The Role of Reputation in Corporate Finance: Evidence from Corporate Bonds, Delegated Monitoring, and Corporate Name Changes

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Content

Chapter 1: Introduction

In the last decade, not only during the financial crisis of 2008-09, numerous cases of fraudulent financial actions, managerial opportunism, and (subsequent) bankruptcies resulted in severe losses faced by investors in both debt and equity markets. In many cases large, reputable firms and intermediaries were involved. One encompassing example is Kmart, one of the largest U.S. chains of discount department stores, filing for Chapter 11 bankruptcy protection in 2002. Kmart's board members were accused of misleading shareholders about the firm's financial trouble while allegedly spending large amounts of the company's resources for private benefits such as houses, boats, and trips to Las Vegas. Later on, Kmart's auditor PricewaterhouseCoopers (PWC) was sued for disregarding the firm's financial problems (Bloomberg Business Week, Nov. 21, 2003). Other well known cases of fraudulent financial actions and large bankruptcies include Enron and WorldCom and intermediaries such as Arthur Andersen and Lehman Brothers. Furthermore, the business press has frequently featured articles about the misconduct of reputable intermediaries like Ernst & Young (Bloomberg on December 20, 2010) and Goldman Sachs, which faced lawsuits against them. In the case of Goldman Sachs Group, the bank was accused by the Securities and Exchange Commission and the U.S. government of defrauding its investors in a mortgage deal named Abacus 2007-AC1 (The New York Times on April 29, 2010). Surprisingly, most of the firms are among today's 'most admired companies' according to the annual surveys by the Fortune Magazine. In particular, Goldman Sachs was ranked first among the most reputable banks in both 2010 and 2011. At the same time, 54% of respondents to a global poll of traders, investors, and analysts said they have an unfavorable opinion of Goldman Sachs (Bloomberg on May 12, 2011). However, 78% of the same survey respondents also said that the accusations would either have no effect at all on the bank or would harm its reputation without driving away any customers. The aforementioned examples, in particular the case of Goldman Sachs, suggest that the role that has been ascribed to reputation in the economic literature might have changed and that a profound understanding of it is needed.

As a reaction to the seemingly uncertain role of reputation and the apparent deficiencies in corporate governance and regulation, academic research in the field of corporate finance and financial intermediation has particularly examined the following topics: the consequences of regulatory changes before the financial crisis, such as the introduction of the Sarbanes-Oxley Act

(SOX) in 2002 (Gillan and Martin 2007) and the repeal of the Glass-Steagall Act in year-end 1999 through the enactment of the Gramm-Leach-Bliley Act (GLBA) (Geyfman and Yeager 2009, Shivdasani and Song 2011), the reasons for the recent financial crisis and its implications for regulation (e.g. Kashyap et al. 2009), the role of banks in capital markets (for an overview, see Drucker and Puri 2006), the disclosure of quality and the role of certification (for an overview, see Dranove and Jin 2010), the impact of competition on the quality of certification and governance (Becker and Milbourn 2011, Fulghieri and Suominen 2005), the cost to firms of 'cooking the books' (Karpoff et al. 2008) and the value of a firm's reputation in external corporate financing (Anginer et al. 2011), as well as the existence and interaction of alternative governance mechanisms (Acharya et al. 2011, Gillan et al. 2007) and the detection of fraud (Dyck et al. 2010).

Although the existent literature has already provided various insights that have significantly improved economists' understanding of the role of governance mechanisms and reputation, the incentives of financial intermediaries, and the consequences of regulation, several questions remain unanswered. One of these questions, for example, is to what extent today's financial intermediaries value and protect their reputation and how their reputation affects the quality and standards of their business. With the financial crisis of 2008-09, some studies have addressed this question in the context of rating agencies. Bolton et al. (2009) and Mathis et al. (2009) theoretically demonstrate that rating agencies may have incentives to inflate their ratings. Particularly the latter argue that rating agencies may build up reputation to take advantage of it later on. However, Covitz and Harrison (2003) offer empirical evidence that reputation-related incentives are strong enough to prevent rating inflation. Except for the studies about rating agencies, the recent empirical literature is relatively silent on the issue of intermediaries' incentives to protect or exploit their reputations. Nevertheless, many reasons exist why more empirical evidence on the role of intermediaries' reputation is needed. First, new theoretical models like Bouvard and Levy (2010), Mathis et al. (2009), and Ottaviani and Sørensen (2006) demonstrate that reputational concerns do not always lead to truthful information provision and that intermediaries can be tempted to take advantage of their built-up reputation. Second, although involved in fraudulent financial actions and often also in subsequent lawsuits (further examples will be provided in chapter 2), most (arguably) reputable intermediaries did not lose business in the last decade. Third, the fact that reputable intermediaries were involved in many

financial scandals may have had an impact on investors' perceptions of reputation and credibility. Accordingly, more recent empirical studies show that reputable underwriters do not significantly reduce underpricing in equity issues (e.g. Beatty and Welch 1996, Logue et al. 2002). Finally, in reaction to the aforementioned financial scandals, profound changes in regulation (GLBA, SOX) have affected competition in the market for auditing and underwriting services. The increase in competition was particularly strong in the market for debt underwriting services where margins are considerably lower than in the equity market (Fang 2005). In a low-margin environment, the incentives of financial intermediaries to conduct proper business may be significantly lower. One can, however, also argue that competition has a positive effect on the quality of intermediaries' offered services. As both the theoretical and the empirical evidence is inconclusive (see chapter 2), this issue remains open for empirical research. One idea - presented in this dissertation - is that the incentives of financial intermediaries may be positively affected if intermediaries (banks in particular) offer several services in a market segment and investors may thus potentially draw inferences about overall product quality and reliability, i.e. potential reputation spillover. The current finance-related literature on spillover effects is very limited. To some extent this can be explained by the difficulties with respect to measuring spillover effects. Nevertheless, Sialm and Tham (2011) provide evidence for spillovers of performance across different business segments of publicly traded mutual fund management companies. A sound understanding of intermediaries' incentives and reputation, and how this affects the quality of their provided services is very important given the size of today's capital markets and its essential role in corporate financing. To illustrate that: the worldwide volume of corporate bond sales alone was more than three trillion U.S. dollars in 2009 and 2010, respectively (see Billings et al. 2011).

In addition to the aforementioned issues related to reputation, another important mechanism in corporate finance and intermediation is delegated monitoring. An understanding of how delegated monitoring works and how it is facilitated by intermediaries is absolutely necessary given the large size of the corporate bond market and the bankruptcies of large companies mentioned before. As corporate bonds are characterized by multiple lenders, monitoring the issuing firm becomes an essential but difficult task. In bond issues this monitoring is (partly) delegated to bond indenture trustees that act on behalf of bondholders to perform the surveillance of bond covenants. The delegation of monitoring from the bondholders to the bond trustee is not only required by law (the U.S. Trust Indenture Act of 1939) stating that all public bond issues

must have a trustee, but it also solves the general problem of monitoring that arises when there are multiple lenders. As Diamond (1984) suggests, the presence of multiple lenders can lead to a range of monitoring outcomes with two extremes. In the first case, all lenders monitor. This results in a duplication of monitoring costs. In the second case, all lenders try to free ride on the monitoring of other lenders. This results in no monitoring. Thus, the presence of a bond trustee (or generally the delegation of monitoring to a credible specialist) can avoid the duplication of monitoring costs (Fama 1990) and can ensure that the optimal amount of monitoring takes place (Smith and Warner 1979). However, Amihud et al. (2000) argue that the bond trustee is an ineffective monitoring device. This point of view is shared by researchers in the legal field (for an overview, see Schwarcz and Sergi 2008). Many academics state that the inefficacy is caused by the current legal setting as well as the low compensation structure in the market for trustee services. Although the requirement to appoint a bond trustee has already existed for a long time, and although academics disagree about the effectiveness of the trustee, no study has yet offered empirical evidence on the trustee's monitoring capabilities. Furthermore, the studies examining the role and pricing of bond covenants (e.g. Reisel 2010) so far have not controlled for the presence and reputation of the bond trustee. First, this is surprising as the bond trustee's task is to monitor the covenants attached to a bond. Second, this may lead to an omitted variable bias in empirical studies that investigate the pricing effect of bond covenants.

Finally, another research question that has not been fully addressed in the literature so far is how firms' and managers' reputation and performance influence corporate investment decisions and how corporate governance affects reputation-related investment choices. As mentioned in Hirshleifer (1993), due to reputational concerns "managers sometimes make investment choices that are bad for shareholders but good for the manager – because they make the manager look good in the short run" (p. 146). One important aspect of a firm's reputation is its name or brand value (Tadelis 1999). Most studies in the field of corporate finance have examined the value of a firm's name by looking at the stock market reaction to announcements of name changes (e.g., see Karpoff and Rankine 1994 and Cooper et al. 2001). The existing literature is inconclusive as some studies find a significant announcement effect while other studies do not. Furthermore, except for Wu (2010), none of these studies has yet offered empirical evidence why managers may have incentives to instigate corporate name changes. In particular, no study has yet investigated if corporate governance has an impact on the observed stock returns to name-change

announcements or on the decision to announce a certain type of name change. This gap in the literature is a surprise as the existing studies constantly state that corporate name changes are resource-consuming, costly investment decisions.

This dissertation attempts to close the aforementioned gaps in the existing literature using an empirical approach. It thereby offers new insights that help to improve economists' understanding of some of today's important issues in corporate finance. The dissertation makes several contributions to related strands of the literature: the role and interaction of intermediaries and particularly the role of intermediaries' reputation in corporate finance, the delegated monitoring of corporate bonds, and the role of reputation and corporate governance in name changes as corporate and managerial investment decisions. In the following, each chapter's contribution and main findings are summarized. Chapters 2 and 3 are outlined together as they are based on the same data set. The summary for chapter 4 follows.

Examining the role and incentives of financial intermediaries in capital markets and corporate finance, chapters 2 and 3 deal with the importance of intermediaries' reputation and their interactions in the corporate bond market. Both chapters investigate a sample of bonds issued between 2000 and 2008 in the U.S. high-yield segment where competition among underwriting banks is especially strong (Fang 2005, Yasuda 2005). In the high-yield bond market issuing firms are usually more opaque and bond investors rely less on the information content of credit ratings (Datta et al. 1997) resulting in higher net certification effects through third-party certification (Puri 1996 and 1999). Furthermore, investors (and issuers) have to face higher probabilities of bond default in this segment of the debt market, particularly necessitating the monitoring of these bonds.

Within this framework, chapter 2, as the first study, incorporates the interactions and simultaneity of all certification devices and thus addresses the potential omitted variable bias not considered in earlier studies on certification. Auditors, credit ratings, listing standards, and underwriters are examined simultaneously. The study investigates how financial intermediaries' reputation affects certifier choice, initial pricing, and short- and long-term performance in the corporate bond market. By examining bonds issued between 2000 and 2008, chapter 2 considers the profound changes in regulation, particularly the enactment of the Gramm-Leach-Bliley Act and the Sarbanes-Oxley Act, that have affected competition in auditing and particularly debt

underwriting markets (e.g., see Asker and Ljungqvist 2005). Controlling for self-selection, we report that reputable underwriters significantly lower initial yield spreads by about 50 basis points, while Big 4 auditors do not directly affect borrowing costs. Furthermore, we find that bonds underwritten by reputable banks perform significantly worse in the long run (as measured by rating performance, defaults, and bankruptcies). No study has yet examined the effect of underwriter reputation on the long-term performance of corporate bonds. The seemingly contradictory finding of successful certification and below-average bond performance indicates that capture and "reputation milking" (Chemmanur and Fulghieri 1994) are problems in the competitive debt underwriting market. This coexistence points to the presence of a state in which banks test investor credulity (in line with the statements in Ljungqvist et al. 2006) by taking advantage of their built-up reputation as it can take investors some time to distinguish honest mistakes from strategic manipulation. This reasoning is comparable to the reasoning in the aforementioned paper by Mathis et al. (2009) on rating agencies and reputation.

Chapter 3 examines the monitoring-intensive high-yield bonds to highlight the role of indenture trustees acting on behalf of bondholders to perform the surveillance of covenants. We show, contrary to the prevailing view that trustees are ineffective, that when banks acting as underwriters in the noninvestment-grade segment ('investment banks') serve as bond trustees, initial borrowing costs are significantly reduced by at least 25 basis points. Results hold when we control for endogenous matching and bond covenants. Interacting trustee and covenant variables, we further show that 'investment banks' are perceived as effective monitoring devices. We argue that 'investment bank' trustees are particularly incentivized to act in the interest of bond investors due to reputation spillover effects on their underwriting business. Our findings that a linear measure for market share and a binary measure for the largest, arguably most reputable trustees in the market do not affect bond prices support our interpretation. In addition, primary evidence on the issuer-trustee matching and the trustees' effects on bond defaults and bankruptcies are provided. Finally, as a byproduct of our methodology, we offer a current overview of the covenant structure of high-yield corporate bonds. Several conclusions can be drawn from the results. First, trustees are not generally perceived as ineffective monitoring devices within the given legal framework. Second, incentives for regular (i.e. non-'investment bank') trustees to acquire reputation capital may be too low (most probably due to the generally low fee level). Third, issuing firms in the public debt market should care for trustee identity. Fourth, studies

about corporate bonds should jointly investigate covenants and the trustees that monitor these covenants to provide a comprehensive picture of monitoring.

Finally, chapter 4 is the first study to investigate the causes and effects of corporate name changes in Continental Europe using a sample of German firms in the period 1997-2009. We report significant abnormal returns of 0.3% and 2.8% for the event day and the [-20,20] event window around announcements of corporate name changes. Results are considerably different for major and minor name changes. Our findings indicate a positive relation between prior firm performance, interpretable as reputation (Fombrun and Shanley 1990, Wu 2010), and observed stock returns. Short-term effects turn out to be transitory as firms significantly underperform the German CDAX in the twelve months after the name change was announced. Furthermore, as the first study, we examine the management's choice between major and minor corporate name changes and show that managers react to poor firm performance by implementing more expensive major name changes. This can be interpreted as an attempt to cloud poor past performance of both the firm and the management. Accordingly, we document a positive relation between managerial influence and the probability of major name changes.

The remainder of this dissertation is organized as follows: Chapter 2 (*"Certification and Reputation Milking: Comprehensive Evidence from Corporate Bonds"*) examines in detail how financial intermediaries' reputation affects certifier choice, corporate bond prices, and the short- and long-run performance of corporate bonds. Chapter 3 (*"Delegated Monitoring: The Effectiveness and Pricing of Bond Indenture Trustees"*) deals with the pricing and effectiveness of bond indenture trustees acting on behalf of bondholders to facilitate bond monitoring. Chapter 4 (*"Fine Feathers Make Fine Birds? Wealth Effects and the Choice between Major and Minor Corporate Name Changes"*) investigates the stockholder wealth effects of corporate name changes and the management's decision to instigate either major or minor name changes.

Chapter 2: Certification and Reputation Milking: Comprehensive Evidence from Corporate Bonds[1]

2.1 Introduction

In recent years, disintermediation and growth in capital markets have significantly increased the importance of certification through financial intermediaries. Given the ambiguous existing empirical literature and the profound changes of financial markets since the mid 1990s, it is surprising that only very few studies on the effects of third-party certification use data from the last decade (2000-09).[2] A large number of bank mergers[3], market entrance by European banks, as well as several regulatory reforms have significantly changed the rules and competitive structures for intermediaries in the U.S. financial markets. The repeal of the Glass-Steagall Act through the enactment of the Gramm-Leach-Bliley Act (GLBA) in 1999, in particular, has enabled commercial banks to freely run securities business and fully compete with investment banks. Accordingly, commercial bank share in the underwriting market has significantly increased around and after the GLBA enactment.[4] As a result, investment banking fee income considerably declined and has remained at historically low levels ever since (see Geyfman and Yeager 2009). The market for auditing services changed from a Big-6 to a Big-4 structure after the accounting scandals that led to the demise of Arthur Andersen and competition for its former clients (see Asthana et al. 2009), the enactment of the Sarbanes-Oxley Act (SOX), and a potential loss of auditors' credibility. In addition, SOX implemented mandatory audit firm rotation (Section 207), which may have led to an ambiguous auditor attestation effect as the result of a trade-off between an auditor's conservatism and independence (Lu and Sivaramakrishnan 2010).

Anecdotal evidence indicates that these changes in competition have negatively affected certifiers' incentives to conduct proper business, in line with theory (e.g. Albano and Lizzeri 2001). Besides Arthur Andersen, there were many more cases of accounting fraud at the

[1] This chapter is joint work with Prof. Dr. André Betzer (University of Wuppertal) and Prof. Dr. Christian Andres (WHU Vallendar – Otto Beisheim Graduate School of Management).

[2] The research on rating agencies is an exception. For an overview of the literature on disclosure and certification of quality, see Dranove and Jin (2010).

[3] An overview of bank mergers between 1988 and 2002 in Ljungqvist et al. (2006) shows an enormous market consolidation in which particularly European banks like UBS and Deutsche Bank acquired several U.S. banks.

[4] Asker and Ljungqvist (2005) and Shivdasani and Song (2011) show that commercial banks' market shares in the market for debt underwritings almost tripled in the period 1997 to 2000 around the enactment of the GLBA.

beginning of the last decade (see Erickson et al. 2006). The financial press has also frequently reported about fraudulent financial actions including reputable banks.[5] Simultaneously, academics have documented aggressive fee schedules (Song 2004) and aggressive analyst recommendations (Michaely and Womack 1999, Ljungqvist et al. 2006) to win underwriting mandates in the mid 1990s to the early 2000s, interpretable as liquidations of reputation capital. The aforementioned evidence suggests that competition may reduce intermediaries' incentives to maintain their reputation.[6] Accordingly, theoretical models (Chemmanur and Fulghieri 1994, Mathis et al. 2009, Bouvard and Levy 2010) suggest that intermediaries may have adverse incentives to take advantage of (or "milk") their built-up reputation to attract more business. However, most economists agree that reputation capital at stake incentivizes certifiers to honestly report the seller's quality. While classical models (Kreps and Wilson 1982, Milgrom and Roberts 1982) suggest that reputation positively affects long-run players' payoffs and incentives, recent work (e.g. Ely and Valimaki 2003) rather suggests the opposite. As experimental evidence (Grosskopf and Sarin 2010) is inconclusive, the effect of competition on long-run players' incentives to protect or misuse their acquired reputation remains open to empirical examination.

This study contributes to the literature on third-party certification by dealing with two basic questions: the first is if and which certification devices (still) work after the profound changes in competitive structures and the occurrence of several fraudulent actions involving reputable certifiers that tested investor credulity. The second question, which has not yet been investigated in bond markets, is whether certification is beneficial for investors in the short and the long run. Answering these two questions, this study is the first to account for the presence and interaction of several certification devices. We thus address the potentially resulting omitted variable bias not considered in earlier empirical studies on certification.

We conduct the first comprehensive analysis of third-party certification taking into account the coexistence and interaction of all relevant certification devices – auditors, listing standards, credit

[5] For example, the New York Times on August 25, 2002, featured an article about underwriting fraud in which U.S. banks like Citigroup, JPMorgan, and Merrill Lynch were blamed they had misused their reputation. In 2009 newspapers reported intensively about the investigations into Goldman Sachs initiated by Securities and Exchange Commission (SEC). The business press has consistently blamed incentive problems caused by informational advantages, compensation structures, and additional advisory services as the reasons for misreporting by certifiers.

[6] We acknowledge that several studies state that markets for investment bank services are competitive, see, for instance, Ellis et al. (2006). This holds particularly in the case of competition among banks for debt underwriting services where margins are lower than for other investment bank services (see Fang 2005).

ratings, and underwriters. Using unique data on information-sensitive U.S. high-yield corporate bonds[7] issued between 2000 and 2008, we account for the profound changes in competitive structures in underwriting and auditing markets and offer the first empirical evidence suggesting that 'capture' and 'reputation milking' are problems in the competitive debt underwriting industry. Doing so, we further provide evidence on certifier interactions and underwriting standards of reputable banks. Finally, we are the first to investigate the short- and long-term performance of corporate bonds certified by reputable intermediaries.

Our examinations offer insightful results. First, controlling for endogenous matching, we document that reputable underwriters significantly reduce firms' borrowing costs by more than 50 basis points, while both enhanced listing standards and Big 4 auditors do not seem to affect borrowing costs. We argue and empirically demonstrate that the insignificance (not equivalent to inefficacy) of the Big 4 auditors found in this study may be due to our result that the reputation of the issuing firm's auditor appears to be a significant underwriting standard in debt markets and hence is incorporated in the underwriter's reputation in the bonds' pricing process. Accordingly, we show i) that the probability of having a reputable underwriter is significantly increased when the issuer employs a Big 4 auditor and ii) that the Big-4-auditor variable loses significance when we control for the information conveyed by the issuer-underwriter matching in the bond-pricing regressions. Furthermore, reputable banks also tend to underwrite issues by firms listed on either the New York Stock Exchange (NYSE) or the American Stock Exchange (AMEX). These findings suggest that interactions of intermediaries (i.e. 'certification among certifiers') exist and that it is important to simultaneously investigate the effects of certification devices.

