term domestic) issuer credit rating by Standard and Poor's. We exclude financial firms (SIC codes 6000-6999) from the sample due to the highly regulated environment in which they operate and as their capital structures are likely to differ substantially compared from those of industrial or service firms. Since our analysis is geared to S&P's credit rating outlook, which although it was previously assigned, was only reflected in the database in 1990, the period under review is 1990-2008.[59] In a first step, we match all observations with firm-level and stock return data from the Thomson Financial database. In a second step, we match all observations with Securities Data Company's (SDC)

[58] Our study focuses on the short-term impact of market timing on security issuance decisions. Other papers study whether firms undo the effects of market timing on capital structure in the long run (e.g. Leary and Roberts 2005).

[59] The rating outlook was first introduced in the US and subsequently applied to the whole S&P universe.

Global New Issues database.[60] This allows us to identify firms that have issued public equity, i.e. conducted seasoned equity offerings during the sampling period. Pure secondary offerings, i.e. offerings during which the firm received no cash, are excluded. Only pure primary and combinations of primary and secondary offerings are included in the subsequent analysis. Moreover, we exclude unit offers, closed-end funds, American Depository Receipts, limited partnerships, and penny stocks from the sample.[61] In the rare cases of a single issuer having conducted multiple SEOs per year, we aggregate the issue proceeds and treat the total as a single observation. In order to guarantee a broad dataset, firms are not required to have complete data for all the variables available on Thomson Financial every year.

Firm years are classified as net debt issuers if the year on year change in total (short-term plus long-term) book debt exceeds 5 percent of the total assets (for a similar approach, see Hovakimian et al. (2001)). Therefore, the definition of debt issuance comprises capital from both public and private sources.[62] This is a valid approach as rating agencies do not distinguish between the sources of capital and market timing efforts largely refer to equity issuances (Baker and Wurgler 2002; Standard&Poor's 2008b).

Consequently, our main findings are based on a sample of 13,736 firm years, 822 SEOs, and 5,491 debt issuances.

We largely follow the studies by Rajan and Zingales (1995) and Alti (2006) in our selection and definition of variables that determine capital structure. The variables are defined as follows: book debt, *D*, is the total liabilities and the preferred stock (replaced by the redemption value of the preferred stock if this is missing) minus the deferred taxes and convertible debt; book equity, *E*, is the total assets minus the book debt; book leverage, *D/A*, is the book debt divided by the total assets; and net equity issued, *e/A*, is the change in the book equity from the fiscal year *t-1* to *t* minus the change in balance sheet retained earnings divided by

[60] Alternatively, equity issuers can be defined as firms with a year-on-year change in balance sheet equity greater than 5 percent of their total assets (Hovakimian et al. 2001). This alternative definition of equity issuers does not materially affect the findings of this study.
[61] See Bortolotti et al. (2008), Draho (2008) and Hsuan-Chi et al. (2010) for alternative equity selling mechanisms.
[62] The main findings of the study are robust if debt issuance is restricted to public non-convertible debt.

the total assets. Net debt issued, *d/A*, is defined as the year on year change in book debt, while market-to-book ratio, *M/B*, is the same as book debt plus the market value of equity (common shares outstanding multiply by the share price) divided by the total assets.[63] The standardized market-to-book ratio, *Stand-M/B*, is the actual market-to-book ratio divided by the median market-to-book ratio of all firms in the sample (DeAngelo et al. 2009); the historic finance weighted average of the market-to-book ratio, *BW-M/B*, is consistent with Baker and Wurgler (2002); and the industry-adjusted market-to-book ratio, *Indu-M/B*, is the actual market-to-book ratio divided by the median industry market-to-book ratio (Dittmar and Thakor 2007). The industry is the three-digit SIC code; the prior abnormal stock return, *PriorAbnReturn*, is the average 36- month prior (and ending immediately before the year in question) stock return net of the value-weighted market index (Loughran and Ritter 1995; Loughran and Ritter 1997); while the future abnormal stock return, *FutureAbnReturn*, is the average 36-month future (starting with the closing price after the year in question) stock return net of the value-weighted market index. Other measures of mispricing relative to previous years are the price run-up, *PriceRunup*, defined as market value of equity in year *t* divided by the average market value of the equity of the years *t-1* and *t-2*. The price-earnings multiple, *PE*, is defined as the share price at the fiscal year-end divided by the last 12-month earnings per share. Discretionary accruals, *Disc-Accruals*, are a balance-sheet-based overvaluation measure, defined as the difference between realized and normalized accruals (Chan et al. 2006; Polk and Sapienza 2008).

Profitability, *EBITDA/A*, is defined as earnings before interest, taxes, and depreciation/amortization divided by the total assets. Firm size, *SIZE*, is the natural log of total sales; while *R&D/A* is the research and development expense divided by the total assets and replaced by zero if missing. It serves as a proxy for investment opportunities (Fama and French 2002). In conjunction with this, the dummy variable, *R&Dd*, takes a value of one in the regressions if *R&D/A* is missing and is accordingly replaced by zero (Alti 2006). The tangibility of the total assets, *PPE/A*, is the net plant, property, and equipment over assets; and

[63] Consistent with previous studies on the topic, we drop observations for which M/B or its modifications exceed 10.0.

financial slack, *Cash/A*, is the cash and equivalents divided by the total assets (Dittmar and Thakor 2007).

3.3.2 Operationalization of Rating Concerns

Consistent with Michelsen and Klein (2010), we define managers' rating concerns on the basis of S&P's credit rating outlook. Specifically, we construct dummy variables that help distinguish between firms that are close to a credit rating upgrade / downgrade and those that are not. This setting allows us to test for changes in both micro rating categories, i.e. BBB+ or BBB, and in major (broad) rating categories, i.e. BBB or BB. Although corporate ratings are rather stable and insensitive to short-term movements in the firm's economic and/or business conditions (due to the "through-the-cycle" rating methodology), the rating outlook delivers additional and particularly timely information on corporate creditworthiness (Altman and Rijken 2007). In an attempt to balance rating stability and timeliness, the credit outlook "assesses the potential direction of a long-term credit rating over the intermediate term (typically six months to two years)" (Standard&Poor's 2009). Since investors rely heavily on the rating outlook – especially from their point-in-time perspective – managers also pay close attention to the firm's prevailing rating outlook.

As an operationalization, we create two dummy variables, *PosOutl/NegOutl*, for the rating outlook at the end of the firm's fiscal year and track the firm's security issuance decisions over the subsequent 12 months (Michelsen and Klein 2010). This approach is likely to add noise to the empirical tests because the firm's rating outlook or issuer rating can easily change during the 12-month period. Any interim fiscal year changes would therefore render a measurement at the beginning of the year inaccurate. Other constraining issues are the considerable transactions costs associated with debt and equity offerings and the time lag between decision making and issuance (Lee et al. 1996). Owing to these, seasoned equity offerings are very irregular and rare (Eckbo and Masulis 2005). On the whole, all these complicating factors could impair the accuracy of our analyses and, consequently, influence the measured credit rating effect.

The variables *PosOutl* and *NegOutl* are the focal point of this study regarding measuring firms' potential rating concerns when conducting seasoned equity offerings or issuing debt.

3.3.3 Sample Characteristics

Tables 3-1 to 3-3 display the summary statistics of the externally rated firm sample.

Table 3-1 presents selected variables' statistics for the overall sample, the two security issuance types (debt and equity), and non-issuers. By comparison, our equity issuers are larger than the sampled firms in related studies by Elliott et al. (2008) and Chang et al. (2006). This is not surprising, as externally rated firms tend to be larger than average public firms (Chang et al. 2006; Hovakimian et al. 2009; Lemmon et al. 2008).[64] In line with previous works, the SEO firms are also smaller in terms of both total assets and sales than the debt issuance sub-sample. Perhaps surprisingly, the equity issuers' average market-to-book ratio is slightly lower than that of debt issuers. However, both averages are higher than those of non-issuers. Equity and debt issuers' leverage, profitability, and financial slack (cash balances) statistics are more or less equal.[65] The SEO subsample has more tangible assets than debt or non-issuers. Generally, we expect firms with a high degree of collateral to issue debt instead of equity. This differing finding might be due to the overall rated sample having more tangible assets on average than the cross section of non-rated issuers (Lemmon et al. 2008).

Table 3-2 and table 3-3 show summary statistics of SEO firms relative to the offer (fiscal) year. Table 3-2's general patterns are consistent with studies by Alti (2006) and Wagner (2008). On average, leverage drops from 64.4 percent before the SEO to 60.7 percent in the (fiscal) year of the offering, and is more or less constant in the following years. Favoring market timing, the market-to-book ratio is highest at 1.59 in the year before the offering and declines subsequently. As

[64] Generally, rated firms have more easy access to debt at lower costs (Elliott et al. 2008). This translates into a higher leverage ratio of firms with rated debt outstanding. Moreover, Hovakimian et al. (2009) show that rated firms tend to be older, more profitable, and have more tangible assets. In terms of market values, their leverage ratios are also higher on average than those of the cross-section of non-rated firms.

[65] Consistent with Hovakimian (2004), we find that equity issuers are rather under-levered than over-levered.

expected, the equity financing *e/A* is most pronounced (9.7 percent of total assets) in the offer year and drops significantly in the aftermath. Interestingly, debt financing coincides with the equity issuance decision and is at its highest around the SEO offer year (Walker and Yost 2008). While 8.3 percent (of total assets) in the year prior to the offering and 7.1 percent in the offering year, debt issuance declines heavily in the following years. Cash balances increase only slightly from 7.4 percent pre-SEO to 8.2 percent in the offering year. Therefore, in contrast to Kim and Weisbach (2008), we do not find widespread stockpiling of issue proceeds. However, our results could be more in line with DeAngelo et al. (2009), who find that their sample firms would soon face financial constraints without the SEO issue proceeds.

Table 3-3 displays leverage and market-to-book ratios in SEO time by rating outlook as of the fiscal year-end before the offering year. The pre-SEO leverage ratio of the three different rating outlooks is comparable. Perhaps surprisingly, in the offer year, the leverage reduction of -10.2 percent in positive outlook firms is most pronounced. This should be compared with -3.8 percent and -5.5 percent in negative and stable outlook firms. Interestingly, negative outlook firms reduce their leverage ratio significantly from 61.0 percent to 57.9 percent between the offer year +3 and the offer year +5, while the other firms keep the ratio more or less constant over the same period.[66] In terms of market-to-book ratio, negative outlook firms have a considerable lower ratio in the year before the offering, which declines even further in the offer year. However, the ratio increases significantly between the offer year and the offer year +1. In contrast, SEOs with a positive prior rating outlook show a hike in the market-to-book ratio in the SEO year, but decline steadily thereafter. This suggests that the mispricing opportunities and managers' market timing efforts of positive and negative outlook SEOs might differ.

The rating distribution of the SEO sample is essentially symmetric (not tabulated); with approximately 250 firms each, BBB and BB issuers dominate the dataset. This is consistent with the overall rating distribution of S&P's long-term issuer credit rating distribution.

[66] This is in contrast to Walker and Yost (2008), who find that firms increase their long-term debt after the seasoned equity offering. This debt increase results in firms' leverage ratios after the SEO being similar to those before the offering.

3.4 Main Empirical Results

3.4.1 Univariate Evidence of the Decision to Conduct an SEO

Table 3-4 contrasts the rating outlook, market timing opportunities, and capital structure characteristics of seasoned equity issuers and non-equity issuers, as well as debt issuers and non-debt issuers. Moreover, the table shows univariate test statistics for equity versus debt transactions.[67]

Panel A of table 3-4 suggests that the credit ratings of firms conducting SEOs have a negative outlook significantly more often and a positive outlook prior to the transaction less often. This favors our hypothesis that SEOs are conducted to support or protect the issuer's credit rating. With respect to the market-to-book ratio and its modifications, we find no evidence of market timing efforts. Note that the non-issuing group even exhibits a higher historic finance weighted average of the market-to-book ratio than the SEO sample. However, the lack of statistical significance may be due to the above-mentioned shortcomings of the market-to-book ratio as a proxy of the market timing efforts. In fact, the SEO sample differs significantly with respect to our alternative market timing proxy variables *PriorAbnReturn* and *FutureAbnReturn*. On average, firms in the SEO sample statistically show significantly higher stock returns prior to the offerings, while their post-transaction stock returns are lower than those of the non-issuing group. These observed stock return patterns support the hypothesis that managers conduct SEOs to take advantage of attractive stock market valuations (Loughran and Ritter 1995). We find that firms issuing equity have statistically higher pre-transaction leverage ratios, less R&D expenses, and more tangible assets. They exhibit significantly lower operating profitability and are smaller, in terms of total sales, than non-equity-issuers.

In panel B of table 3-4, we find that, statistically, debt issuers less often have a negative rating outlook prior to debt offerings, which is consistent with our postulated *credit rating-capital structure hypothesis*. However, they exhibit no difference with respect to the positive rating outlook. Managers might regard a possible downgrade of the corporate rating as a stronger signal to follow a more

[67] In panel C, we exclude cases where firms issued both debt and equity in a given fiscal year (Hovakimian et al. 2001; Marsh 1982). Our results are qualitatively identical if these cases are instead classified according to the maximum amount of a type of security issued in a given year.

conservative debt issuance.[68] This may be interpreted as consistent with Kisgen (2009), who finds that ratings downgrades result in subsequent leverage reductions, but that firms do not appear to react to rating upgrades. On average, firms issuing debt exhibit higher market-to-book ratios. Interestingly, the pattern of pre-transaction and post-transaction stock returns is similar to the above-mentioned equity issuer characteristics. This can be explained by the above described coincidence of equity and debt issues. We find that debt issuers have lower leverage ratios and R&D expenses and exhibit a higher operating profitability and asset tangibility.

Panel C contrasts equity and debt issuers' sample characteristics. The results suggest that equity issuers more often have a pre-transaction negative rating outlook. However, we find no statistical and only marginal economic difference with regard to the positive outlook. Consistent with the findings of panel A regarding the SEO sample, debt issuers, on average, exhibit higher market-to-book ratios. As expected, on the back of the simultaneous timing of equity and debt issues, there is no statistical difference in respect of the abnormal stock return patterns (Walker and Yost 2008). However, equity issuers have higher pre-offer leverage ratios and show lower operating profitability. They are smaller in terms of total sales and have more tangible assets on the balance sheet.

On the whole, from a univariate point of view, we find strong evidence of rating considerations prior to equity and debt transactions, while we find only limited support for rated equity issuers' potential market timing efforts.

3.4.2 Multivariate Tests of the Security Issuance Decision

To identify the multivariate impact of our empirical proxies on the likelihood of security issuance, we estimate logit regression models (DeAngelo et al. 2009).[69] The dependent variable in table 3-5's regressions equals one if a firm conducts an SEO in a given year and zero otherwise. We use the above-described rating dummy variables, market timing proxies, and capital structure characteristics as independent variables.

[68] Using Eurobond data, Steiner and Heinke (2001) find only abnormal negative bond returns following negatives reviews and downgrades and no significant price changes following positive reviews and upgrades. Hull et al.'s (2004) results suggest that positive rating events are far less significant for CDS prices than negative rating events.

[69] Our findings are qualitatively identical if, instead, probit models are applied.

Table 3-5 provides the regression results with the coefficients reported as marginal effects. While panel A contains the full sample, panel B excludes cases of SEOs and debt offerings (dual issues) in the same fiscal year (Autore and Kovacs 2010; Hovakimian et al. 2001; Marsh 1982). The descriptive analysis in section 3.3.3 suggests that rated firms' equity and debt issuance are often paired.[70] Excluding dual issues allows us to draw a clearer distinction between the decision to issue equity or debt.

The first column of panel A includes only the two rating outlook dummies in the analysis. Both variables have a statistically significant influence on the likelihood of an SEO. As expected, firms are likelier to announce an SEO at the fiscal year-end following a negative rating outlook before the offering, while a positive prior rating outlook lessens the likelihood of an SEO. At 0.9 percent and -1.7 percent the marginal effects of the rating concerns are modest. This nevertheless supports our hypothesis that firms issue equity to bolster their credit rating if they experience negative rating momentum, and refrain from issuing equity if the rating momentum is positive. However, the overall model fit is rather poor.

The second column of table 3-5 provides the regression results of only the set of control variables and market timing proxies (Alti 2006; Wagner 2008). While the influence of the standardized market-to-book ratio on the SEO probability is positive, its marginal effect is only modest. Therefore, using the market-to-book ratio as the proxy for mispricing, we find only limited support for the *market timing hypothesis*. With respect to the other control variables, the results show that profitability, R&D expenses, and size lessen the likelihood of an SEO. On the other hand, firms with more tangible assets are likelier to announce an SEO.

The third column of panel A presents logistic estimations for the full set of variables. Note that the negative rating outlook variable is no longer statistically significant under this setting, while the positive rating outlook still has a statistically significant negative influence on the SEO likelihood. The other variables' marginal effects are largely unchanged. Also clustering the standard errors by industry (based on the two-digit SIC code), or by industry and time does

[70] Walker and Yost (2008) report a similar finding.

not change our results (per Petersen 2009). This finding is not fully consistent with our *credit-rating hypothesis*, as we regard a negative rating outlook a stronger signal for managers. There are two possible explanations for this result. First, the yearly measurement of the rating outlook – discussed above – is likely to add noise to the analysis. Second, the results may be driven by equity offerings together with debt offerings. As our postulated implications for debt and equity offerings with respect to the rating rationale are contrary, it could make sense to restrict the sample to SEOs with no simultaneous debt offering in the same fiscal year.

In this alternative specification in panel B of table 3-5, only a negative prior rating outlook has a statistically significant positive influence on the SEO decision. Moreover, its marginal effect of 1.1 percent is also slightly higher compared to the 0.7 percent in panel A. The positive rating outlook dummy variable still has a negative marginal effect but it is no longer statistically significant. These findings are consistent with our univariate results above. We find no evidence of market timing attempts, as the standardized market-to-book ratio has no economically significant impact on the likelihood that an SEO will be conducted. The results of the control variables are qualitatively identical to those in panel A.

Together, the estimates indicate that rating concerns indeed play a significant role in the decision to conduct an SEO. If the market-to-book ratio is applied as the mispricing proxy, the rating concerns inherent in SEOs are even stronger than market timing attempts.

Next, we more closely investigate the general security issuance decision. Table 3-6's logistic estimations are motivated by Autore and Kovacs (2010) and Hovakimian et al. (2001), and contrast the decision to issue equity or debt. The dependent variable in the regressions equals one if a firms conducts an SEO in a given year and zero if it issues a significant amount of debt.[71] In panel A, dual issues of equity and debt are excluded from the analysis, while we restrict the sample to "pure" transactions in panel B (Hovakimian 2004; Hovakimian et al. 2009). Transactions in which firms issue equity while reducing debt, or where

[71] The results are qualitatively identical if the equity issuance is defined on the basis of changes in the balance sheet equity. This approach could help mitigate the effect of executive stock options (Autore and Kovacs 2010).

they issue debt while repurchasing equity, are excluded. This is motivated by Hovakimian (2004), who provides evidence that the subsample of equity issues together with debt reductions is the major driver of the target leverage's role (and deviation from it) in earlier debt versus equity issuance models.

Consistent with the *credit rating-capital structure hypothesis*, we expect firms to issue equity rather than debt when their credit rating outlook is negative (Kisgen 2006; Michelsen and Klein 2010). On the other hand, a positive rating outlook could limit the need for an SEO, and therefore lessen the likelihood of an equity issue relative to a debt issue. Losing or obtaining a broad rating category, such as A or BBB, might be an even stronger signal to investors than the change in micro rating categories, or may induce rating-triggered costs (benefits) for the firm. Table 3-6 provides evidence of the relationship between changes in broad ratings and managers' security issuance decisions.[72] In addition, the dummy variable investment grade/speculative grade (*IGSG*) allows us to test for the importance of the distinction between investment-grade and speculative-grade ratings.[73] We expect that particularly firms on the verge of an investment grade credit rating issue equity rather than debt in order to support an upgrade or avoid any down notching to speculative grade. On the other hand, temporary market mispricing, measured by the standardized market-to-book ratio, is expected to increase the likelihood of equity financing versus debt financing.

The logistic estimations in panel A of table 3-6 show that the credit rating effect in external financing decisions is stronger if debt and equity issuance are contrasted. While both rating outlook dummy variables have the expected sign of the marginal effect, the market-to-book ratio has a negative influence on the equity issuance likelihood. However, only a negative rating outlook has a statistically significant influence on the issuance of equity rather than debt. The dummy variables measuring imminent changes in broad rating categories have the expected signs of the marginal effects, but they do not exhibit a statistically significant influence on the security issuance decision.[74] The same is true for the

[72] See Michelsen and Klein (2010) for a complete definition of the dummy variables that help to measure the potential change in broad rating categories.
[73] The variable *IGSG* is defined consistent with chapter 2.
[74] The dummy variable *BroadPos* takes the value "1" if the firm's rating is on the upper border of a broad rating, for example, BB+, and has a positive outlook. The dummy variable *BroadNeg*

investment grade/speculative grade variable *IGSG*. The marginal effect estimates in panel B suggest that if only "pure" transactions are considered, both credit rating outlooks are key drivers of security issuance decisions. A positive rating outlook lessens the likelihood of equity issuance rather than debt by 6.1 percent, while a negative outlook increases the likelihood by 3.3 percent. In addition, in this context, neither the broad rating changes variables nor our market timing proxy gains statistical significance.[75]

In summary, the debt-equity choice models support our *credit-rating hypothesis*. The security issuance decisions of externally rated firms appear to be driven more by rating considerations than by market timing attempts.[76]

Firms' capital structure decision adjustments are not solely done through security issuance, but also with the help of equity repurchases and debt reductions.[77] The study by Hovakimian (2004) reports that debt reductions are specifically used to offset deviations from the target leverage. Therefore, only a model that displays the whole spectrum of possible mechanisms for capital structure alterations is appropriate to correctly measure possible credit rating concerns and market timing efforts. Table 3-7's multinomial logit model estimates the probability of issuing or repurchasing debt or equity against a no-transaction alternative.

Marginal effects indicate that the probability of a debt issue is less for firms with a negative prior rating outlook (-5.7 percent). Also the likelihood of firms buying back debt is higher if there is a negative rating momentum (2.9 percent). However, the negative credit rating outlook is insignificant if equity issues or repurchases are considered. Moreover, a positive rating outlook has no effect on issuing, or repurchasing debt or equity. Apparently, managers react to rating pressure by adjusting primarily the firm's debt position. This is reasonable, as equity offerings have a longer lead time and higher transactions costs. Consistent

takes the value "1" if the firm's rating is on the lower border of a broad rating, for example, BB-, and has a negative outlook.

[75] The marginal effects of the control variables are in line with the findings of the previous logit models.

[76] In section 3.4.4 we will replicate the logistic estimates with alternative market timing proxies.

[77] Kisgen (2009) examines firms' issuance and repurchase decisions following downgrades and upgrades. The results indicate that a downgrade is associated with a lower probability of debt issuance, a higher probability of debt reduction, and a lower probability of equity repurchases.

with our univariate results, the probability of a debt or equity issue is higher for firms with higher market-to-book ratios. Higher pre-issuance book leverage levels lessen the probability of debt or equity issues and equity repurchases. As expected, the likelihood of debt reductions increases with pre-issue leverage.[78]

The results imply that both rating considerations and market timing efforts play a role in managers' capital structure decisions if a multinomial model is applied. We find no evidence that distinguishing between investment grade and speculative grade is incrementally important in the security issuance and repurchase choice. However, this might be due to the inherent restrictions in measuring the respective credit rating outlook and the subsequent financing decisions.

3.4.3 Equity Issue Characteristics

To complete the picture, we have investigated the composition of SEOs more closely, i.e. the primary and secondary components (Alti 2006; Wagner 2008). The *market timing capital structure theory* not only indicates that firms issue equity when their perceived market conditions are favorable, but they also sell more equity if they believe that their stock price is overvalued.[79] This can be either achieved by issuing shares at higher offer prices or by selling a higher number of shares (Alti 2006). Our subsequent regressions will account for this differentiation and various other firm characteristics.[80] Considering the *credit rating-capital structure hypothesis*, we expect firms with a negative rating outlook to sell a higher amount of equity, while the offer price is likely to be lower due to negative rating momentum. Managers are expected to issue as much equity as possible to prevent the rating agencies from downgrading the firm. Given our previous results, the motivations for SEOs following positive rating outlooks are not as clear cut. Consequently, we do not expect these types of offerings to have any significant characteristics.

[78] This is generally consistent with a hypothesis of target leverage in capital structure decisions (Hovakimian 2004; Hovakimian et al. 2001).

[79] We expect stronger market timing if all the proceeds are considered, as this variable also includes the primary component of the total issuance amount, i.e. share sales by the firms' existing shareholders, who may be regarded as insiders (Alti 2006). Kim and Weisbach (2008) even use the fraction of secondary shares sold as a measure of overvaluation.

[80] Deviations from the target leverage as a driver of equity issue characteristics are accounted for by including firms' pre-offer leverage level. To control for firm heterogeneity in industry characteristics, we clustered standard errors using the three-digit SIC code.

Table 3-8's regressions results of the total issuance proceeds, primary proceeds, and primary proceeds standardized by pre-SEO assets suggest the market timing of equity issues. Firms with higher market-to-book ratios also sell a higher amount of equity. As expected, the effect is strongest for the total proceeds, which also include sales by firm insiders. Normalizing the proceeds figure by the SEO fiscal year-end total assets may lessen the market timing effect. Consistent with this, the market-to-book effect is stronger if the primary proceeds are standardized by the pre-SEO total assets. However, also the results of the negative rating outlook SEOs are consistent with the hypothesis of managers structuring equity issues to please rating agencies. Total SEO proceeds are indeed higher if preceded by a negative rating outlook. We do not find any statistical or economically significant influence on primary proceeds. This makes total sense, as the firms' capital ratios can only improve if additional equity is sold, i.e. secondary shares, and with fresh equity entering the firm. Looking at the composition of the issue proceeds, as expected, the credit rating effect comes by means of a higher number of shares sold. The offer price coefficient is negative but insignificant. Interestingly, the market timing effect is based on a lower number of shares sold, although at considerably higher prices.

In summary, we find evidence of both market timing and credit rating concerns if the equity issue proceeds are investigated.

3.4.4 Alternative Market Timing Measures

The appropriateness of the market-to-book ratio to correctly measure market timing is challenged in the literature (e.g. Alti 2006; Elliott et al. 2007; Elliott et al. 2008; Kayhan and Titman 2007; Leary and Roberts 2005). To account for the concerns, table 3-9 provides the logistic estimations results as in panel A of table 3-5 but with alternative market timing proxies.[81]

Both raw and industry-adjusted market-to-book ratios have a comparable positive economic effect on the SEO likelihood. Note that Baker and Wurgler's (2002) historic finance weighted market-to-book ratio shows a negative, though

[81] The base case control variables are also included in the logistic regression but the results are not tabulated.

statistically not significant, marginal effect.[82] A positive rating outlook's statistically significant negative influence persists in these alternative model specifications and stands at approximately -1.4 percent. Using stock return data as the proxy for market timing efforts suggests that SEOs are positively related to prior excess stock returns and negatively related to future excess stock returns (DeAngelo et al. 2009). This is consistent with our *market timing hypothesis*. However, the economic effect is rather limited. Note that the rating outlook variables lose their statistical significance if abnormal stock returns are included in the logit model. Higher price run-ups and price-earnings multiples also raise the likelihood of an SEO.[83] The economic effect of these mispricing proxies and the rating concerns on the SEO likelihood is comparable. For further robustness, we also apply a balance sheet-based market timing proxy in our analysis. Accordingly, we include discretionary accruals as a proxy for mispricing (Chan et al. 2006; DeAngelo et al. 2009; Polk and Sapienza 2008). While we expect a positive correlation between the amount of discretionary accruals and the SEO likelihood, the marginal effect of the logistic estimate is essentially negative. We therefore omit the discretionary accruals variable from further analysis.

In summary, the credit rating effect of a positive outlook on the SEO likelihood persists in most alternative model specifications.

3.5 Further Robustness Issues

To determine the robustness, we have run logistic estimates of our overall SEO sample's sub-samples. The sub-groups: investment grade companies, speculative grade companies, US companies, EMEA companies, firms on the verge of losing their prime commercial paper rating (i.e. firms rated AA-, A, or BBB), and the sampling periods 1990-1999 and 2000-2008.

Table 3-10 suggests that the credit rating effect in SEOs is only evident for firms rated investment grade. The logit model's marginal effects of speculative rated companies show the right signs but prove to be statistically insignificant. A

[82] We therefore omitted the historic finance weighted market-to-book ratio from the main body of analysis.

[83] Price run-up is the change in market capitalization defined as the market capitalization in a given year divided by the average market capitalization of the prior two fiscal years (Elliott et al. 2008).

possible explanation is that investment grade firms' cost of capital is more sensitive to minor changes and therefore managers steer their credit rating more forcefully. On the other hand, the market timing effect, measured by the standardized market-to-book ratio, is comparatively stronger and statistically significant for both investment grade and speculative grade firms.

In addition, in untabulated analyses we have included country dummies in the multivariate regressions to control for the different jurisdictions and legal frameworks of our sample. In a second step, we estimated the logistic regressions of table 3-5 through table 3-9 including country-specific creditor and shareholder rights indices (Demirgüç-Kunt and Maksimovic 2002; La Porta et al. 1997). The results show that the credit rating effect persists both economically and statistically in these alternative model specifications.

Kisgen (2006) demonstrates that firms are most concerned about ratings if access to the commercial paper market is at risk.[84] Accordingly, we build a sub-sample of firms rated AA-, A, or BBB and only include the negative rating outlook dummy variable. Comparing the results from table 3-10 with the logistic estimates of table 3-5's panel A shows that a negative outlook indeed has a stronger positive effect on the SEO likelihood if a company could lose its prime commercial paper rating.

Interestingly, managers' reaction to a positive and negative credit rating outlook seems to differ in US and EMEA companies. While a positive rating outlook statistically significantly decreases the SEO likelihood for US firms, SEOs by EMEA firms are positively related to a prior negative rating outlook. Moreover, the results of table 3-10 suggest that only the latter sampling period rating concerns play a significant role in managers' equity issuance decisions. This may be explained by debt capital markets' increasing importance for corporate refinancing and the resultant increasing importance of credit ratings (Dittrich 2007; Frost 2007).

[84] See Kisgen (2006) and Michelsen and Klein (2010) for a complete description of the relationship of long-term and short-term ratings.

3.6 Summary and Conclusion

The results of this study imply that rating concerns are an important consideration for equity issuing firms. We find that the likelihood of a seasoned equity offering is positively (negatively) related to a negative (positive) prior rating outlook. Thereby, a positive rating outlook's negative impact is economically stronger than market timing, measured by the standardized market-to-book ratio. Excluding dual issue (parallel issuance of debt and equity in a given fiscal year) confirms that also a negative rating outlook has a statistically significant positive influence on the SEO likelihood. Rating concerns are even more important if the decision to issue equity rather than debt is considered. Specifically, we report that the probability of equity issuance (rather than debt) increases (decreases) by 3.3 (6.1) percent if the issuer credit rating has a negative (positive) outlook prior to the offering. Market timing considerations play only a subordinated role in the externally rated firm sample's debt-equity choice. In addition, multinomial logistic estimates show that a negative rating outlook decreases the likelihood of pure debt issues, although it increases the probability of pure debt reductions. On the other hand, a positive rating outlook statistically significantly lowers managers' need to issue equity. Moreover, the rating effect mostly persists if alternative market timing proxies are applied.

In summary, our results suggest that, going forward, empirical capital structure studies should also take rating concerns/considerations into account when they investigate managers' financing decisions.

Further research on credit ratings and managers' behavior could include other corporate decision making topics like payout and investment policy.

Tables 3

Table 3-1 Descriptive Statistics of Rated Company Sample

		(1) Rated Sample	(2) Rated Security Issuers	(3) Rated SEO Sample	(3) Rated Debt Issuers	(4) Rated Non-issuers
		Panel A: Summary Statistics on Firm-Specific Variables				
Total Assets	Mean	10,838.3	11,657.4	8,154.2	12,009.8	10,181.3
	Median	3,079.5	3,234.9	2,406.4	3,348.7	2,930.0
	Standard deviation	(24,996.3)	(27,280.8)	(18,139.9)	(27,963.4)	(22,981.6)
Total Sales	Mean	8,955.9	9,423.1	5,423.1	9,761.2	8,581.8
	Median	2,625.1	2,645.5	1,534.1	2,779.9	2,609.5
	Standard deviation	(20,937.8)	(22,204.9)	(12,502.4)	(22,831.3)	(19,858.9)
M/B	Mean	1.551	1.679	1.566	1.687	1.455
	Median	1.323	1.393	1.323	1.399	1.274
	Standard deviation	(1.102)	(1.159)	(0.963)	(1.170)	(1.048)
D/A	Mean	0.623	0.649	0.607	0.652	0.603
	Median	0.588	0.608	0.594	0.610	0.572
	Standard deviation	(0.382)	(0.439)	(0.216)	(0.450)	(0.327)
EBITDA/A	Mean	0.141	0.135	0.117	0.136	0.145
	Median	0.133	0.129	0.109	0.131	0.137
	Standard deviation	(0.183)	(0.251)	(0.071)	(0.259)	(0.098)
R&D/A	Mean	0.015	0.013	0.009	0.013	0.017
	Median	0.000	0.000	0.000	0.000	0.000
	Standard deviation	(0.032)	(0.029)	(0.022)	(0.030)	(0.034)
PPE/A	Mean	0.367	0.374	0.437	0.370	0.361
	Median	0.320	0.327	0.418	0.323	0.315
	Standard deviation	(0.240)	(0.250)	(0.276)	(0.248)	(0.233)
Cash/A	Mean	0.082	0.080	0.082	0.080	0.083
	Median	0.047	0.045	0.044	0.045	0.048
	Standard deviation	(0.102)	(0.103)	(0.107)	(0.102)	(0.102)
		Panel B: Number of Debt/Equity Issues and Firm Years				
Number of issues		-	5,886	822	5,491	-
Number of firm years		13,736	-	-	-	7,339

The table provides summary statistics (the mean, median, and standard deviation) of various firm characteristics for the overall sample and sub-samples. The overall sample consists of S&P-rated firms during the period 1990-2008. Security issuers are firms that have conducted seasoned equity or debt offerings in the respective fiscal year. Accordingly, debt issuers are defined by a change in the total book debt greater than 5 percent of their assets. Non-issuer have not conducted a seasoned equity offering or issued debt. *Total Assets* is defined as the book value of total assets. *Total Sales* are net sales. Market-to-book ratio, *M/B*, is defined as the book debt plus the market value of the equity divided by the total assets. Book Leverage, *D/A*, is the ratio of book debt to total assets. Profitability is measured by *EBITDA/A*, which is earnings before interest, taxes, and depreciation divided by the total assets. *R&D/A* is the research and development expense divided by the total assets. Asset tangibility, *PPE/A*, is defined as the net plant, property, and equipment divided by the total assets. *CashSTInvest/A* is defined as cash and short-term investments divided by the total assets. The financial information was obtained from the Thomson Financial database. Observations with missing values for commonly used variables are excluded from the empirical tests in this chapter.

Table 3-2 Descriptive Statistics of Seasoned Equity Offerings

Year		N	D/A	M/B	d/A	e/A	Cash/A
OY-1	Mean	816	0.6439	1.5905	0.0828	0.0445	0.0737
	Median		0.6263	1.3403	0.0620	0.0131	0.0361
	StandDev.		(0.2388)	(1.0086)	(0.1901)	(0.1175)	(0.1030)
Offer Year	Mean	818	0.6065	1.5662	0.0714	0.0970	0.0815
	Median		0.5937	1.3232	0.0533	0.0755	0.0442
	StandDev.		(0.2156)	(0.9633)	(0.1817)	(0.1220)	(0.1068)
OY+1	Mean	778	0.6052	1.4143	0.0545	0.0359	0.0761
	Median		0.5952	1.2768	0.0428	0.0131	0.0399
	StandDev.		(0.2162)	(0.8369)	(0.1464)	(0.0820)	(0.1011)
OY+2	Mean	708	0.6063	1.3465	0.0432	0.0260	0.0699
	Median		0.6017	1.2428	0.0319	0.0103	0.0355
	StandDev.		(0.2166)	(0.8038)	(0.1431)	(0.0854)	(0.0927)
OY+3	Mean	648	0.6035	1.3387	0.0374	0.0147	0.0700
	Median		0.5998	1.2397	0.0306	0.0094	0.0391
	StandDev.		(0.2193)	(0.7740)	(0.1429)	(0.1147)	(0.0895)
OY+5	Mean	498	0.5926	1.2718	0.0244	0.0155	0.0736
	Median		0.6005	1.1844	0.0276	0.0073	0.0378
	StandDev.		(0.2256)	(0.9269)	(0.1580)	(0.1087)	(0.0986)
OY+7	Mean	355	0.6079	1.3239	0.0382	0.0093	0.0793
	Median		0.5837	1.1887	0.0277	0.0044	0.0428
	StandDev.		(0.2739)	(1.0601)	(0.1316)	(0.0689)	(0.0952)

The sample consists of SEOs of S&P-rated firms between January 1, 1990 and December 31, 2008. Statistics (the mean, median, and standard deviation) are reported in years relative to the offering year. The offering year is the fiscal year during which the SEO takes place. Firm-specific fiscal year-ends and fiscal year changes are accounted for. *D/A* is book debt to assets (book leverage). *M/B* are the assets minus the book equity plus the market equity all divided by the assets, where the book equity is defined as the total assets minus the total liabilities and preferred stock plus deferred tax and convertible debt. *d/A* is the residual change in assets divided by the assets. *e/A* is the change in the book equity minus the change in balance-sheet-retained earnings divided by the assets. *Cash/A* is cash and short-term investments over the assets. *N* are the number of observations.

Table 3-3 SEO Firm Sample: Time Series of Selected Variables by Credit Rating Outlook before the Offering

Year		D/A			M/B		
		Positive Outlook	Negative Outlook	Stable Outlook	Positive Outlook	Negative Outlook	Stable Outlook
OY-1	Mean	0.6716	0.6609	0.6395	1.7470	1.2673	1.5185
	Median	0.6452	0.6327	0.6244	1.2708	1.1744	1.2784
	StandDev.	(0.3327)	(0.1999)	(0.2356)	(1.4358)	(0.4525)	(0.9597)
Offer Year	Mean	0.6123	0.6458	0.5987	1.7939	1.1804	1.3560
	Median	0.5795	0.6087	0.5903	1.4091	1.1458	1.2424
	StandDev.	(0.2533)	(0.2257)	(0.2126)	(1.4828)	(0.9858)	(1.0142)
OY+1	Mean	0.5985	0.6369	0.6060	1.5138	1.3842	1.3861
	Median	0.5872	0.6067	0.6021	1.2497	1.3182	1.2652
	StandDev.	(0.2029)	(0.2217)	(0.2173)	(0.9210)	(0.7215)	(0.8463)
OY+2	Mean	0.5823	0.6158	0.6131	1.3319	1.3698	1.3637
	Median	0.5867	0.6064	0.6040	1.2392	1.2989	1.2431
	StandDev.	(0.1820)	(0.2157)	(0.2250)	(0.7710)	(0.7185)	(0.8543)
OY+3	Mean	0.5683	0.6090	0.6079	1.3149	1.3580	1.3540
	Median	0.5903	0.6088	0.5881	1.2723	1.2823	1.2299
	StandDev.	(0.1914)	(0.2049)	(0.2300)	(0.7252)	(0.6338)	(0.8391)
OY+5	Mean	0.5883	0.5784	0.6057	1.3736	0.9708	1.3120
	Median	0.6090	0.5696	0.6005	1.2647	1.0998	1.1830
	StandDev.	(0.1820)	(0.1745)	(0.2349)	(0.5895)	(0.6533)	(0.9709)
OY+7	Mean	0.6744	0.6340	0.6039	1.3349	1.0766	1.2849
	Median	0.6111	0.5593	0.5885	1.1961	1.1580	1.1570
	StandDev.	(0.6111)	(0.3851)	(0.2262)	(0.7425)	(0.7031)	(1.0379)

The sample consists of SEOs of S&P-rated firms between January 1, 1990 and December 31, 2008. Statistics (the mean, median, and standard deviation) are reported in years relative to the offering year. *Positive/Negative/Stable Outlook* refers to companies with an assigned positive/negative/stable credit rating outlook by S&P at the fiscal year-end before the offering year. The offering year is the fiscal year during which the SEO takes place. Firm-specific fiscal year-ends and fiscal year changes are accounted for. *D/A* is the book debt to assets (book leverage). *M/B* is the assets minus the book equity plus market equity all divided by the assets, where book equity is defined as the total assets minus the total liabilities and preferred stock plus deferred tax and convertible debt.