Second, we present evidence for the existence of the problems of 'capture' and 'reputation milking' (Chemmanur and Fulghieri 1994) in the competitive market for debt underwriting services. Employing variables on credit-rating deterioration and default as measures of bond performance, we show that bonds underwritten by reputable banks have a significantly higher probability of witnessing poor performance in the long (but not the short) run. Results hold irrespective of whether we look at the ten or the three largest underwriters by market share. We

[7] Generally, investigating bond issues is motivated by two statements made in Ljungqvist et al. (2006): first, that commercial bank entry had the greatest competitive impact in debt markets and, second, that incentives to preserve reputation capital can be less constraining for banks specializing in underwriting debt (as compared to equity), implying a greater willingness to test investors' credulity. Accordingly, the authors find more aggressive analyst behavior ahead of debt deals than ahead of equity deals. Our focus on low-grade debt is motivated in section 3.

find similar results for bonds issued by firms that employed Arthur Andersen as their auditing firm around the time of the bond issue. Thereby, we corroborate both theoretical models and anecdotal evidence. Yet, reconciling successful certification and a simultaneous misuse of built-up reputation seems to be a difficult task. In their model, however, Benabou and Laroque (1992) argue that an equilibrium can exist in which insiders repeatedly take advantage of their private information even when disclosed information can generally be evaluated. This holds because it can take investors a long time to distinguish honest mistakes from strategic manipulation as private information is noisy. In addition, Chemmanur and Fulghieri (1994) argue that reputation milking by underwriters may even occur in an infinite horizon model.

Our results are important for both issuing firms and investors. On the one hand, firms may want to know if the increased listing standards of some stock exchanges are of any importance in the bond issuance process and whether it is worth paying premium fees for more reputable underwriters (Fang 2005) or Big 4 auditors (Gosh and Pawlewicz 2008). On the other hand, investors are highly interested in the general reliability of the quality signaled by certifiers, how competition affects the quality of services provided by these certifiers, and, of course, factors influencing bond performance. Furthermore, our study adds to the growing literature on the economics of conflicts of interest and the effects of financial (de)regulation in the United States.

The remainder of this chapter is organized as follows. Section 2 reviews the related literature, while section 3 discusses our data. Section 4 provides an overview of the employed variables. Sections 5 and 6 contain the multivariate analyses. Section 7 concludes.

2.2 Related Literature

A. Theory

As suggested by Allen (1990), informational advantages constitute the importance of financial intermediaries in certifying the quality of their clients. In this context, many studies – based on the seminal work of Klein and Leffler (1981) – deal with the argument of reputation capital at stake and the mechanism of reputational signaling to overcome information problems between insiders and outsiders (e.g. Booth and Smith 1986, Titman and Trueman 1986, Balvers et al. 1988, Beatty 1989, Datar et al. 1991, and Chemmanur and Fulghieri 1994). All of these papers suggest a positive relation between the intermediary's reputation and security prices.

Although the incentive to protect reputation capital to ensure higher margins, market share, or even firm survival seems to be reasonable, several studies argue that neither reputation nor competition do always help correct the adverse incentives of certifiers. Bouvard and Levy (2010) model a certification agency that needs to attract both sellers and buyers to successfully exercise its activities. The authors show that the certification agency can maximize its own revenue when it provides neither too precise nor too noisy information. With respect to reputation, their model yields ambiguous effects. For less credible agencies, reputation acts as a disciplining device and the precision of provided information improves. Agencies that exhibit (already) a good reputation tend to be more lenient in order to draw more future customers.[8] The aforementioned result is in line with Chemmanur and Fulghieri's (1994) model in which the authors demonstrate the existence of a U-shaped relation between intermediaries' reputation and the probability of incorrect (or dishonest) certification. The authors show that very prestigious intermediaries may have incentives to "milk" their built-up (i.e. costly) reputation. They further state that milking effects may even arise in an infinite horizon model (with discounted future cash flows). Furthermore, Benabou and Laroque (1992) reason that there can be an equilibrium where insiders provide accurate information at the beginning and then take advantage of their private information in later periods. The authors argue that this result holds even if disclosed information can be evaluated because private information is noisy. Hence, it can take market participants a long time to distinguish if an insider makes honest errors or strategically manipulates. In this model, detected manipulation may still hurt the insider's reputation, but more gradually and in a reversible way as he can mix truthful reporting and manipulation to suit his interests.

Strausz (2005) argues that certifiers may be tempted to accept bribes as they are predominantly compensated by sellers, an agency problem referred to as 'capture'.[9] This behavior enables a certifier to potentially extract payments for favorable assessments and to spend less effort on the determination of product quality. The author models conditions under which reputation facilitates intermediaries to resist capture. He demonstrates that honest certification exhibits economies of scale and requires a high price that can even exceed the monopoly price.

[8] In their model about the incentives of credit rating agencies, Mathis et al. (2009) demonstrate that reputation cycles may exist where rating agencies build up reputation by providing accurate information to take advantage of their reputation later to inflate credit ratings.

[9] Tirole (1986), for example, shows that (given a standard auditing contract) an agent, e.g. the firm's CEO, has an incentive to bribe an auditor into not revealing any incriminating information.

With respect to competition in certification markets, Albano and Lizzeri (2001) show that, except for the case of perfect competition, the presence of multiple certification agencies does not lead to full information provision as noisy grading enables the agencies to extract more profits from low-quality sellers. Competition may even worsen this problem when the existence of multiple certifiers encourages 'certification shopping'. This can particularly hold when application for the certificate is non-transparent as is the case in the underwriting market.[10] Finally, in Anand and Galetovic's (2000) model the information about client quality produced by financial intermediaries becomes a public good which may lead to an information free-riding problem among underwriters resulting in possible market failure as no underwriter has an incentive to bear the costs of collecting information. The authors demonstrate that in equilibrium an underwriter only produces valuable information in an oligopolistic market structure where other underwriters refrain from competing with the information producer. In perfect competition rents are too small to preserve these incentives. The model implies that an increasing number of competitors lowering the price of certification services may reduce the quality of certification. However, Anand and Galetovic also argue that competitor entry halts before all of the profits are competed away.

In sum, theory makes inconclusive predictions about the impact of competition on the quality of certification services and the intermediaries' incentives to protect reputation capital. The more recent studies demonstrate that honest reporting (and the protection of built-up reputation) only takes place under circumstances that are rather not found in today's capital markets.

B. Empirical Literature

There are many studies investigating the role of intermediaries in the firm's security-issuance process. Most empirical work, however, relates to initial public offerings (IPOs) of equity. In case of underwriters, early evidence (e.g. Beatty and Ritter 1986, Tinic 1988, Carter and Manaster 1990) suggests that there is a negative relation between bank reputation and underpricing, while more recent studies (Beatty and Welch 1996, Cooney et al. 2001, Logue et al. 2002) rather find the opposite or no effect at all. The evidence on underwriter effects in public debt offerings is rather scarce and uses data from before the last decade. Datta et al. (1997)[11],

[10] See Farhi et al. (2008) for an excellent analysis of certification and transparency.
[11] The study by Datta et al. (1997) only uses a sample of 50 bond issues between 1976 and 1992. Thus, one should be cautious when interpreting the authors' results.

Livingston and Miller (2000), and Fang (2005) provide evidence on a negative relation between underwriter prestige and a firm's borrowing costs. Nevertheless, only the study by Fang (2005) econometrically addresses the problem of endogenous matching of issuers and underwriters.

In the case of auditor certification, the impact of auditor reputation on a firm's borrowing costs is not well documented. Mansi et al. (2004) and Pittman and Fortin (2004) find that the Big 6 auditors significantly reduce initial yield spreads. Both studies, however, investigate sample periods from the 1970s to 1990s, so before the U.S. reporting scandals and the subsequent reactions by the U.S. government (in the form of SOX) in 2002. Guedhami and Pittman (2008) using data from 1996 to 2004 cannot confirm that the Big 4 auditors have an impact on private firms' borrowing costs in the market for SEC Rule-144A issues. Hence, the impact of auditor quality on a firm's borrowing costs remains an unanswered question.

Empirical evidence on the certification role of stock exchanges (via their listing standards) is provided by Affleck-Graves et al. (1993) and Lowry and Shu (2002). The authors show that firms that list on the NYSE or AMEX in an IPO exhibit lower underpricing. Additionally, Datta et al. (1997) offer evidence that debt IPOs of firms listed on the NYSE or AMEX also exhibit lower underpricing. Yet, in a more recent article, Macey and O'Hara (2002) argue NYSE's reputational role has diminished (but do not provide empirical evidence for their statement).

To investigate if reputation capital is valued by the certifier itself and therefore protected, it seems reasonable to consider the performance of securities certified by reputable intermediaries. This has been done for banks acting as underwriters (Carter et al. 1998, Dong et al. 2011) and auditors (Michaely and Shaw 1995) in equity IPOs. These studies find a positive relation between reputation and long-run stock performance suggesting that intermediaries do not take advantage of their reputation on average. With regard to bond performance, the dominance of Drexel Burnham Lambert (DBL) in the junk bond market of the 1980s let economists at that time start to ask if there was an 'underwriter effect' of DBL. In this context, Asquith et al. (1989) find that high-yield bonds underwritten by DBL had considerably lower default rates between the mid 1970s and the mid 1980s. Platt (1993) finds the same result and infers that new bank entrants to the junk bond market reduced their underwriting standards to attract more business.

With regard to competition and reputation, Gande et al. (1999) report commercial-bank entry into the corporate-debt underwriting market before 1996 lowered market concentration and lead to a

significant reduction in underwriter spreads and ex-ante yields. Interpreting these lower yields and spreads as measures of quality, competition seems to have increased the quality of debt issues. The empirical results of Roten and Mullineaux (2002), however, do not confirm these findings for the period 1995-98. Shivdasani and Song (2011) document that increased competition in the debt-underwriting market between 1996 and 2000 led to the emergence of co-led underwriter syndicates. The authors argue that underwriters' reputation-based incentives to screen issuer quality became weaker as a result of the larger syndicates due to free-riding problems among underwriters. They find that this new syndicate structure also led to lower-quality issuers accessing the bond market (in line with the strong growth of the high-yield segment in the last decade). Becker and Milbourn (2011) show that with increased competition due to the strengthening of Fitch as the third large rating agency the quality of credit ratings by the incumbents, Moody's and S&P, has deteriorated. Contrarian evidence is offered by Hong and Kacperczyk (2010) who show competition reduces analysts' earnings forecasts bias and increases the quality of provided information. Apart from that, the literature is relatively silent on how recent market developments have affected the incentives and credibility of intermediaries.

Thus, while initially studies supported the idea of reputational signaling, more recent work is rather inconclusive or does not support the certification role of intermediaries. This trend may be due to the fact that earlier work, in almost all cases, does not address the problem of self selection. It may however also stem from the well documented increase in competition and the many cases of fraudulent financial actions that potentially resulted in changes in intermediaries' incentives and perceived credibility, altering their efficacy as certification devices.

2.3 Data

A. Focus on Low-Grade Debt

To highlight the role of third-party certification, we focus on the high-yield sector of the corporate bond market. Puri's (1996) results suggest that there is a higher net certification effect for information-sensitive securities like noninvestment-grade bonds.[12] In general, the literature agrees upon the idea that certification is likely to be more valuable for more opaque firms (e.g. Puri 1999, Duarte-Silva 2010). Hence, it seems reasonable to consider in detail the high-yield bond market where the demand for certification (by issuing firms and investors) and resulting net

[12] As Puri (1996) puts it: "There are issues for which, ex ante, little certification is 'purchased', compared to issues where the demand for certification is high" (p.376).

effects are substantially large. Additionally, Datta et al. (1997) argue that while investment-grade bonds are exclusively sold on bond rating, junk bonds are sold based on stories that relate to future prospects of the issuing firm and are therefore often referred to as "story bonds" (a point of view shared by practitioners, see Fridson and Garman 1998). As a result, we expect bond ratings to capture less pricing-relevant information and leave more value added through certification.[13] Furthermore, Gande et al. (1999), Yasuda (2005), and Shivdasani and Song (2011) argue that the competitive impact of commercial-bank entry was strongest in the low-grade segment of the corporate debt market.[14] Finally, two points are important to mention in the context of our study: first, low-grade issuers are often financially constrained or distressed and thus may have stronger incentives to bribe certifiers or manipulate their figures.[15] Second, these issuers' (and the issued bonds) tend to be smaller and less visible than in the investment-grade segment. This may result in underwriting banks being less incentivized (through less potential reputational damage) to conduct proper business.[16]

B. Data Selection and Descriptive Statistics

Data on original U.S. corporate high-yield bonds issued by both public and private firms between January 1, 2000 and September 15, 2008 (when Lehman Brothers filed for Chapter 11) are collected from S&P's Capital IQ database. In line with prior research, we exclude convertible debt as well as bonds issued by financial institutions. We check the data using Bloomberg to ensure bonds are non-convertible and original speculative-grade issues. Further, we exclude bond issues for which no initial issue-specific credit rating or rating history is available. We are left with a sample of 635 high-yield bond issues for which initial bond prices and credit ratings are provided. For the remaining bonds, information such as the issuing firm's auditor or the first-time issuer status are mainly hand-selected using Capital IQ and the firms' debt history available therein. Despite our best efforts, we are not able to gather full information for all bonds. For

[13] In this context, John et al. (2003) report that credit ratings are not a sufficient statistic for determining bond yields and Yu (2005) shows that bond ratings do not perfectly incorporate a firm's disclosure quality.

[14] The size of the high-yield bond market itself gives rise to the need for a sound understanding of this asset class. According to data from Thompson Reuters, the U.S. high-yield issuance volume exhibited a compound annual growth rate (CAGR) of almost 16% over the last decade, averaging $100 billion of debt issued each year. The amount of outstanding high-yield bonds is more than $1 trillion. Recent data (for the last twelve months as of May 2011) from Capital IQ show high-yield bonds account for one third of all numbers of debt issues.

[15] Accordingly, Erickson et al. (2006) find that a firm's leverage - the main characteristic of low-grade issuers - significantly drives the probability of accounting frauds.

[16] A similar reasoning, following Rhee and Valdez (2009), is found in Golubov et al. (2010) in the context of M&A advisors' reputation and deal/firm size.

example, information about underwriters (split ratings) is available for 626 (625) bonds. The number of issuing firms is 380, i.e. on average each firm in our sample issues 1.6 bonds. The number of lead underwriters (auditors) in our sample is 30 (15). Summary statistics are provided in Table 2.1.

Table 2.1: Summary of Sample Statistics

This table reports the descriptive statistics of our sample of U.S. original high-yield corporate bonds issued between January 1, 2000 and September 15, 2008. Mean values are reported. Rating information refers to issue-specific credit ratings as provided by Standard and Poor's.

BB	27%	Secured	17%
B	60%	Senior Subordinated	29%
CCC or below	13%	Callable	76%
Split rating (at issue)	54%	Clawback provision	67%
Volume ($ mn)	267	SEC Rule 144A	76%
Maturity (years)	7.7	First-time issuer	22%
Benchmark spread (bps)	501	Stock-listed issuer	62%
Coupon rate (bps)	901	Issuer on NYSE/AMEX	45%
No. of covenants	15.9	First rating action downgrade	53%
No. of underwriters	3.1	Deterioration 6 months	6%
No. of lead underwriters	1.7	Deterioration 15 months	23%

Considering the sample statistics by underwriter reputation (Table 2.2), we document that more reputable banks (defined as the top 10 underwriters by annual league table ranking) underwrite less risky issues in terms of issue-specific credit ratings. The difference is about a notch in terms of Standard and Poor's credit ratings and about half a notch in terms of Moody's credit ratings. The differences are statistically significant. Furthermore, the two groups are significantly different with respect to their maturity and volume. Issues underwritten by reputable banks are more than 85% larger than their counterparts and have longer maturities of about one and a half years. Finally, reputable banks also tend to underwrite lower fractions of first-time issues. Except for the results on credit ratings, the aforementioned differences remain statistically significant

when we consider bond issues underwritten by the top 3 underwriters (in parentheses). Hence, at no surprise, the well recognized issue of selection in the underwriting process (i.e. underwriting standards) becomes apparent in our data. We address this issue later in our econometric analysis.

Table 2.2: Sample Statistics by Underwriter Reputation

This table reports means of the main issue characteristics for bonds underwritten by reputable and non-reputable underwriters. The group of reputable underwriters consists of the ten (three) largest banks by market share. Higher values for issue-specific credit ratings mean lower default probabilities (a value of 11 is equal to a B rating by Standard & Poor's and a B2 rating by Moody's). The t-statistics for differences in means are reported.

	Issues Underwritten by Reputable Banks	Issues Underwritten by Less Reputable Banks	t-statistics
Issue-specific rating (S&P)	11.5 ***(11.5)***	10.6 ***(11.3)***	3.37 ***(1.38)***
Issue-specific rating (Moody's)	11.3 ***(11.3)***	10.7 ***(11.2)***	2.40 ***(0.41)***
Split-rated bonds (%)	54.3 ***(53.2)***	44.6 ***(53.9)***	1.38 ***(-0.18)***
Maturity (years)	7.9 ***(7.9)***	6.3 ***(7.5)***	7.72 ***(2.93)***
Volume ($ mn)	279.8 ***(290.3)***	149.9 ***(242.1)***	6.00 ***(3.78)***
First-time issuer (%)	20.1 ***(17.3)***	39.6 ***(27.0)***	-3.45 ***(-2.96)***
Rule 144A (%)	75.7 ***(76.4)***	81.0 ***(75.4)***	-0.90 ***(0.30)***
Stock-listed (%)	63.4 ***(65.9)***	48.3 ***(57.6)***	2.26 ***(2.14)***

Information about the underwriting market is retrieved from Bloomberg's underwriter league tables for the U.S. high-yield bond market. We use league tables that exclude bonds issued by financial institutions. The market for high-yield bond underwriting services has become increasingly competitive since the start of our sample period, which begins right after the enactment of the Gramm-Leach-Bliley Act. Table 2.3 provides summary statistics for the largest underwriters in the high-yield corporate bond market (Panel A) as well as an overview of the annual fee structures (Panel B) in our sample period. The average number of underwriters listed in the league tables in this period is 18 with a maximum of 21 - the number of underwriters grew at a CAGR of 15% between 2000 and 2008 and at a CAGR of 11% between 2000 and 2006 (not reported) implying increased competition. This competition also stems from (market entry of) European banks that account for 40% of the 15 largest underwriters in the market. In 2000 this figure was only about 20%. Furthermore, as can be seen from Panel A, the top 10 ranking of the high-yield underwriting market is equally split up between investment banks and commercial

banks. With respect to the fee structure in this market, we report that the average fee for reputable banks is 0.94% (top 3) and 0.98% (top 10), while it is 0.88% for less reputable banks.[17] Overall, in line with increased competition, the average fee level decreased significantly due to lower fees charged by reputable banks.

Table 2.3: Overview of the High-Yield Corporate Bond Underwriting Market

Panel A: Top 15 Underwriters in the Sample Period 2000-2008

This table presents summary statistics for the top 15 underwriters in the high-yield corporate bond market for our sample period 2000-2008. The data is retrieved from Bloomberg league tables and excludes issues by financial firms. Average annual market share is the average of the underwriters' market shares in the annual league tables. Asterisks indicate that the bank does not appear in all (but at least 50% of) annual league tables.

Underwriter	Total amount (USD mn)	Average annual market share (%)	Average annual number of issues	Average fees (%)
Citigroup	59,467	18.6	32	0.9
JP Morgan	49,597	15.9	31	1.0
Bank of America	37,812	11.8	24	0.9
Credit Suisse	24,666	8.1	16	1.1
Morgan Stanley	24,140	7.4	13	1.2
Merrill Lynch	22,403	6.7	12	1.0
Goldman Sachs	21,106	6.6	11	1.0
Lehman Brothers	14,753	4.9	11	1.1
UBS	13,795	4.3	9	0.8
Deutsche Bank	12,354	4.4	8	1.1
Barclays*	11,165	4.5	9	0.7
Wachovia*	8,459	3.4	9	1.0
Bear Stearns*	6,315	1.8	4	1.2
RBS*	3,583	2.8	6	0.7
BNP Paribas*	1,288	0.6	2	0.6

[17] In her study, Fang (2005) reports that the average fee for reputable (top 8) banks is 0.9% and about 1.5% for less reputable banks. However, she uses data for 1991-2000 and does not focus on the low-grade debt segment.

Panel B: Annual Fee Structure in the Sample Period 2000-2008

This table provides an annual overview of the underwriter fee structure in the high-yield corporate bond market. The figures refer to all underwriters in the market, not just the 15 largest ones. CAGR is the compound annual growth rate. Fees are defined as gross spreads (as percentages of issue amounts).

Year	Average fees (%)	Average fees (%) top 3 underwriters	Average fees (%) top 10 underwriters	Average fees (%) non-top 10 underwriters
2000	0.95	0.81	1.08	0.53
2001	0.97	0.98	0.93	1.08
2002	1.12	0.88	0.94	1.31
2003	1.04	0.99	1.11	0.87
2004	1.04	0.95	1.01	1.08
2005	0.95	0.82	0.78	0.93
2006	0.84	1.15	1.01	0.66
2007	0.89	1.05	1.08	0.71
2008	0.79	0.81	0.85	0.71
Average	0.95	0.94	0.98	0.88
2008 relative to 2000 (%)	-17.65	0.37	-21.65	33.05
CAGR (2000-2008)	-0.83	0.03	-0.89	12.07
CAGR (2000-2006)	-0.59	10.60	-0.36	3.60

2.4 Employed Variables

As stated above, we conduct a multi-stage analysis of the effects of third-party certification on corporate bonds: In a first step, we analyze the determinants of the borrowing cost at issuance ("Does certification (still) work?"), taking into account the coexistence of multiple certification devices. In the second step, we then investigate which factors influence the short- and long-term performance of these bonds ("Should certification work?", i.e. "Is certification beneficial for investors in the short and the long run?"). In the following, we define the dependent variables used in these regressions (section A) and describe our key certification variables (section B).