Table 3-4 Univariate Test Statistics

		Panel A			Panel B			Panel C		
		Equity Issuers	Non-Equity Issuers	Difference	Debt Issuers	Non-Debt Issuers	Difference	Equity Issuers	Debt Issuers	Difference
		Mean	Mean	t-value	Mean	Mean	t-value	Mean	Mean	t-value
Rating Variables	$PosOutl_{t-1}$	0.068	0.093	2.427 **	0.094	0.093	-0.162	0.075	0.097	1.360
	$NegOutl_{t-1}$	0.209	0.178	-2.230 **	0.147	0.196	6.384 ***	0.229	0.143	-4.411 ***
Market Timing Variables	M/B_{t-1}	1.590	1.570	-0.481	1.715	1.443	-13.019 ***	1.501	1.771	4.082 ***
	Stand-M/B_{t-1}	1.322	1.274	-1.319	1.393	1.173	-12.154 ***	1.241	1.434	3.322 ***
	BW-M/B_{t-1}	1.536	1.701	3.725 ***	1.715	1.649	-2.935 ***	1.487	1.763	4.034 ***
	Indu-M/B_{t-1}	0.857	0.855	-0.117	0.926	0.797	-11.108 ***	0.854	0.947	2.681 ***
	PriorAbnReturn	0.748	0.478	-3.236 ***	0.609	0.359	-6.054 ***	0.678	0.682	0.034
	FutureAbnReturn	0.187	0.315	2.277 **	0.267	0.339	2.358 **	0.165	0.265	1.379
Control Variables	D/A_{t-1}	0.644	0.614	-2.153 **	0.606	0.632	3.610 ***	0.691	0.594	-4.663 ***
	$EBITDA/A_{t-1}$	0.120	0.143	3.407 ***	0.148	0.138	-2.799 ***	0.117	0.148	2.208 **
	$SIZE_{t-1}$	7.242	7.889	11.364 ***	7.952	7.895	-1.916 *	7.289	7.833	6.331 ***
	$R\&D/A_{t-1}$	0.009	0.015	5.811 ***	0.013	0.016	4.101 ***	0.009	0.015	3.342 ***
	$R\&Dd_{t-1}$	0.534	0.430	-5.867 ***	0.414	0.443	3.023 ***	0.494	0.413	-3.134 ***
	PPE/A_{t-1}	0.448	0.365	-9.517 ***	0.378	0.364	-3.237 ***	0.441	0.374	-5.135 ***

The table reports differences (two sided t-test) in key variables between equity issuers and non-equity issuers, between debt issuers and non-debt issuers and between equity and debt issuers. The sample consists of S&P rated equity and debt issues between January 1, 1990 and December 31, 2008. Equity issuers are defined as firms conducting a seasoned equity offering. Debt issuers exhibit a change in book debt greater than 5 percent of their total assets. In panel C, dual issues (firms that issue both debt and equity in the same fiscal year) are excluded from the analysis (Hovakimian et al. 2001; Marsh 1982). *PosOutl* and *NegOutl* are dummy variables for the credit rating outlook equal to "1" if the rating outlook is "positive" or "negative" and "0" otherwise. Market-to-book ratio, *M/B*, is defined as the book debt plus the market value of the equity divided by the total assets. *Stand-M/B*, which is the standardized market-to-book ratio, is defined as the firm's raw *M/B* divided by the median market-to-book ratio of all the firms. *BW-M/B* is the historic finance weighted market-to-book ratio. *Indu-M/B*, which is the industry-adjusted market-to-book ratio, is defined as the firm's *M/B* divided by the median industry's *M/B*, where the industry is determined using the three-digit SIC codes. *PiorAbnReturn* is the average 36-month market-adjusted prior abnormal stock return (winsorized on the 1 percent and 99 percent quantile). *FutureAbnReturn* is the average 36-month market-adjusted future abnormal stock return (winsorized on the 1 percent and 99 percent quantile). Book leverage, *D/A*, is the ratio of the book debt to the total assets. Profitability is measured by *EBITDA/A*, which is earnings before interest, taxes, and depreciation divided by total assets. *SIZE* is measured as the natural log of the net sales. *R&D/A* is the research and development expense over the total assets. The dummy variable *R&Dd* takes the value of "1" when research and development expense information is missing in the database. Asset tangibility, *PPE/A*, is defined as the net plant, property, and equipment divided by the total assets. The financial information was obtained from the Thomson Financial database. In this chapter, observations with missing values for commonly used variables are excluded from the empirical tests. T-values indicate if the two subsets are significantly different using a t-test. *, **, and *** denote that the parameter is statistically significantly different from "0" at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 3-5 Logit Model of Seasoned Equity Offering Decision

Panel A: All Seasoned Equity Offerings					
	Pooled Logit				
	dF/dx	dF/dx	dF/dx	dF/dx	dF/dx
	(se)	(se)	(se)	(se)	(se)
$PosOutl_{t-1}$	-0.017 **	-	-0.017 **	-0.017 **	-0.017 **
	(0.141)	-	(0.147)	(0.124)	(0.111)
$NegOutl_{t-1}$	0.009 *	-	0.007	0.007	0.007
	(0.095)	-	(0.097)	(0.119)	(0.118)
$Stand\text{-}M/B_{t-1}$	-	0.009 ***	0.009 ***	0.009 ***	0.009 **
	-	(0.050)	(0.050)	(0.053)	(0.088)
D/A_{t-1}	-	0.003	0.002	0.002	0.002
	-	(0.098)	(0.096)	(0.119)	(0.113)
$EBITDA/A_{t-1}$	-	-0.204 ***	-0.195 ***	-0.195 ***	-0.195 ***
	-	(0.569)	(0.564)	(1.024)	(1.054)
$SIZE_{t-1}$	-	-0.007 ***	-0.007 ***	-0.007 ***	-0.007 **
	-	(0.030)	(0.030)	(0.041)	(0.052)
$R\&D/A_{t-1}$	-	-0.167 **	-0.167 *	-0.167	-0.167
	-	(1.590)	(1.597)	(2.088)	(2.488)
$R\&Dd_{t-1}$	-	0.007	0.007	0.007	0.007
	-	(0.101)	(0.102)	(0.102)	(0.107)
PPE/A_{t-1}	-	0.069 ***	0.069 ***	0.069 ***	0.069 ***
	-	(0.218)	(0.220)	(0.311)	(0.363)
Company Clusters	Yes	Yes	Yes	No	No
Industy Clusters	No	No	No	Yes	Yes
Offer Year Clusters	No	No	No	No	Yes
N	13,689	12,849	12,806	12,806	12,806
Pseudo-R^2	0.0015	0.0385	0.0404	0.0404	0.0404
Chi^2	8.40	165.18	170.66	133.94	190.60
Prob	0.0150	0.0000	0.0000	0.0000	0.0000

	Panel B: Excluding Dual Issues		
	Pooled Logit		
	dF/dx	dF/dx	dF/dx
	(se)	(se)	(se)
$PosOutl_{t-1}$	-0.009	-0.009	-0.009
	(0.198)	(0.219)	(0.266)
$NegOutl_{t-1}$	0.011 **	0.011 **	0.011 **
	(0.113)	(0.119)	(0.111)
Stand-M/B_{t-1}	0.000	0.000	0.000
	(0.081)	(0.101)	(0.159)
D/A_{t-1}	0.006 *	0.006	0.006 *
	(0.107)	(0.123)	(0.112)
$EBITDA/A_{t-1}$	-0.097 ***	-0.097 **	-0.097 **
	(0.727)	(1.166)	(1.044)
$SIZE_{t-1}$	-0.004 ***	-0.004 **	-0.004 *
	(0.035)	(0.042)	(0.071)
$R\&D/A_{t-1}$	-0.149 *	-0.149 *	-0.149 *
	(2.481)	(2.852)	(2.901)
$R\&Dd_{t-1}$	-0.002	-0.002	-0.002
	(0.119)	(0.112)	(0.110)
PPE/A_{t-1}	0.042 ***	0.042 ***	0.042 ***
	(0.240)	(0.283)	(0.328)
Company Clusters	Yes	No	No
Industy Clusters	No	Yes	Yes
Offer Year Clusters	No	No	Yes
N	12,466	12,466	12,466
Pseudo-R^2	0.0382	0.0382	0.0382
Chi^2	130.80	115.45	176.19
Prob	0.0000	0.0000	0.0000

This table shows a logit analysis of the seasoned equity offering (SEO) decision in a given year as a function of a set of explanatory variables. The sample consists of SEOs by S&P-rated companies between January 1, 1990 and December 31, 2008. Panel A reports statistics for the full SEO sample, while panel B is only based on SEOs exhibiting no debt offering in the same fiscal year, i.e. excluding "dual" issues (Hovakimian et al. 2001; Marsh 1982). *PosOutl* and *NegOutl* are dummy variables for the credit rating outlook equal to "1" if the rating outlook is "positive" or "negative" and "0" otherwise. *Stand-M/B*, which is the standardized market-to-book ratio, is defined as the firm's raw *M/B* (defined as book debt plus the market value of equity divided by total assets) divided by the median market-to-book ratio of all the firms. Profitability is measured by *EBITDA/A*, which is the earnings before interest, taxes, and depreciation divided by the total assets. *SIZE* is measured as the natural log of the net sales. *R&D/A* is the research and development expense over the total assets. The dummy variable *R&Dd* takes the value of "1" when research and development expense information is missing in the database. Asset tangibility, *PPE/A*, is defined as the net plant, property, and equipment divided by the total assets. The financial information was obtained from the Thomson Financial database. In this chapter, observations with missing values for commonly used variables are excluded from the empirical tests. Coefficients are reported as marginal effects. Robust asymptotic standard errors are in brackets (clustered at the firm, industry, or offer year level). *, **, and *** denote that the parameter is statistically significantly different from "0" at the 10 percent, 5 percent, and 1 percent level, respectively. *Prob* denotes the significance level of the asymptotic Chi^2 statistic, which tests the hypothesis that all parameters in the model are simultaneously equal to zero.

Table 3-6 Logit Model of Debt-Equity Choice

	Panel A: Excluding Dual Issues			Panel B: Pure Transactions		
	dF/dx	dF/dx	dF/dx	dF/dx	dF/dx	dF/dx
	(se)	(se)	(se)	(se)	(se)	(se)
$PosOutl_{t-1}$	-0.022	-	-0.025	-0.061 **	-	-0.067 **
	(0.204)	-	(0.211)	(0.180)	-	(0.184)
$NegOutl_{t-1}$	0.038 ***	-	0.038 ***	0.033 **	-	0.034 **
	(0.124)	-	(0.124)	(0.113)	-	(0.113)
$BroadPosOutl_{t-1}$	-	-0.026	-	-	-0.051	
	-	(0.342)	-	-	(0.273)	
$BroadNegOutl_{t-1}$	-	0.020	-	-	0.005	
	-	(0.160)	-	-	(0.162)	
$IGSG_{t-1}$	-	-	0.004	-	-	0.019
	-	-	(0.115)	-	-	(0.105)
Stand-M/B_{t-1}	-0.011	-0.015 **	-0.012	0.010	0.008	0.011
	(0.095)	(0.097)	(0.097)	(0.058)	(0.059)	(0.058)
D/A_{t-1}	0.026	0.031	0.026	0.007	0.012	0.008
	(0.309)	(0.351)	(0.340)	(0.133)	(0.136)	(0.146)
$EBITDA/A_{t-1}$	-0.300 ***	-0.323 ***	-0.303 ***	-0.481 ***	-0.494 ***	-0.486 ***
	(0.899)	(0.902)	(0.911)	(0.729)	(0.751)	(0.735)
$SIZE_{t-1}$	-0.008 **	-0.007 **	-0.007 **	-0.009 **	-0.009 **	-0.009 **
	(0.035)	(0.035)	(0.035)	(0.031)	(0.031)	(0.031)
$R\&D/A_{t-1}$	-0.269	-0.317	-0.368 *	-0.146	-0.115	-0.119
	(2.763)	(2.545)	(2.639)	(1.854)	(1.930)	(1.877)
$R\&Dd_{t-1}$	-0.006	-0.007	-0.007	0.019	0.020	0.019
	(0.122)	(0.120)	(0.121)	(0.109)	(0.110)	(0.110)
PPE/A_{t-1}	0.080 ***	0.080 ***	0.080 ***	0.140 ***	0.144 ***	0.145 ***
	(0.245)	(0.246)	(0.249)	(0.235)	(0.235)	(0.238)
N	4,824	4,821	4,792	4,481	4,475	4,451
Pseudo-R^2	0.0545	0.0503	0.0561	0.0441	0.0398	0.0455
Chi^2	133.32	115.50	133.86	115.91	101.25	116.52
Prob	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

This table shows a logit analysis of the debt-equity choice in a given year as a function of a set of explanatory variables. The sample consists of equity and debt issues by S&P-rated companies between January 1, 1990 and December 31, 2008. Debt issues are defined as a change in the book debt greater than five percent of the total assets. Equity issues are defined as seasoned equity offerings. The dependent variable equals "1" for equity issues and "0" for debt issues. In panel A, observations with both debt and equity offerings in the same fiscal year (dual issues) are excluded from the analysis (Hovakimian et al. 2001; Marsh 1982). Panel B excludes "mixed" transactions (debt (equity) issuance together with equity (debt) reduction in the same fiscal year) and therefore considers only "pure" transactions (Hovakimian 2004). *PosOutl* and *NegOutl* are dummy variables for the credit rating outlook and are equal to "1" if the rating outlook is "positive" or "negative" at the fiscal year-end before the offering, and "0" otherwise. The dummy variable *BroadPos* takes the value "1" if the firm's rating is on the upper border of a broad rating category and has a positive outlook, and "0" otherwise (Michelsen and Klein 2010). The dummy variable *BroadNeg* takes the value "1" if the firm's rating is on the lower border of a broad rating and has a negative outlook and "0" otherwise. The dummy variable *IGSG* takes the value "1" if the company is rated BBB, BBB-, BB+, or BB, and "0" otherwise (Michelsen and Klein 2010). *Stand-M/B*, which is the standardized market-to-book ratio, is defined as the firm's raw *M/B* (defined as the book debt plus the market value of the equity divided by the total assets) divided by the median market-to-book ratio of all the firms. Book leverage, *D/A*, is the ratio of the book debt to the total assets. Profitability is measured by *EBITDA/A*, which is earnings before interest, taxes, and depreciation divided by the total assets. *SIZE* is measured as the natural log of the net sales. *R&D/A* is the research and development expense over the total assets. The dummy variable *R&Dd* takes the value of "1" when research and development expense information is missing in the database. Asset tangibility, *PPE/A*, is defined as the net plant, property, and equipment divided by the total assets. The financial information was obtained from the Thomson Financial database. In this chapter, observations with missing values for commonly used variables are excluded from the empirical tests. Coefficients are reported as marginal effects. Robust asymptotic standard errors are in brackets (clustered at the firm level). *, **, and *** denote that the parameter is statistically significantly different from "0" at the 10 percent, 5 percent, and 1 percent level, respectively. *Prob* denotes the significance level of the asymptotic *Chi^2* statistic, which tests the hypothesis that all parameters in the model are simultaneously equal to zero.

Table 3-7 Multinomial Analysis of Capital Issuance and Repurchase Decision

	Pure Debt Issues	Pure Equity Issues	Pure Debt Reduction	Pure Equity Repurchases
	dF/dx	dF/dx	dF/dx	dF/dx
	(se)	(se)	(se)	(se)
$PosOutl_{t-1}$	0.004	-0.022 **	0.005	0.004
	(0.070)	(0.179)	(0.106)	(0.134)
$NegOutl_{t-1}$	-0.057 ***	0.006	0.029 **	-0.005
	(0.061)	(0.110)	(0.072)	(0.121)
Stand-M/B_{t-1}	0.041 ***	0.011 ***	-0.031 ***	-0.001
	(0.034)	(0.052)	(0.065)	(0.052)
D/A_{t-1}	-0.077 **	0.000	0.051 **	-0.027 ***
	(0.170)	(0.125)	(0.148)	(0.205)
$EBITDA/A_{t-1}$	-0.093	-0.175 ***	-0.025	0.211 ***
	(0.372)	(0.605)	(0.509)	(0.591)
$SIZE_{t-1}$	-0.004	-0.004 ***	-0.005 **	0.005 **
	(0.017)	(0.033)	(0.021)	(0.029)
$R\&D/A_{t-1}$	-0.269 **	-0.110 **	-0.004	-0.104 *
	(0.914)	(1.752)	(1.135)	(1.691)
$R\&Dd_{t-1}$	0.017 *	0.009 **	0.002	-0.006
	(0.055)	(0.115)	(0.072)	(0.105)
PPE/A_{t-1}	0.085 **	0.070 ***	-0.110 ***	-0.059 ***
	(0.114)	(0.245)	(0.146)	(0.241)
N	12,806			
Pseudo-R^2	0.0221			
Chi^2	478.13			
Prob	0.0000			

This table shows a multinomial logit analysis of the security issuance and repurchase decision in a given year as a function of a set of explanatory variables. The sample period is January 1, 1990 to December 31, 2008. Pure debt (equity) issues are identified when only a debt (equity) issuance and no equity (debt) reduction occurs (Hovakimian 2004). Pure debt reductions and equity repurchases are similarly defined. Equity issues (repurchases) are instances when the net equity issued (repurchased) exceeds five percent of beginning-year firm assets. The net equity issuance is measured as the change in book equity minus change in the retained earnings. The book value of equity is the total assets minus the total liabilities minus preferred stock plus deferred taxes. Debt issues (reductions) are instances when the net debt issuance (retired) exceeds five percent of the total assets. The net debt issuance is measured as the change in the book value of long-term debt and short-term debt. *PosOutl* and *NegOutl* are dummy variables for the credit rating outlook equal to "1" if the rating outlook is "positive" or "negative" at the fiscal year-end before the offering and "0" otherwise. *Stand-M/B*, which is the standardized market-to-book ratio, is defined as the firm's raw *M/B* (defined as the book debt plus the market value of the equity divided by the total assets) divided by the median market-to-book ratio of all the firms. Book leverage, *D/A*, is the ratio of the book debt to the total assets. Profitability is measured by *EBITDA/A*, which is the earnings before interest, taxes, and depreciation divided by the total assets. *SIZE* is measured as the natural log of the net sales. *R&D/A* is the research and development expense over the total assets. The dummy variable *R&Dd* takes the value of "1" when research and development expense information is missing in the database. Asset tangibility, *PPE/A*, is defined as the net plant, property, and equipment divided by the total assets. The financial information was obtained from the Thomson Financial database. In this chapter, observations with missing values for commonly used variables are excluded from the empirical tests. Coefficients are reported as marginal effects. Robust asymptotic standard errors are in brackets (clustered at the industry level). *, **, and *** denote that the parameter is statistically significantly different from "0" at the 10 percent, 5 percent, and 1 percent level, respectively. *Prob* denotes the significance level of the asymptotic Chi^2 statistic, which tests the hypothesis that all parameters in the model are simultaneously equal to zero.

Table 3-8 Equity Issuance Characteristics

	Panel A: Offering Proceeds			Panel B: Decomposition of offering proceeds		
	$Procceds^T/A_{t=0}$	$Procceds^P/A_{t=0}$	$Procceds^P/A_{t=-1}$	$Quantity^T$	$Quantity^P$	Price
$PosOutl_{t-1}$	0.019	-0.001	0.001	0.006	-0.001	-1.020 **
	(0.022)	(0.014)	(0.021)	(0.008)	(0.010)	(0.461)
$NegOutl_{t-1}$	0.021 **	0.002	0.000	0.009 *	0.012 *	-0.410
	(0.010)	(0.006)	(0.009)	(0.005)	(0.007)	(0.289)
M/B_t	0.048 ***	0.013 **	0.021 **	-0.012 ***	-0.015 ***	1.591 ***
	(0.012)	(0.006)	(0.009)	(0.003)	(0.004)	(0.236)
D/A_{t-1}	0.002	-0.004	-0.054 **	0.024 **	0.062 **	-1.302 ***
	(0.027)	(0.018)	(0.024)	(0.012)	(0.020)	(0.305)
$EBITDA/A_{t-1}$	0.534 **	0.058	0.127	0.023	-0.101 **	0.853
	(0.226)	(0.062)	(0.084)	(0.041)	(0.047)	(2.442)
$SIZE_{t-1}$	-0.033 ***	-0.023 ***	-0.033 ***	-0.016 ***	-0.009 ***	-0.118
	(0.004)	(0.003)	(0.005)	(0.002)	(0.002)	(0.101)
$R\&D/A_{t-1}$	-0.774 **	-0.164	-0.262	-0.062	-0.039	-4.373
	(0.309)	(0.119)	(0.169)	(0.084)	(0.120)	(8.312)
$R\&Dd_{t-1}$	-0.023 **	-0.010	-0.011	-0.017 **	-0.024 **	-0.434
	(0.010)	(0.007)	(0.011)	(0.006)	(0.008)	(0.357)
PPE/A_{t-1}	-0.099 ***	-0.049 ***	-0.083 ***	-0.041 **	-0.021	-0.427
	(0.017)	(0.012)	(0.019)	(0.014)	(0.014)	(0.797)
N	1,135	646	649	1,113	685	1,135
R^2	0.3889	0.2620	0.2507	0.1139	0.1222	0.1423

The table shows coefficients and standard errors from pooled time series, cross-sectional regressions. The sample consists of seasoned equity offerings by S&P-rated companies between January 1, 1990 and December 31, 2008. The dependent variable is indicated in the column title, t=0 is the fiscal year of the SEO, and t=-1 is the fiscal year prior to the SEO. In panel A, $Proceeds^T$ are the total offering proceeds, $Proceeds^P$ are the primary offering proceeds. All proceed variables are scaled by the firm's total assets. In panel B, the total and primary offering proceeds are deconstructed into their components, i.e. number of shares and offering price. $Quantity^T$ is the total number of shares divided by the total shares outstanding at t=0. $Quantity^P$ is the total number of primary shares divided by the total number of shares outstanding at t=0. *Price* is the offer price scaled by per share book value in t=0. *PosOutl* and *NegOutl* are dummy variables for the credit rating outlook equal to "1" if the rating outlook is "positive" or "negative" at the fiscal year-end before the offering, and "0" otherwise. Market-to-book ratio, *M/B*, is defined as the book debt plus the market value of the equity divided by the total assets. Book leverage, *D/A*, is the ratio of book debt to total assets. Profitability is measured by *EBITDA/A*, which is earnings before interest, taxes, and depreciation divided by the total assets. *SIZE* is measured as the natural log of the net sales. *R&D/A* is the research and development expense over the total assets. The dummy variable R&Dd takes the value of "1" when research and development expense information is missing in the database. Asset tangibility, *PPE/A*, is defined as the net plant, property, and equipment divided by the total assets. The financial information was obtained from the Thomson Financial database. In this chapter, observations with missing values for commonly used variables are excluded from the empirical tests. Robust asymptotic standard errors are in brackets (clustered at industry level). *, **, and *** denote that the parameter is statistically significantly different from "0" at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 3-9 Alternative Market Timing Proxies

	Pooled Logit						
	dF/dx	dF/dx	dF/dx	dF/dx	dF/dx	dF/dx	dF/dx
	(se)	(se)	(se)	(se)	(se)	(se)	(se)
$PosOutl_{t-1}$	-0.014 **	-0.013 **	-0.014 **	-0.011	-0.019 **	-0.015 *	-0.017 **
	(0.128)	(0.130)	(0.129)	(0.223)	(0.159)	(0.173)	(0.171)
$NegOutl_{t-1}$	0.007	0.006	0.006	0.001	0.007	0.011 **	0.005
	(0.117)	(0.115)	(0.120)	(0.167)	(0.109)	(0.115)	(0.115)
M/B_{t-1}	0.006 **	-	-	-	-	-	-
	(0.051)	-	-	-	-	-	-
$BW\text{-}M/B_{t-1}$	-	-0.003	-	-	-	-	-
	-	(0.066)	-	-	-	-	-
$Indu\text{-}M/B_{t-1}$	-	-	0.010 **	-	-	-	-
	-	-	(0.092)	-	-	-	-
PriorAbnReturn	-	-	-	0.003 **	-	-	-
	-	-	-	(0.029)	-	-	-
FutureAbnReturn	-	-	-	-0.007 **	-	-	-
	-	-	-	(0.044)	-	-	-
$PriceRunup_{t=0}$	-	-	-	-	0.018 ***	-	-
	-	-	-	-	(0.081)	-	-
$PE_{t=0}$	-	-	-	-	-	0.009 ***	-
	-	-	-	-	-	(0.057)	-
$Disc.Accruals_{t-1}$	-	-	-	-	-		-0.013
	-	-	-	-	-		(0.229)
N	13,076	12,306	13,011	7,914	11,843	9,978	10,882
Pseudo-R^2	0.0396	0.0343	0.0400	0.0455	0.0524	0.0594	0.0476
Chi^2	135.49	125.33	127.38	114.42	152.47	168.48	182.09
Prob	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

This table shows a logit analysis of the seasoned equity offering (SEO) decision in a given year as a function of credit rating concerns and alternative market timing proxies. The sample consists of SEOs by S&P-rated companies between January 1, 1990 and December 31, 2008. Table 3-5's control variables are included in the analysis but the results are not tabulated. *PosOutl* and *NegOutl* are dummy variables for the credit rating outlook equal to "1" if the rating outlook is "positive" or "negative" at the fiscal year-end before the offering and "0" otherwise. Market-to-book ratio, *M/B*, is defined as the book debt plus the market value of the equity divided by the total assets. *BW-M/B* is the historic finance weighted market-to-book ratio. *Indu-M/B*, which is the industry-adjusted market-to-book ratio, is defined as the firm's *M/B* divided by the median industry's M/B, where the industry is determined using the three-digit SIC codes. *PiorAbnReturn* is the average 36-month market-adjusted prior abnormal stock return (winsorized on the 1 percent and 99 percent quantile). *FutureAbnReturn* is the average 36-month market-adjusted future abnormal stock return (winsorized on the 1 percent and 99 percent quantile). *PriceRunup*, which is the change in market capitalization, is defined as the market capitalization in a given year divided by the average market capitalization of the prior two fiscal years. *PE* is the price earnings multiple. *Disc-Accruals*, which is discretionary accruals, is defined as the difference between the realized accruals and normalized accruals (Chan et al. 2006; Polk and Sapienza 2008). In this chapter, observations with missing values for commonly used variables are excluded from the empirical tests. Coefficients are reported as marginal effects. Robust asymptotic standard errors are in brackets (clustered at the industry level). *, **, and *** denote that the parameter is statistically significantly different from "0" at the 10 percent, 5 percent, and 1 percent level, respectively. *Prob* denotes the significance level of the asymptotic Chi^2 statistic, which tests the hypothesis that all parameters in the model are simultaneously equal to zero.

Table 3-10 Robustness Tests

	Investment Grade	Speculative Grade	Commercial Paper Access[1]	US Companies	EMEA Companies	1990-1999	2000-2008
	dF/dx (se)	dF/dx (se)					
$PosOutl_{t-1}$	-0.021 **	-0.023	-	-0.021 **	0.005	-0.009	-0.020 **
	(0.289)	(0.175)	-	(0.161)	(0.378)	(0.290)	(0.180)
$NegOutl_{t-1}$	0.010 *	0.002	0.014 *	0.001	0.026 **	-0.012	0.010 *
	(0.152)	(0.128)	(0.214)	(0.111)	(0.209)	(0.284)	(0.104)
$Stand\text{-}M/B_{t-1}$	0.011 ***	0.021 ***	0.017 ***	0.008 **	0.012 *	0.011 ***	0.009 **
	(0.081)	(0.061)	(0.133)	(0.054)	(0.115)	(0.069)	(0.064)
D/A_{t-1}	0.022 **	-0.011 **	0.064 ***	-0.001	0.037 **	0.015	0.001
	(0.250)	(0.093)	(0.496)	(0.088)	(0.344)	(0.292)	(0.097)
$EBITDA/A_{t-1}$	-0.238 ***	-0.167 ***	-0.334 ***	-0.211 ***	-0.116 **	-0.201 ***	-0.194 ***
	(1.211)	(0.598)	(2.258)	(0.637)	(1.041)	(1.072)	(0.619)
$SIZE_{t-1}$	-0.005 **	0.000 **	-0.002	-0.008 ***	-0.002	-0.017 ***	-0.005 **
	(0.048)	(0.039)	(0.076)	(0.036)	(0.076)	(0.060)	(0.033)
$R\&D/A_{t-1}$	-0.054	-0.240	0.075	-0.165 **	-0.197	0.000	-0.196 **
	(3.375)	(1.760)	(4.887)	(1.642)	(4.678)	(3.192)	(1.807)
$R\&Dd_{t-1}$	0.009 *	0.001 *	0.012	0.009	0.000	0.008	0.006
	(0.162)	(0.124)	(0.227)	(0.113)	(0.250)	(0.199)	(0.114)
PPE/A_{t-1}	0.060 ***	0.092 ***	0.086 ***	0.088 ***	-0.009	0.029	0.080 ***
	(0.367)	(0.255)	(0.570)	(0.249)	(0.408)	(0.411)	(0.237)
N	6,908	5,898	2,560	10,103	2,477	2,637	10,169
Pseudo-R^2	0.0770	0.0231	0.0818	0.0597	0.0169	0.0721	0.0399
Chi^2	112.98	57.09	49.72	195.48	22.73	101.97	123.23
Prob	0.0000	0.0000	0.0000	0.0000	0.0068	0.0000	0.0000

[1] Firm-years rated AA-, A, BBB

This table shows a logit analysis of the seasoned equity offering (SEO) decision in a given year as a function of a set of explanatory variables for differently defined sub-samples. The sample consists of SEOs by S&P-rated companies between January 1, 1990 and December 31, 2008. The subsample *Investment Grade* is made up of firm years rated BBB- or better. *Speculative Grade* consists of firm years rated BB+ or lower. The subsample *Commercial Paper Access* restricts the analysis to firm years rated AA-, A or BBB. *US and EMEA Companies* is made up of firms incorporated in the US or Europe, the Middle East, and Africa (EMEA). The sub-samples *1990-1999 and 2000-2008* split the overall sampling period into two time periods. *PosOutl* and *NegOutl* are dummy variables for the credit rating outlook equal to "1" if the rating outlook is "positive" or "negative" at the fiscal year-end before the offering, and "0" otherwise. *Stand-M/B*, which is the standardized market-to-book ratio, is defined as the firm's raw M/B (defined as the book debt plus the market value of the equity divided by the total assets) divided by the median market-to-book ratio of all the firms. Book leverage, *D/A*, is the ratio of the book debt to the total assets. Profitability is measured by *EBITDA/A*, which is earnings before interest, taxes, and depreciation divided by the total assets. *SIZE* is measured as the natural log of the net sales. *R&D/A* is the research and development expense over the total assets. The dummy variable *R&Dd* takes the value of "1" when research and development expense information is missing in the database. Asset tangibility, *PPE/A*, is defined as the net plant, property, and equipment divided by the total assets. The financial information was obtained from the Thomson Financial database. In this chapter, observations with missing values for commonly used variables are excluded from the empirical tests. Coefficients are reported as marginal effects. Robust asymptotic standard errors are in brackets (clustered at the industry level). *, **, and *** denote that the parameter is statistically significant different from "0" at the 10 percent, 5 percent, and 1 percent level, respectively. *Prob* denotes the significance level of the asymptotic Chi^2 statistic, which tests the hypothesis that all parameters in the model are simultaneously equal to zero.

4 "Privacy please!" - The Public to Private Decision in Germany[85]

4.1 Introduction

Through its division of ownership and control, and widely dispersed shareholdings, the publicly held corporation's benefits significantly exceed those of a privately held company. Consequently, going public is often regarded as an endpoint in the corporate life cycle (Burghof and Schilling 2003), and has been the focus of a wide strand of literature. The observation that the majority of companies remain private and that an increasing number of firms are opting for a delisting contradicts a linear interpretation of the corporate life cycle in which the endpoint is an initial public offering (IPO). Since going private is associated with high transaction costs as well as considerable execution risks, the dominant arguments have to favor a complete delisting.

While the going private phenomenon is still relatively young in Germany, it has become a permanent element of highly flexible stock markets such as those in the US. The introduction of the German Transformation Act (Umwandlungs-gesetz) in 1995 facilitated taking PTP decisions in practice. This explains the numerous empirical studies on the going private market in the US and limited work on the German equity market.[86] Our study is based on a sample period between 1996 and 2004, which helps broaden the data base and scope of previous German empirical works.[87]

Most going private research is based on US samples covering the 1980s. However, it is doubtful whether the implications of other seminal going private studies on international capital markets can simply be applied to Germany. Since going private is commonly understood as a transaction to alter a firm's corporate

[85] Co-author: Christian Klein, Universität Hohenheim, Germany, forthcoming in Review of Managerial Science, copyright Springer.

[86] Prior studies on the German PTP market include those by Zillmer (2002; 2003) and Eisele et al. (2003).

[87] Our study contributes to the existing literature in two ways. First, the introduction of the squeeze-out regulation was a cornerstone in the development of the German PTP market. The studies by Zillmer (2002; 2003) and Eisele et al. (2003) do not cover this major change in legislation. Furthermore, the latter's work primarily focuses on forms of going private and descriptive statistics, while our study provides a comprehensive analysis of PTP motives. Second, our study allows secondary market liquidity, which is a driver of a PTP, to be tested.

control structure (Easterbrook and Fischel 1981), the German peculiarities regarding corporate governance make applying foreign findings very difficult. The German corporate governance system is specifically characterized by an influential and controlling corporate institution supervisory board and public corporations' concentrated ownership. The difference becomes clear when comparing the number of hostile takeovers in the US and Germany, or in Continental Europe in general. Second, German companies, or their majority shareholders, must offer to buy out pre-transaction investors before delisting their shares. This course of action is unlike in the UK where, for example, investors can find their money trapped in companies after 75 percent of the shareholders have approved the move. Finally, international corporate tax regimes differ substantially, complicating the universal interpretation of going private transactions as a measure to save taxes.

Further research into the going private decision is extremely useful, as the financial crisis and its repercussions in the global equity markets have put delisting on the agenda again. While the last few years were marked by strong stock markets, the mood has totally changed since the events of September 2008. Across the board, global stocks have lost a significant share of their pre-crisis value. The shares of small and medium-sized companies are among the hardest hit, as the MSCI Europe Small Cap Index has more or less trailed bigger stocks. Moreover, a notable number of European small cap funds was liquidated or discontinued in 2008 and 2009. Some funds stop investing in companies, especially smaller companies, with a market value below EUR 400 million, as they expect them to suffer financial problems due to the crisis. These circumstances are likely to intensify the trend of going private in the coming months and years. London's Alternative Investment Market has already seen PTPs just a year after the initial going public due to these companies' shares falling heavily.

Since the German private equity market has developed rather slowly in terms of size, investors in German companies going private are mainly strategic buyers and only a small number of private equity sponsors. Therefore, our study is well suited for investors who want to identify potential going private candidates in order to speculate in takeover premiums or positive share price reactions after the

announcement. On the other hand, our findings can also be of help to investors who want to avoid being squeezed out of a company, as can happen when, for example, funds are restricted to invest in quoted vehicles only.

Our sample comprises 52 Germans PTPs which took place from 1996 until the end of 2004 and for which sufficient data are available. Unlike in other major stock markets, there are no official statistics available that track going private transactions; consequently, we hand-collected the sample from various public data sources. The sample comprises firms taken private by strategic investors, private equity buyers, as well as their owners. Our analysis empirically tests the relevance of the following important hypotheses derived from international going private research in respect of the German market: a strong free cash flow in firms, a potential to further leverage their capital structure, high ownership concentration, their stock market quotation's decreasing benefits, a limited capital market efficiency and dividend payments which have to be collected privately.

The results obtained show that, in Germany, going private transactions are predominately undertaken by smaller companies with average total assets of EUR 242 million and an average market capitalization of just EUR 109 million. After 2001, larger companies also delisted, partly driven by financial sponsors' increasing activity as they tend to buy larger firms. The sample's breakdown per sector is dominated by mature industries, with the companies showing weak sales and employee growth rates. The profitability of the going private firms was also lower compared to that of a control group. This favors the hypothesis regarding a stock market listing's decreasing benefits in the current stage of the firm's corporate life cycle. Moreover, we find evidence of the hypothesis that a PTP transaction further leverages the capital structure, as the sample companies' gross debt to assets ratios are lower. However, the equity market is not fully efficient for PTPs, as the respective shares' trading volumes were very low. We find no evidence to support the *free cash flow hypothesis*, as the companies were not taken private to pay out high free cash flows.

The chapter is organized as follows: in section 4.2, we review the existing literature and derive hypotheses which will form the foundation of our empirical study. In section 4.3, we describe the sampling procedure of our going private

transactions as well as that of the control group, and outline the variables used in the analysis. We moreover provide some descriptive statistics regarding the going private sample. Section 4.4 forms the main body of our study, which is divided into the univariate and multivariate test statistics, and presents the results of our research as well as robustness checks. Section 4.5 provides a description of our main findings and concludes the chapter.

4.2 Theoretical Foundations and Hypotheses

The theory on the conflict between the ownership and control of a publicly held company (Berle and Means 1932; Fama and Jensen 1983) has been a cornerstone of PTP research for a long time. In particular, the free cash flow discussion, originally postulated by Jensen (1986; 1989), has triggered a considerable number of studies in respect of the US and other capital markets. Nevertheless, as Halpern et al. (1999) rightly point out, firms going private do not form a homogenous population. For example, depending on the management's degree of share ownership, the motives for a PTP might differ substantially. We therefore formulate various hypotheses which might explain the reason for taking a firm private and will also cover this heterogeneity in motives.[88] These hypotheses, which are derived from the existing literature on going private transactions, form the basis of our empirical analysis in section 4.4.

4.2.1 Free Cash Flow

Although only the studies by Lehn and Poulsen (1989), Opler and Titman (1993), and Rao et al. (1995) could find evidence that support a positive correlation between the amount of free cash flow in a target firm and the probability of a PTP in the US, Jensen's (1986) theory is still the foundation of going private research. The management of a publicly held company has strong incentives to keep any free cash flow within the corporation in order to remain flexible and avoid the monitoring of outside debt and equity investors. This suboptimal allocation of capital is the free cash flow's agency costs, as any excess

[88] We consequently concentrate on hypotheses that can be tested in respect of the German market. There are, for example, no official statistics of hostile takeover bids, which makes testing for this impractical. Secondly, the number of hostile takeovers in Germany is still negligible.

cash should be disbursed to the shareholders. This phenomenon is most likely to occur in industries characterized by stable, but low, long-term growth rates, as well as by limited opportunities to invest in projects with a positive net present value (Jensen et al. 1988). This holds true, among others, for the tobacco, forestry, pulp and paper, and food industries. Especially highly diversified conglomerates are likely to have considerable agency costs in respect of ownership and control conflict. A PTP transaction may reduce these costs through the management's equity participation in the private company, which, in turn, should help realign the incentives between the firm's post-transaction shareholders and the management. Second, buyouts are commonly financed by means of considerable debt in order to discipline the management through increasing debt servicing costs, which reduces their discretionary scope. Consequently the amount of free cash flow in a company should positively influence the probability of a PTP. This forms the *free cash hypothesis* H1. Zillmer (2003) could not, however, find evidence to support this relationship in respect of the German stock market. The same holds true for Renneboog et al. (2007) in respect of the UK capital market.

4.2.2 Leverage Potential

The debt financing argument also applies to the second hypotheses (H2), which sees an additional value creation potential in the target companies by means of their capital structure. Before the PTP, these companies' financing structure appears to be suboptimal. The companies' stable operating cash flow and their assets' tangible character, which facilitates their use as security, reduce the agency costs of debt compared to those in the corporate life cycle's previous stages (Kim and Lyn 1991). Thus, a higher debt burden in the capital structure and, therefore, a releveraging of companies appears to be preferred in terms of agency costs.[89] The additional debt puts pressure on the management to perform, limits their scope for discretionary spending, and increases the risk of imminent job losses if performance is poor. The findings regarding this relationship in respect of the US market are inconsistent. While Kim and Lyn (1991) have found evidence that support a negative relationship between leverage and the probability of PTP, Rao

[89] Though it remains unclear why the company or the management refrains from adjusting the debt level (e.g., through share buybacks) before the PTP takes place. This can only be explained by significant agency problems between the management and shareholders.

et al. (1995) do not find any evidence of this. Zillmer (2003) finds a lower leverage ratio in respect of German PTPs.

4.2.3 Ownership Concentration

Our third hypothesis (H3) reflects the direct and indirect costs associated with a PTP transaction. In Germany, the legal precondition for taking a firm private is a 75 percent share of the capital with voting rights. In his study, Lawrence (1986) finds evidence that support PTP's higher ownership concentration in the form of majority owners. Zillmer (2002) finds evidence that in German takeover bids aimed at delisting, 79 percent of the bidders between 1996 and 2001 already possessed 75 percent of the voting stock. A majority owner or several shareholders with a combined majority ownership clearly facilitate the successful closure of the PTP transaction, as the number of outside investors entitled to compensation is smaller. This helps reduce the delisting's coordination costs. These costs are expected to increase proportionally to the number of outstanding shares (Zillmer 2003). This implies that especially companies with a low free float are likely to file for a delisting. A majority voting interest of 95 percent increases this probability significantly, as German legislation has allowed minority owners to be squeezed out since 2002.[90] Alternatively, a high free float might lead to shareholders controlling the management suboptimally due to free rider problems. This would add to the agency costs of a publicly held company.[91]

4.2.4 Decreasing Benefits of a Stock Market Quotation

Our next two hypotheses (H4 and H5) are closely related to organized capital markets' functions: valuation, funding, liquidity, and control.

If, on stock markets, the need to raise additional equity capital with the help of secondary public offerings decreases, a PTP might become an option for a

[90] Currently, the German government plans to reduce this percentage to 90 percent as part of its efforts to help struggling companies overcome the financial crisis. This could trigger a new wave of German PTPs in the coming years.

[91] In order to investigate this relationship more closely, we would have to identify the free float figure long before the PTP, as majority owners often increase their shareholding on the free market long before the actual PTP.

listed company. In this case, a private entity's expected benefits overshadow any associated limitations and costs. Companies in a corporate life cycle stage marked by slow growth in the mid to long term might benefit from such an option. Such companies can be easily financed by means of internal capital generation, or low cost debt sourced outside. Moreover, compared to their previous life cycle stages, such companies have a larger amount of easy to assess assets, which can serve as security for debt financing. This additional security may help reduce their risk profile and, consequently, the debt funding costs. A decreased need for external funding can be triggered by both slow growth rates and higher and more stable operating cash flows. This holds true for companies in stagnating or shrinking industries, which is consistent with the *free cash flow hypothesis* (H1) mentioned above.

Capital markets produce random, although diverse, information on strongly growing companies, which not only helps investors, but also the management itself, to assess investment projects (Subrahmanyam and Titman 1999). Moreover, the stock market quotation allows the original owners and management to protect specific investments if the net cash flow is insufficient to pursue the envisaged growth targets. If this occurs, the original owners and management constantly face the risk that well informed investors with strong bargaining power could oust them from the company, leading to the loss of their investments (Burghof and Rudolph 1999). Another argument for delisting might be the decreasing amount of company-specific risks associated with more stable cash flows that are easier to evaluate and forecast. A stock market listing allows the former owners to spread the idiosyncratic risks, as investors are able to diversify their portfolios more widely (Shah and Thakor 1988). However, as the company-specific risks decrease, the quotation might become obsolete. Generally speaking, the motives for the initial going public are no longer as evident as in the corporation's current life cycle status (Nathusius 2003).

A similar argument can be applied to the relative costs of a stock market listing. The costs of investor relations as well as the opportunity costs of the required management attention, which is hard to quantify, should be regarded in relation to the company size and prospective growth. In this regard, the going private transaction might not be the outcome of the management's wrong

decisions, or the capital markets malfunctioning, but rather a logic step in the corporate life cycle since funding decisions have to be regarded and taken in a dynamic context (Burghof and Schilling 2003).

The company size is also expected to induce a degree of information asymmetry in the capital markets (Kim and Lyn 1991; Rao et al. 1995). Small and medium-sized companies are more likely to experience undervaluation than big corporations, as they produce less valuable information randomly. Thus, the costs of signaling and bonding measures to convey internal valuation factors increase. This is linked to the listing's decreasing attractiveness, as other projects can only be funded under unattractive terms and conditions. On the other hand, the relative costs of the obligatory capital market communication decrease with an increase in company size (DeAngelo et al. 1984).