A. Measures of Borrowing Costs and Bond Performance

In line with prior research (e.g. Fang 2005, Livingston and Miller 2000), we use the initial benchmark spread (over U.S. Treasury Securities with similar maturity) of the issued bond as our measure for the issuing firm's borrowing costs.

With regard to short- and long-term performance, we screen the credit rating history of each bond in our final sample via Capital IQ and construct three binary variables. The first and the second variable are set to one if the bond's rating declined within the first six and the first fifteen months (respectively) subsequent to the bond issue, while the third variable is set to one if the bond's first overall rating action is a downgrade.[18] As shown by Lando and Skødeberg (2002) and Güttler and Wahrenburg (2007) credit ratings exhibit a positive serial correlation when the initial rating change is a downgrade. We also find a strong tendency of further rating changes in the direction of the initial rating change when scanning our sample. The existing literature shows that rating downgrades, as opposed to upgrades (in most studies), have a significant negative effect on bond prices (Wansley et al. 1992, Hand et al. 1992, Hite and Warga 1997) and even on the firm's long-run stock performance (Dichev and Piotroski 2001). Most of the aforementioned studies report that these effects are particularly pronounced for bonds and issuers in the high-yield segment. Thus, we use the three variables defined above as our proxies for bond performance. Recently, Klein and Zur (2011) also use a downgrade indicator variable to measure bond performance. We additionally employ an indicator variable which obtains a value of one if the bond defaults. The use of default/survival rates and default indicator variables as measures of bond performance is common practice (e.g. Altman 1989, Kroszner and Rajan 1994, Puri 1994).

Besides the well documented price reactions to rating downgrades, the rationale for using bond rating variables stems from the structure of the investor base in the high-yield market. According to Standard & Poor's (2007), the largest groups of investors are mutual funds (35%), pension funds (25%), and insurance companies (16%). The balance is held by CDOs/CBOs, hedge funds, and retail investors. Not only are the majority of the aforementioned groups long-term investors, but the three largest investor groups are most notably strictly regulated with respect to their investments in bonds. Regulators, for example, demand capital requirements for investments made by insurance companies based on a rating scoring system: firms with a credit rating of BB are assigned a value of 3, B firms a value of 4, and CCC firms a value of 5 (for an overview of the use of credit ratings in regulation, see Kisgen 2006). Hence, rating downgrades either lead to immediate costs due to enhanced capital requirements or increase the probability of future costs in case a notch-wise downgrade does not directly lead to a direct change of the rating class (e.g.

[18] We define rating actions as either rating upgrades or rating downgrades. Watch-list actions etc. are not considered.

from BB to B).[19] Furthermore, as mentioned in Kisgen (2006), liquidity concerns are most significant in the speculative-grade bond segment. Lower credit ratings are generally associated with less liquidity. Accordingly, Alexander et al. (2000) empirically show credit ratings affect bond liquidity in the high-yield bond market. Thus, rating downgrades can increase the investors' liquidity risk. In this context, Bao et al. (2011) document that liquidity significantly affects bonds' yield spreads. Finally, the use of rating-deterioration variables allows incorporating time-dependent aspects (important in the context of this study).

B. Certification and Control Variables

REPUTABLE LEAD UNDERWRITERS Prestigious underwriters face a severe trade-off between protecting reputation capital and taking the bait of misusing market power ("reputation milking") to promote low-quality debt and hence generate more business to maintain or enhance their league table positions.[20] We measure reputation by the underwriters' market shares based on annual league tables for high-yield bond issues (as provided by Bloomberg). Lead underwriters are classified as "reputable" when they appear in the top 10 of the league table (Livingston and Miller 2000) for the year of the bond issue.[21] For robustness purposes, we i) use a sample-period league table (based on market share over the study period similar to Fang 2005, Livingston and Miller 2000, and Megginson and Weiss 1991) instead of annual league tables and ii) classify underwriters as reputable when they appear in the top 3 of the league tables.[22]

[19] We acknowledge that mark-to-market accounting may lead to additional costs due to necessary write-downs.

[20] Talks to practitioners and anecdotal evidence point to the idea that competition for league table positions may adversely affect banks' incentives and underwriting standards. In an article in the Wall Street Journal (2007) the author Dennis Berman states that the industry's most-respected institutions are rabid about staying in these rankings. He further remarks: "If you want to understand the Street at its absurd best, watch men in Rolexes grub for credit for deals they barely worked on for clients who probably won't pay them" (WSJ 2007).

[21] The use of a binary variable to measure reputation is necessary to adapt a variable for possible self-selection bias. Besides, using a continuous variable for reputation is not preferable econometrically as this requires the variable to measure reputation with precision and to have a constant effect on the dependent variables (see Fang 2005). We acknowledge that we do not use lagged league table rankings to construct our binary variables as done in studies that investigate certification in the loan market, such as McCahery and Schwienbacher (2010). Our rationale for using underwriter market shares for the year of the bond issue is that we want to capture the effects of the underwriters' efforts to generate business and potentially maintain their league table positions on the performance of the issued bonds. In this context, Fang (2005) argues that "there is a sense of stability of […] reputation over time" (p. 2735) and remarks that the same banks appear almost every year among the top 10 league tables.

[22] The classification of top 3 underwriters versus less reputable underwriters is motivated by the fact that the three largest banks in the junk-bond underwriting market constantly own double-digit market shares both on an annual basis and for the sample period. In their studies on certification in the bank loan market, Ross (2010) and McCahery and Schwienbacher (2010) also use a Big 3 variable.

BIG 4 AUDITORS Theory suggests auditor size (DeAngelo 1981) or alternatively auditors' wealth at risk from litigation (Dye 1993) are positively correlated with audit quality. Accordingly, Francis et al. (1999) find that firms employing reputable auditors exhibit less aggressive earnings management and Lennox (1999) shows that large audit firms give more accurate signals of financial distress. We hence create a dummy variable that is set to one if the issuer was audited by one of the Big 4 auditors (Deloitte Touche Tohmatsu, Ernst & Young, KPMG, PricewaterhouseCoopers) in the fiscal year preceding the issue.

NYSE/AMEX LISTING According to Affleck-Graves et al. (1993), the minimum listing requirements (e.g. the timeliness of disclosure) for firms listed on the NYSE or AMEX are substantially higher than for other listed firms. They further report that several provisions of the corporate governance standard go beyond the SEC's rules.[23] A NYSE/AMEX listing hence carries with it the approval and reputation of the trading system that certifies that the listed firm meets the exchange's quantitative and qualitative listing standards. Further, Baker et al. (1999) find that NYSE listings are associated with increases in firm visibility. Therefore, we assume that both ex-ante and ex-post uncertainty of these firms acting as issuers in bond markets is lower. In addition, rating agencies may more accurately assign an appropriate initial rating to bonds of these firms, resulting in lower probabilities of necessary subsequent corrections.

CONTROLS We control for several variables that have been shown to impact initial yield spreads of corporate high-yield bonds and that we expect to have an impact on bond performance. These variables are: CALLABILITY (Livingston and Miller 2000), the issue-specific CREDIT RATING on notch level (Guedhami and Pittman 2008), FIRST-TIME ISSUES (Gande et al. 1999), MATURITY (Helwege and Turner 1999), SENIORITY[24] (John et al. 2010), VOLUME (Alexander et al. 2000a), and ZERO-COUPON OR STEP-UP bonds (Fenn 2000). Besides, we control for the following variables for which only little research has been conducted yet and that may be important for the performance of corporate bonds: EQUITY CLAWBACKS

[23] For example: the number of outside directors or the representation of independent directors on the audit committee.

[24] Guedhami and Pittman (2008) and John et al. (2010) offer evidence that subordinated bonds exhibit lower initial yield spreads relative to senior bonds with comparable default risk. The authors argue this is due to Moody's and Standard & Poor's rating policy of generally notching down subordinated bonds by two (S&P) or even up to three (Moody's) notches relative to senior bonds. As the market can disagree upon this rating practice, a correction can be reflected in the initial spread.

(Goyal et al. 1998, Daniels et al. 2009), SEC RULE 144A issues (Fenn 2000, Livingston and Zhou 2002), and SPLIT RATINGS (Santos 2006, Livingston and Zhou 2010).

Table 2.4 contains a list of all variables used in our analysis including detailed definitions. Pair-wise correlations of the main variables are shown in Table 2.5 in the appendix.

Table 2.4: Description of Key Analyses Variables

Variable	Definition	Literature
Bankruptcy	Dummy variable that takes a value of 1 if the bond issuer files for bankruptcy within the sample period or thereafter (the observation period ends in Q1 2010), zero otherwise	*Platt/Platt 1990, Tennyson et al. 1990*
Benchmark Spread	The bond's offering yield minus the yield of the (on-the-run) U.S. Treasury with equal maturity (in bps)	*Gande et al. 1999, John et al. 2003*
Big 4 Auditor	Dummy variable that takes a value of one if the bond issuer employed one of the Big 4 auditing firms, zero otherwise	*Mansi et al. 2004 (Big 6), Guedhami/Pittman 2008*
Callable	Dummy variable that takes a value of one if the bond is callable, zero otherwise	*Livingston/Miller 2000, Fang 2005*
Clawback	Dummy variable that takes a value of one if the bond has an equity-clawback feature, zero otherwise	*Goyal et al. 1998, Daniels et al. 2009*
Default	Dummy variable that takes a value of one if the bond defaulted within the sample period or thereafter (the observation period ends in Q1 2010), zero otherwise	*Asquith et al. 1989, Puri 1994*
Deterioration 6 months	Dummy variable that takes a value of one if the bond's credit rating deteriorates within 6 months after bond issue, zero otherwise	
Deterioration 15 months	Dummy variable that takes a value of one if the bond's credit rating deteriorates within 15 months after bond issue, zero otherwise	*Comparable to Klein/Zur 2011*
Deterioration overall	Dummy variable that takes a value of one if the bond's first credit-rating action is a downgrade (as opposed to an upgrade) over the bonds maturity, zero otherwise	
EBITDA Margin	The issuing firm's reported EBITDA margin in the year prior to the bond issue	*Comparable to, Shivdasani/Song 2011, Golubov et al. 2010*
First-Time Issuer	Dummy variable that takes a value of one if the issuing firm did not issue public debt at least 15 years prior to the bond issue, zero otherwise	*Gande et al. 1999*
Guaranteed	Dummy variable that takes a value of one if the bond is guaranteed (i.e. interest and principal on the bond are guaranteed to be paid by another entity), zero otherwise	*Fabozzi 2010*

Leverage	The issuing firm's leverage (total liabilities to total assets) in the year prior to the bond issue	*Fang 2005, Shivdasani/Song 2011*
Maturity	The natural logarithm of the bond's maturity	*Fenn 2000, Fang 2005*
Number of Lead Underwriters	The number of lead banks underwriting a bond issue	*Puri 1996 (syndicate), Shivdasani/Song 2011*
NYSE/AMEX	Dummy variable that takes a value of one if the issuing firm is listed on either NYSE or AMEX, zero otherwise	*Affleck-Graves et al. 1993, Datta et al. 1997*
Public Firm	Dummy variable that takes a value of one if the issuing firm is a public firm, zero otherwise	*Fenn 2000, Livingston/Zhou 2002*
Rating	S&P's (Moody's) issue-specific credit rating (on notch level)	*Fenn 2000, Guedhami/Pittman 2008*
Redeemable	Dummy variable that takes a value of one if the bond is redeemable, zero otherwise	*John et al. 2010*
Rule 144A	Dummy variable that takes a value of one if the bond is issued under SEC Rule 144A, zero otherwise	*Fenn 2000, Livingston/Zhou 2002*
Split rating	Dummy variable that takes a value of one if Moody's and Standard and Poor's assign different issue-specific ratings to a bond issue, zero otherwise	*Livingston/Miller 2000, Livingston/Zhou 2002*
Subordinate	Dummy variable that takes a value of one if the bond issue is subordinated within the issuing firm's capital structure, zero otherwise	*Guedhami/Pittman 2008, John et al. 2010*
Top Lead Underwriter	Dummy variable that takes a value of one if the bond's underwriter is ranked top 10 (top 3) in the high-yield specific underwriter league tables as provided by Bloomberg, zero otherwise	*Livingston/Miller 2000, (McCahery/Schwienbacher 2010)*
Total Assets (Firm Size)	The natural logarithm of the issuing firm's total assets in the year prior to the bond issue	*Guedhami/Pittman 2008*
Unsecured	Dummy variable that takes a value of one if the bond is unsecured, zero otherwise	*John et al. 2010*
Volume	The natural logarithm of the proceeds raised through the bond issue	*Puri 1996, John et al. 2003*
Zero or Step-up	Dummy variable that takes a value of one if the bond is a zero-coupon or step-up bond, zero otherwise	*Fenn 2000*

2.5 Empirical Findings: Bond Pricing and Certification

A. Econometric Testing

This section investigates whether the certification devices outlined in section 4 significantly affect borrowing costs measured by the initial benchmark spread at bond issuance. To address the well recognized issue of endogenous matching of reputable certifiers to issuing firms, we use a Heckman (1979) two-stage approach similar to Ross (2010), McCahery and Schwienbacher (2010), and Puri (1996).[25] We may merely measure a clientele effect of reputable certifiers if the potential problem of self-selection is significant and not controlled for. Accordingly, in the first stage, we estimate five selection equations: two for the issuing firm's auditor and three alternative regressions for the bond's lead underwriter.[26] In case of the auditor selection equation, we basically follow the studies by Erickson et al. (2006) and Chaney et al. (2004), while we generally follow Fang (2005) for the underwriter selection equation. Each selection model is estimated using probit regressions. Regression results are summarized in Table 2.6.

[25] This approach is also used in other recent studies such as Golubov et al. (2010) and Gatti et al. (2008). Fang (2005) uses a switching regression model (a generalization of the Heckman) to analyze the effect of reputable underwriters on yield spreads. We instead use the basic Heckman approach. Thereby, we (econometrically) assume that the pricing process is the same for bonds underwritten by reputable banks and those underwritten by non-reputable banks (when we employ all observations in our regression). A detailed description of how the Heckman model can be used to correct for the problem of selection is given in Briggs (2004).

[26] For robustness purposes, we estimate several selection equations for the issuer-certifier matchings (Table 2.6). The economic relevance and statistical quality of the regressions is supported by significant values of the LR Chi-squared statistics and the size of the Pseudo R^2's.

Table 2.6: Selection Equations (First-Stage Regressions)

This table contains results of probit regressions of underwriter and auditor choice on several firm and issue-specific characteristics (first-stage regressions). The indicator variable Top 10 Underwriter is the dependent variable in regression specifications 1-3, while the indicator variable Big 4 Auditor is the dependent variable in specifications 4 and 5. All variables are defined as explained in Table 2.4. Standard and Poor's issue-specific credit rating classes are employed. A constant term, whose value is not reported, is included in all regressions. Z-statistics are reported in parentheses. Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*) level.

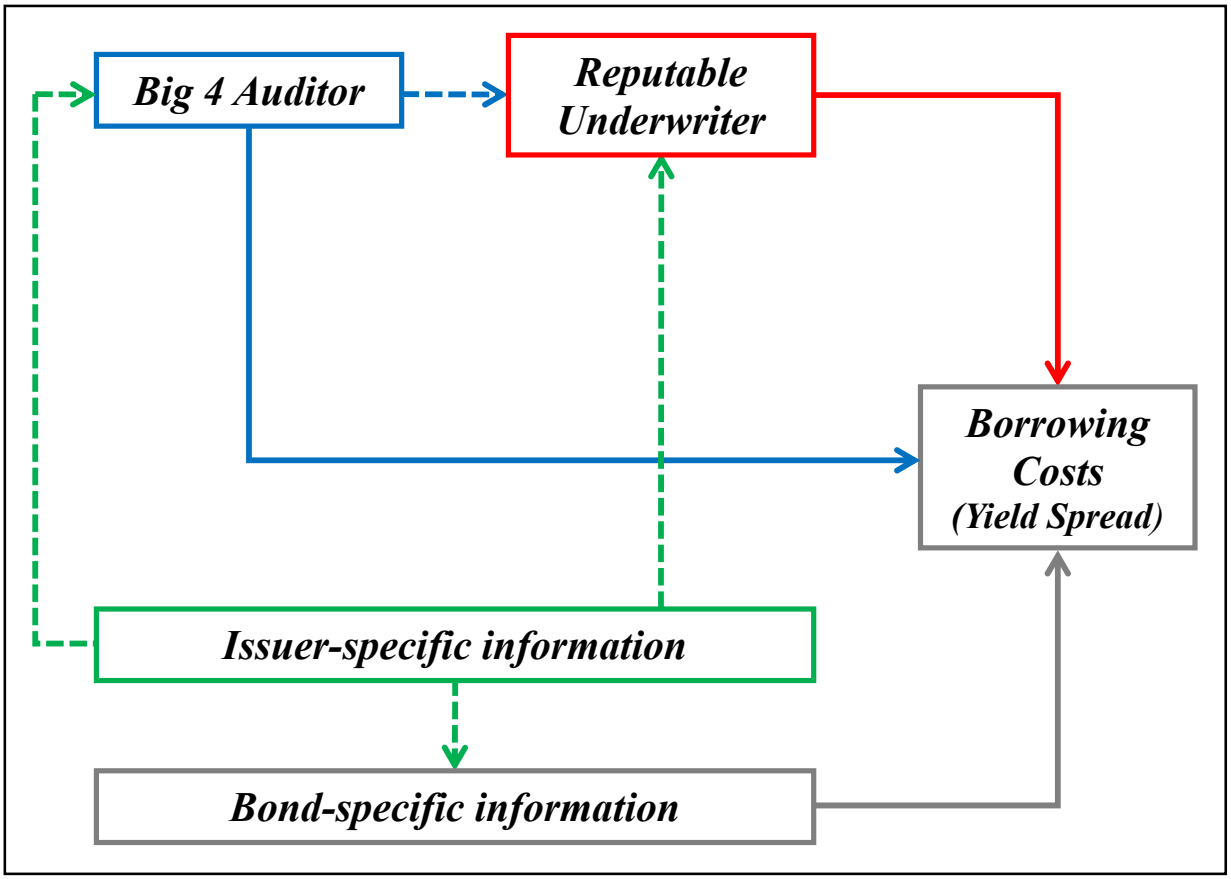
Variable	**Top 10 Underwriter**			**Big 4 Auditor**	
	(1)	(2)	(3)	(4)	(5)
NYSE/AMEX		0.426 (1.91) *			-0.021 (-0.09)
Public Firm	-0.180 (-0.79)		-0.005 (-0.03)	-0.044 (-0.19)	
Big 4 Auditor	0.657 (1.99) **	0.565 (1.72) *	0.487 (1.72) *		
First-Time Issuer	-0.310 (-1.33)	-0.094 (-0.38)	-0.239 (-1.23)	-0.018 (-0.07)	-0.005 (-0.02)
BB	0.239 (0.75)	0.004 (0.01)	0.577 (2.14) **	-0.063 (-0.16)	-0.056 (-0.14)
B	-0.091 (-0.33)	-0.057 (-0.21)	0.228 (1.07)	-0.067 (-0.22)	-0.061 (-0.20)
Volume	0.516 (3.43) ***	0.369 (2.16) **	0.593 (4.57) ***		
Redeemable	-0.042 (-0.11)	0.196 (0.50)	-0.228 (-0.62)		
Unsecured	-0.915 (-3.14) ***	-0.947 (-3.26) ***	-1.053 (-4.23) ***		
Guaranteed	-0.245 (-0.95)	-0.194 (-0.72)	-0.086 (-0.36)		
Issuer Size	-0.003 (-1.08)	0.081 (1.17)		0.446 (4.12) ***	0.443 (4.03) ***
Leverage	0.000 (0.22)	0.000 (0.24)		0.001 (0.17)	0.001 (0.18)
EBITDA Margin	0.533 (0.94)	0.371 (0.68)		-0.051 (-1.23)	-0.051 (-1.23)
NObs	500	500	593	506	513
Pseudo R-squared	0.1711	0.1885	0.1858	0.1782	0.1778
Wald Chi-squared (p-value)	45.15 (0.00)	49.73 (0.00)	65.47 (0.00)	39.58 (0.00)	39.64 (0.00)

The regression coefficient of the Big 4 Auditor indicator variable is positive and significant at the 5% (model 1) and 10% level (models 2 and 3) in the issuer-underwriter matching probit regression.[27] This finding is in line with theory (Balvers et al. 1988) and suggests that, first, it is necessary to consider interactions of certification devices and, second, that reputable (Big 4) auditors are interpretable as an underwriting standard set by banks in the high-yield bond market. It thus seems reasonable to focus on the issuer-underwriter matching and the private information it conveys as the certification role of auditors seems to be already incorporated into the underwriter choice. We depict the assumed direction of underwriters', auditors', and issuing-firm characteristics' influence on borrowing costs in Figure 2.1.

[27] To the best of our knowledge, this study is the first to empirically document that auditor reputation can be considered a significant underwriting standard in debt markets. This finding seems to be intuitive as the majority of high-yield bonds are issued under SEC Rule 144A which enables speedy bond issuance due to the permission of a subsequent registration process wherein issuers do not have to file public registration statements with the SEC. Thus, Rule 144A leads to a problem of reduced due diligence as described, among others, in Blackwell et al. (1990). One way underwriters can reduce this risk, is setting an underwriting standard with respect to auditor's reputation. This reasoning and the significance of our results indicate the importance of certifiers' interactions and simultaneity. Our interpretation is further backed by selection equation (2): reputable banks tend to underwrite issues of NYSE/AMEX listed firms (significant at the 10% level) rather than issues by other quoted firms. Overall, results indicate that certification among certifiers exists.

Figure 2.1: Determinants of the Certifier Choice and Bond Pricing

This figure illustrates the driving forces of underwriter choice and the (flows of) information affecting a firm's borrowing costs. Dashed arrows represent firm characteristics driving certifier choice, whereas solid arrows represent the determinants affecting a firm's borrowing costs.



In the second stage, we estimate the following benchmark equation and (partly) add the inverse Mills ratios for the issuer-auditor matching ($Mills_A$) and the issuer-underwriter matching ($Mills_U$) to address the potential problem of endogenous matching:

$$\textbf{Spread}_i = c_0 + c_1\ \textbf{NYSE/AMEX}_i + c_2\ \textbf{Big 4 Auditor}_i + c_3\ \textbf{Top 10 Lead Underwriter}_i + \textbf{…Controls} + e_i$$

Similar to McCahery and Schwienbacher (2010), among others, we run the above regression model without inverse Mills ratios using the standard OLS approach to be able to compare our results to earlier studies and to the results of the Heckman approach. If the regression coefficients are similar for both approaches, this points to the robustness and stability of the regression results. Accordingly, model specification (1), our benchmark model, and specification (2) are

estimated using OLS. The latter employs an indicator variable Top 3 Lead Underwriter instead of the Top 10 Lead Underwriter variable.[28] Regression models (3) to (5) show the results of the Heckman second-stage regressions for the issuer-underwriter matching using the inverse Mills ratio $Mills_U$. Finally, model (6) contains the the inverse Mills ratio ($Mills_A$) of the Heckman approach obtained from the first-stage of the issuer-auditor matching regression. As we examine bond issues by both quoted and unquoted firms, we are not able to run regression models (3) and (6) with all observations due to unavailable fundamental data. In all models we control for industry and year effects. Results are summarized in Table 2.7.[29]

[28] For robustness, we run specification (2) to test whether our choice of the top 10 indicator variable is the right one. If the top 3 dummy is not significant, then this suggests that the three largest underwriters in the market are not the right proxy (or cut-off point) for an indicator variable measuring underwriter reputation.

[29] Tests for heteroscedasticity suggest there is heteroscedasticity in the residuals. Tests were conducted using the White Heteroscedasticity Test (without cross-terms). The test statistic of all models lies above the 0.05-critical Chi-square value. Therefore, we use White's (1980) heteroscedasticity-consistent as well as cluster-robust standard errors in the performed regressions.

Table 7: Initial Pricing and Certification

This table contains regression results of the initial benchmark spread on several firm and issue-specific characteristics for a sample of U.S. high-yield bonds issued between 2000 and 2008. The estimation method is the two-step Heckman selection model (second-stage regression), except for specifications (1) and (2) which are estimated using OLS (for comparison purposes). First-step regression of the Heckman model is based on regression specifications as shown in Table 2.6. Model (3) in this table uses the inverse Mills ratio from specification (2) in Table 2.6, while models (4) and (5) are based on specification (3) in Table 2.6. Model (6) is based on specification (4) as shown in Table 2.6. All variables are defined as explained in Table 2.4. T-Statistics (in parentheses) are based on White-heteroscedasticity consistent standard errors. All regressions include year and industry dummies and a constant term (not reported). Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*) level.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	All (OLS)	All (OLS)	All	Reputable Banks	All	All
NYSE/AMEX	-30.45	-34.83		-29.28	-30.43	-21.09
	(-2.33) **	(-2.67) ***		(-2.33) **	(-2.33) **	(-1.52)
Public Firm			-47.56			
			(-3.02) ***			
Big 4 Auditor	-49.10	-53.97	-21.27	-16.94	-23.18	-33.34
	(-2.06) **	(-2.31) **	(-0.78)	(-0.58)	(-0.85)	(-1.26)
Top 10 Lead	-61.97		-47.03		-52.61	-50.91
Underwriter	(-3.00) ***		(-1.97) **		(-2.48) **	(-2.29) **
Top 3 Lead		2.66				
Underwriter		(0.25)				
Rating	-41.33	-40.97	-43.87	-38.01	-37.53	-42.90
	(-9.06) ***	(-8.87) ***	(-9.03) ***	(-6.97) ***	(-7.44) ***	(-8.73) ***
Split Rating	28.33	28.29	23.74	32.52	28.11	22.19
	(2.69) ***	(2.67) ***	(2.21) **	(2.93) ***	(2.67) ***	(2.02) **
Volume	-21.83	-28.18	-14.61	3.30	0.63	-19.43
	(-2.27) **	(-2.91) ***	(-1.17)	(0.19)	(0.04)	(-1.83) *
Maturity	-99.33	-127.38	-88.86	-94.09	-100.01	-103.42
	(-2.59) ***	(-3.20) ***	(-2.26) **	(-2.39) **	(-2.65) ***	(-2.56) **
Subordinated	-62.92	-69.81	-44.99	-22.26	-27.80	-69.72
	(-4.71) ***	(-5.18) ***	(-2.47) **	(-0.96)	(-1.28)	(-5.17) ***
Callable	32.85	40.55	19.50	29.55	32.04	17.08
	(1.52)	(1.89) *	(0.87)	(1.30)	(1.48)	(0.74)
First-Time	25.80	29.64	20.18	20.02	15.27	14.54
Issuer	(1.82) *	(2.09) **	(1.25)	(1.28)	(1.03)	(0.78)
SEC Rule 144A	10.80	21.79	14.76	20.60	25.33	16.19
	(0.76)	(1.54)	(0.99)	(1.41)	(1.81) *	(1.07)
Zero or Step-up	194.97	191.41	192.84	194.40	191.66	202.29
	(7.18) ***	(7.06) ***	(6.04) ***	(6.82) ***	(7.19) ***	(6.56) ***
Clawback	-0.82	-0.97	-0.77	-2.22	-0.62	-5.26
	(-0.06)	(-0.07)	(-0.05)	(-0.15)	(-0.04)	(-0.35)
$Mills_U$			138.94	186.95	165.82	
			(1.88) *	(1.73) *	(1.75) *	
$Mills_A$						223.94
						(2.14) **
NObs	591	593	499	541	591	499
Adjsuted R-squared	0.4981	0.4902	0.5388	0.4843	0.5009	0.5313
F-statistic/Wald Chi-squared	29.98 ***	27.70 ***	30.64 ***	27.09 ***	29.78 ***	28.23 ***
Max. (average) VIF	7.69 (2.56)	7.71 (2.50)	9.25 (2.85)	8.07 (3.08)	8.10 (3.00)	9.23 (2.71)

B. Certification Variables

First, we take a closer look at the main certification variables in our model. With respect to listing standards, the coefficient of the NYSE/AMEX listing dummy is negative and significant (at least) at the 5%-level in regression models (1), (2), (4) and (5). In economic terms, a listing on either NYSE or AMEX reduces the borrowing costs of issuing firms by about 30 basis points (bp). The magnitude and statistical significance of the corresponding regression coefficient remains similar irrespective of whether we use basic OLS or Heckman second-stage regressions. However, two things should be mentioned at this point: First, the regression coefficient loses significance when we control for the issuer-auditor matching in regression model (6). Second, when we substitute the NYSE/AMEX dummy variable for an indicator variable capturing stock quotation in general ('Public Firm'), the corresponding regression coefficient is also significant but with about -50 bp even larger in magnitude (see regression model 3).[30] Thus, the NYSE/AMEX listing seems to be no additional certification device in bond issues. This finding seems to corroborate Macey and O'Hara's (2002) statement that NYSE's reputational role has diminished. However, we believe it simply reflects the benefits from certification which tend to be larger for younger firms often without a track record in the public debt market. These firms are rather listed on exchanges other than the NYSE or AMEX.

The regression coefficient of the Big 4 auditor variable is about -50 bp and significant at the 5%-level in models (1) and (2). Controlling for the issuer-certifier matchings in models (3) to (6), the regression coefficient loses statistical significance and magnitude. The inverse Mills ratio for the issuer-auditor matching in model (6) is significant at the 5% level and large by magnitude (224 bp).[31] This result seemingly does not justify the higher fees of about 20% pre SOX (Francis 2004) and of about 40% post SOX (Gosh and Pawlewicz 2008) charged by the large auditors which must come at a benefit, particularly for financially constrained issuers. However, this does not necessarily mean that reputable auditors are ineffective given the aforementioned results of the first-stage regressions. As Big 4 auditors can be interpreted as an underwriting standard in the high-yield debt market, auditor reputation might just be incorporated in the underwriter's

[30] These additional regressions are not reported for brevity. We do not use both variables jointly because the Public Firm and the NYSE/AMEX dummy exhibit a significant correlation of 0.71 (see Table 2.5 in the appendix). However, employing both variables together, overall results remain qualitatively unchanged and the coefficient for NYSE/AMEX loses statistical significance, while the coefficient for Public Firm remains significant.

[31] Results are similar when we use the inverse Mills ratio based on selection equation (5) in Table 6 (not reported).

reputation and hence not be priced separately when both certification devices are examined simultaneously. This interpretation is in line with our finding that the indicator variable for Big 4 auditors loses significance as soon as we control for the issuer-underwriter matching.

Finally, we document that hiring a reputable underwriter has a significant impact on a firm's borrowing costs. The regression coefficient for the indicator variable Top 10 Lead Underwriter is significant at the 1% level and amounts to -62 bp in our benchmark model (1). This finding is comparable to Livingston and Miller (2000) who report a significant coefficient for their Top 10 Lead Underwriter variable of -46 bp. When we control for the issuer-certifier matching (models (3), (5) and (6)), coefficients are still statistically significant and closer to Livingston and Miller (2000) in terms of magnitude.[32] The coefficient is significant at the 5% level and amounts to about -50 bp. In models (3) to (5) the corresponding inverse Mills ratios ($Mills_U$) are statistically significant at the 10% level suggesting that relevant private information is conveyed via the observable matching. This finding is in line with Fang (2005).

C. Robustness

Results remain qualitatively unchanged when we control for issue-specific credit ratings provided by Moody's instead of S&P (Fang 2005) or for rating classes (Livingston and Miller 2000). Results also remain unchanged when we control for the effect of Arthur Andersen being the issuing firm's auditor and for the size of the underwriter syndicate. The corresponding regression coefficients are statistically insignificant. Furthermore, the pair-wise correlation matrix (Table 2.5) shows a comparatively high correlation between the variables Callable and Clawback (0.57) and between the variables Callable and Rating (-0.56). We therefore estimate all model specifications without the variable Callable. All coefficient estimates (and significance levels) are qualitatively similar. In addition, we report a negative correlation of -0.51 between the variable Volume and the employed inverse Mills ratio for the issuer-underwriter matching ($Mills_U$). Results are not altered when we exclude the variable Volume from the regression models. Finally, we conduct the following additional robustness checks: First, we run all regressions using cluster-robust standard errors (cluster: issuing firms). Doing so, the inverse Mills ratios in regressions (4) and (5) are no longer statistically significant. Second, we control for several macroeconomic variables, namely the level of the BofA/Merrill Lynch High-Yield index over 10-

[32] Results also hold when we use the inverse Mills ratio based on selection equation (1) in Table 2.6 (not reported).

year Treasuries, the level of the S&P500 index, and the yield curve (i.e. the yield differential of 10-year to 3-month Treasuries). Third, we use indicator variables for top 3 and top 10 underwriters based on sample-period market share (instead of annual league tables). Our results remain qualitatively unchanged.[33] Variance inflation factors remain below critical values in all of our performed regressions. The Wald Chi-squared statistic and the F-statistics are highly significant in all regressions indicating that the employed variables have strong explanatory power in general.

D. Control Variables

The coefficient of the variable Rating is significantly negative at the 1% level throughout the regressions and amounts to about 40 bp. Split ratings increase borrowing costs by at least 28 bp significant at the 1% level in models (1), (2), (4) and (5) and by at least 22 bp in models (3) and (6), significant at the 5% level. This finding is in line with Livingston and Zhou (2010) and Santos (2006), but considerably larger than in these studies. The difference can be explained by our focus on more information-sensitive high-yield bonds.

The coefficient of the bond's issuance volume amounts to about -19 to -28 bp (in models 1, 2 and 6), significant at least at the 10% level. Yet, controlling for the issuer-underwriter matching, the variable loses significance. Our result offers weak evidence for Alexander et al.'s (2000a) finding that larger high-yield bonds exhibit a significantly higher liquidity. The coefficient for the variable Maturity is statistically significant at least at the 5% level in all regression models, consistent with Fenn (2000) and Guedhami and Pittman (2008). This suggests that bond issues with longer maturities have a lower risk in the high-yield market, corroborating the findings of Helwege and Turner (1999).

The coefficient of the variable Subordinated is also statistically significant at the 1% level in models (1), (2) and (6). This confirms, among others, John et al.'s (2010) findings suggesting that due to the rating policy of the large rating agencies subordination reduces initial bond spreads. However, the coefficient loses significance when we control for endogenous matching in models (4) and (5), but not in model (3). We further report that the coefficient of the indicator variable for zero-coupon or step-up bonds is significant at the 1% level in all regression models. The coefficient is considerably larger than the coefficient for the same variable in Fenn (2000) –

[33] As these checks are for robustness purposes only, we do not report the results of the additional regressions.

between 191 and 202 bp compared to 65 bp – providing even stronger evidence for the interpretation that this premium reflects the value of the issuing firm's default option. The difference can most likely be explained by the focus on low-grade debt.

Finally, with respect to bonds issued under SEC Rule 144A, our results do not yield evidence in favor of Fenn's (2000) inadequate-disclosure hypothesis. The corresponding coefficient is indeed positive but statistically insignificant throughout the regression models (except for model 5). We also fail to corroborate the studies by Goyal et al. (1998) and Daniels et al. (2009) as the coefficient for the clawback dummy is near to zero and insignificant in all regressions.

Results for these variables remain unchanged when we conduct the aforementioned controls. Finally, except for the variables Big 4 auditor, Volume, and Subordinated, the regression results are similar for both OLS and Heckman regressions, pointing to the robustness of our findings.

2.6 Empirical Findings: Bond Performance and Certification

In a second step, we investigate whether short-term and long-term bond performance are affected by reputation. The evidence in the previous section indicates that certification actually works in the pricing process of high-yield bonds, i.e. reputable intermediaries are associated with lower bond spreads. In this section, we try to answer the question of whether certification is beneficial for bond investors in the short and the long run. As outlined above, the certification process gives rise to a potential agency problem often referred to as 'capture' since intermediaries are in most cases paid by issuers who prefer favorable reports/ratings. By looking into the determinants of short- and long-term bond performance, we are able to investigate whether the cost of losing reputation capital is sufficiently high to mitigate this agency problem.

As performance measures, we use three indicator variables that are set to one if the bond rating is downgraded within 6 months or 15 months after bond issue (short run) or if the first credit rating action is a downgrade over the bond's maturity (long run), and zero otherwise. Based on these definitions, 5.98% (6 months) and 23.3% (15 months) of the bonds in our sample perform poorly in the short run, while 53.4% of the bonds in our sample perform poorly in the long run. Using these dummy variables as dependent variables and all other control variables used in the previous analysis, we run several probit regressions with our certification variables among the set of explanatory variables. Tables 2.8 and 2.9 contain results for these regressions.

A. Short-Term Bond Performance

We first take a look at our main certification variables. Bonds issued by firms listed on either NYSE or AMEX have a lower probability of witnessing rating deterioration in the short run. However, results are not significant on conventional levels. When we substitute the NYSE/AMEX indicator variable for the more general Public Firm dummy, regression coefficients are close to zero in terms of both magnitude and statistical significance (not reported for brevity). Hence, the more stringent disclosure duties firms on the NYSE or AMEX are subject to do not lead to significantly more precise assessments by the rating agencies.

Second, considering the impact of the issuers' employed auditing firm, results do not depict a significant relation between the auditor's reputation (or size) and the bonds' short-term performance. Nevertheless, the negative sign of the regression coefficients is in line with theoretical predictions made in the literature and earlier empirical results. We additionally investigate the effect of Arthur Andersen on bond performance. Thereby, we try to shed some more light on the controversial question if the auditor was simply a scapegoat in the 2002 reporting scandals (Morrison 2004) or if its auditing practices at that time were really dubious.[34] Interestingly, we document a very poor performance of bonds issued by firms audited by Arthur Andersen. In regression model (4) the coefficient of the corresponding indicator variable is positive and significant at the 10% level.

Third, reputable underwriters (both top 10 and top 3) do not affect 6-months rating performance on a statistically significant basis. With regard to 15-months bond performance, we find that bonds underwritten by one of the top 3 underwriters have an increased (!) probability of witnessing a downgrade significant at the 10% level. However, this result does not hold for our main variable, the top 10 underwriter.[35, 36]

With regard to our control variables, the following should be mentioned: both risk (as measured by the benchmark spread) and ambiguity in the rating process (as measured by the split rating

[34] As the Wall Street Journal (2005) put it: "The Justice Department needed a political scalp at the time, and it is certainly true that Andersen's senior partners had a lot to answer for."

[35] We acknowledge that this finding is in line with the practitioners' viewpoint. In talks with employees of large investment banks, practitioners admitted it is common practice (or an underwriting standard if you will) to make sure that underwritten bonds do not exhibit rating deterioration in the period of at least six months after issuance.

[36] We further acknowledge that high-yield notes, unlike equity issues, are usually stabilized by the bookrunner for a few days only.

dummy) have a positive influence on the probability of a rating deterioration within 6 and 15 months of bond issue. With regard to 6-months (15-months) deterioration, results are significant at the 1% and 5% (10%) level, respectively. We thereby corroborate Livingston et al. (2008) who report that bonds with initial split ratings show a higher probability of future rating revisions. Bonds with a longer maturity are associated with a lower probability of rating deterioration within both six and fifteen months after issuance. The corresponding regression coefficients are significant at the 1% level (models 1 and 2) and at the 10% level (models 3-5). This supports the findings by Helwege and Turner (1999) who suggest that high-quality issuers in the high-yield market issue longer-maturity debt. The remaining variables do not significantly affect short-term performance. Overall, the reported Wald Chi-squared statistic is significant in all regressions indicating that the employed variables do well in explaining the bonds' short-term performance.

Table 2.8: Short-Term Bond Performance and Certification

This table contains results of probit regressions of the short-term bond performance (measured as deterioration within 6 months and within 15 months after bond issue) on several firm and issue-specific characteristics for a sample of U.S. high-yield bonds issued between 2000 and 2008. All variables are defined as explained in Table 2.4. Z-Statistics (in parentheses) are based on robust standard errors. All regressions include year and industry dummies and a constant term (not reported). Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*) level.

Variable	**6 Months**		**15 Months**		
	(1)	(2)	(3)	(4)	(5)
NYSE/AMEX	-0.296	-0.270	-0.230	-0.199	-0.232
	(-1.41)	(-1.30)	(-1.61)	(-1.39)	(-1.62)
Big 4 Auditor	-0.174	-0.112	-0.260	-0.269	-0.228
	(-0.54)	(-0.35)	(-1.02)	(-1.06)	(-0.90)
Arthur Andersen				0.581	
				(1.66) *	
Top 10 Lead Underwriter	0.400		0.202	0.198	
	(1.39)		(0.94)	(0.93)	
Top 3 Lead Underwriter		-0.080			0.206
		(-0.44)			(1.66) *
Benchmark Spread	0.002	0.002	0.002	0.002	0.002
	(3.16) ***	(3.07) ***	(4.11) ***	(4.06) ***	(3.99) ***
Split Rating	0.411	0.412	0.215	0.209	0.224
	(2.02) **	(2.04) **	(1.71) *	(1.66) *	(1.78) *
Volume	0.178	0.220	0.031	0.015	0.039
	(1.40)	(1.79) *	(0.28)	(0.14)	(0.36)
Maturity	-1.484	-1.400	-0.670	-0.686	-0.696
	(-2.97) ***	(-2.78) ***	(-1.81) *	(-1.86) *	(-1.89) *
Subordinated	-0.146	-0.095	-0.171	-0.166	-0.149
	(-0.60)	(-0.40)	(-1.06)	(-1.04)	(-0.94)
Callable	0.236	0.200	0.202	0.226	0.182
	(0.91)	(0.78)	(1.02)	(1.13)	(0.92)
First-Time Issuer	-0.356	-0.374	-0.014	-0.009	0.011
	(-1.26)	(-1.35)	(-0.09)	(-0.05)	(0.07)
SEC Rule 144A	-0.189	-0.183	-0.244	-0.257	-0.244
	(-0.95)	(-0.91)	(-1.63)	(-1.72) *	(-1.64)
Zero or Step-up	-0.379	-0.368	0.511	0.476	0.532
	(-0.89)	(-0.85)	(1.59)	(1.48)	(1.67) *
Clawback	-0.104	-0.123	-0.226	-0.240	-0.215
	(-0.53)	(-0.63)	(-1.43)	(-1.51)	(-1.37)
NObs	590	591	590	590	591
Pseudo R-squared	0.1806	0.1756	0.1180	0.1214	0.1200
Wald Chi-squared (p-value)	58.96 (0.00)	54.20 (0.00)	69.36 (0.00)	72.52 (0.00)	69.79 (0.00)

B. Long-Term Bond Performance

Regression results with long-term performance as the dependent variable reveal a different picture.[37] Again, we first take a look at our certification variables. We find that a NYSE/AMEX listing is associated with a lower probability of rating deterioration significant at the 1% level throughout all regression models. Regression specification (2) reveals that being listed on the NYSE or AMEX is beneficial (in terms of bond performance): employing the more general Public Firm indicator variable, we document that the corresponding regression coefficient is considerably smaller by magnitude (-0.3 as compared to -0.6) and only significant at the 5% level. This result suggests that bonds issued by NYSE/AMEX-listed firms suffer less informational asymmetry and as a result can be evaluated more accurately at issue. Hence, the downgrade probability is lower. The superior performance of securities issued by firms listed on the NYSE or AMEX might also be attributed to enhanced corporate governance standards.[38]

We report statistically insignificant near-to-zero coefficients for our variable Big 4 Auditor, while we again document a largely positive regression coefficient significant at the 5% level for the Arthur Andersen indicator variable (model 3). Computing marginal effects (with all other variables at their means), we find that the presence of Arthur Andersen increases the deterioration probability by 31%. The result that Big 4 auditors do not affect their clients' long-term bond performance is in line with the mandatory audit firm rotation. The seemingly lasting effect of Arthur Andersen, if someone wants to interpret it, might be an indication of subsequent rating revisions that become necessary as inaccuracies reveal over time.