4.2.5 Limited Capital Market Efficiency

Also our following hypothesis (H5) is connected to the capital markets' above-mentioned main functions. Ideally, corporate shares' secondary market pricing should reflect the inner value of the firm itself. Nevertheless, the information asymmetries between firm insiders and outsiders may lead to valuation discrepancies due to the differing information and assumptions regarding the firm's future productivity and profitability (among others, Myers and Majluf 1984). If insiders are aware of the firm's undervaluation, it is beneficial to, for example, set up share buyback programs and signal the undervaluation to the capital markets. In this context, the going private and final delisting can be regarded as an ultimate share buyback (Lehn and Poulsen 1989). Therefore, the PTP helps correct the undervaluation and should be initiated by insiders, i.e. the management or the majority shareholders (Kim and Lyn 1991).

The demand side in the capital markets might also be a potential cause of a PTP transaction. An example of this occurring is specifically in small and medium-sized companies that are majority owned by founder families (Kemper and Schiereck 2002). This implies a limited market capitalization, which has adverse effects on the secondary market liquidity. On the Warsaw Stock exchange, Jackowicz and Kowalewski (2006) observe subdued liquidity in respect

of PTP shares. Not only do institutional investors have a restricted capability to influence these companies' strategic decisions, but this subdued liquidity also makes any investment appear unattractive. The low market depth prevents investors from exiting the company at short notice, thus limiting the flexibility required (Raffel 2003). This effect is amplified by equity analysts' inadequate coverage of the shares due to the subdued free float, which may add to the information asymmetries between firm insiders and outsiders. Moreover, most stock markets show a certain degree of sector rotation in terms of investor interests and market sentiment. Therefore, investors might even pay very little attention to companies with strong growth stories due to their currently unattractive industry background. The insufficient liquidity reinforces the undervaluation of such companies, increasing either the owners and management's incentives to take them private, or those of outside investors' who have identified a potential for value generation by taking them over.

The subdued liquidity also constrains another function of organized capital markets: the market for corporate control, i.e. the management's supervision and sanctioning through the shareholders. No investor interest and random price setting due to lacking liquidity hamper, or even inhibit, an efficient form of corporate control through the market. In such an environment, the secondary market price no longer serves as an adequate criterion for the management's capital allocation. In such a constellation, a concentrated shareholdership without public listing might outweigh the traditional advantages of capital markets.

4.2.6 Dividend Payments

Our last hypothesis (H6) is also closely associated with the perception of PTPs as rather stable companies that tend to operate in mature industries characterized by low R&D costs and investment needs. Owing to these characteristics, companies eligible for PTP transactions are expected to pay relatively higher dividends (Carroll et al. 1988). The same argument applies to the possibility to service higher interest expenses, as the dividends can be partly retained going forward and may be applied as debt service payments. On the whole, we expect PTPs to yield high dividend payments, which makes taking the firm private attractive for investors as they can thereafter collect the payout fully.

Moreover, any corporation's dividend policy is marked by conflicting interests between shareholders and management. While the shareholders have a strong interest in high dividend payments, the management wants to keep financial resources within the company (Rao et al. 1995). Going private in the form of an owner or management buyout may help to restore – at least partly – the division between ownership and control. Thereafter, the management can act without the pressure of having to account for high short-term profits and dividends, but can follow long-term strategies and goals.

We have now formed six fields of possible motives for a PTP transaction, which are operationalized by means of financial variables in section 3.2. This allows us to test the hypotheses in an empirical context.

4.3 Data Set and Variables

4.3.1 Sample Selection

Our subsequent analysis of German publicly owned firms taken private covers the period 1996 to 2004. The period before 1996 has no empirical relevance since PTPs in the German capital markets were only practically facilitated by the introduction of the German Transformation Act (Umwandlungsgesetz) in 1995.[92]

Unlike other important stock markets, there is no central data base available that tracks PTP transactions in Germany; accordingly, we had to turn to different data sources to construct our sample. The study by Hohn (2000) provided data for the period 1995 to 1999.[93] Second, as another source of information, we used the voluntary public notice of takeover bids, which was in use before the introduction of the German Securities Acquisition and Takeover Act (Wertpapiererwerbs- und Übernahmegesetz – WpÜG) in 2002. We specifically concentrated on takeover bids that explicitly mentioned a private corporation's aim of delisting the target

[92] Furthermore, including transactions which took place before 1996 would have led to a possible structural interruption in the study with unknown consequences for the analysis due to the introduction of the German Transformation Act. Eisele et al. (2003), Zillmer (2002), and Hohn (2000) followed a similar approach.

[93] While cross-checking the compilation of the PTPs, there were seven corporations in the sample for which we could not find any information. These companies were consequently excluded. Furthermore, four PTP candidates abandoned their plans and were also eliminated.

company. As this procedure does not cover "cold delisting," we supplemented our sample with the help of the *Hoppenstedt* and *Saling* Financial Information Stock Guides for the entire sampling period.[94] We cross-checked the annual stock market exit data included in the Guides against newspaper information to identify suitable PTPs. The data bases LexisNexis and Genios, which cover all relevant German financial newspapers, and Factiva!, which lists Reuters news reports and all publicly listed companies' ad hoc notices, served as a fourth source of information for the construction of our sample. In addition, the German Association for the Protection of Small Shareholders provides a data base that allows a search for all German publicly held corporations' shareholder meetings.[95] When we found hints of a potential PTP in one source of information, we double-checked this with other sources. Finally, we compared our preliminary sample with Zillmer's (2003) list of German PTPs during the period 1990 to 2001.

The differences between the two samples are due to missing company information, a different interpretation of the available news flow, and delisting plans that were subsequently abandoned.[96] With the help of this sampling procedure, we identified 57 successfully completed PTPs between 1996 and 2004. A further 12 PTPs had been announced but not completed by December 31, 2004. After excluding three observations from the financial services industry due to differing accounting standards and eliminating five PTPs due to insufficient data coverage, the sample consisted of 52 corporations. Accordingly, the number of observations in the sample is not very large, but this is an inherent problem in the going private research. The sample size in other notable studies ranges from 54 (Maupin 1987) to 263 (Lehn and Poulsen 1989). The complete list of company names and those of their investors can be found in the Appendix.

In order to analyze the characteristics of the going private sample with the help of univariate and multivariate test statistics, we needed a control group, which is made up of publicly held corporations listed on a German stock exchange. We therefore used the complete list of all publicly listed German

[94] Cold delisting makes use of company law provisions that allow the requirements for a stock market listing to be omitted (Oetker and Heise 2002).
[95] The data base is available at www.hv-info.de.
[96] The data bases used especially lacked sufficient information on transactions before 1996.

corporations in the *Datastream* database on December 31 2004 as the universe.[97] The control group's selection was choice based, i.e. according to the paired sample design. This approach has been used in numerous studies, for example, by Cosslet (1981), Lehn and Poulsen (1989), Spiess and Affleck-Graves (1995), and Weir et al. (2005a; 2005b). Other studies have relied on random sampling of the control group (Kim and Lyn 1991; Rao et al. 1995; Zillmer 2003). A matched pairs approach has two advantages in our context. First, random sampling would not allow controlling for industry and size effects in the univariate analysis. Second, as German PTPs are of relatively smaller size, random samples or industry adjusted control samples would always lead to control portfolios of much larger average size (Wagner 2005). Furthermore, our approach is widely regarded as appropriate if the sub-group is minimal in relation to the total population (Amemiya 1985). The studies by Song and Walking (1993) and Jackowicz and Kowalewski (2006) used both approaches, but the authors were unable to find any significant differences in their analysis. Consequently, we use the paired sample design for our analysis.[98]

The two criteria for the selection of the control group are industry background and size (Lawrence 1986; North 2001). This approach helps us minimize any sector or size effects in our analysis.[99] We relied on the FTSE Global Classification System as of January 2005 for the sector classification. In a first step, we looked for control companies by means of the three-digit FTSE code and the latest available sales figure (Wagner 2005). We tried to select one firm with a higher sales figure than the going private company and one with a lower one as the control group for each PTP.[100] If the approach delivered no, or only one, fitting control company, the approach was continued on the level of the two-digit

[97] Consequently, firms that vanished as a result of takeovers or bankruptcies were ex-ante excluded from our sample. This approach might, however, exclude relevant parameters from the regression – for a detailed discussion, see Kieschnick (1998). Since the extent of this effect is unclear, this approach was nevertheless used for our analysis.

[98] Furthermore, any systematic biases due to the sampling approach should not occur in the explanatory variables or the standard error, but in the constant term (Maddala 1983).

[99] Our study design is therefore based on differences in the explanatory variables within an industry group. Some balance sheet ratios and figures might correlate with the respective company's sector background. If this were the case, our study design would not be sufficient to identify company-specific differences in the variables (Lawrence 1986).

[100] This sampling approach should enhance the matching of the control group (Spiess and Affleck-Graves 1995). In addition, the problem of the "public company" group's underrepresentation relative to the overall population might be reduced to some degree.

FTSE classification code. Ultimately, we identified 90 listed corporations for our control sample as we were unable to find two fitting control companies for each PTP.[101]

To obtain reliable statements on going private companies' characteristics, we have to assess whether our sample is representative. Possible biases can occur because our data bases specifically lack balance sheet, profit and loss statement, and cash flow information on small companies. However, this problem holds good for most studies on this topic. Moreover, the beginning of our sampling period tends to be underrepresented due to missing data, especially regarding early PTPs.[102]

4.3.2 Definition of Key Variables

In order to test the above-derived hypotheses, we need a sound definition of the key variables.[103] For the calculation of the explanatory variables, we mostly relied on the last complete financial year prior to the PTP transaction. This financial year is regarded as the control group's reference year. A complete list of the variables that we used can be found in the Appendix.

We first use the firm's free cash flow with regard to the *free cash flow hypothesis's* explanatory variables. We follow the definition by Lehn and Poulsen (1989) to calculate this factor.[104] Since we expect the free cash flow figure to increase with increasing company size, we standardize the variable with the help of the book value of the firm's equity value.[105] We also include a standardized

[101] On the one hand, some German sectors have only a very limited number of listed companies. On the other hand, if the market leader of one sector opted for a PTP, the control group's sales figures differed significantly.
[102] However, this situation limits any adverse economic cycle side-effects on our financial data over the study period.
[103] It is noteworthy that in our data bases, information on profit and loss statements is partly aggregated, which prevents the calculation of some variables. Furthermore, a number of our hypotheses are based on or connected to the extent of the information asymmetry in the capital markets, which cannot be measured directly. We therefore try to assess this value by indirect means and variables.
[104] As we were unable to obtain company information on interest payments, our free cash flow figures tend to be higher than in comparable US studies. Our figures are, however, comparable to that in Zillmer's (2003) study.
[105] Halpern et al. (1999) recommend a standardization approach by means of the sales figures as a measure of the company's cash flow. This should lead to fewer distortions in the analysis, as no capital structure components enter the variable. Our control sample's sampling procedure by the means of the sales figure makes the equity figure appear more feasible.

operating cash flow and an available cash holdings figure in the analysis, as our approximation's feasibility remains unclear. Since the described three variables only provide the firm's amount of liquidity in the financial year prior to the PTP, but not the prospective growth potential, we also include a Tobin's Q figure which measures future investment projects' value (Tobin 1969). For our analysis, we use the approximation of the Tobin's Q by Denis (1992) and Opler and Titman (1993), which relies on the book values of assets and debt instead of market values.[106] [107]

In order to measure the potential for further debt in the sample firms' capital structure, we used a leverage variable, defined as the total debt to assets. In addition, the decision on a further leveraging depends on the total cost of the debt, which is driven by the specific risk premium in the credit agreements. We have tried to approximate the sample's risk profile with the help of the operating earnings' fluctuation range, i.e. the variant coefficient of the EBIT in the three financial years prior to the PTP, or the control sample's reference period. Moreover, we expect the going private companies to have higher tax payments, which management or investors try to reduce with a higher debt. The study by Lehn and Poulsen (1989) found evidence to support this link to a certain extent.[108] Accordingly, we include the standardized total tax burden in our analysis.[109]

The *ownership hypothesis* will be measured by the percentage of free float shares as well as the number of shareholders who, together, hold more than 50 percent of the share capital (Beck and Stinn 2002).[110]

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[106] Denis (1992) mentions that this approximate figure depends on the current level of prices in stock markets and it may therefore fluctuate over time. As we have used an effective date comparison regarding the control sample, this constraint does not apply.

[107] In order to measure the postulated relationship between free cash flow and the amount of valuable future growth projects, we have developed two interaction variables (not reported): First, the multiple of the respective free cash flow and Tobin's Q figure (Lang et al. 1991). Second, we constructed a dummy variable which splits the going private and control sample along the median in respect of the observed free cash flow and Tobin's Q values. Companies above the first variable's median and below the second one are coded "1," i.e. firms with above average unused liquidity but below average investment opportunities with a positive net present value. As the separating force of the two interaction measures is limited, we have excluded the variables from our presented analysis.

[108] Since German tax legislation differs from that of the US, the relevance of this relationship is unclear.

[109] Alternatively, the tax rate was applied instead, but the results did not show any difference.

[110] We have excluded the number of holders from our further analysis, because the separating force of the variables is limited.

Since the hypothesis regarding the decreasing benefits of a stock market listing covers several arguments, it will also be measured by a wider range of variables. In order to cover the relative costs of the quotation in relation to the company size, we use different size proxies like the sales, total assets, the book and market value of the company's equity position, and the number of employees. Whether the going private sample is marked by slow growth in the years before the PTP will be analyzed on the basis of the sales figure's growth rates and that of the firm's work force for the years t-1 to t-3. In addition, the growth values' respective geometric means will be applied.

A potential systemic undervaluation of the going private sample, as expressed in our fifth hypothesis, will be measured by the market capitalization to book value ratio, as well as the price-earnings and the price-sales multiple. The assumption that PTPs tend to take place in industries with low prospective growth rates and value creation potential is closely associated with the undervaluation. This can be illustrated by a rather low price-earnings multiple, which could indicate little future earnings potential. We apply the EBITDA margin and the return on capital ratio (ROCE) as other variables for the sample companies' productivity. A comparatively low efficiency and productivity could explain the undervaluation and the need for restructuring.[111] [112]

The weekly trading volume mean in the calendar year prior to the PTP and the control sample's reference date allow us to analyze the relationship between secondary market liquidity and the PTP probability. We expect a negative link between the two variables.

[111] The studies by Kim and Lyn (1991), Denis (1992), Rawashdeh (1994), Rao et al. (1995), and Halpern et al. (1999) find evidence that supports this negative relationship between profitability and the PTP probability.

[112] Financial sponsors' target firms specifically show a profitable operating business but low valuations. In order to examine this relationship more closely, we constructed a dummy variable and an interaction variable (not reported). The dummy variable takes the value "1" for companies with a ROCE above the respective sample median and, simultaneously, a market-to-book ratio below the median. The interaction variable is defined as the multiple of the EBITDA margin and the market-to-book ratio. However, the two variables did not have any significant influence on the decision to conduct a PTP.

In order to test the *dividend hypothesis*, we use the dividend yield. The studies by Rao et al. (1995) and Carroll et al. (1988) have found higher dividend yields or payout ratios with regard to US PTPs.[113]

4.3.3 Sample Characteristics

In order to characterize the firms of our two samples, table 4-1 provides descriptive statistics of the most important key variables used.[114]

We can see that the going private sample is made up of small firms with average total assets of EUR 242 million and average sales of EUR 325 million. The average market capitalization of just EUR 109 million presents a similar picture when compared to values of EUR 219 million, EUR 245 million, and EUR 85 million in respect of the "public company" sample.[115] The figures are also higher compared to the earlier study by Zillmer (2003), which indicates that especially larger firms opted for PTP transactions in later years. This could be a sign of financial sponsors' increasing activity in the German market. From an international point of view, the German going private sample appears to comprise relatively smaller firms.[116]

The PTP sample is marked by slow, or even negative, growth rates of, respectively, 2 percent and -2 percent with regard to total sales and number of employees. This compares to 9 percent and 2 percent for the control sample. Accordingly, the values of the PTP sample can be regarded as low both in absolute and relative terms. This could confirm our hypothesis regarding PTP transactions mainly involving slowly growing, stagnating, or even shrinking companies. The average weekly trading volume of just 2,439 PTP shares, compared to that of 17,313 control sample shares, is consistent with our assumptions of low trading in PTP shares before going private. Nevertheless, the valuation, measured by the market-to-book ratio and the price-earnings multiple,

[113] We also included the payout ratio in our analysis (not reported), but could not find any significant influence on the PTP probability.
[114] In our descriptive analysis, we concentrate on the median instead of the mean, as the distribution of most variables shows a considerable skewness.
[115] Initially, it is surprising that the going private companies tend to be larger than the control firms in terms of assets, sales, and market capitalization. However, this is probably due to our sampling technique regarding the control sample and its inherent size restrictions as mentioned above.
[116] In respect of the US market, compare the studies by Denis (1992) and Lehn and Poulsen (1989). However, the different observation periods are a limiting factor in any comparison.

is inconclusive regarding the going private sample's potential systematic undervaluation.

The free cash flow figures are lower compared to those of the control sample, which clearly contradicts Jensen's (1986) theory. Our observed values are, however, comparable to the figures in the study by Zillmer (2003).

From a relatively low leverage of 17 percent in terms of total assets, it is possible to conclude that the PTPs could be financed by means of additional debt, which should bring the going private companies' capital structure more in line with the public company control sample.

In the PTP companies, both the ROCE and the EBIT variation coefficient value are lower. This could confirm our assumption that PTP transactions are undertaken by firms with low profitability but rather stable operative earnings, which reduces the risk of any additional debt financing, thereby decreasing its risk premium.

The free float figure does not differ significantly in the two samples, but is relatively low at the PTPs' 24 percent and the control group's 27 percent. Despite the stock market listing, large blockholders seem to still control both samples. This could explain why the *free cash flow hypothesis* does not seem to apply to the German market regarding corporate control: these blockholders have strong incentives to monitor the management closely and the power to execute strategic changes (Shleifer and Vishny 1986). This is especially true in illiquid stock markets, as the investors cannot exit a company within a short timeframe if the corporate performance is weak (Maug 1998).

In order to obtain a better understanding of the going private sample's industry background, we have classified the PTP companies according to the FTSE Global Classification System and their core business.

The table 4-2 shows a broad spectrum of industries and sectors with an emphasis on manufacturing businesses. The producers of capital goods are the largest single group. However, this focus reflects the overall distribution of small and medium-sized companies in Germany. In comparison to Germany's stock market indices, S-DAX and M-DAX, the focus on manufacturing sectors and

machinery is in line. However, the going private distribution shows relatively more companies in the food producing sectors than the indices do. Generally speaking, the industry allocation mainly shows sectors that can be considered mature and slow growing (Eisele et al. 2003). This is compliant with our observed growth rates regarding the total sales and number of employees in table 4-1. As discussed above, these industries show relatively low capital needs, which can be fulfilled by cheaper funding alternatives. Additionally, such industries tend to show strong and relatively stable cash flows, which strengthen their ability to refinance internally and decrease their need to turn to external capital markets.

An analysis of the investor types who took the sample companies private could provide further information about their motives and characteristics. We therefore clustered the sample according to the investor categories: strategic investors, financial investors, and traditional owner buyout.[117] By means of this approach, we were able to identify 40 transactions led by strategic investors, nine by financial sponsors, and three owner buyouts.[118] As the number of typical owner buyouts is very low in Germany, the three sub-samples' descriptive statistics are presented in the Appendix.

Although the number of transactions in which financial sponsors are involved as investors is still limited in our sample, we examine the differences between the two groups with the help of univariate test statistics. The results are shown in table 4-3. The companies which were taken private by strategic investors tend to be smaller in size. Their asset value is EUR 199 million compared to the financial sponsor group's of EUR 488 million. A similar picture emerges for the equity book value of just EUR 39 million (EUR 119 million) and the sales figure of EUR 290 million (EUR 668 million). However, only the number of employees –1,100 – is significantly lower than that of the financial buyouts (5,400).

[117] We follow the definition that strategic investors have an operating business and their principal goal is to generate synergies by combining the target and the existing operations. They do not have a clear exit strategy. Financial investors, in contrast, have no operating business but funds that they invest in firms, which may have a different industrial background. They follow a clear, short to mid-term exit strategy.

[118] The classification of transactions according to financial investors and owner buyouts is sometimes difficult, as external investors also tend to hold controlling interest in a company more than a year before the actual PTP.

Moreover, the strategic investor sub-sample shows significantly lower growth rates in the year preceding the PTP. This might explain why strategic buyers do not envisage short-term value generation. This argument is supported by the observation that beside the slow growth in sales, the companies also demonstrate a lower return on capital than the reference group does. Financial investors might want to make these companies more profitable, while strategic buyers might have their eye on operating synergies with their companies. However, we do not find any reliable evidence that would characterize the PTP companies as typical restructuring candidates. This observation is similar to the discussion by Sinnenberg (2005).

We find some evidence that the *free cash flow hypothesis* might only apply to financial buyouts. These companies show higher cash flow figures, measured by free cash flow and EBITDA, and have a lower Tobin's Q proxy. However, only the former two variables differ significantly from those in the strategic buyer sample.