To our very surprise, we document a strong positive effect of the Top 10 (and the Top 3) Lead Underwriter variable and the probability of long-term rating deterioration, significant at the 5% level in all models (except for the 10% level in model 2). Computing marginal effects (again with all variables at their means), we document that reputable underwriters increase the probability of rating deterioration by more than 18%. This finding implies that certification by reputable underwriters does not seem to contain valuable information for the long run. Reputable

[37] All long-term performance regressions exclude bonds issued after 2006 (to assure that bonds have a sufficiently long performance history). With respect to the different lifetimes of the bonds, we further acknowledge that the fraction of bonds underwritten by top 3 underwriters in our sample is identical (namely 53%) for the periods 2000-02 and 2003-06. For top 10 underwriters the fraction is 9% larger for the interval 2000-02 compared to 2003-06.

[38] As in section 2.5, we do not regress both variables NYSE/AMEX and Public Firm together due to their high correlation of 0.71. However, doing so, only the former is statistically significant (at the 1% level).

underwriters seem to systematically underwrite issues that are riskier in terms of overall rating deterioration probability and hence underperform in the long run.

Considering short- and long-term results together, one possible interpretation of these results could be that reputable underwriters try to make sure that they do not lose reputational capital by underwriting issues that quickly turn out to be poor performers, but put less effort in predicting the long-term performance of these issues. This is in line with the idea that bond underwriters do not remain in a transaction-based relationship with the issuer. As a less favorable interpretation, these results could be regarded as evidence of the capture problem: top lead underwriters could underwrite low-quality (i.e. low-prospect) issuers who benefit most (and therefore are willing to pay most) from high underwriter reputation. Since reputable underwriters have reputation capital at stake, they have an incentive to identify low-quality issuers that are just "good enough" to satisfy creditors over the short-term, a period over which dissatisfied investors would most likely hold the underwriter accountable for bad performance of their investments. After a longer time period, it seems plausible that investors will not blame underwriters who sold an issue several years ago. If top underwriters had the ability to identify this type of issuer, it would enable them to earn maximum fees and preserve their reputation at the same time.

One can also argue in the following way: reputable banks may have incentives to identify those issuers who benefit the most from certification and have a sufficient short-term performance. As the literature suggests, the more opaque a firm is, the more it benefits from certification. However, it also holds that the more opaque an issuing firm is, the higher the costs that underwriters (in most cases) will have to incur to become a firm insider and hence a credible certification device. Reputable banks may be tempted to misuse their reputation and save at least some of these costs (those for becoming credible certifiers for the long-term performance) because they can successfully certify an issues' quality via the reputation they have already acquired and lower their underwriting standards to attract business (i.e. "reputation milking").

To conclude, no matter which argumentation one believes in, our findings offer evidence that reputable underwriters, to the detriment of investors, act in their own interest rather than in good faith and take advantage of their reputation. This result lends evidence to the models by Bouvard and Levy (2010) and, particularly, Chemmanur and Fulghieri (1994) who conclude there exists a reputation-milking effect for prestigious underwriters. The finding that the most prestigious

banks, i.e. the top 3 underwriters, even negatively affect 15-months bond rating performance (while the top 10 banks do not) is further in line with the finding of a U-shaped relation between acquired reputation and the quality of reports in Chemmanur and Fulghieri (1994).

The simultaneous evidence on successful certification in the pricing process of high-yield bonds and a potential misuse of reputation is in line with the reasoning in Benabou and Laroque (1992) who argue that an equilibrium can exist in which insiders can take advantage of their private information although their disclosed information (or trustworthiness if you will) can be evaluated. The authors argue that it can take investors a long time to distinguish between honest mistakes and strategic manipulation as private information is noisy. This conclusion is in line with anecdotal evidence. The business press has frequently reported cases of underwriting fraud and misreporting by large auditors. Yet, most reputable certifiers, banks in particular, have not suffered a significant loss of reputation and even academics state that the market for reputation in the investment banking industry is a robust one (see Macey 2010).[39]

Results regarding our control variables point in the same direction as previous results on short-term bond performance. A higher initial benchmark spread increases the probability of long-term (or overall) rating deterioration significantly (at the 1% level in all models). So does the variable split rating. The variable's regression coefficient is positive and significant at the 5% level in all regression models. Thus, results again support the findings of Livingston et al. (2008). Results do no longer support Helwege and Turner (1999) as the regression coefficient for the variable capturing the bonds' maturity is insignificant throughout all models. However, our findings suggest that the equity-clawback feature is a useful (and de facto applied) mechanism for firms to manage their leverage and potentially avoid financial distress. Accordingly, we document a negative regression coefficient significant at the 10% level (in models 1, 3 and 5). To the best of our knowledge, this is the first empirical evidence on the impact of clawbacks on bond

[39] Besides the examples given in the introduction, numerous other cases were reported in public news sources. For example, Citigroup, the largest underwriter in the high-yield market (see Table 2.3), faced several scandals such as a rogue bond trade in Europe, involvement in the 2001/02 accounting scandals, and an accusal by New York Attorney Andrew Cuomo for making wrong statements about debt securities (Reuters on August 8, 2008). Another example is JPMorgan, also one of the largest high-yield debt underwriters. In 2009 the bank agreed to a settlement of more than $700 million with the SEC to end a probe into the sale of bonds and derivatives to Jefferson County. JPMorgan was also sued by insurance company Assured Guaranty Ltd. (Bloomberg on June 16, 2010). Macey (2010) mentions the case of Bankers Trust as another example and acknowledges: *"The continued existence of informational asymmetries between issuers and investors, coupled with the lack of completely efficient markets or effective regulation, means that there is still a role for reputational intermediaries"* (p.27).

performance. Finally, we control for the number of lead underwriters in the bond's underwriter syndicate as suggested by Shivdasani and Song (2011). Doing so, we document a positive and significant regression coefficient. Hence, employing another measure of bond performance than the authors, we lend supportive evidence to Shivdasani and Song's (2011) findings that the screening efficacy of underwriters may suffer from free-rider problems in underwriting syndicates. Overall, the reported Wald Chi-squared statistic is again significant in all regressions indicating that the employed variables have strong explanatory power in general.

Table 2.9: Long-Term Bond Performance and Certification

This table contains results of probit regressions of long-term bond performance (measured as overall/long-term rating deterioration) on several firm and issue-specific characteristics for a sample of U.S. high-yield bonds issued between 2000 and 2006. All variables are defined as explained in Table 2.4. Z-Statistics (in parentheses) are based on robust standard errors. All regressions include year and industry dummies and a constant term (not reported). Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*) level.

Variable	(1)	(2)	(3)	(4)	(5)
NYSE/AMEX	-0.600		-0.585	-0.619	-0.600
	(-4.63) ***		(-4.50) ***	(-4.79) ***	(-4.63) ***
Public Firm		-0.340			
		(-2.47) **			
Big 4 Auditor	0.005	-0.019	-0.004	0.001	0.005
	(0.02)	(-0.08)	(-0.02)	(0.00)	(0.02)
Arthur Andersen			0.824		
			(2.12) **		
Top 10 Lead Underwriter	0.528	0.422	0.532	0.474	
	(2.26) **	(1.81) *	(2.28) **	(1.99) **	
Top 3 Lead Underwriter					0.528
					(2.26) **
Number of Lead Underwriters				0.111	
				(1.71) *	
Benchmark Spread	0.001	0.001	0.001	0.001	0.001
	(2.77) ***	(3.03) ***	(2.72) ***	(2.76) ***	(2.77) ***
Split Rating	0.255	0.231	0.250	0.264	0.255
	(2.19) **	(2.02) **	(2.15) **	(2.26) **	(2.19) **
Volume	-0.107	-0.123	-0.123	-0.151	-0.107
	(-1.00)	(-1.14)	(-1.13)	(-1.36)	(-1.00)
Maturity	-0.537	-0.489	-0.535	-0.577	-0.537
	(-1.46)	(-1.32)	(-1.46)	(-1.58)	(-1.46)
Subordinated	-0.075	-0.056	-0.068	-0.094	-0.075
	(-0.53)	(-0.40)	(-0.49)	(-0.67)	(-0.53)
Callable	-0.195	-0.143	-0.201	-0.220	-0.195
	(-0.98)	(-0.72)	(-1.01)	(-1.11)	(-0.98)
First-Time Issuer	-0.094	-0.101	-0.085	-0.073	-0.094
	(-0.63)	(-0.67)	(-0.57)	(-0.49)	(-0.63)
SEC Rule 144A	-0.018	0.030	-0.020	-0.051	-0.018
	(-0.13)	(0.22)	(-0.14)	(-0.36)	(-0.13)
Zero or Step-up	0.207	0.295	0.151	0.217	0.207
	(0.63)	(0.89)	(0.45)	(0.67)	(0.63)
Clawback	-0.264	-0.213	-0.266	-0.240	-0.264
	(-1.66) *	(-1.35)	(-1.67) *	(-1.51)	(-1.66) *
NObs	575	575	575	575	575
Pseudo R-squared	0.1278	0.1317	0.1278	0.1310	0.1255
Wald Chi-squared	100.54	112.00	100.54	106.01	100.71
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

We conduct several examinations to check the robustness of the aforementioned results on both short-term and long-term bond performance. We examine a number of supplementary model specifications.[40] Because of the comparatively high correlation between the variables Callable and Clawback (0.57) and between the variables Callable and Rating (-0.56), we estimate all model specifications without the variable Callable. All coefficient estimates (and significance levels) are qualitatively similar. When we replace the number of lead underwriters used in model specification (4) by the number of all underwriters, the corresponding coefficients are positive and insignificant in both the short- and long-term regressions. All other coefficients remain similar to the estimates in column (4). We repeat all regressions using issuer-cluster robust standard errors. All findings remain significant, except for the coefficients of the variables Number of Lead Underwriters and Arthur Andersen. Furthermore, results remain unchanged when we control for issue-specific credit ratings provided by Moody's. Finally, we find no evidence that reputable underwriters affect the number or structure of bond covenants.[41]

C. Bond Default and Issuer Bankruptcy

To further test the robustness of the aforementioned results, we run probit regressions on two additional indicator variables capturing the probability of bond default and issuer bankruptcy. In a first step, we run the regressions with an indicator variable 'default' as the dependent variable. This dummy is set to one if the issuing firm defaults on the bond (as reported in Capital IQ) within the sample period or thereafter. Our control period for bond default ends after the first quarter of 2010. Using this variable, we can investigate the drivers of the bonds' default probability including our certification devices, especially the impact of reputable underwriters. Results for these regressions are shown in Table 2.10.

[40] Due to the large number of possible variable combinations, we do not tabulate these model specifications. They are available upon request.

[41] In this context, Rajan and Winton (1995) argue that covenants can increase a lender's incentive to monitor.

Table 2.10: Bond Default and Certification

This table contains results of probit regressions of bond default on several firm and issue-specific characteristics for a sample of U.S. high-yield bonds issued between 2000 and 2006. All variables are defined as explained in Table 2.4. Z-Statistics (in parentheses) are based on robust standard errors. All regressions include year and industry dummies and a constant term (not reported). Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*) level.

Variable	(1)	(2)	(3)
NYSE/AMEX	-0.283 (-1.55)		-0.470 (-3.00) ***
Public Firm		0.216 (1.15)	
Top 10 Lead Underwriter	0.868 (1.77) *	0.828 (1.68) *	0.882 (1.76) *
Number of Lead Underwriters			0.067 (0.62)
Benchmark Spread	0.002 (4.32) ***	0.002 (4.43) ***	0.002 (4.19) ***
Deterioration 15 months	0.442 (2.35) **	0.493 (2.58) ***	0.454 (2.43) **
Rating	0.061 (1.11)	0.026 (0.46)	-0.020 (-0.34)
Volume			0.216 (1.30)
Maturity			-0.148 (-0.24)
Subordinated			-0.233 (-1.05)
First-time Issuer			-0.248 (-0.91)
Clawback			-0.476 (-2.44) **
Number of observations	584	584	582
Pseudo R-squared	0.1702	0.1889	0.2229
Wald Chi-squared (p-value)	55.38 (0.00)	62.38 (0.00)	75.83 (0.00)

We find strong support for our results on rating deterioration. First of all, throughout the regression models (1) - (3) the coefficient of the main variable Top 10 Lead Underwriter is largely positive and significant at the 10% level. This finding is robust to the inclusion of the number of lead underwriters as regression model 3 indicates. Computing marginal effects (with all other variables at their means), we find that reputable underwriters increase bond-default probability by 3.4% (model 1) and 2.9% (model 3). In line with the other results, bonds issued by firms listed on the NYSE or AMEX have a significantly lower default probability (see model 3). Furthermore, we find additional support for the positive impact of clawback features on the performance of bonds and our reasoning that these features help to avoid financial distress (model 3). Finally, we offer evidence on the importance of our employed rating-deterioration variables. As models (1) and (2) show, bonds that witness a rating downgrade within fifteen months after issuance have a significantly higher probability of default significant at the 5% and the 1% level, respectively. The same applies to the variable for long-run rating deterioration (not reported for brevity). This result corroborates our statement made in section 4.1 on the serial correlation of rating downgrades found for our sample of high-yield bonds. Again, our findings remain significant when we use cluster-robust standard errors.

In a second step, we run probit regressions with an indicator variable ‘bankruptcy’ as the dependent variable. This dummy is set to one if the issuing firm files for bankruptcy (as reported in Capital IQ) within the sample period or thereafter. Again, our control period for issuer bankruptcy ends after the first quarter of 2010. We employ this variable to measure general issuer risk. Results for these regressions are shown in Table 2.11.

Table 2.11: Issuer Bankruptcy and Certification

This table contains results of probit regressions of issuer bankruptcy on several firm and issue-specific characteristics for a sample of U.S. high-yield bonds issued between 2000 and 2008. All variables are defined as explained in Table 2.4. Z-Statistics (in parentheses) are based on robust standard errors. All regressions include year and industry dummies and a constant term (not reported). Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*) level.

Variable	(1)	(2)	(3)
NYSE/AMEX	-0.896 (-5.91) ***	-0.976 (-5.67) ***	
Public Firm			0.179 (0.94)
Top 10 Lead Underwriter	0.404 (1.79) *	0.554 (1.91) *	0.509 (1.67) *
Benchmark Spread	0.002 (5.17) ***	0.002 (4.52) ***	0.002 (5.21) ***
Firm Size		0.069 (1.59)	-0.038 (-0.87)
Leverage		0.143 (0.51)	0.179 (0.69)
EBITDA Margin		0.011 (0.69)	0.018 (1.20)
Number of observations	624	526	526
Pseudo R-squared	0.1755	0.1989	0.1341
Wald Chi-squared (p-value)	83.08 (0.00)	79.59 (0.00)	46.66 (0.00)

As before, the results on the drivers of the issuers' bankruptcy probability strongly support our findings on rating deterioration. Throughout the regression models (1) - (3) the coefficient of the Top 10 Lead Underwriter variable is positive and significant at the 10% level. Computing marginal effects (again with all other variables at their means), we find that reputable underwriters increase bankruptcy probability by 7.0% (model 1) and 7.7% (model 2). With respect to listing standards, a comparison of models (2) and (3) reveals that firms listed on the NYSE or AMEX witness a considerably lower bankruptcy risk than firms which are generally listed on a stock exchange (controlling for firm size). The corresponding coefficient of the NYSE/AMEX variable is largely negative and significant at the 1% level in models (1) and (2).

In both regression approaches (Tables 2.10 and 2.11) the benchmark spread is positive and significant at the 1% level, which is in line with the fact that higher default and bankruptcy risk is priced by market participants. Overall, the quality of the regression models is supported by significant values of the Wald Chi-squared statistics as well as the size of the Pseudo R^2's.

In sum, our analysis of the relationship between different dimensions of certification and bond performance reveals consistent and both statistically and economically significant patterns. These findings turn out to be robust as the aforementioned examinations show. We document a positive impact of a NYSE/AMEX listing and bond performance, which is most likely due to lower information asymmetries and hence lower rating opacity. The negative effect on long-term downgrade and issuer bankruptcy probability suggests that more stringent rules for corporate governance and disclosure may have a positive effect on the debtor's performance. We also find that bonds issued by firms that were audited by Arthur Andersen perform significantly worse. Most interesting, our results show that certification by the (arguably) most reputable underwriters does not seem to provide short- or long-term benefits: high-yield bonds underwritten by top lead underwriters show a significantly higher probability of downward rating revisions, bond default, and issuer bankruptcy, which can be interpreted as evidence of agency conflicts and poor incentives of lead underwriters to produce reliable information on new issues. Results hold when we control for the number of lead underwriters as proposed by Shivdasani and Song (2011).

2.7 Conclusion

Using a data set from 2000 to 2008 (i.e. after the repeal of the Glass-Steagall Act and before the financial crisis), this chapter contributes to the as yet limited empirical literature on third-party certification in security markets after several fraudulent actions by reputable certifiers and regulatory changes such as SOX and GLBA at the beginning of the new millennium. We expect that increased competition and deregulation significantly affected the incentives of intermediaries in financial markets and hence influenced the role of certification in the security-issuance process in the last decade. Investigating these effects, we are the first who account for the simultaneity and interaction of all relevant certification devices in the security issuance process.

We document that third-party certification via underwriters works in the pricing process of high-yield corporate bonds. In sum, employing a reputable underwriter significantly reduces initial yield spreads by more than 50 basis points after controlling for endogenous matching. Big 4

auditors and listing standards, however, are not found to be significant certification devices. Yet, the insignificance of Big 4 auditors – which may not be equivalent to inefficacy – can be explained by our finding that auditor reputation seems to be an underwriting standard of reputable banks and is hence incorporated in the underwriter's reputation when high-yield bonds are priced.

The impact of our certification variables on future bond performance is mixed. First, our results indicate that listing standards are important for bond investors. We offer evidence that bonds issued by firms listed on either NYSE or AMEX witness an above-average performance as measured by rating deterioration, default, and bankruptcy. Second, we report that bonds issued by firms that hired Arthur Andersen as their auditor perform poorly. Consistently, the market does not consider Arthur Andersen to be a credible certification device.

Most remarkably, we find that bonds underwritten by reputable banks experience rating deterioration and default (as well as bankruptcy) with a higher probability than those bonds underwritten by less reputable banks. This indicates that certification via reputable underwriters is detrimental to bond investors in the long run. Somehow inconsistently, we show that reputable underwriters successfully certify bond quality and reduce a firm's initial borrowing costs. Hence, we provide evidence that underwriters attempt to test investor credulity in the corporate bond market as suggested in Ljungqvist et al. (2006). Our results are in line with the reasoning in Benabou and Laroque (1992).

Particularly, our findings support the implications of the models by Bouvard and Levy (2010) and Chemmanur and Fulghieri (1994) who reason prestigious intermediaries take advantage of their acquired reputation at some point of time. As it is extremely difficult, after a certain period of time, to tell whether an underwriter misused its reputation to sell low quality at an excessively high price, underwriters may be tempted to misuse their market power (i.e. reputation milking). Banks may be especially capable of misusing their reputation if they can successfully identify low-quality issuers with a low probability of witnessing rating deterioration in the short run. Thus, investors may conclude that it can be advantageous from an informational point of view to be more skeptical about the truthful information provision by high-prestige banks or auditors and to doubt the prevailing argument that certifiers have strong incentives to protect their reputation.