4.4 Empirical Results of Univariate and Multivariate Analysis

4.4.1 Univariate Test Statistics

The observed sample's characteristics and differences will now be analyzed by means of univariate test statistics. The table 4-4 shows the results of the Wilcoxon rank-sum test.[119] This test statistic allows a better control of potential outliers because it relies on the sample median instead of the mean.[120] As the sales growth measures are marked by a very high standard deviation, we winsorized them on the 95 percent quantile.[121]

As already mentioned above, the univariate analysis also clearly shows that the going private sample is marked by slow growth in sales and number of employees. The sales growth rates range between 6 percent and 10 percent with regard to the median control company, which is considerable above the observed

[119] The results are qualitatively identical if a t-test is applied.
[120] Furthermore, a non-parametric test statistic is better suited for our study, as the assumption of the variables' normal distribution has to be rejected.
[121] The findings are not affected if the variable is winsorized on the 99 percent quantile.

rates of the PTP sample. Accordingly, statistically, the sales growth rates' geometric means in the second and third year before the PTP are significantly higher at the 5 percent and 10 percent level. The sample shows a high heterogeneity in the work force growth rates, but the median PTP firm has a constant number of employees in the second year directly before the going private, even reducing this number it in the third year. The employee growth variable two years before the transaction is thus significantly lower than the control group's rate at the 10 percent level. Although the standard deviation in the sample is high, we maintain that going private companies are not growth companies, but merely keep their sales figures constant. The development of the work force clearly shows that these companies are no longer growing. This speaks in favor of our hypothesis regarding a stock market quotation's decreasing benefits.

Moreover, the profitability and productivity in the year before the PTP are slightly lower compared to those of the control sample. The variables of the EBITDA margin and the return on capital employed are significantly lower at the 10 percent level. The PTP sample's median EBITDA margin stands at 8 percent, while the "public company" group has a margin of 9 percent. The median return of just 4.2 percent compares unfavorably with the 6.5 percent of the reference group. However, future profitability in the form of the Tobin's Q variable is identical at a median level of 0.73. This might indicate that there is a prospective value generation potential in the companies but that this potential should be raised outside the public markets. Therefore, our hypothesis regarding the stock market listing's decreasing benefits cannot be rejected at this point.

The difference between the two groups' weekly trading volume before the PTP is highly significant at the 1 percent level. A closer investigation of the going private sample's data shows that a significant number of companies tend to have no trading for several weeks and therefore have no price setting. The limited liquidity restricts capital markets' other main functions as mentioned above, thereby making a further stock listing unattractive. Our hypothesis regarding the limited capital market efficiency can therefore be confirmed from a univariate point of view. A limiting factor in our observation and assessment is the

considerable variability in the weekly trading volume, which makes the sample very heterogeneous.

Also our hypothesis regarding the further leverage potential can be confirmed on a univariate basis, as the median going private leverage of 17 percent is significantly lower than the control figure of 26 percent. Accordingly, we maintain that the initiators of the transaction regard PTPs' leverage ratio and, consequently, their capital structure as inadequate; therefore, the taking private aligns these with the respective risk profile. This adjustment is expected to create value for the post-transaction shareholders.

We were unable to find any evidence in favor of the postulated *free cash flow hypothesis*. The free cash flow figure is lower for the going private sample and there is no significant difference in the Tobin's Q figure.

Also our *dividend hypothesis* has to be rejected from a univariate point of view, as the control group shows a significantly higher dividend yield. This observation is partly due to numerous PTP companies not paying any dividends at all, which might be explained by their slow growth and low profitability.

4.4.2 Univariate Test Statistics of Subdivided Going Private Samples

The considerable heterogeneity in our sample might be a result of changing PTP motives over time. We therefore divide our overall observation period into two sub-samples. The figure 4-1 shows the chronological distribution of the going private sample and the announcement dates of still pending taking private transactions.

Subsequent to the introduction of the squeeze-out legalization in Germany in 2002, companies literally rushed away from the public markets. Of our overall 52 observations, 12 were completed in 2002. Moreover, the number of PTP appears to be dependent on the overall stock market development. The weak market conditions in 1999 and 2000 specifically led to a large number of going privates.

In order to mirror the evolution of the legislation as a result of the squeeze-out rule, we have divided the overall observation phase into the periods 1996–

2001 and 2002–2004. The table 4-5 shows descriptive and univariate test statistics for the two groups. The first stage consists of 30 transactions and the second of 22 going privates.[122]

The analysis of the size variables clearly shows that from 2002–2004, larger companies opted for a delisting. While in the first period, the median going private firm had total assets of EUR 214 million, a market capitalization of just EUR 50 million, and total sales of EUR 290 million, the later median company shows figures of EUR 320 million, EUR 251 million, and EUR 420 million. The equity's book value paints a similar picture. The first period's total of 1,510 employees compares poorly with the 2,980 of the second group. The trading volume seems to be a function of the low market capitalization as, in the first half, only 2,250 shares were traded weekly in respect of the median company. The second group shows a weekly trading of at least 5,210 shares. This significant difference may be explained by the simplified squeeze out of minorities after 2002, or by financial investors initiating important going private transactions. Both explanations argue in favor of a professionalization of the German PTP market, which Eisele et al. (2003) also support. The strong deviation in the median and mean reveals the strong heterogeneity in size – even within the sub-groups. This supports the conclusion that both small and larger companies are taken private by their owners. We expect this to hold true for the future German market as well.[123]

We find some evidence of the assumed increased information asymmetry in the form of a higher undervaluation of smaller sized companies in the first group. The median market-to-book ratio and price-sales multiple are lower for the first sub-group. The latter variable is significantly different at the 5 percent level. However, the price-earnings multiple shows a contrary relationship.[124]

Moreover, we observe that the first group has significantly lower sales growth rates in the third year before the PTP transaction. However, in the financial year immediately before the going private, the relationship is the reverse

[122] The split between the two time periods is 17 and 22 PTP transactions for the trading volume variable.
[123] Eisele et al. (2003) come to the same conclusion.
[124] Some outliers in terms of the price-earnings multiple distort the analysis.

and the workforce growth does not differ significantly, which precludes any direct conclusion.

The free cash flow figure of the first group is slightly higher than for the second sample, and the Tobin's Q somewhat lower. However, as the variance in the second group is very high and the difference is not significant; any conclusion would be controversial.

Since all other variables do not show any systematic differences, the overall going private sample is representative of our subsequent multivariate analysis, which forms the main body of our study.

4.4.3 Multivariate Analysis

We decided to estimate a logit model by maximum-likelihood, comparable to the one employed in the studies by Lehn and Poulsen (1989) and Weir et al. (2005a; 2005b), for our multivariate analysis. Previous studies had partly used probit models (Rao et al. 1995; Verbeek 2000).[125]

The dependent variable in our model equals zero if the company stays public over the sampling period and one if the company goes private. In order to guarantee the correct use of the logit model, we examined the independent variables for multi-collinearity. Linear dependencies between the explanatory variables with a correlation coefficient of $r > 0.5$ were only observed in respect of the different size proxies. Accordingly, they were not simultaneously included in the logit model. Second, an analysis of the variance inflation factors did not show any signs of multicollinearity (not reported).[126] Thus, multi-collinearity should not constrain our model's separating force and the variables should be free of any significant biases.[127] As only observations that have valid data for all the included variables are used in the model, the number of observations in the different specifications of the logit model varies. However, we could not find structural

[125] Using a probit model instead of a logit regression produces qualitatively similar results.

[126] Only the tax variable showed minor collinearity indications and was accordingly not simultaneously included in the multivariate analysis. In a simplified model specification with no collinearity problems, the variable had no significant influence on the PTP probability (not reported).

[127] One observation had to be excluded from the multivariate analysis as it showed outlier characteristics in numerous explanatory variables (using Cook's D).

differences between the overall data set and the reduced sample. Consequently, all model specifications should be feasible and comparable.

We have estimated four different model specifications, which form our core results. The results are tabulated in table 4-6. The first model allows us to test all our postulated hypotheses. The scope of the selected variables is therefore rather broad and partly influenced by the univariate analysis results. However, chapter 4.4.4 illustrates the robustness of our results in respect of alternative model and variable definitions.

The first two models vary only in respect of the inclusion of the weekly trading volume variable in the first specification. Without the VOLUME variable, the data set increases from 101 to 125, as a number of companies' trading volume data are unavailable. Since the first logit model's overall goodness of fit remains relatively poor in the first step, we searched for outliers with the help of Cook's D, which measures the influence of a given data point in the regression analysis (Cook and Weisberg 1982; Long and Freese 2006). Through this approach, we identified seven outlier observations and, accordingly, included an outlier dummy variable in the first model specification. This confirms the rather high heterogeneity in the sample, which we already observed in our univariate analysis above. Moreover, we winsorized the variables VOLUME, SALE1-3, and MARGIN on the 5 percent- and 95 percent quantile in respect of both model specifications.[128] This allowed us to keep the outlier observations in the model and maintain the broad data set.

All four estimated specifications of the logit model show satisfactory economic properties. In terms of the McFadden pseudo-R^2 ratio, the specifications' model fit ranges from 0.050 to 0.104. The Wald test for the null hypothesis of the independent variables' lack of joint influence can always be rejected at the 1 percent level. At first, a very broad variety of variables was included in the model specifications, which should help reflect the wide range of potential company specifications and minimize the risk of an omitted variable bias. Nevertheless, the risk of not identifying a valuable influencing factor, or the

[128] Alternatively, we winsorized the variables on the 1 percent and 99 percent quantile, which did not change the results.

failure to operationalize such a factor, cannot be fully excluded. For example, one can assume that the degree of information asymmetry regarding large diversified conglomerates is especially high. In this context, a PTP might help reorganize the corporation in private through the spin-off of non-core activities and the refocusing of the remaining operations. The Herfindahl index is a good proxy to measure the extent of information asymmetry (Opler and Titman 1993). However, due to a lack of data on the "dead" companies, we were not able to calculate the index value of the whole sample and therefore did not include this Herfindahl index in our analysis. Nevertheless, as discussed above, the linear correlation between our variable data set is minimal, which should also hold true for any unobserved variables. This should help keep any adverse effects at a minimum.

In a multivariate context, the statistical significance of the variables in our univariate analysis changes partly. The geometric mean of the growth in total sales in the three years before the PTP transaction is no longer significant. The first model shows significant statistical influence on the probability of a PTP in 5 of 11 variables included in the model, i.e. the leverage ratio (statistical significance at 5 percent), the current valuation of the target company in the form of the market-to-book ratio (statistical significance at 1 percent), and the profitability measured by the return on capital employed (statistical significance at 10 percent). Also the ratio of net working capital to total assets, which should help measure the company's liquidity position, gains statistical significance at the 5 percent level. In addition, the variable of the weekly trading volume is significant at 5 percent in the first model and increases the respective model specification's goodness of fit, while the marginal effect on the PTP probability is negligible.

By excluding the trading volume variable in the second model specification, we have a broader data set of 125 observations compared to 101 in the first logit model. This allows us to drop the outlier variable as well. The statistical significance in this specification is reduced to three out of nine included explanatory variables. The leverage ratio is now even significant at the 1 percent level. The market-to-book ratio is now only significant at 5 percent, but the return on the capital employed improves its significance at the 5 percent level.

Increasing the leverage by one unit, decreases the probability of a PTP by 1.070, with a standard error of 0.364 in the first model specification. With a parameter of 1.112 and a standard error of 0.305, the relationship is even stronger in the second model. That is, the higher the leverage ratio of the company, the lower the probability that it will become a target for PTP. Since the effect on the going private decision is very strong, this relationship confirms our *leverage hypothesis* (H2). However, the other proxies that helped us operationalize the leverage potential hypothesis – variance in earnings and the company's tax burden – gain no significance in the analysis (not reported). A low leverage is therefore a significant factor in the decision to go private, which adjusts to a more optimal level. In this sense, the right leverage level will be strongly influenced by the company's current risk profile and, consequently, by the cost of debt.

All three measures of the hypothesis regarding a stock market quotation's decreasing benefits (H4) show the right signs of the coefficients. With a marginal effect of -0.613, the EBITDA margin has the strongest influence on the probability of a PTP in a simplified model 3, which removes insignificant explanatory variables. However, the effect is not statistically significant in the first and second model specification. The return on the capital employed seems to have a minor, but statistically significant, effect at -0.007 (-0.008/-0.005). As the parameter of the sales growth rates' geometric mean at least has the right sign in all three model specifications, hypothesis H4 is confirmed in the multivariate environment. The going private companies' economic situation has probably changed since the initial IPO, and the stock market listing no longer justifies their inherent direct and indirect costs. In respect of a sample of reverse LBOs, which returned to the capital markets, Muscarella and Vetsuypens (1990) demonstrated that three-fourths of the companies had in the meantime undergone a restructuring to strengthen their profitability. A strategic reorganization is specifically simpler outside the public capital market and without minority shareholders' involvement. Since the risk of delay is minimal in a private context and with a dominant shareholder, we expect the initiators of the PTP transaction to operationally or strategically reorganize the company. However, as discussed above, the going private companies do not qualify as classic restructuring candidates since the debt ratio shows potential for further leverage.

On examining the PTP companies' market valuation, it is clear that undervaluation, measured by the market-to-book ratio, has a marginal effect of -0.028 (-0.020/-0.022) on the probability of a going private. This influence is significant in all three model specifications. Although the effect is only marginal, the weekly trading volume has the right sign and the univariate analysis also supports the assumption of low trading in PTPs' shares the year prior to the taking private. Therefore, also our hypothesis regarding the limited capital market efficiency of PTPs (H5) is confirmed in the multivariate environment. The lower valuation increases the costs of refinancing with the help of the stock market. Capital increases may, however, no longer be placed in the market due to a lack of investor interest. This assumption is supported by the rather mature industry breakdown and the weak trading in PTP shares. Alternatively, company insiders may use the low valuation and their informational advantage regarding the firm's real inner value to buy outsiders out at very attractive terms. This is equivalent to an overreaching of the pre-transaction shareholders by paying too low premiums over the current share price. Eisele and Walter (2003) find evidence that the positive share price effects after the announcement of German PTPs are compensated by induced gains in the company value as well as by the redistribution of wealth between the shareholder groups.

The free cash flow variable's parameter shows the right sign in all three model specifications, but the figures remain insignificant regarding the probability of a taking a company private. The liquidity ratio, measured by the working capital to total assets, is statistically significant in the first and third logit model, but has the opposite sign, as postulated by our *free cash flow hypothesis* (H1). It seems that a better liquidity situation decreases the likelihood of going private. In the fourth model, we replaced the free cash flow variable with the Tobin's Q measure, but also this alternative explanatory variable shows no significant influence on the going private decision. Therefore, we have to dismiss the *free cash flow hypothesis* (H1), also in the multivariate context.[129] The agency conflict described by Jensen does not appear to be severe enough in the German corporate governance system to justify a PTP. On the other hand, the relationship of the liquidity figure could support the *cost saving hypothesis* (H4). Companies could

[129] The study by Zillmer (2003) comes to the same conclusion.

try to save their listing and other associated costs in order to bolster their decreasing liquidity.

Hypothesis H3 regarding PTPs' greater ownership concentration has to be rejected, also in the multivariate context. The free float explanatory variable gains no significance in the analysis (models 1, 2 and 4) and has a positive marginal effect, which is contrary to our hypothesis. The study by Zillmer (2003) comes to a different conclusion, which might be due to the differing sampling approach in respect of the control group. Accordingly, the coordination costs of a delisting seem to play no overruling role regarding taking private considerations. The successful introduction of the squeeze-out regulation in Germany might have added to this observation.

Similarly, the assumption by H6 regarding PTPs paying higher payouts in the form of dividends, which external shareholders want to collect in the private sphere, cannot be confirmed. The dividend yield variable gains no statistical significance in the analysis and shows the opposite sign of the coefficient than expected. However, it may be the other way round and financial investors may want to increase the payout ratio in their favor after the taking private. However, the dividend variables' lack of significance and the liquidity proxy's opposite sign do not indicate any surplus in liquid assets that might be distributed after the going private.

4.4.4 Robustness Checks

We have conducted further analyses to gauge the extent to which the results are robust to alternative model and variable definitions.

First, we reestimated our four main models using robust standard errors. All core results are robust to this alternative model specification. Only the statistical significance is somewhat reduced. Second, a number of alternative growth and size measures were also tested. All were found to be insignificant, which supports our findings in section 4.3. Third, given free cash flow's contended impact on PTP decisions in other studies, we estimated models 1 to 3, using the cash flow measures instead of the free cash flow variable. Also this variable was insignificant, suggesting, that the *free cash flow hypothesis* plays no role in

German PTPs. Fourth, we estimated the logit models by replacing the market-to-book ratio with alternative valuation measures, i.e. the price-earnings and price-sales ratio. Neither measure was found to be significant, which partly challenges our hypothesis regarding the limited capital market efficiency. However, both explanatory variables show the correct signs of the coefficients, which definitely supports our hypothesis of a systematic undervaluation of PTP companies. Accordingly, our core results appear to be robust.

4.5 Conclusion

The table 4-7 provides an overview of the main findings of our study. The aim of this study was to examine the characteristics of going private companies in Germany and the possible motives behind such a transaction. With this in mind, we analyzed a hand-collected sample of 52 PTP companies for the period 1996 to 2004 with the help of univariate and multivariate test statistics.

Our findings show that with total assets of EUR 241 million, German going private companies are relatively small in size. However, after 2001, an increasing number of larger companies delisted. This might be due to the increasing activity of financial sponsors in the German capital markets, as their target companies have an average equity book value of EUR 120 million compared to the mere EUR 39 million of those of strategic investors. Financial investors' subdued activity at the beginning of our sampling period may be one explanation why we did not find evidence to support the *free cash flow hypothesis*. Taking firms private with the aim of paying out unused liquidity and cash flow to ex-post shareholders would specifically apply to buyout deals led by financial investors.

We showed that mature sectors, which are marked by slow growth and low capital needs, dominate the going private sample. The PTP companies have very low sales growth figures in the three financial years preceding the taking private.

A very important factor in the going private rationale should be the low trading in the PTP companies' shares. In most cases, we observed consecutive weeks without any price setting. There can be no doubt that the shares' low liquidity has adverse effects on the companies' valuation besides hindering the

capital markets’ correct functioning. The advantage of refinancing through the public capital market is therefore no longer valid for PTPs.

Another central characteristic of the going private companies is their low leverage, measured as the gross debt to total assets. Accordingly, we conclude that the initiators of the transaction regard the ex-ante capital structure as suboptimal and that the taking private will be used to align the debt to assets ratio to the respective corporate risk profile.

Statistically, PTP firms’ low profitability, measured by the return on capital employed, increases the probability of a PTP significantly. The explanatory variable should be partly correlated with the mature industry breakdown. On the other hand, the low profitability supports the idea of the PTP companies’ strategic reorganization and operative restructuring after the taking private. The low EBITDA margin paints a similar picture regarding the value generation potential through streamlining.

On the whole, we find no evidence of the free cash flow problem in the German corporate governance system. In respect of the respective PTP companies, the PTP phenomenon can be accounted for by a changing corporate life cycle status and a malfunctioning of the public capital markets.

Tables 4

Table 4-1 Descriptive Statistics

	Going private sample				Control sample			
	Median	Mean	StandDev	N	Median	Mean	StandDev	N
ASSETS[a]	241,560	579,121	880,835	52	218,633	451,723	724,502	90
MKTCAP[a]	108,500	327,011	570,311	52	84,680	274,753	732,893	90
SALE-1	324,811	917,224	1,826,795	52	245,178	570,157	819,751	90
SALE1-3	0.02	0.11	0.41	52	0.09	0.46	1.80	75
EMPLGR-3	-0.02	0.14	0.76	52	0.02	0.11	0.53	87
VOLUME[b]	2,439	92,990	315,342	39	17,313	138,321	549,370	73
FCF[c]	0.22	0.18	0.72	51	0.28	0.12	3.96	90
LEVERAGE	0.17	0.18	0.17	52	0.26	0.27	0.20	90
MKTBOOK	1.90	2.11	5.29	52	1.35	8.53	36.50	89
PE[c]	8.94	21.28	61.77	51	11.35	-9.50	206.09	90
RETURN	4.23	-4.17	47.86	52	6.49	8.54	19.94	89
VARIA	0.37	2.51	14.97	52	0.42	0.46	3.71	86
FREEFLOAT	0.24	0.29	0.25	52	0.27	0.31	0.24	90

[a] in '000 EUR

[b] in shares

[c] One outlier observation eliminated in the going private sample

This table contains a selection of key variables for the two samples and shows that the going private sample contains mainly small and medium-sized companies with low growth rates in sales and number of employees. The free cash flow figure is lower for the going private sample, which contradicts the free cash flow hypothesis. ASSETS is the total assets on the balance sheet; MKTCAP the market capitalization; SALE-1 is the total sales in t=-1; SALE1-3 the last three sales growth values' geometric mean; EMPLGR-3 the growth in the number of employees between t=-3 and t=-2; VOLUME measures the average weekly trading volume in the calendar year or reference year before PTP; FCF is the free cash flow; LEVERAGE is the ratio of the gross debt / total assets; MKTBOOK is the ratio of the market capitalization to the equity's book value; PE is the price-earnings multiple; RETURN is return on capital employed, VARIA measures the EBIT's variation coefficient for the years t=-1 to t=-3, FREEFLOAT is defined as the percentage of shares in free float.

Table 4-2 Industry Distribution of Going Private Sample

Industry	N	Share
Chemicals	3	5.8%
Construction and materials	4	7.7%
Electronic and electric	2	3.8%
Engineering and machinery	17	32.7%
Food producers	7	13.5%
Forestry and paper	3	5.8%
Healthcare	2	3.8%
Investments and real estate	2	3.8%
IT hardware and information technology	4	7.7%
Household goods and textiles	6	11.5%
Transport and logistics	2	3.8%
Sum	**52**	**100%**

This table contains an aggregated overview of the industry distribution of the going private sample. The companies were classified with the help of the FTSE global classification system and according to their core business and activities. The industry breakdown shows some similarities with the overall population breakdown of small and medium-sized companies in Germany, but focuses on mature and slow-growing industries like food production and household goods /textiles.

Table 4-3 Univariate Test Statistics of Sample Breakdown between Strategic and Financial Investors

	Strategic investors			Financial investors			Difference	
	Median	Mean	StandDev	Median	Mean	StandDev	Wilcoxon	
ASSETS	199,875	595,443	945,031	487,931	638,529	726,552	-1.084	
EQUITY	38,702	152,253	282,792	119,295	135,935	147,129	-0.852	
MKTCAP	111,200	366,584	637,891	112,000	230,134	216,314	-0.103	
SALE-1	290,175	985,461	2,045,134	667,753	835,232	829,139	-1.239	
EMPL-1	1,107	4,457	8,075	5,439	4,964	2,708	-1.911	*
SALGR-1	0.01	0.00	0.30	0.08	0.96	2.65	-1.679	*
SALGR-2	0.05	0.07	0.31	0.06	-0.03	0.31	0.387	
SALGR-3	0.01	0.15	0.60	0.02	0.06	0.15	-0.439	
SALE1-2	0.03	0.04	0.25	0.06	0.46	1.18	-1.317	
SALE1-3	0.00	0.07	0.30	0.09	0.33	0.76	-1.936	*
EMPLGR-1	0.00	-0.05	0.35	0.04	0.88	2.44	-1.988	
EMPLGR-2	0.00	0.18	0.73	0.02	-0.08	0.28	0.026	
EMPLGR-3	0.00	0.19	0.87	-0.04	-0.04	0.05	1.368	
VOL	2,348	119,112	356,697	5,501	7,243	5,905	-0.853	
FCF	0.18	-3.77	24.38	0.50	0.61	0.41	-2.685	***
CF	0.22	0.17	0.82	0.63	0.72	0.43	-2.659	***
LIQUI	0.22	0.51	1.65	0.27	0.23	0.23	0.000	
TAX	0.03	0.04	0.13	0.02	0.04	0.08	0.232	
DIVY	0.01	0.02	0.02	0.00	0.02	0.03	0.164	
LEVERAGE	0.12	0.17	0.18	0.22	0.20	0.15	-0.723	
MKTBOOK	1.85	2.07	6.01	2.15	2.38	1.31	-1.007	
PRISALE	0.39	2.02	5.12	0.20	0.29	0.23	1.782	*
PE	4.91	-310.26	2050.99	21.01	57.35	85.42	-2.195	**
MARGIN	0.06	0.05	0.45	0.10	0.09	0.04	-0.981	
PROXYQ	0.77	1.13	1.27	0.60	0.64	0.37	1.420	
RETURN	1.38	-8.34	53.95	8.07	8.91	4.55	-1.885	**
VARIA	0.39	3.08	17.07	0.38	0.73	0.65	-0.542	
FREEFLOAT	0.29	0.33	0.26	0.17	0.19	0.19	1.511	

* Significance at 10%; ** Significance at 5%; *** Significance at 1%

[a] in '000 EUR

[b] in shares

The table shows the going private sample's univariate test statistics (Wilcoxon rank-sum test) broken down according to the strategic and financial investors in the PTP transaction. Financial investors' target companies seem to be larger, although the difference is not significant. The strategic sub-sample shows slower growth rates in the year directly before the PTP. The same is true for the return on capital, which, statistically, is significantly lower in the strategic buyer sample. The free cash flow hypothesis might therefore only apply to financial buyouts, as their standardized cash flow figures are significantly higher. ASSETS is the total assets on the balance sheet; EQUITY the book value of the company's equity position; MKTCAP the market capitalization; SALE-1 is the total sales in t=-1; EMPL-1 is the number of employees in t=-1; SALGR-1 measures the growth in sales in t=-1; SALGR-2 is the growth in sales t=-2; SALGR-3 the growth in sales in t=-3; SALE1-2 is the last two sales growth values' geometric mean: SALE1-3 the last three sales growth values' geometric mean; EMPLGR-1 the growth in the number of employees in t=-1; EMPLGR-2 the growth in the number of employees in t=-2; EMPLGR-3 the growth in the number of employees in t=-3; VOLUME measures the average weekly trading volume in the calendar year or reference year before PTP; FCF is the free cash flow; CF is a cash flow proxy defined as EBITDA / Equity (book value); LIQUI is defined as the net working capital / total assets; TAX is the ratio of the taxes paid and total equity (book value); DIVY is the dividend yield; LEVERAGE is the ratio of the total debt / total assets; MKTBOOK is the ratio of market capitalization to the equity's book value; PRISALE is the sales multiple of the market capitalization; PE is the price-earnings multiple; MARGIN is the EBITDA margin; PROXYQ the Tobin's Q approximation; RETURN is return on capital employed, LIQUI is defined as the net working capital / total assets; VARIA measures the EBIT's variation coefficient for the years t=-1 to t=-3, FREEFLOAT is defined as the percentage of shares in free float.

Table 4-4 Univariate Test Statistics of entire Sample

	Going private sample			Control sample			Difference	
	Median	Mean	StandDev	Median	Mean	StandDev	Wilcoxon	
SALGR-1 [a]	0.01	0.04	0.17	0.06	0.09	0.19	1.479	
SALGR-2 [a]	0.03	0.04	0.24	0.10	0.08	0.28	1.503	
SALGR-3 [a]	0.02	0.09	0.28	0.07	0.15	0.34	1.584	
SALE1-2 [a]	0.03	0.07	0.20	0.07	0.13	0.23	1.748	*
SALE1-3 [a]	0.02	0.11	0.29	0.09	0.18	0.33	2.501	**
EMPLGR-1	0.00	0.12	1.07	0.00	0.06	0.38	0.959	
EMPLGR-2	0.00	0.13	0.66	0.02	0.14	0.41	1.757	*
EMPLGR-3	-0.02	0.14	0.76	0.02	0.11	0.53	1.593	
VOLUME [b]	2,439	92,990	315,342	17,313	138,321	549,370	2.849	***
FCF	0.22	0.17	21.40	0.28	0.12	3.96	0.275	
CF	0.34	0.28	0.77	0.43	1.10	4.63	1.469	
LIQUI	0.25	0.45	1.46	0.09	0.60	2.65	-1.682	*
TAX	0.03	0.04	0.12	0.03	0.14	0.82	0.347	
DIVY	0.01	0.02	0.03	0.00	0.11	0.32	-0.232	
LEVERAGE	0.17	0.18	0.17	0.26	0.27	0.20	2.465	**
MKTBOOK	1.90	2.11	5.29	1.35	8.53	36.50	-0.838	
PRISALE	0.36	1.62	4.54	0.30	1.63	3.51	-0.356	
PE	8.38	-228.23	1,800.25	11.35	-9.50	206.09	0.254	
MARGIN	0.08	0.06	0.40	0.09	0.13	0.17	1.630	*
PROXYQ	0.73	1.02	1.14	0.73	1.35	2.06	0.068	
RETURN	4.23	-4.17	47.86	6.49	8.54	19.94	1.681	*
VARIA	0.37	2.51	14.97	0.42	0.46	3.71	0.457	
FREEFLOAT	0.24	0.29	0.25	0.27	0.31	0.24	0.730	

* Significance at 10%; ** Significance at 5%; *** Significance at 1%

[a] Data was winsorized on the 95% quantile

[b] in shares

The table shows univariate test statistics (Wilcoxon rank-sum test) on the differences between the going private sample and the control sample. The test statistics show that the going private sample is marked by slow growth in total sales and number of employees. Second, the profitability and productivity, measured by the return on capital and EBITDA margin, are slightly lower. Statistically, there is significantly less trading in the going private sample's shares. Also the leverage, measured as gross debt to total assets, is significantly lower in respect of the PTP companies. We do not find evidence in favor of the free cash flow hypothesis. ASSETS is the total assets on the balance sheet; EQUITY the book value of the company's equity position; MKTCAP the market capitalization; SALE-1 is the total sales in t=-1; EMPL-1 is the number of employees in t=-1; SALGR-1 measures the growth in sales in t=-1; SALGR-2 is the growth in sales t=-2; SALGR-3 the growth in sales in t=-3; SALE1-2 is the last two sales growth values' geometric mean; SALE1-3 the last three sales growth values' geometric mean; EMPLGR-1 the growth in the number of employees in t=-1; EMPLGR-2 the growth in the number of employees in t=-2; EMPLGR-3 the growth in the number of employees in t=-3; VOLUME measures the average weekly trading volume in the calendar year before PTP or reference year; FCF is the free cash flow; CF is a cash flow proxy defined as EBITDA / Equity (book value); LIQUI is defined as the net working capital / total assets; TAX is the ratio of taxes paid and the total equity (book value); DIVY is the dividend yield; LEVERAGE is the ratio of total debt / total assets; MKTBOOK is the ratio of market capitalization to the equity's book value; PRISALE is the sales multiple of the market capitalization; PE is the price-earnings multiple; MARGIN is the EBITDA margin; PROXYQ the Tobin's Q approximation; RETURN is return on capital employed, LIQUI is defined as the net working capital / total assets; VARIA measures the EBIT's variation coefficient for the years t=-1 to t=-3, FREEFLOAT is defined as the percentage of shares in free float.

Table 4-5 Univariate Test Statistics of different Time Periods

	1996 - 2001			2002 - 2004			Difference	
	Median	Mean	StandDev	Median	Mean	StandDev	Wilcoxon	
ASSETS [a]	213,551	379,696	473,496	320,419	851,065	1,200,150	-1.648	*
EQUITY [a]	32,703	109,417	215,937	89,787	191,861	298,944	-2.074	**
MKTCAP [a]	50,270	221,120	445,954	250,570	471,408	690,945	-2.352	**
SALE-1 [a]	290,175	627,227	1,014,908	419,704	1,312,674	2,529,462	-0.815	
EMPL-1	1,512	2,563	2,778	2,979	6,864	10,166	-1.473	
SALGR-1	0.04	0.31	1.48	0.00	-0.03	0.24	1.093	
SALGR-2	0.01	0.00	0.31	0.09	0.12	0.27	-1.278	
SALGR-3	-0.03	0.06	0.27	0.07	0.22	0.76	-1.723	*
SALE1-2	0.03	0.15	0.70	0.06	0.05	0.15	-0.407	
SALE1-3	0.01	0.12	0.49	0.04	0.10	0.28	-0.704	
EMPLGR-1	0.00	0.19	1.41	0.00	0.01	0.17	-0.278	
EMPLGR-2	0.00	0.07	0.52	0.02	0.21	0.81	-0.537	
EMPLGR-3	-0.02	0.01	0.16	0.00	0.32	1.15	-0.861	
VOLUME [b]	2,257	7,565	12,247	5,208	159,000	411,525	-0.991	
FCF	0.26	0.30	0.76	0.09	-7.00	32.85	2.334	**
CF	0.35	0.39	0.79	0.24	0.14	0.74	1.241	
LIQUI	0.19	0.58	1.89	0.25	0.26	0.28	0.037	
TAX	0.02	0.06	0.11	0.03	0.01	0.12	0.593	
DIVY	0.00	0.01	0.02	0.02	0.03	0.04	-1.570	
LEVERAGE	0.19	0.18	0.16	0.15	0.18	0.19	-0.037	
MKTBOOK	1.64	2.49	3.97	2.16	1.60	6.76	-0.871	
PRISALE	0.25	1.06	3.35	0.41	2.39	5.78	-2.000	**
PE	9.85	-402.45	2371.73	3.60	9.35	17.74	0.963	
MARGIN	0.06	0.07	0.15	0.10	0.05	0.59	-0.463	
PROXYQ	0.64	0.87	0.65	0.81	1.22	1.59	-1.111	
RETURN	4.23	-6.78	60.84	2.47	-0.61	20.73	0.871	
VARIA	0.44	0.17	2.53	0.35	5.70	22.73	-0.426	
FREEFLOAT	0.21	0.26	0.23	0.27	0.33	0.28	-0.871	

* Significance at 10%; ** Significance at 5%; *** Significance at 1%

[a] in '000 EUR

[b] in shares

The table shows univariate test statistics (Wilcoxon rank-sum test) for the differences between the going private sample and the control sample for the periods 1996–2001 and 2002-2004. The test statistics show that, in the latter period, bigger companies – in terms of all size variables – opted for PTP transactions. The first period's trading volume is also significantly lower. ASSETS is the total assets on the balance sheet; EQUITY the book value of the company's equity position; MKTCAP the market capitalization; SALE-1 is total sales in t=-1; EMPL-1 is the number of employees in t=-1; SALGR-1 measures the growth in sales in t=-1; SALGR-2 is the growth in sales t=-2; SALGR-3 the growth in sales in t=-3; SALE1-2 is the last two sales growth values' geometric mean: SALE1-3 the last three sales growth values' geometric mean; EMPLGR-1 the growth in the number of employees in t=-1; EMPLGR-2 the growth in the number of employees in t=-2; EMPLGR-3 the growth in the number of employees in t=-3; VOLUME measures the average weekly trading volume in the calendar year before PTP or reference year; FCF is the free cash flow; CF is a cash flow proxy defined as EBITDA / Equity (book value); LIQUI is defined as the net working capital / total assets; TAX is the ratio of taxes paid and the total equity (book value); DIVY is the dividend yield; LEVERAGE is the ratio of total debt / total assets; MKTBOOK is the ratio of market capitalization to the equity's book value; PRISALE is the sales multiple of the market capitalization; PE is the price-earnings multiple; MARGIN is the EBITDA margin; PROXYQ the Tobin's Q approximation; RETURN is return on capital employed, LIQUI is defined as the net working capital / total assets; VARIA measures the variation coefficient of the EBIT for the years t=-1 to t=-3, FREEFLOAT is defined as the percentage of shares in the free float.

Table 4-6 Results and Diagnostics for Alternative Specifications of the Logit Model

	Hypothesis	*(1)* *dF/dx* *(se)*	*(2)* *dF/dx* *(se)*	*(3)* *dF/dx* *(se)*	*(4)* *dF/dx* *(se)*
LIQUI	H1	-0.194 **	-0.052	-0.241 **	-0.206 **
		(0.091)	(0.035)	-(0.703)	(0.089)
FCF	H1	0.035	0.048	0.015	
		(0.026)	(0.040)	(0.166)	
PROXYQ	H1				0.017
					(0.061)
LEVERAGE	H2	-1.070 **	-1.112 ***	-0.969 ***	-1.126 ***
		(0.364)	(0.305)	(0.325)	(0.342)
FREEFLOAT	H3	0.148	-0.027		0.186
		(0.169)	(0.192)		(0.177)
SALE1-3	H4	-0.055	-0.175	-0.121	-0.039
		(0.165)	(0.161)	(0.156)	(0.174)
RETURN	H4	-0.007 *	-0.008 **	-0.005 *	-0.007 *
		(0.004)	(0.004)	(0.004)	(0.004)
MARGIN	H4	-0.609	-0.520	-0.613 *	-0.672
		(0.406)	(0.426)	(0.400)	(0.438)
MKTBOOK	H5	-0.028 ***	-0.020 **	-0.022 **	-0.023 ***
		(0.008)	(0.010)	(0.007)	(0.007)
VOLUME	H5	0.000 **		0.000 **	0.000 *
		(0.000)		(0.000)	(0.000)
OUTLIER		-0.156		0.342 *	-0.167 **
		(0.080)		(0.078)	(0.085)
DIVY	H6	-0.065	-1.228		-0.007
		(0.736)	(0.938)		(0.769)
CONSTANT		2.665 *	1.765 **	2.835 **	2.382 **
		(0.910)	(0.605)	(0.898)	(0.876)
N		101	125	101	101
Pseudo-R²		0.064	0.058	0.104	0.050
Chi²		32.55	29.76	33.92	30.72
Prob		0.0006	0.0005	0.0001	0.0012

* Significance at 10%; ** Significance at 5%; *** Significance at 1%

The table shows Logit maximum-likelihood estimation of the determinants of a going private decision. The dependent variable equals "1" for PTP companies and "0" for the matched control sample. In the first model, a lower leverage, poorer valuation in terms of market-to-book ratio, an inferior return on capital, and a lower liquidity position have a positive effect on the PTP probability. Also the weekly trading volume is significant with the right sign, although the marginal effect is minimal. Excluding the trading volume in the second model specification increases the number of observations and shows the robustness of the results. The third model is estimated without explanatory variables, which proved insignificant in the univariate analysis. This helps to improve the overall goodness-of-fit of the logit model, but does not lead to different results. The fourth model specification includes the Tobin's Q measure instead of the Free Cash Flow variable. This does not change our conclusions either. LIQUI is defined as the net working capital / total assets; FCF is the free cash flow; PROXYQ the Tobin's Q approximation; LEVERAGE is the ratio of total debt / total assets; FREEFLOAT is defined as the percentage of shares in the free float; SALE1-3 is the last three sales growth values' geometric mean; RETURN is the return on capital employed, MARGIN is the EBITDA margin; MKTBOOK is the ratio of market capitalization to the equity's book value; VOLUME measures the average weekly trading volume in the calendar year before PTP or reference year; OUTLIER is a dummy variable for outliers by means of Cook's distance statistic; DIVY is the dividend yield. Coefficients are reported as marginal effects for all continuous variables, as a discrete change of the OUTLIER dummy variable from 0 to 1. Standard errors are reported in parentheses. The *Pseudo-R^2* reported is the McFadden (1973) measure. The asymptotic *Chi^2-Wald statistic* tests the hypothesis that all parameters in the model are simultaneously equal to zero. *Prob* denotes the significance level of the *Chi^2* statistic.

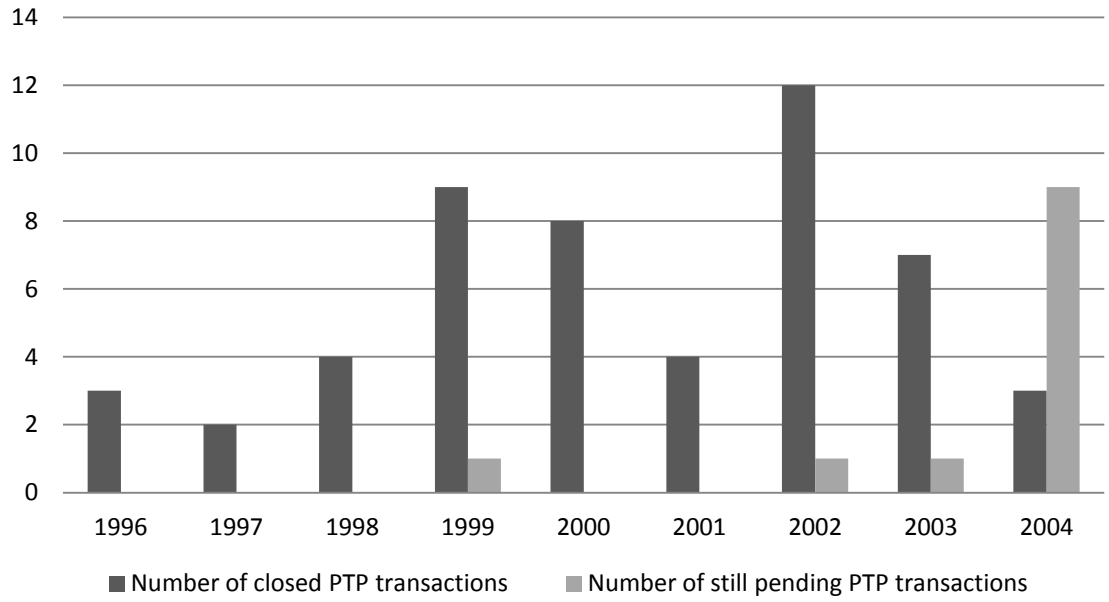
Table 4-7 Overview of Findings

Hypothesis	*Assumed relationship*	*Observed relationship - univariant*	*Observed relationship - multivariate*	*Decision on hypothesis*
H1: Free cash flow	positive	insignificant	insignificant	reject
H2: Leverage potential	negative	negative	negative	accept
H3: Ownership concentration	negative	insignificant	insignificant	reject
H4: Decreasing benefits of a stock market quotation	negative	negative	negative	accept
H5: Limited capital market efficiency	negative	negative	negative	accept
H6: Dividend payments:	positive	insignificant	insignificant	reject

The table shows the observed relationship between the individual hypotheses derived from the literature and the probability of a PTP, the observed relationship in the univariate and multivariate tests, and the final decision regarding the validity of the hypothesis.