Chapter 3: Delegated Monitoring: The Effectiveness and Pricing of Bond Indenture Trustees

3.1 Introduction

Today, with more than 3 trillion dollars in worldwide corporate bond sales in 2009 and 2010, respectively (reported in Billings et al. 2011), the bond market is an essential source of financing for corporations. The huge size and the strong growth of public debt markets can in part be explained by the investors' enhanced liquidity and diversifiability of public compared to private lending. As corporate debt financing results in agency costs due to conflicts of interest between shareholders and creditors (Jensen and Meckling 1976, Myers 1977, Smith and Warner 1979), monitoring becomes necessary. In this context, the alleged advantages of public debt turn out to be severe disadvantages. Dispersed ownership, bondholder anonymity, and the fluidity of bonds make monitoring and collective actions difficult tasks. To facilitate monitoring and to mitigate the collective-action problem, bond contracts contain two important ingredients: a set of covenants and an indenture trustee to monitor and enforce the included covenants.

Although Smith and Warner (1979), in their seminal work, reason that choosing a reputable indenture trustee is important for bondholders as trustees can assure that the optimal amount of monitoring and covenant enforcement takes place, Amihud et al. (2000) argue that trustees are ineffective monitoring devices (a view shared by many practitioners) and call for a "supertrustee". Yet, none of these studies uses data to validate their conclusions. Thus, empirical examination is clearly needed to complement the scarce and inconclusive existing literature. Consequently, closing this gap in the literature, this chapter offers primary empirical evidence on the role, effectiveness, and pricing of indenture trustees who act on behalf of bondholders to monitor public debt. We examine the noninvestment-grade corporate bond market where defaults are more likely to occur, covenants are numerous, issuers are more opaque, and monitoring is hence particularly important to investors. Thereby, as the first study, we jointly analyze bond covenants and indenture trustees and show that trustees are not generally perceived as ineffective monitoring devices. Indeed, trustee identity and interaction terms of trustees and covenants are significantly priced in high-yield bond issues. Furthermore, as a byproduct of our methodology,

we offer first empirical evidence on the determinants of the issuer-trustee matching as well as a current overview of the covenant structure of high-yield corporate bonds.

To thoroughly understand and interpret our results, an understanding of the trustee's role and responsibilities and of the sources of criticism is needed in the first place. In bond issues, the relevant agreement between the issuer, the creditors, and the appointed trustee is the bond indenture. According to the Trust Indenture Act (TIA) of 1939, public[42] bond contracts must appoint an independent trustee that is prohibited from having any severe conflicts of interest such as being an obligor to the issuing firm or acting as an underwriter for the same bond issue (for an overview, see Johnson and Boardman 1998, Friedman 1974).[43] The indenture trustee generally is a trust company or large banking institution with significant revenues from business unrelated to being a trustee. Its duty is to represent bondholders' interests and act as their agent in the enforcement of bond covenants and remedial provisions specified in the indenture. The trustee's responsibilities are limited prior to default. They include paying and transfer agent services, organizing bondholder meetings, the provision of monthly statements as well as monitoring bond covenants and the timely reporting of covenant breaches to investors and rating agencies. Furthermore, for its review, the trustee is provided with a draft of the indenture (and the intercreditor arrangement) prior to the deal being finalized. It ensures that all federal and state requirements are met and may be involved in the (non-final) drafting of the indenture. In default the trustee's responsibilities increase within the framework given by statute and the indenture contract. Within this frame, the corporate trust officer's skills and expertise become essential. He must organize significant actions and decide which remedies to pursue and how to discharge the trustee's powers and duties in bankruptcy. Several of these actions do not require bondholder consent. For example, the decision to enforce remedies such as the acceleration of maturities, demand for specific performance of covenants, the suit for overdue payments, or even the decision to join an involuntary bankruptcy petition against the issuer.[44]

Researchers, both in finance and in the legal field (e.g., see Schwarcz and Sergi 2008), have argued that the indenture trustee is ineffective in monitoring public debt and renegotiating with

[42] Private debt issues may (and do) also have trustees (e.g., see Smith and Warner 1979).

[43] For the purpose of our study, this regulation is preferable econometrically as it simplifies the analyses and most probably rules out problems of potential biases caused by lending or underwriting relationships.

[44] For more information about the TIA and the trustee's rights and duties, see Smith and Warner (1979), Hall (1989), Johnson and Boardman (1998), Spiotto (2008), and Huff (2010). See Schwarcz and Sergi (2008) for a recent overview of the legal literature. Furthermore, see Johnson (1970a, 1970b) for articles about default administration.

investors. They blame legal frictions with regard to the trustee's rights and liabilities as well as a too low (non performance-based) compensation for this ineffectiveness. Regarding its duties and responsibilities, the trustee has to act according to the prudent man rule only in case of default (see TIA §315c, Robertson 1988). Prior to default, the trustee must only act in good faith without negligence or willful misconduct and is liable only for failure to perform in accordance with the indenture (see TIA §315a (2), Robertson 1988). A true fiduciary standard has not generally been imposed by U.S. courts.[45] With respect to trustee compensation, Johnson and Boardman (1998), as the only existing study, document that bond indenture trustees are paid small administration fees of less than 10,000 dollars per year.[46]

Besides the aforementioned statements about trustee ineffectiveness, our study is motivated by Smith and Warner's (1979) hypothesis that choosing a hard-to-bribe trustee can be valuable for bond investors because shareholders have an incentive to bribe the trustee to overlook covenant breaches. Our examinations are twofold: In a first step, we examine whether trustee identity (capturing reputation) matters to bondholders. If so, trustee identity should be priced in bond issues. We thereby assess i) whether bond investors view trustees as ineffective in monitoring corporate bonds and ii) if choosing a hard-to-bribe trustee is important for investors. We consider two groups of trustees that, we believe, are hard to bribe: the largest trustees in the high-yield segment by market share (denoted as Top 3 trustees) and banks that act as both underwriters and trustees in the high-yield bond market (denoted as 'investment bank' trustees). While the former may have considerable income to lose, the latter may care for reputation spillover effects that can impact their underwriting business.[47] In a second step, we offer additional evidence on the role of trustees in corporate bonds that helps us understand and validate our results found for the bond-pricing process and the current legal framework trustees operate in. We therefore examine

[45] Sklar (1989) concludes that: "[…] although the courts have not always imposed a true fiduciary standard, the trustee should in fact be held liable as a fiduciary" (p.42). In 2008 the New York Court of Appeals, New York's highest court, decided that indenture trustees do not owe fiduciary duties to bondholders (Pillsbury 2011). Note that the interpretation of indentures is largely governed by New York law (Sklar 1989) as "New York City is the center of the indenture trustee industry" (Johnson and Boardman 1998, p. 27).

[46] Additional up-front fees amount to another ca. 10,000 dollars. Usually fees increase if a default has occurred. With respect to this study, the mean bond volume in our sample is 272 million dollars (see Table 3.4). Hence, an annual fee of 10,000 dollars is equal to less than 0.004% of the mean bond volume only.

[47] 'Investment bank' trustees have significantly smaller market shares than the Top 3 trustees. Thus, they will not care so much for their market position (but much more for their overall reputation and perceived investor orientation).

whether reputable trustees, due to enhanced monitoring and superior decisions in case of default, are able to reduce the probability of bond default and issuer bankruptcy.

Using a sample of U.S. high-yield corporate bonds issued between 2000 and 2008[48], our results suggest that not all bond trustees are viewed as ineffective. In particular, we document that 'investment bank' trustees significantly reduce borrowing costs by at least 25 basis points, even when we control for endogenous matching and covenant structures. Results further reveal that these trustees are especially viewed as effective monitoring devices as variables interacting 'investment banks' and covenants have significant regression coefficients between -2 and -5 basis points. We do, however, not find any pricing effect for Top 3 trustees in our sample. Hence, while Top 3 trustees do not affect bond prices and monitoring in a significant way, 'investment bank' trustees appear to act more dedicated and investor-oriented in line with our reasoning of reputation spillovers to their underwriting business.[49, 50]

In sum, allowing for potential spillover effects as an alternative to the standard approach of measuring incentives to protect reputation capital by market shares, we offer evidence in favor of Smith and Warner's (1979) reasoning that choosing a hard-to-bribe trustee can be valuable for bond investors. Furthermore, our results suggest that i) bond trustees are not generally perceived as ineffective monitoring devices within the given legal framework, ii) 'investment bank' trustees that are also active as underwriters seem to have incentives to act more investor-oriented due to reputation spillover effects, iii) incentives of regular trustees to acquire reputation capital may be too low (most probably due to the generally low fee level), iv) issuing firms in the bond market should care for trustee identity, v) studies about bond issues should jointly investigate bond covenants and the trustees that monitor these covenants to provide a comprehensive picture of monitoring and to avoid an omitted variable bias.

Finally, we offer first empirical evidence on the determinants of the issuer-trustee matching. Our findings suggest that the driving forces, but not their respective sign and magnitude, are very

[48] We further motivate our focus on low-grade debt issues and the choice of the sample period in section 3A.

[49] One may argue that our results for 'investment bank' trustees stem rather from the banks' (cost-free utilizable) generally enhanced expertise in the low-grade segment acquired, for instance, through their underwriting business. However, under the reasonable assumption that these banks incur costs when they act more investor-friendly and perform enhanced monitoring, our interpretation of reputation spillover effects appears robust.

[50] The finance-related literature on (reputation) spillover effects is limited. Sialm and Tham (2011) provide evidence for spillover effects of performance across different business segments of publicly traded mutual fund management companies. Gopalan et al. (2007) offer evidence for spillover effects of firm bankruptcies in Indian business groups.

similar for both the choice of a Top 3 trustee or an 'investment bank'. The identified determinants inversely affect the choice of the two types of bond trustees. Results further point to the existence of significant differences between 'investment bank' trustees and other trustees and suggest that trustee reputation is not considered an underwriting standard by reputable underwriters (in line with practitioners' statements).

The remainder of this chapter is organized as follows. Section 2 presents the empirical implications and employed variables. Section 3 discusses our data and provides the reader with an overview of bond covenants in the high-yield debt market. Section 4 deals with the issuer-trustee matching, while sections 5 and 6 present our results found in the multivariate regressions. Conclusions follow.

3.2 Empirical Implications and Employed Variables

A. Trustees

Smith and Warner (1979) argue that after a bond has been sold, the issuing firm's stockholders have an incentive to bribe the bond trustee so that they can violate the bond's covenants. The authors suggest that bribing a trustee is expensive if the trustee is reputable and its reputation has enough value in the marketplace. Accordingly, they reason that choosing a hard-to-bribe trustee is, at least ex ante, in the interest of both bondholders and shareholders.[51]

Employing a two-step approach, we first test if the indenture trustee's identity and reputation matter to bond investors, and are consequently priced in bond issues, or if trustees are perceived as ineffective monitoring (and renegotiation) devices.[52] If bond trustees are really ineffective as stated in the finance and the legal literature (Amihud et al. 2000, Schwarcz and Sergi 2008), we would expect to find no pricing effect of their identity/reputation in bond issues, neither in connection with bond covenants nor without. Second, as trustees frequently gather information and monitor the issuing firms, and are involved in making relevant decisions such as suing for overdue payments or bankruptcy petitions in case of covenant breaches and default, it seems

[51] This is because the value of the firm at the time of the bond issue reflects the probability of covenant enforcement.

[52] This ineffectiveness may be caused either by law or by low fees. In the first case, trustees are simply incapable within the legal framework, while in the second case, trustees may just not be incentivized enough to act properly.

intuitive to consider their effect on bond default and issuer bankruptcy.[53] We do so to offer a more complete picture of the role of bond trustees and argue that if bond trustees care for their reputation and perceived investor friendliness, their performance will at least not be significantly below average.[54] Regarding bond performance, we note that the use of default-related variables to measure performance is common practice (e.g., see Asquith et al. 1989, Puri 1994).

We examine the effects of two groups of trustees that, we believe, have incentives to protect their reputation capital and are thus hard to bribe in the sense of Smith and Warner (1979). The first group we consider are the largest trustees in the high-yield bond market. For this group we measure reputation by sample market share over the study period (see Table 3.1). The use of rankings based on study-period market share is common practice in the certification literature (e.g. Megginson and Weiss 1991), particularly in studies on bond underwriter reputation (Fang 2005, Livingston and Miller 2000). We consider the effect of the largest bond indenture trustee, the Bank of New York (BNY). BNY, and later BNY Mellon, has been the dominant player in the market for trustee services over the last decade and, not surprisingly, has by far the largest market share in our sample of high-yield bond issues (36%). Yet, we primarily examine the effect of the three largest trustees, BNY, US Bancorp, and Wells Fargo. We call this group the Top 3 trustees. The Top 3 classification is based on the fact that the three largest trustees in the market have double-digit market shares, whereas all other trustees have considerably smaller market shares. The Top 3 trustees account for a 69% market share in our sample. These banks may want to protect their reputation as trustees because they have significant market share (i.e. income) to lose.[55]

[53] If certain trustees significantly affect bond performance, their identity should be priced. However, this effect may be due to selection in the acceptance of trusteeships (i.e. particularly choosing to monitor the bonds issued by firms that are unlikely to witness financial distress) rather than differences with regard to the trustee's skills or reputation. We econometrically address this issue in our pricing analyses. Furthermore, we note that already our focus on low-grade debt mitigates this selection problem in the first place.

[54] Whether trustees care for their reputation is an interesting question, not only because of the low fee level mentioned before, but particularly as the concentration of the market for trustee services has sharply and continuously increased. For example, the Bank of New York made 104 acquisitions between 1990 and 2009 (41 acquisitions in our sample period) including the acquisition of Mellon Financial Corp. in 2007. In 2004 JP Morgan Chase purchased Bank One, Wachovia acquired SouthTrust, and SunTrust acquired National Commerce Financial. Later, in 2007 and 2008, Bank of America purchased LaSalle Bank and U.S. Trust Corporation and Wells Fargo acquired Wachovia.

[55] This argumentation follows the basic idea of repeated business and reputation capital at stake (see e.g. Klein and Leffler 1981, Kreps and Wilson 1982, and Booth and Smith 1986). One may argue that due to the relatively low fees charged for trustee services, trustees may have lower incentives to protect their reputation. In their annual reports,

Table 3.1: Trustee Sample Market Shares

This table provides an overview of the sample market shares over the study period 2000-2008 for the three largest trustees in the high-yield corporate bond market and for certain groups of trustees.

Trustee	Share by number of issues (%)	Total amount (million USD)	Share by amount (%)
Bank of New York / BNY Mellon	36.3	66,152	37.4
US Bancorp	19.8	30,593	17.3
Wells Fargo	13.2	21,962	12.4
Top 3 Trustees	69.3	118,707	67.2
Investment Bank Trustees (*i.e. Bank of America, Citigroup, Deutsche Bank, JP Morgan Chase, Wachovia*)	11.3	20,178	11.4
Other Trustees (*e.g. Fifth Third Bank, Harris N.A., Wilmington Trust, State Street Bank, SunTrust Bank*)	19.3	37,870	21.4

The second group of trustees that we are interested in are 'investment bank' trustees. We define 'investment bank' trustees as banks that offer both trustee and underwriting services in the high-yield bond market. These trustees account for more than 11% market share in our sample[56], both by number and volume of monitored bonds. We consider this group because these banks may care for their reputation as bond trustees due to potential reputation spillover effects to their bond underwriting business. Hence, besides the Top 3 trustees, 'investment bank' trustees may also be hard to bribe as they have reputation capital at stake due to significant income generated by related business. As the provision of investment-bank services and the banking industry itself are trust based, we argue that 'investment bank' trustees have incentives to protect their perceived overall reputation.[57] Additionally, 'investment banks' may be more capable of monitoring (and

banks frequently lump revenues from corporate trust services with those of security services (e.g. global custody). Hence, it is not possible to exactly identify banks' revenue contributions of their corporate trust business. However, in Bank of New York Mellon's 2007 annual report 'issuer services fees' (which include corporate trust services) account for 31% of total securities servicing fees and for 17% of total fees and other revenue. In 2005 BNY's issuer services fees accounted for almost 14% of total fees and other revenue.

[56] The resulting asymmetry of the indicator variable 'investment bank' trustee (separating banks that also act as underwriters and those that do not) is not uncommon in the bond pricing and certification literature. For example, the top-8-underwriter variable used in Fang (2005) captures the market shares of the eight largest underwriters in the debt market that account for 87% market share. Also, Livingston and Miller (2000) use a top-10-underwriter variable although the ten largest underwriters account for 91% market share.

[57] One may ask why some banks even offer trustee services at all given the low fee structure and the possibility of harming their reputation. We argue that banks do so for two reasons: First, offering these services yields additional

renegotiating) high-yield bonds because they act as underwriters (and potentially as restructuring advisors) in the low-grade debt segment. As a result, these banks may have more expertise and particularly more intensified relations to other underwriters in the high-yield market. This group of trustees consists of the following banks in our sample: Bank of America, Citigroup, Deutsche Bank, JP Morgan Chase, and Wachovia. For the sample period 2000-2008, all of these banks, except for Wachovia, were among the ten largest underwriters in the low-grade corporate bond segment (see Andres et al. 2011).[58]

To test the aforementioned empirical implications, we use indicator variables set to one if the indenture trustee is either one of the Top 3 trustees or if it is an 'investment bank' trustee.[59] For robustness purposes, we also examine the effects of indicator variables for BNY and Top 5 trustees. Furthermore, we use interaction terms of the trustee indicator variables with the total number of covenants and with the number of bondholder-protective covenants to emphasize the trustees' monitoring abilities.

B. Control Variables

We control for several variables that have been shown to significantly impact initial yield spreads of corporate high-yield bonds as well as bond default probability. These variables are: *CALLABILITY* (Livingston and Miller 2000), the issue-specific *CREDIT RATING* (Guedhami and Pittman 2008), *FIRST-TIME ISSUERS* (Gande et al. 1999), *MATURITY* (Helwege and Turner 1999), *PUBLIC FIRMS* (Livingston and Zhou 2002), *SEC RULE 144A* (Fenn 2000, Livingston and Zhou 2002), *SENIORITY* (Fridson and Garman 1998, John et al. 2010) [60], *SPLIT RATINGS* (Santos 2006, Livingston and Zhou 2010), *VOLUME* (Alexander et al. 2000a), *ZERO-*

stable income. Second, banks learn about the issuing firms' borrowing behavior and have access to issuers' inside information. This information may be particularly valuable for banks acting as underwriters in the high-yield bond market segment.

[58] In our sample period, Wachovia is among the fifteen largest underwriters in the high-yield segment and even among the top ten in some of the annual league tables. We note that underwriting services are also provided by the Top 3 trustees. However, they usually do not underwrite low-grade debt. Accordingly, only Wells Fargo appears in one of the annual league tables, and only with one underwritten transaction.

[59] We create a binary variable that measures reputation because a dummy variable is necessary to control for a possible self-selection bias. Besides, using a continuous variable for reputation is not preferable econometrically as this requires the variable to measure reputation with precision and to have a constant effect on the dependent variables (see Fang 2005). However, we control for trustee market share in some regressions using a linear variable.

[60] As explained in these papers, both Moody's and Standard & Poor's pursue a rating policy of generally notching down subordinated bonds by two (S&P) or even up to three (Moody's) notches relative to senior bonds. As the market may disagree upon this rating practice, a correction can be reflected in the initial spread.

COUPON OR STEP-UP STATUS (Fenn 2000), and the level of the BofA/ML HY Master Index over 10-year Treasuries (Fridson and Garman 1998).

Table 3.2 contains a list of all variables used in the empirical analyses including detailed definitions. Pair-wise correlations of the main variables are shown in Table 3.3 in the appendix.

Table 3.2: Description of Key Analyses Variables

Variable	Definition
Bankruptcy	Dummy variable that takes a value of 1 if the bond issuer files for bankruptcy within the sample period or thereafter (the observation period ends in Q1 2010), zero otherwise
Benchmark spread	The bond's offering yield minus the yield of a U.S. Treasury with equal maturity (in basis points (bps))
Callable	Dummy variable that takes a value of one if the bond is callable, zero otherwise
Default	Dummy variable that takes a value of one if the bond defaulted within the sample period or thereafter (the observation period ends in Q1 2010), zero otherwise
First-time issue	Dummy variable that takes a value of one if the issuing firm did not issue public debt at least 15 years prior to the bond issue, zero otherwise
HY index spread	BofA/Merrill Lynch US High-Yield Master II Index minus 10-year U.S. Treasuries (in bps)
Market share	The trustees' sample market shares by number of issues.
Maturity	The natural logarithm of the bond's maturity
No. of covenants	The total number of covenants a bond indenture includes
No. of BP covenants	The number of bondholder-protective covenants a bond indenture includes
Public Firm	Dummy variable that is equal to one if the issuing firm is stock listed, zero otherwise
Rating	Standard and Poor's issue-specific credit rating on notch level
Redeemable	Dummy variable that is set to one if the bond is redeemable, zero otherwise
Rule 144A	Dummy variable that takes a value of one if the bond is issued under SEC Rule 144A, zero otherwise
Split rating	Dummy variable that takes a value of one if Moody's and Standard and Poor's assign different issue-specific ratings to a bond issue, zero otherwise
Subordinate	Dummy variable that takes a value of one if the bond issue is subordinated within the issuing firm's capital structure, zero otherwise
Investment-bank trustee	Dummy variable that takes a value of one if the bond's indenture trustee offers investment-bank services (i.e. underwriting) in the high-yield bond market, zero otherwise

Top 3trustee	Dummy variable that takes a value of one if the bond's indenture trustee is one of the three largest trustees in the market, zero otherwise
Top 10 underwriter	Dummy variable that takes a value of one if at least one of the bond's lead underwriters is ranked among the top 10 in the annual league tables for underwriters in the high-yield debt market, zero otherwise
Unsecured	Dummy variable that takes a value of one if the bond is unsecured, zero otherwise
Volume	The natural logarithm of the proceeds raised through the bond issue
Zero-coupon or Step-up	Dummy variable that takes a value of one if the bond is a zero-coupon or step-up bond, zero otherwise

3.3 Data

A. Focus on Low-Grade Debt

To highlight the role of the bond indenture trustee, we focus on the high-yield sector of the U.S. corporate bond market. We do so for several reasons. First of all, low-grade debt issuers are predominantly more opaque firms (e.g. Puri 1996) with a larger number of covenants (relative to investment-grade issuers) attached to their bonds, and thus more need for monitoring.[61] This increased need for monitoring, of course, generally stems from the increased probability of default issuers and investors in the high-yield bond market have to face. Hence, monitoring can be more beneficial in the low-grade segment. Accordingly, Bradley and Chen (2011) show that the closer a firm is to default, the more does governance matter to bondholders. Second, as we assess the trustee's performance by employing bond defaults and issuer bankruptcies as performance measures, using low-grade debt obviously has advantages due to the fact that defaults occur more frequently for these bonds. Third, another benefit of examining high-yield bonds stems from the fact that issuing firms that are financially constrained or even distressed have potentially stronger incentives to bribe intermediaries and engage in wealth transfers from bondholders to shareholders.[62] Finally, in the context of our study, the focus on low-grade bonds is also advantageous because competition among underwriters, particularly with the repeal of the

[61] In this context, Rajan and Winton (1995) argue that covenants can increase lenders' incentives to monitor.