Figures 4

Figure 4-1 The PTP Transactions of over time (closing year or announcement year)



Appendix 4

Appendix 4-1 Description of Variables

Name of Variable	*Definition*
Cash flow (CF)	EBITDA / Equity (Book Value)
Dividend yield (DIVY)	Dividend per share*100 / Share price at fiscal year end
EBITDA margin (MARGIN)	EBITDA / Sales
Employee growth (EMPLGR-1, EMPLGR-2, EMPLGR	Employee growth figures in FY t-1, t-2 and t-3
Employees (EMPL-1)	Average number of employees
Equity (EQUITY)	Book value of equity
Free cash flow (FCF)	(EBITDA - Net tax expense - Dividends paid) / Equity (Book Value)
Free float (FREEFLOAT)	Free float of shares outstanding in %
Leverage (LEVERAGE)	Total debt / Total assets
Liquidity (LIQUI)	Net working capital / Total Assets
Market capitalization (MKTCAP)	Number of outstanding shares * share price at fiscal year end
Market to Book ratio (MKTBOOK)	Market capitalization / Equity (Book Value)
Mean of sales growth (SALE1-2, SALE1-3)	Geometric mean of last two or three sales growth figures
Payout ratio (DIVQ)	Dividends paid / Net income
Return on capital employed (RETURN)	Net income / (Equity incl. Minorities + total net debt + provisions)
Sales (SALE-1)	Total sales
Sales growth (SALEGR-1, SALEGR-2, SALEGR-3)	Sales growth figures in FY t-1, t-2 and t-3
Sales multiple (PRISALE)	Market capitalization / Sales
Taxes paid (TAX)	Taxed paid / Equity (book value)
Tobin's Q (PROXYQ)	(Market Capitalization + Debt) / Total Assets
Total assets (ASSETS)	Book value of total assets
Trading volume (VOLUME)	Average weekly trading volume in the calendar year before PTP or reference year
Variance in EBIT (VARIA)	Standard deviation of EBIT (t-1 to t-3) / Mean of EBIT (t-1 to t-3)

Note: If not otherwise stated, figures are as of the financial year before the PTP (FY t=-1) or the the control sample's reference year

Appendix 4-2 Overview of Hypotheses and Operationalization

Hypothesis	*Variables*	*Assumed relationship to PTP probability*
H1: Free cash flow	FCF CF LIQUI TOBIN'S Q	positive
H2: Leverage potential	LEVERAGE VARIA TAX	negative positive
H3: Ownership concentration	FREEFLOAT HOLDER	negative
H4: Decreasing benefits of a stock market quotation	SALE-1 ASSETS EQUITY MKTCAP EMPL-1 MARGIN RETURN SALEGR-1 to -3 SALE1-2, SALE1-3 EMPLGR -1 to -3	negative
H5: Limited capital market efficiency	VOLUME MKTBOOK PRISALE PE	negative
H6: Dividend payments	DIVY	positive

The table shows the different hypotheses derived from the literature, the operationalization of the individual hypotheses through a set of variables and the assumed relationship between the value of the variables and the PTP probability.

Appendix 4-3 Investor Breakdown of Going Private Sample

	Strategic investors				Financial investors				Owner Buyout			
	Median	Mean	StandDev	N	Median	Mean	StandDev	N	Median	Mean	StandDev	N
ASSETS [a]	199,875	595,443	945,031	40	487,931	638,529	726,552	9	203,939	183,267	42,487	3
EQUITY [a]	38,702	152,253	282,792	40	119,295	135,935	147,129	9	68,279	63,301	12,799	3
MKTCAP [a]	111,200	366,584	637,891	40	112,000	230,134	216,314	9	36,460	90,003	119,812	3
SALE-1 [a]	290,175	985,461	2,045,134	40	667,753	835,232	829,139	9	261,436	253,361	59,798	3
EMPL-1	1,107	4,457	8,075	40	5,439	4,964	2,708	9	2,057	1,647	807	3
SALGR-1	0.01	0.00	0.30	40	0.08	0.96	2.65	9	0.00	0.03	0.06	3
SALGR-2	0.05	0.07	0.31	40	0.06	-0.03	0.31	9	-0.02	0.02	0.09	3
SALGR-3	0.01	0.15	0.60	40	0.02	0.06	0.15	9	0.03	0.05	0.12	3
SALE1-2	0.03	0.04	0.25	40	0.06	0.46	1.18	9	0.04	0.03	0.04	3
SALE1-3	0.00	0.07	0.30	40	0.09	0.33	0.76	9	0.05	0.03	0.06	3
EMPLGR-1	0.00	-0.05	0.35	40	0.04	0.88	2.44	9	0.00	0.01	0.06	3
EMPLGR-2	0.00	0.18	0.73	40	0.02	-0.08	0.28	9	-0.06	-0.04	0.05	3
EMPLGR-3	0.00	0.19	0.87	40	-0.04	-0.04	0.05	9	-0.02	-0.02	0.04	3
VOLUME [b]	2,348	119,112	356,697	30	5,501	7,243	5,905	7	1,271	1,271	244	2
FCF	0.18	-3.77	24.38	40	0.50	0.61	0.41	9	0.25	0.16	0.52	3
CF	0.22	0.17	0.82	40	0.63	0.72	0.43	9	0.45	0.49	0.14	3
LIQUI	0.22	0.51	1.65	40	0.27	0.23	0.23	9	0.19	0.23	0.11	3
TAX	0.03	0.04	0.13	40	0.02	0.04	0.08	9	0.07	0.06	0.06	3
DIVY	0.01	0.02	0.02	40	0.00	0.02	0.03	9	0.06	0.09	0.07	3
LEVERAGE	0.12	0.17	0.18	40	0.22	0.20	0.15	9	0.23	0.26	0.06	3
MKTBOOK	1.85	2.07	6.01	40	2.15	2.38	1.31	9	1.24	1.85	1.10	3
PRISALE	0.39	2.02	5.12	40	0.20	0.29	0.23	9	0.14	0.30	0.38	3
PE	4.91	-310.26	2050.99	40	21.01	57.35	85.42	9	9.31	8.76	8.01	3
MARGIN	0.06	0.05	0.45	40	0.10	0.09	0.04	9	0.11	0.12	0.04	3
PROXYQ	0.77	1.13	1.27	40	0.60	0.64	0.37	9	0.50	0.70	0.57	3
RETURN	1.38	-8.34	53.95	40	8.07	8.91	4.55	9	11.73	12.14	7.99	3
LIQUI	0.22	0.51	1.65	40	0.27	0.23	0.23	9	0.19	0.23	0.11	3
VARIA	0.39	3.08	17.07	40	0.38	0.73	0.65	9	0.22	0.26	0.14	3
FREEFLOAT	0.29	0.33	0.26	40	0.17	0.19	0.19	9	0.03	0.07	0.07	3

* Significance at 10%; ** Significance at 5%; *** Significance at 1%

[a] in '000 EUR

[b] in shares

The table shows the going private sample's descriptive statistics according to the type of investor in the PTP transaction. While the size of owner buyouts and strategic buys differs only marginally, financial investors' median target company is considerably larger in terms of all size variables. ASSETS is the total assets on the balance sheet; EQUITY the book value of the company's equity position; MKTCAP the market capitalization; SALE-1 is total sales in t=-1; EMPL-1 is the number of employees in t=-1; SALGR-1 measures the growth in sales in t=-1; SALGR-2 is the growth in sales t=-2; SALGR-3 the growth in sales in t=-3; SALE1-2 is the geometric mean of the last two sales growth values: SALE1-3 the last three sales growth values' geometric mean; EMPLGR-1 the growth in the number of employees in t=-1; EMPLGR-2 the growth in the number of employees in t=-2; EMPLGR-3 the growth in the number of employees in t=-3; VOLUME measures the average weekly trading volume in the calendar year before PTP or reference year; FCF is the free cash flow; CF is a cash flow proxy defined as EBITDA / Equity (book value); TAX is the ratio of the taxes paid and total equity (book value); DIVY is the dividend yield; LEVERAGE is the ratio of the total debt / total assets; MKTBOOK is the ratio of the market capitalization to the equity's book value; PRISALE is the sales multiple of the market capitalization; PE is the price/earnings multiple; MARGIN is the EBITDA margin; PROXYQ the Tobin's Q approximation; RETURN is return on capital employed, LIQUI is defined as the net working capital / total assets; VARIA measures the EBIT's variation coefficient for the years t=-1 to t=-3, FREEFLOAT is defined as the percentage of shares in free float.

Appendix 4-4 Details of the Going Private Sample

No.	Target company	Investor	Type	Announcement	Delisting
1	A. Friedr. Flender	Citicorp. Venture Capital	Finan. investor	20-Oct-00	12-Mar-01
2	Aesculap	B. Braun Melsungen	Strateg. investor	01-Mar-96	17-Mar-97
3	Allweiler	Constellation Verwaltungs GmbH & Co.	Strateg. investor	2002	14-Oct-03
4	ATB Antriebstechnick	Gesellschaft des Bundes für Industriepolitische Maßnahmen	Strateg. investor	1999	16-Oct-02
5	Barmag	W. Schlafhorst AG & Co.	Strateg. investor	2002	15-Aug-03
6	BBG-Beteiligungs AG (ehemals Frankfurter Bankgesellschaft)	Rudolf August Oetker	Strateg. investor	24-Apr-02	29-Aug-02
7	Brauerei Cluss	Dinkelacker AG	Strateg. investor	12-Nov-98	19-Mar-00
8	CAA AG	Harman Becker Automotive Systems	Strateg. investor	05-Sep-02	10-Oct-02
9	Campina (Suedmilch AG)	Campina Malkunie BV	Strateg. investor	1999	14-Apr-00
10	Computer 2000	Tech Data Germany AG	Strateg. investor	26-Feb-99	16-Jul-99
11	Concept!	OgilvyOne worldwide GmbH & Co. KG (WPP Group)	Strateg. investor	28-May-02	16-Oct-02
12	Duewag	Siemens	Strateg. investor	1999	01-Aug-03
13	Edscha	Carlyle Group	Finan. investor	2003	29-Jan-04
14	Ezwo Computervertriebs AG	-	Strateg. investor	1998	10-Jan-01
15	FAG Kugelfischer	Ina Holding Schaeffler KG	Strateg. investor	30-Oct-02	18-Dec-03
16	FPB Holding (Feldmuehle Nobel AG)	Stora Enso	Strateg. investor	2000	22-Oct-01
17	Friedrich Grohe	BC Partners	Finan. investor	21-Jun-99	30-Mar-01
18	GAH Anlagentechnik	GAH Beteiligungs AG (Tochter Dt. Beteiligungs AG)	Finan. investor	01-Nov-98	13-Nov-98
19	Gardena	Industri Kapital	Finan. investor	12-Sep-02	16-Jan-03
20	Gerresheimer Glas	Investcorp / JPMorgan	Finan. investor	13-May-03	06-Jun-03
21	Gestra	Foxboro Eckardt GmbH	Strateg. investor	08-Mar-97	28-Jul-97
22	Hamburger Hochbahn	HGV (Hamburger Gesellschaft für Vermögens- u. Beteiligungsverwaltung)	Owner buyout	04-Jul-03	28-Oct-03
23	Honsel	Carlyle	Finan. investor	1999	27-Oct-99
24	Kamps	Barilla	Strateg. investor	25-Jun-05	09-Apr-04
25	Kiekert	Permira	Finan. investor	25-Apr-02	15-Jul-02
26	KM Europa Metall	Finmetall Investitions GmbH & Co. KG	Strateg. investor	1999	01-Mar-01
27	Koepp	Dt. Vita Polymere GmbH	Strateg. investor	15-Jul-00	30-Jun-00
28	Lambda Physik	Coherent Holding GmbH	Strateg. investor	06-May-04	25-Jan-05
29	Macrotron	Ingram Micro. Inc.	Strateg. investor	30-May-99	28-Jan-03
30	Michael Weinig AG	Weinig International AG	Owner buyout	16-Jul-02	21-Oct-02
31	MONACHIA Grundstücks-Aktiengesellschaft	Bayerische Städte- und Wohnungsbau GmbH (Doblinger Group)	Strateg. investor	08-Feb-02	08-Aug-02
32	MTD Products (Gutbrod AG)	MTD Products Inc.	Strateg. investor	1997	13-Jun-97
33	Muehle Rueningen	Werhan Muehlen KG	Strateg. investor	2000	03-Jan-01
34	MVS Miete Vertrieb Service AG	Cottbuser Maschinen- und Stahlbau GmbH	Strateg. investor	15-Oct-04	27-Dec-04
35	Otavi Minen	Silver & Baryte Ores Mining Co. S. A.	Strateg. investor	2000	04-Sep-02
36	Pfersee-Kolbermoor	Wissner Dienstl. GmbH Plauen & Co. KG	Strateg. investor	05-Sep-96	17-Feb-97
37	Radeberger	Dr. August Oetker KG	Strateg. investor	18-Aug-03	13-Aug-04
38	Revell	Revell-Monogram Inc.	Strateg. investor	1996	12-Jul-96
39	Rolf Benz	LoCom GmbH	Strateg. investor	25-May-00	13-Oct-00
40	Rütgers	RAG AG	Strateg. investor	2003	16-Jul-03
41	SAI Automotive AG	Faurecia S.A	Strateg. investor	04-Oct-02	12-Jul-04
42	Schaerf	Samas	Management buy.	01-Oct-99	03-Apr-01
43	Schleicher & Co. International AG	Martin Yale Industries Inc.(Escalade Group)	Strateg. investor	05-May-03	22-Oct-03
44	Schmalbach-Lubeca	Allianz Capital Partners	Finan. investor	2002	19-Nov-02
45	SG Holding AG	Emil-Frey-Gruppe	Strateg. investor	2001	29-Nov-01
46	Steinbeis Temming	Steinbeis Temming GmbH & Co.KG	Owner buyout	2001	31-Dec-03
47	Stinnes	Deutsche Bahn AG	Strateg. investor	2003	12-May-03
48	Stixi	Vogeley Lebensmittelwerk GmbH	Strateg. investor	18-Dec-98	01-Jul-99
49	Systematics	electronic Data Systems Corp	Strateg. investor	2001	17-Oct-02
50	Wayss & Freytag	Beton Groep	Strateg. investor	1999	03-Jan-00
51	Wickrather Bauelemente	Bowater Windows Limited	Strateg. investor	2000	30-Mar-01
52	Zanders Feinpapiere	Metsä-Serla	Strateg. investor	2001	09-Aug-02

5 Summary

(1) Even though it is now more than 50 years since Modigliani and Miller (1958) formulated their irrelevance theorem, capital structure research is still a key cornerstone of corporate financial theory. It encompasses, among other topics, the search for the optimal balance between debt and equity, the adjustment behavior of firms after experiencing shocks to their capital structure, the timing of equity issues by managers, and the choice between public and private equity financing. However, the empirical evidence that is provided in the literature seems partly contradictory, and alternative theories do not explain observed leverage ratios satisfactorily.

(2) The list of possible variables that are likely to affect capital structure choices was reduced to the following "core" determinants: growth, size, tangibility, profitability, industry median debt ratios, and expected inflation. Against the background of the rising importance of debt capital markets for corporate financing and its interconnection with issuer ratings by external rating agencies, capital structure decisions are likely to also be influenced by credit ratings.

(3) Different rating levels are associated with discrete costs (benefits) for the firm: Rating changes may cause alterations to the coupon rate, put rights for investors, loss of access to the commercial paper market, or loss of a contract. Regulatory costs of bond investments by banks, insurance companies, and funds are mainly based on and driven by the respective rating of the security. As credit ratings serve as the main source of information on firm quality, a rating change will inevitably result in discrete changes in a firm's cost of capital. Managers take the credit ratings into account when they consider capital structure because of these direct and indirect costs for the firm.

(4) The *credit rating-capital structure hypothesis* is consistent with both the *trade-off* and the *pecking order theory*. In terms of the former, the rating-dependent costs and benefits are balanced against the traditional costs and benefits proposed by the *trade-off theory*. If the costs (benefits) of different rating levels are material, capital structure choices may deviate from behavior implied by

the *trade-off theory*. Regarding the *pecking order theory*, the relative advantage of debt over equity financing, in terms of asymmetric information costs, may shift if the firm is near an upgrade or downgrade of the corporate rating. In other words, the costs (benefits) associated with credit ratings and therefore with a manager's rating concerns are most material if a firm is near a rating change. Accordingly, the primary testable hypothesis that I considered in this study is that firms that are close to an upgrade or downgrade of the issuer rating prefer equity to debt financing, or issue less net debt relative to net equity, than firms that are not close to a rating change.

(5) The rating outlook and the watchlisting present appealing proxies for measuring the imminence and likelihood of a rating change. Both measures provide more accurate information regarding the future development of a credit rating than previous proxies described in the literature.

(6) The study shows that firms near a rating change, measured by a positive or negative rating outlook, issue 1.8 percent less net debt relative to equity (as a percentage of total assets) than firms that are not near a rating change. The credit rating effect is even economically larger if the credit rating is about to be lowered (-2.1 percent). The measured impact of credit ratings on capital structure decisions is stronger and robust to the inclusion of large debt and equity offerings that those described in previous studies.

(7) We find that the credit rating effect is more pronounced for US firms. Positive outlook firms in the US reduce net debt issuance (relative to net equity) by -1.7 percent; negative outlook firms measure a reduction of -3.6 percent. The negative and statistically significant coefficient of positive outlook firms underlines that the measured credit rating effect bears no relation on any distress arguments. Descriptive statistics show that positive outlook firms have, on average, better credit quality and should, in terms of a distress rationale, issue more net debt. These results show the contrary. Moreover, we find that EMEA firms are not subject to a direct credit rating effect. Credit ratings matter only if large debt and equity offerings are excluded from the analysis. However, the impact of credit ratings on net debt issuance is then comparable to the results of the US sample.

(8) Although S&P's watchlisting is a stronger and more short-term indication of credit rating changes, the credit watch dummy variables have no statistically significant influence on capital structure decisions. The watchlists' very short timeframe makes the measurement on a 12-month basis rather noisy.

(9) Potential changes in broad rating categories (e.g., AA or A) have a comparable economic effect on net debt (relative to net equity) issuance in the year that follows. However, the relationship is only statistically significant if the firm is near a downgrade of a broad rating category (-1.8 percent less net debt relative to net equity).

(10) We find that the borderline between investment and non-investment-grade becomes incrementally more important in managers' capital structure choices. The possibility of losing or obtaining an investment-grade rating has a statistically significant influence on the proportion of net debt to net equity issuance.

(11) Multivariate analysis by rating categories indicates that rating levels that are crucial for gaining access to the US commercial paper market are also invaluable for subsequent net debt (relative to net equity) issuance.

(12) Rating considerations play a central role in a firm's decision to conduct a seasoned equity offering. We find that the probability of an equity issue is positively (negatively) related to a negative (positive) prior rating outlook. However, only the positive outlook's influence (-1.7 percent) is statistically significant in a multivariate analysis. This credit rating effect is economically even stronger than an alternative market timing explanation of seasoned equity offerings, measured by the market-to-book ratio (0.09 percent).

(13) Descriptive statistics indicate that debt and equity offerings of rated firms are often paired, which makes it difficult to draw clear distinctions between the underlying motives. Accordingly, the negative outlook's estimated marginal effect of 1.1 percent is only statistically significant if dual issues (cases of seasoned equity and debt offerings in the same fiscal year) are excluded from the sample.

(14) The importance of credit ratings in managers' capital structure choice is more pronounced when the decision to issue equity is contrasted by the alternative of debt issuance. We find that the likelihood of equity issuance (rather than debt) increases (decreases) by 3.3 (6.1) percent if the issuer credit rating has a negative (positive) outlook prior to the offering. This further supports that the direct rating effect has a significant impact on capital structure decision making.

(15) Deviations from credit rating induced target leverage may be offset by debt and equity issuance as well as reductions (repurchases). The results of a multinomial logistic model suggest that a negative outlook decreases the likelihood of a debt issuance (against a no-transaction alternative), while it increases the probability of a debt reduction. A positive outlook, however, has a statistically significant negative marginal effect on the likelihood of an equity issue. All in all, firms adjust their leverage ratio to the respective rating situation mainly by increasing or reducing their debt position.

(16) We find evidence of both market timing and credit rating concerns in our investigation of the composition of seasoned equity offerings. A prior negative rating outlook increases total offering proceeds (scaled by total assets) by 2.1 percent. There is no credit rating effect in primary proceeds (equity sale of insiders), as fresh equity is needed to bolster credit ratios. The market timing effect on total offering proceeds, measured by the market-to-book ratio, is comparatively stronger with 4.8 percent. A more thorough analysis shows that managers' market timing efforts are based on a lower number of shares offered, but at higher prices. We find that a negative outlook is associated with more shares offered, at lower prices. However, only the former relationship is statistically significant.

(17) The *trade-off theory* helps to explain German public-to-private transactions very well. The results show that German PTP firms emerge from relatively mature industries and are marked by low growth rates and less profitability. Moreover, we find that the going private companies have statistically significant lower leverage ratios before the transaction than the control group. This is completely in line with the *trade-off theory*, which posits higher debt

ratios for mature, cash-cow businesses with few profitable investment opportunities.

(18) We do not find a notable discrepancy between managers and shareholders' interest in the form of a large amount of financial slack in the going private firms (*free cash flow theory*). This suggests that German companies are not taken private to disgorge excess cash to the new shareholders. This phenomenon is likely to be restricted to the US equity market in the 1980s.

(19) The low trading volume of going private companies' shares is another central characteristic of German PTPs. We observed that there was no price setting before a transaction for several consecutive weeks. The reduced liquidity and therefore public capital markets' malfunctioning has adverse effects on the companies' valuation and increases the likelihood of a firm to go private.

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