[62] For example, managers may enter negative-NPV investment strategies (Myers 1977), issue additional debt with (at least) the same priority (Smith and Warner 1979), or distribute corporate assets to shareholders by paying (extra) dividends (Black 1976). For a detailed analysis of the bondholder-stockholder conflict, see Smith and Warner (1979). For evidence on bondholder-stockholder conflicts in the high-yield market, see Alexander et al. (2000b).

Glass-Steagall Act in year-end 1999 (the start date of our sample period), has been shown to be most pronounced for this market segment (e.g., see Shivdasani and Song 2011, Yasuda 2005).

B. Data Selection, Sample Statistics, and the Covenant Structure of High-Yield Bonds

Data on original U.S. high-yield corporate bonds issued by public and private firms between January 1, 2000 and September 15, 2008 (Lehman Brother's filing for Chapter 11) are collected from Standard & Poor's Capital IQ (CIQ) database.[63] CIQ provides detailed issue information, including access to bond indentures in many cases. In line with the existing research on bond pricing effects (Fang 2005, Livingston and Miller 2000), we exclude convertible debt as well as bonds issued by financial institutions. We check the data using the Bloomberg database to ensure bonds are non-convertible and original speculative-grade issues. Further, we exclude bond issues for which no initial issue-specific credit rating, market price, or trustee information is available. We are left with a sample of 600 high-yield bond issues. For the remaining bonds, variables such as the first-time issuer status and the bond's covenants are mainly hand-selected using CIQ and the bond indentures available therein. Despite our best efforts, we are not able to gather full information for all bonds. For example, data on bond covenants is available for only 586 bonds. Summary statistics are provided in Table 3.4. The total number of trustees in our sample is 26. Overall, there are 383 issuing firms, i.e. each firm in our sample issues less than 1.6 bonds on average. Data about the market for bond trustee services is provided by Capital IQ and additional research on the internet.

[63] Basically, after the collapse of Lehman Brothers there were no high-yield bond issues at all for a certain period of time. Besides, this event affected investors' attitude towards risk and hence (potentially) their demand for covenants and monitoring.

Table 3.4: Summary of Sample Statistics

This table reports the descriptive statistics of our sample of U.S. high-yield corporate bonds issued between January 1, 2000 and September 15, 2008. Means are reported.

BB	28%	Volume ($ millions)	272
B	59%	Maturity (in years)	7.8
CCC or below	13%	Secured	17%
Split rating (at issue)	54%	Senior Subordinate	29%
Coupon rate (bps)	909	Callable	77%
Benchmark spread (bps)	495	Zero-coupon/Step-up bonds	4%
First-time issues	22%	Stock-listed issuers	62%

With respect to the covenant structure of U.S. high-yield corporate bonds, Table 5 provides a detailed overview of the covenant structure for the bonds in our sample. The only study that deals with high-yield bond covenants in particular, to the best of our knowledge, is Gilson and Warner (1998). For their sample of 164 high-yield bonds issued between 1980 and 1992, the authors report that the average number of restrictive covenants is 6 (relative to 24 for bank loans). Hence, they conclude that high-yield bonds are covenant-light debt instruments. The more recent evidence we present shows that public debt in the low-grade segment has become more restrictive in terms of covenants. Accordingly, in Panel A of Table 3.5 we report that the average number of restrictive covenants in our sample is 10 and the total number of covenants is 16.[64] The 10% percentile of the total number of covenants is 10, indicating that there are certain types of covenants that tend to be included in almost every bond indenture. Hence, we additionally consider the distribution of certain groups of covenants in Panel B of Table 3.5. Following the classification in Mansi et al. (2011), we document that four groups of covenants are included in more than 80% of all bond indentures (comparable to the statistics for junk bond covenants as provided by Reisel 2010): borrowing restrictions, payment restrictions, asset and investment restrictions, and antitakeover-related covenants. We thereby corroborate the authors' conclusion that 'herding' in the use of covenants may occur. Furthermore, about 19% of all bonds include

[64] Gilson and Warner (1998) only investigate bonds issued by firms listed on the NYSE, AMEX or NASDAQ. However, when we restrict our sample to issuers listed on the NYSE or AMEX, the average number of restrictive covenants is still 9 and the total number of covenants is 15 (not reported for brevity).

restrictions on stock issuance in their indentures. This is surprising, in particular for issuers in the low-grade segment, as these covenants can hinder firms from raising equity in bad times and hence increase their risk of bankruptcy (see Mansi et al. 2011).

Table 3.5: The Covenant Structure of High-Yield Corporate Bonds

Panel A: Covenant classification according to Standard and Poor's Capital IQ database

This panel shows the average number of covenants included in a bond indenture. The presented classification of covenants is taken from Standard and Poor's Capital IQ database (and is also used in Mansi et al. 2011). Percentiles refer to the total number of covenants (the corresponding standard deviation is 3.95 covenants).

No. of covenants total	15.9	10% Percentile	10
No. of bondholder-protective covenants	6.3	25% Percentile	15
No. of issuer-restrictive covenants	5.7	50% Percentile	17
No. of subsidiary-restrictive covenants	4.2	90% Percentile	20

Panel B: Covenant classification according to Mansi et al. (2011)

This panel displays the distribution of different types of covenants in our sample. The presented classification and the definitions of each group of covenants follow the paper by Mansi et al. (2011). Means are reported.

Borrowing restrictions	95.8%	Stock issuance restrictions	18.8%
Asset and investment restrictions	88.4%	Rating trigger covenants	1.5%
Antitakeover related covenants	87.5%	Profit maintenance covenants	0.7%
Payment restrictions	82.6%	Default related covenants	0.3%

Finally, in Table 3.6, we analyze the bond covenant structures and issue-specific credit ratings for different groups of trustees. First, bonds monitored by one of the Top 3 trustees turn out to be riskier in terms of credit ratings. The difference to bonds monitored by other trustees is almost one notch and statistically significant. The total number of covenants is 16.2 as compared to 15.4, i.e. bonds monitored by one of the three largest trustees on average include almost one covenant more. Also, the number of subsidiary-restrictive covenants is slightly larger. These differences are statistically significant. Second, bonds monitored by 'investment bank' trustees are less risky in terms of credit ratings. However, the difference, though statistically significant, is only about half a notch. Regarding the covenant structure, the total number of covenants amounts to 16 for

both groups of bonds. 'Investment bank' trustees tend to monitor bonds with a slightly larger number of bondholder-protective covenants[65] (6.5 versus 6.2) and a smaller number of uncommon covenants (3.2 versus 3.6) defined as covenants that are attached to less than 75% of all bonds. The aforementioned differences suggest that bonds monitored by 'investment bank' or Top 3 trustees might potentially witness different initial benchmark spreads.

[65] For the classification of bondholder-protective, issuer-restrictive, and subsidiary-restrictive covenants, we follow the classification made in Standard and Poor's Capital IQ database. Mansi et al. (2011) also use these categories.

Table 3.6: Covenants and Ratings Analyses by Trustee Identity

Panel A: Covenants and Ratings Analysis by Trustee Identity (Top 3 Trustees)

This table reports means of the number covenants and issue-specific ratings for bonds monitored by Top 3 trustees and bonds monitored by one of the remaining trustees. Higher values for issue-specific credit ratings mean lower default probabilities (a value of 11 is equal to a B-rating by S&P). Covenants are defined as uncommon if they are attached to less than 75% of all bond issues in our sample. The t-statistics for differences in means are reported.

	Bonds monitored by Top 3 trustees	Bonds monitored by less reputable trustees	t-statistics
Issue-specific credit rating (S&P)	11.2	12.0	-4.90
No. of covenants total	16.2	15.4	2.40
No. of bondholder-protective covenants	6.4	6.1	2.15
No. of issuer-restrictive covenants	5.7	5.7	0.12
No. of subsidiary-restrictive covenants	4.3	3.9	2.74
No. of uncommon covenants	3.5	3.4	0.52

Panel B: Covenants and Ratings Analysis by Trustee Identity ('Investment Bank' Trustees)

This table reports means of covenants and issue-specific ratings for bonds monitored by investment-bank trustees and bonds not monitored by investment banks. Higher values for issue-specific credit ratings mean lower default probabilities (a value of 11 is equal to a B-rating by S&P). Covenants are defined as uncommon if they are attached to less than 75% of all bond issues in our sample. The t-statistics for differences in means are reported.

	Bonds monitored by Investment Banks	Bonds not monitored by Investment Banks	t-statistics
Issue-specific credit rating (S&P)	11.9	11.4	2.32
No. of covenants total	16.0	16.0	-0.01
No. of bondholder-protective covenants	6.5	6.2	1.63
No. of issuer-restrictive covenants	5.7	5.7	-0.02
No. of subsidiary-restrictive covenants	4.0	4.2	-0.81
No. of uncommon covenants	3.2	3.6	-1.25

3.4 Empirical Findings: Determinants of the Issuer-Trustee Matching

Using a Heckman (1979) two-stage approach to address the endogenous matching of issuing firms and bond trustees in our later analysis (section 3.5), we run probit regressions for the issuer-trustee matching in a first step. In the context of this issuer-trustee matching, not only the issuing firm may have reasons to appoint a certain trustee (e.g. a Top 3 trustee or an 'investment bank'). As Spiotto (2008) puts it, trustees have an incentive to review the documents prior to closing and to put bondholders' interests first because they should be certain prior to accepting a trusteeship that, if accepting the trusteeship, they will be able to protect bondholders and to function under the terms of the indenture (e.g. to reduce their own legal risks or minimize their effort given the low compensation for trustees). To the best of our knowledge, no study has yet examined the determinants of the matching between bond issuers (who choose a certain trustee) and indenture trustees (who accept a trusteeship). Given the observable outcomes of this matching procedure, we run four probit regressions: two for the matching of an issuer with an 'investment bank' trustee (specifications 1 and 2) and two for the matching of an issuer with a Top 3 trustee (specifications 3 and 4).[66] In regression specifications 2 and 4 we particularly include an indicator variable for reputable (top 10) high-yield bond underwriters to examine whether they affect the probability that a reputable trustee is chosen to monitor a bond.[67] Regression results are reported in Table 3.7.

[66] For brevity, we do not elaborate on the variables we use in these regressions. Yet, all variables capture either the necessity for monitoring or the required effort for monitoring, or both. The values of the LR Chi-squared statistics indicate that overall the models do well in explaining the issuer-trustee matching.

[67] This additional check is conducted for two reasons: to examine whether the choice of a reputable trustee can be interpreted as an underwriting standard of reputable banks and to address the possibility of underwriter relations and tit-for-tat strategies between underwriting banks and 'investment bank' trustees.

Table 3.7: Issuer-Trustee Matching (First-Stage Regressions)

This table contains results of probit regressions of the trustee choice (for 'investment-bank' and Top 3 trustees) on several firm and issue-specific characteristics (Heckman first-stage regressions of the two-step estimation procedure). All variables are defined as explained in Table 3.1. A constant term, whose value is not reported, is included in all regressions. Z-statistics are reported in parentheses. Results do not significantly change when we use heteroscedasticity-robust or issuer-cluster robust standard errors. Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*)-level.

Variable	**(1)** **Investment-Bank Trustee**	**(2)** **Investment-Bank Trustee**	**(3)** **Top 3 Trustee**	**(4)** **Top 3 Trustee**
Public firm	0.482 (2.80) ***	0.441 (2.60) ***	-0.402 (-3.10) ***	-0.410 (-3.15) ***
Top 10 underwriter		0.011 (0.04)		-0.140 (-0.59)
No. of covenants	0.022 (1.01)	0.023 (1.06)	-0.004 (-0.21)	-0.003 (-0.15)
BB	0.636 (2.10) **	0.686 (2.27) **	-0.582 (-2.77) ***	-0.561 (-2.67) ***
B	0.492 (1.73) *	0.502 (1.77) *	-0.273 (-1.42)	-0.264 (-1.38)
Volume	-0.181 (-1.45)	-0.181 (-1.42)	0.051 (0.51)	0.053 (0.52)
Maturity	0.159 (0.46)	0.082 (0.23)	-0.385 (-1.39)	-0.410 (-1.43)
Unsecured	-0.162 (-0.95)	-0.162 (-0.94)	0.091 (0.66)	0.072 (0.52)
Redeemable	-0.469 (-1.69) *	-0.465 (-1.67) *	0.671 (2.81) ***	0.643 (2.67) ***
First-time issuer	0.111 (0.60)	0.093 (0.50)	0.026 (0.17)	0.015 (0.10)
SEC Rule 144A	-0.217 (-1.29)	-0.204 (-1.22)	0.291 (2.12) **	0.288 (2.09) **
Nobs	580	580	580	580
Pseudo R-squared	0.0578	0.0547	0.0700	0.0699
LR Chi-squared (p-value)	23.98 (0.00)	22.95 (0.02)	50.33 (0.00)	50.24 (0.00)

As our findings indicate, the significant determinants of the issuer-trustee matching are similar for both types of trustees. However, the identified driving forces turn out to inversely affect the choice of Top 3 and 'investment bank' trustees pointing to considerable differences between these two types of trustees.

First, the coefficient of the indicator variable for public firms is statistically significant at the 1% level in both regressions. Yet, while 'investment bank' trustees monitor significantly larger fractions of bonds issued by stock-listed firms, Top 3 trustees, on the contrary, monitor considerably lower fractions of bonds by public firms. Second, 'investment bank' trustees rather monitor low-risk high-yield debt issues (as measured by issue-specific rating classes), while Top 3 trustees tend to monitor riskier debt issues instead. The corresponding regression coefficients for the indicator variable BB are significant at the 5% and 1% level, respectively. Third, Top 3 trustees tend to monitor considerably larger fractions of redeemable bonds and bonds issued under SEC Rule 144A. The first-time issuer status or other bond-specific features such as volume and maturity do not have an impact on the issuer-trustee matching. Finally, reputable underwriters do not affect the probability that reputable bond trustees are chosen and, in particular, that other underwriting banks act as bond trustees (see regression specification 2). Furthermore, employing issuer-cluster or year-cluster robust standard errors does not considerably change the results. Yet, in the second case, the total number of covenants attached to a bond significantly increases the probability that an 'investment bank' trustee is chosen to monitor the bond at the 5% level.

3.5 Empirical Findings: Trustee Identity and Initial Pricing

A. Econometric Testing

This section investigates whether the bond trustee's identity/reputation and the control variables outlined in section 3.2 significantly affect firms' borrowing costs as measured by the initial benchmark spread[68] at bond issuance. To address the issue of endogenous matching between bond trustees and issuing firms (similar to the well recognized matching of reputable underwriters and issuers, see Fang 2005), we use a Heckman (1979) two-stage approach as

[68] In line with other studies on bond pricing effects (Fang 2005, Livingston and Miller 2000, Fridson and Garman 1998), we use the yield-yield spread to U.S. Treasuries with similar maturity.

recently employed in Ross (2010) and McCahery and Schwienbacher (2010).[69] We may merely measure a clientele effect for a certain group of trustees if the potential problem of self-selection is significant and not controlled for. The approach requires estimating selection equations in the first step (see section 4). From these regressions (specifications 1 and 3) we obtain inverse Mills ratios for the trustee choice. To control for endogenous matching, the Mills ratios are included in the following equation (*Trustee* stands for either 'investment bank' or Top3 trustee):[70]

$$\textbf{Benchmark spread}_i = c_0 + c_1\, \textit{Trustee}_i + \textbf{…Controls…} + e_i$$

Following McCahery and Schwienbacher (2010) and Gatti et al. (2008), we run the same regression model using the standard OLS approach to have a benchmark. If the selection problem is not significant, we may basically rely on our OLS results. Furthermore, comparing the similarity of the regression coefficients found in the two approaches is an additional robustness check for our results. Regression results are summarized in Tables 3.8 and 3.9. All regressions include controls for industries (first-digit SIC codes) and years. In the following we will focus on the results shown in Table 3.9.

B. Trustee Variables

Table 3.8 shows the results for the group of Top 3 trustees (Panel A)[71] and 'investment bank' trustees (Panel B) when we run regressions using heteroscedasticity-robust standard errors.

[69] The Heckman two-step approach is also used in Gatti et al. (2008) and Puri (1996). All studies examine the issuer-certifier matching. A detailed description of how the Heckman model can be used to correct for the problem of selection bias is given in Briggs (2004). For an excellent overview of econometric methods to deal with self-selection and applications related to corporate finance, see Li and Prabhala (2005).

[70] The applied methodology makes the (econometric) assumption that the pricing process is the same for all bonds in our sample irrespective of the trustee's identity. This assumption appears reasonable and is, above all, backed by our later results that show similar coefficients of our control variables irrespective of the trustee's identity.

[71] Regression specifications (4) and (5) in Table 3.8A are only shown for comparative means. As Table 3.3 in the appendix illustrates, the inverse Mills ratio for the choice of a Top 3 trustee is highly correlated with the variables Public Firm, Rating, Callable, and Rule 144A. Hence, one should be careful when interpreting these findings. When we exclude these variables, the coefficient of Top 3 trustee indicator variable remains statistically insignificant.

Table 3.8A: Bond Pricing and Trustee Identity (Top 3 Trustees)

This table contains results for OLS and Heckman second-stage regressions of the initial benchmark spread (in basis points) on several issue-specific characteristics for a sample of U.S. high-yield bonds issued between 2000 and 2008. All variables are defined as explained in Table 3.1. T-Statistics (in parentheses) are based on *heteroscedasticity-robust standard errors*. Employing year-cluster robust standard errors does not significantly change the results. A constant term, whose value is not reported, is included in all regressions. Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*)-level.

Variable	**(1)** **OLS (all)**	**(2)** **OLS (all)**	**(3)** **OLS (all)**	**(4)** **Heckman (Top 3)**	**(5)** **Heckman (all)**
BNY Mellon	0.51				
	(0.05)				
Top 3 trustee		1.38			2.28
		(0.12)			(0.19)
# covenants * Top 3 trustee			0.54		
			(0.80)		
Public firm	-54.64	-54.54	-54.14	-53.48	-54.82
	(-4.28) ***	(-4.25) ***	(-4.17) ***	(-2.41) **	(-3.13) ***
First-time issuer	27.49	27.41	26.31	34.16	26.83
	(2.06) **	(2.07) **	(1.97) **	(2.20) **	(1.99) **
Rating	-44.85	-44.83	-44.40	-39.75	-44.73
	(-10.36) ***	(-10.33) ***	(-10.03) ***	(-5.48) ***	(-8.21) ***
Split rating	21.86	21.89	22.16	23.60	21.91
	(2.13) **	(2.14) **	(2.13) **	(1.98) **	(2.11) **
Volume	-31.47	-31.45	-31.78	-35.06	-31.75
	(-3.26) ***	(-3.26) ***	(-3.21) ***	(-3.09) ***	(-3.13) ***
Maturity	-132.90	-132.91	-136.43	-155.52	-136.29
	(-3.05) ***	(-3.05) ***	(-3.06) ***	(-2.73) ***	(-2.94) ***
Subordinate	-66.56	-66.50	-67.51	-58.14	-68.02
	(-5.12) ***	(-5.16) ***	(-5.15) ***	(-3.69) ***	(-4.93) ***
Callable	33.30	33.42	31.83	68.44	33.16
	(1.72) *	(1.72) *	(1.64)	(2.65) ***	(1.68) *
SEC Rule 144A	19.02	18.98	19.11	27.42	19.55
	(1.38)	(1.37)	(1.34)	(1.29)	(1.27)
Zero or Step-up	183.94	183.89	181.98	183.70	183.23
	(6.07) ***	(6.05) ***	(5.38) ***	(5.38) ***	(5.39) ***
HY index spread	0.55	0.55	0.55	0.65	0.55
	(7.89) ***	(7.90) ***	(7.83) ***	(7.49) ***	(7.80) ***
Mills_Top 3 trustee				5.36	0.22
				(0.06)	(0.00)
Year and Industry Controls	Yes	Yes	Yes	Yes	Yes
NObs	590	590	576	398	576
R-squared	0.5373	0.5373	0.5317	0.5610	0.5312
F-statistic	32.42 ***	32.30 ***	30.14 ***	22.57 ***	29.24 ***

Table 3.8B: Bond Pricing and Trustee Identity ('Investment Bank' Trustees)

This table contains results for OLS and Heckman second-stage regressions of the initial benchmark spread (in basis points) on several issue-specific characteristics for a sample of U.S. high-yield bonds issued between 2000 and 2008. All variables are defined as explained in Table 3.1. T-Statistics (in parentheses) are based on *heteroscedasticity-robust standard errors*. A constant term, whose value is not reported, is included in all regressions. Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*)-level.

Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	OLS (all)	**OLS (# covenants > 10)**	**OLS (all)**	**OLS (all)**	**Heckman (IB-Trustee)**	**Heckman (all)**
Investment-bank trustee	-26.41 (-1.84) *	-36.54 (-2.48) **				-27.27 (-1.87) *
# covenants * IB trustee			-1.84 (-2.23) **			
# BP covenants * IB trustee				-4.82 (-2.34) **		
Public firm	-52.45 (-4.10) ***	-53.83 (-4.01) ***	-52.31 (-4.01) ***	-52.19 (-4.01) ***	-67.05 (-1.11)	-53.97 (-2.58) ***
First-time issuer	27.51 (2.07) **	30.46 (2.21) **	27.07 (2.02) **	26.70 (1.99) **	77.23 (2.23) **	26.61 (1.87) *
Rating	-44.39 (-10.26) ***	-43.01 (-9.80) ***	-44.21 (-10.08) ***	-44.19 (-10.08) ***	-52.32 (-5.01) ***	-44.43 (-8.25) ***
Split rating	21.92 (2.14) **	29.37 (2.71) ***	21.30 (2.05) **	21.23 (2.04) **	-3.97 (-0.15)	21.86 (2.08) **
Volume	-32.05 (-3.31) ***	-34.79 (-3.27) ***	-33.10 (-3.33) ***	-33.01 (-3.33) ***	-35.98 (-1.28)	-31.89 (-2.65) ***
Maturity	-133.51 (-3.08) ***	-186.33 (-4.74) ***	-136.81 (-3.08) ***	-137.74 (-3.02) ***	-279.78 (-3.82) ***	-137.39 (-3.07) ***
Subordinate	-65.57 (-5.06) ***	-58.21 (-4.38) ***	-67.29 (-5.09) ***	-66.72 (-5.03) ***	-87.87 (-2. 51) **	-67.46 (-4.57) ***
Callable	34.72 (1.79) *	28.08 (1.34)	36.10 (1.84) *	35.19 (1.80) *	43.84 (0.91)	34.80 (1.78) *
SEC Rule 144A	18.59 (1.36)	20.92 (1.39)	19.27 (1.37)	20.10 (1.42)	-49.90 (-1.49)	19.60 (1.33)
Zero or Step-up	183.59 (6.01) ***	182.14 (5.79) ***	182.96 (5.37) ***	183.22 (5.36) ***	301.40 (6.78) ***	183.27 (5.37) ***
HY index spread	0.55 (8.00) ***	0.59 (7.94) ***	0.55 (7.94) ***	0.55 (7.90) ***	0.39 (5.24) ***	0.55 (7.92) ***
Mills_Inv.-bank trustee					28.20 (0.25)	-2.93 (-0.07)
Year and Industry Controls	Yes	Yes	Yes	Yes	No	Yes
NObs	590	527	576	574	67	576
R-squared	0.5395	0.5317	0.5342	0.5340	0.6703	0.5336
F-statistic	32.34 ***	26.29 ***	30.60 ***	30.51 ***		29.69 ***

The results in Panel A suggest that the Top 3 trustees are not perceived as effective monitoring devices and accordingly do not have an impact on the issuing firms' borrowing costs. The corresponding coefficients of the indicator (and interaction) variables and the inverse Mills ratio are statistically insignificant throughout all regressions.[72] Hence, our findings offer evidence in favor of the prevalent view that indenture trustees are ineffective. Yet, the results in Panel B of Table 3.8 show that 'investment bank' trustees, on the contrary, are priced in high-yield bond issues and seemingly perceived as effective monitors. Hence, in the following we present a more detailed analysis for this group of trustees. The results are summarized in Table 3.9.

[72] Results do not change when we employ a Top 5 indicator variable to measure trustee reputation in additional unreported regressions. Furthermore, when we run regressions with an indicator variable for each of the 3 and 5 largest trustees in our sample, none of the corresponding regression coefficients is significant on conventional levels.

Table 3.9: Bond Pricing and Trustee Identity ('Investment Bank' Trustees)

This table contains results for OLS and Heckman second-stage regressions of the initial benchmark spread (in basis points) on several issue-specific characteristics for a sample of U.S. high-yield bonds issued between 2000 and 2008. All variables are defined as explained in Table 3.1. T-Statistics (in parentheses) are based on *year-cluster robust standard errors*. A constant term, whose value is not reported, is included in all regressions. Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*)-level.

Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
	OLS (all)	**OLS (all)**	**OLS (all)**	**OLS (all)**	**OLS (# covenants > 10)**	**OLS (all)**	**OLS (all)**	**Heckman (all)**	**Heckman (all)**
Investment-bank trustee	-25.22 (-3.78) ***	-26.56 (-3.79) ***	-29.03 (-2.64) **	-33.60 (-1.97) *	-37.11 (-6.11) ***			-26.15 (-3.92) ***	-29.50 (-2.53) **
Top 3 Trustee				-11.52 (-0.61)					
# covenants * IB trustee						-1.78 (-6.05) ***			
# BP covenants * IB trustee							-4.69 (-6.39) ***		
Market share			-22.59 (-0.39)						-22.57 (-0.38)
# of covenants		2.43 (1.28)							2.85 (1.52)
Top 10 underwriter	-62.51 (-2.19) *	-64.51 (-2.33) *	-63.25 (-2.20) *	-63.14 (-2.24) *	-53.03 (-1.70)	-64.96 (-2.32) *	-65.18 (-2.31) *	-65.02 (-2.30) *	-64.59 (-2.28) *
Public firm	-52.87 (-3.52) ***	-54.63 (-3.66) ***	-53.47 (-3.67) ***	-53.54 (-3.42) **	-53.77 (-3.87) ***	-52.49 (-3.35) **	-52.36 (-3.35) **	-54.00 (-2.39) **	-45.67 (-2.22) *
First-time issuer	24.20 (2.54) **	22.56 (2.04) *	24.09 (2.52) **	24.71 (2.89) **	28.28 (2.33) *	23.27 (2.25) *	22.86 (2.16) *	22.86 (1.74)	24.41 (1.92) *
Rating	-44.42 (-7.29) ***	-43.32 (-6.71) ***	-44.47 (-7.29) ***	-44.52 (-7.43) ***	-42.44 (-8.03) ***	-44.21 (-7.11) ***	-44.23 (-7.15) ***	-44.41 (-7.40) ***	-41.79 (-6.70) ***

Split rating	22.13 (2.15) *	22.57 (2.17) *	21.86 (2.09) *	21.76 (2.13) *	30.46 (2.72) **	21.49 (2.11) *	21.64 (2.12) *	22.04 (2.06) *	21.52 (1.99) *
Volume	-24.82 (-1.49)	-24.08 (-1.42)	-24.80 (-1.49)	-25.05 (-1.52)	-29.56 (-1.61)	-25.99 (-1.53)	-25.92 (-1.51)	-24.87 (-1.23)	-27.60 (-1.50)
Maturity	-97.53 (-1.79)	-106.83 (-2.09) *	-97.29 (-1.78)	-97.72 (-1.79)	-174.17 (-4.73) ***	-100.87 (-1.83)	-100.68 (-1.84)	-101.47 (-1.86)	-106.10 (-2.09) *
Subordinate	-59.46 (-8.16) ***	-59.00 (-5.44) ***	-59.11 (-7.79) ***	-59.47 (-8.47) ***	-52.19 (-6.41) ***	-61.08 (-6.35) ***	-60.53 (-6.17) ***	-61.19 (-7.09) ***	-54.79 (-4.96) ***
Callable	26.59 (1.05)	19.82 (0.78)	27.22 (1.09)	27.78 (1.08)	23.76 (1.15)	28.09 (1.11)	27.18 (1.09)	26.82 (1.07)	19.39 (0.80)
SEC Rule 144A	20.29 (1.16)	17.71 (0.99)	20.30 (1.17)	20.57 (1.18)	21.78 (1.18)	21.29 (1.16)	22.17 (1.18)	21.58 (1.06)	14.13 (0.73)
Zero or Step-up	187.70 (5.53) ***	185.02 (5.01) ***	188.50 (5.37) ***	188.66 (5.47) ***	186.17 (5.30) ***	186.64 (4.83) ***	186.93 (4.84) ***	186.94 (4.77) ***	185.69 (4.80) ***
HY index spread	0.57 (11.41) ***	0.58 (12.92) ***	0.58 (11.35) ***	0.58 (12.41) ***	0.59 (10.12) ***	0.57 (12.93) ***	0.57 (12.97) ***	0.57 (12.85) ***	0.58 (12.55) ***
Mills_Inv.-bank trustee								-2.51 (-0.06)	23.48 (0.71)
Year and Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NObs	589	575	589	589	527	575	573	575	575
R-squared	0.5507	0.5468	0.5509	0.5513	0.5372	0.5457	0.5455	0.5451	0.5473

Table 3.9 shows the results for 'investment bank' trustees when we use year-cluster robust standard errors[73] and control for reputable underwriters via an indicator variable set to one if at least one of the bonds' lead underwriters is among the top 10 underwriters in the low-grade debt segment (according to annual league table data from Bloomberg). We control for underwriters for two reasons: First, we want to rule out that our results are driven by any unobservable bank relations somehow captured by our trustee variables.[74] Second, we want to avoid an omitted variable bias as it has been shown that reputable underwriters affect initial bond prices (see Fang 2005 for general evidence and Andres et al. 2011 for evidence on high-yield bonds). Furthermore, in some regressions we conduct additional checks for the total number of covenants attached to each bond, trustees' market shares, and Top 3 trustees.

We document that when 'investment banks' act as bond trustees, the initial benchmark spread is reduced by about 25 to 34 basis points (regression specifications 1 to 4, 8 and 9) irrespective of whether we control for the number of covenants attached to a bond, trustees' market shares, Top 3 trustees, or the issuer-trustee matching. The corresponding regression coefficients are statistically significant at the 1% level in specifications 1, 2 and 8. Controlling for market shares and Top 3 trustees (specifications 3 and 4), the regression coefficients for the 'investment bank' trustee variable remain significant at the 5% and 10% level, respectively. Although the coefficients of the aforementioned control variables are negative, both are statistically insignificant. Furthermore, we do not find evidence of a selection problem as the inverse Mills ratio for the choice of an 'investment bank' trustee is not significant in specifications 8 and 9. The same holds for specifications 5 and 6 in Panel B of Table 3.8. When we restrict our sample to bonds that include more than 10 covenants (i.e. exclusion of the 10% percentile of bonds by total number of covenants) in specification 5, 'investment bank' trustees reduce borrowing costs by 37 basis points, significant at the 1% level.[75] We do so because bonds with only a few covenants most probably have less need for monitoring and thus trustee choice may not be that important to

[73] Peterson (2009) mentions that "it is well known that OLS and White standard errors are biased when the residuals are not independent" (p. 475) and shows, though in the context of panel data sets, that the use of clustered standard errors can be advantageous. We aim at capturing the changing market moods and developing standards in bond contracts as well as the phenomenon of 'covenant herding' (Mansi et al. 2011) by using year-cluster robust standard errors.

[74] The correlation between the indicator variables 'Investment Bank' Trustee and Top 10 Underwriter is only 0.01.

[75] We do not find a potential indication of a linear relation between the number of covenants and the pricing effect of 'investment bank' trustees. When we examine only those bonds with more than 17 covenants (i.e. the 50% percentile), the coefficient of the trustee variable is about -33 basis points significant at the 10% level.

bond investors. Our finding that trustee identity is priced more strongly in bond issues with more covenants corroborates our hypothesis. To further emphasize and isolate the effect of 'investment bank' trustees' monitoring abilities, we interact the trustee indicator variable with the total number of covenants and the number of bondholder-protective covenants in specifications 6 and 7, respectively. The corresponding regression coefficients are both significant at the 1% level. Firms' borrowing costs are reduced by about 2 and 5 basis points, respectively.[76] The regression coefficients remain significant at the 1% level when we use the squared number of covenants in additional unreported regressions.

To conclude, these results indicate that not all trustees are perceived as ineffective monitoring devices by bond investors. On the contrary, we find evidence that 'investment bank' trustees are perceived as being more capable of monitoring bond covenants. The results (and we particularly emphasize the insignificance of the variable capturing trustees' market shares) support our reasoning that 'investment banks' have incentives to conduct higher-quality services and signal investor orientation to avoid negative spillover effects on their underwriting business.[77] Our findings that the largest, arguably most reputable trustees in the market do not affect bond prices offer additional support for our reasoning that spillover effects may be an important incentive mechanism.

C. Robustness

For robustness purposes, we conduct the following additional analyses that are not reported for brevity: The results for our trustee variables and interaction terms remain qualitatively unchanged when we control for the yield curve (i.e. the yield differential of 10-year to 3-month Treasuries, see Fridson and Garman 1998), the level of the S&P500 stock index, the total number of covenants, or the presence of certain groups of covenants (following the classification as shown in Table 3.5). The variable capturing the number of covenants attached to a bond do not significantly affect the bonds' initial pricing in any of the regressions. Furthermore, when we control for the trustees' market shares or Top 3 trustees, the interaction terms (in specifications 6 and 7) remain unchanged and significant at the 5% level. When we control for the total number

[76] In unreported regressions without variables capturing trustee identity, neither the total number of covenants nor the number of bondholder-protective covenants significantly affect initial bond prices.

[77] One may even reason that building up a reputation as an investor-friendly bank - by acting dedicated on behalf of bondholders - can positively affect a bank's credibility as a certifier/underwriter.

of covenants, results remain unchanged and significant at the 1% level. The regression coefficient of the variable capturing trustees' market share is insignificant throughout all regressions. Examining only those bonds issued by stock-listed firms or repeated issuers, the regression coefficient of our variable for 'investment bank' trustees as well as the coefficients of the employed interaction terms are significant at the 1% level. Doing so, the coefficients of the trustee indicator variables amount to -36 and -37 basis points, respectively. The robustness of our results is further backed by the results shown in Panel B of Table 3.8. Although the regression coefficients of our main variables forfeit some of their significance, all of them remain statistically significant at conventional levels when we use heteroscedasticity-robust standard errors. Finally, in all regressions the regression coefficients in both approaches, OLS and Heckman, are similar pointing to the stability of our results. Variance inflation factors remain below critical values in all regressions.

D. Control Variables

In the following, we mainly refer to the results documented in Table 3.9. The regression coefficient of the variable Rating (on notch level) is significant at the 1% level in all regression models. The pricing effect amounts to -42 to -44 basis points in all regressions. Also, the coefficient of the variable Split Rating is significant (at least) at the 10% level, positive as expected, and amounts to about 22 basis points in all full-sample regressions. We thereby corroborate the findings in Santos (2006) and Livingston and Zhou (2010). In addition, results for the regression coefficients of the variables HY Index Spread, Subordinate, and Zero-coupon or Step-up are also in line with the literature. All coefficients are significant at the 1% level in all regressions. The coefficient of the indicator variable Subordinate amounts to about -60 basis points in the full-sample regressions in line with the results in John et al. (2010) and Fridson and Garman (1998). The coefficient on the Zero- or Step-up coupon dummy is considerably larger than the coefficient on the same variable in Fenn (2000) – more than 185 basis points compared to 65 basis points – providing even stronger evidence for the interpretation that this premium reflects the value of the firm's default option (and in line with the focus on low-grade debt).

Furthermore, corroborating Livingston and Zhou (2002), we report that public firms have significantly lower borrowing costs of about -52 to -55 basis points. This pricing effect is at least significant at the 5% level (except for specification 9) and roughly 30 basis points larger than in

Livingston and Zhou (2002), attributable to our focus on low-grade debt. Our findings for the first-time issuer status are also in line with previous work such as Gande et al. (1999). The variable's coefficient is positive and at least significant at the 10% level. The pricing effect amounts to 23 to 25 basis points. With respect to the bonds' maturity and volume, our results, using year-cluster robust standard errors, do not support the previous findings in Alexander et al. (2000), who document a significant negative relation between issue volume and bond yields, or in Helwege and Turner (1999) and Guedhami and Pittman (2008) who find that maturity considerably affects initial bond prices. However, using heteroscedasticity-robust standard errors (see Table 3.8), we offer empirical support for these studies.

Finally, we present recent evidence on the empirical question of the impact of SEC's Rule 144A on the pricing of corporate bonds. We document a positive but throughout insignificant pricing effect between 18 and 22 basis points. Hence, our results do not corroborate Fenn's (2000) inadequate-disclosure hypothesis but rather corroborate more recent studies (Ramchand and Chaplinsky 2004, Huang and Ramirez 2010) that fail to support this hypothesis.

3.6 Empirical Findings: The Impact of Trustees on Bond Performance

In this section, we intend to offer a more complete picture of the role of the bond trustee and accordingly examine if reputable trustees affect the probability of bond default and issuer bankruptcy. To do so, we run probit regressions as displayed in Table 3.10. The corresponding indicator variables are respectively set to one if the issuing firm defaults on the bond or files for bankruptcy (as reported in Capital IQ) within the sample period or thereafter. Our control period for default and bankruptcy ends after the first quarter of 2010.

Table 3.10: Bond Defaults, Issuer Bankruptcies, and Trustee Identity

This table presents results of probit regressions. The dependent variable is either an indicator variable set to one 1 if the bond defaults or if the issuer files for bankruptcy (we consider data as of the first quarter of 2010). All variables are defined as explained in Table 3.1. Z-Statistics are in parentheses. Employing year-cluster robust standard errors does not significantly change the results. All regressions include year and industry controls and a variable capturing the high-yield market sentiment (variable HY index spread). A constant term (not reported) is included in all regressions. Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*)-level.

Variable	**Default**		**Bankruptcy**	
	(1)	**(2)**	**(3)**	**(4)**
Top 3 trustee		-0.077	0.118	
		(-0.31)	(0.72)	
Investment-bank trustee				-0.331
				(-1.27)
BNY Mellon	-0.242			
	(-0.98)			
Public firm	-0.223	-0.205	-0.295	-0.290
	(-0.80)	(-0.74)	(-1.81) *	(-1.77) *
First-time issuer	-0.063	-0.073	-0.157	-0.144
	(-0.19)	(-0.22)	(-0.86)	(-0.79)
Rating	-0.204	-0.209	-0.141	-0.138
	(-2.31) **	(-2.36) **	(-2.69) ***	(-2.63) ***
Split rating	-0.205	-0.207	0.174	0.175
	(-0.88)	(-0.90)	(1.24)	(1.24)
Volume	0.089	0.086	0.059	0.051
	(0.40)	(0.39)	(0.44)	(0.38)
Maturity	-0.330	-0.359	-0.122	-0.135
	(-0.47)	(-0.52)	(-0.26)	(-0.29)
Subordinate	-0.474	-0.508	-0.625	-0.615
	(-1.51)	(-1.63)	(-3.37) ***	(-3.32) ***
Callable	-0.214	-0.242	0.099	0.129
	(-0.58)	(-0.65)	(0.41)	(0.54)
SEC Rule 144A	-0.740	-0.732	0.099	0.096
	(-2.86) ***	(-2.85) ***	(0.55)	(0.53)
Zero or Step-up	0.601	0.576	0.438	0.443
	(1.38)	(1.33)	(1.36)	(1.37)
NObs	587	587	589	589
Pseudo R-squared	0.1949	0.1904	0.1410	0.1433
LR Chi-squared	39.06	38.17	73.40	74.59
(p-value)	(0.04)	(0.04)	(0.00)	(0.00)

Regarding the impact of reputable bond trustees on the probability of bond default, we document a negative but insignificant regression coefficient of the indicator variable Top 3 Trustee (model 2). The coefficient for the variable BNY (model 1) is more negative and insignificant as well. However, the number of defaulted bonds monitored by one of the Top 3 trustees amounts to 50% of all defaulted bonds in our sample. This is less than expected as the three largest trustees monitor 69% of all bonds in our sample. Overall, our finding that Top 3 trustees are not priced in bond issues is in line with the fact that they do not affect bond default probability.

With respect to the effect of 'investment bank' trustees on bond defaults, we do not provide regression results because none of the bonds monitored by an 'investment bank' defaulted over the examined period. As the number of bonds monitored by investment banks amounts to 11% of the sample, we would have expected the fraction of defaulted bonds monitored by investment banks to be at least larger than zero percent. Thus, the significant negative regression coefficient found for the 'investment bank' trustee indicator variable in the previous section on bond pricing seems to be justified by better-than-expected bond performance.

Additionally, we run probit regressions using the issuing firms' bankruptcy as the dependent variable. Top 3 trustees do not systematically monitor bonds issued by firms with increased bankruptcy probability (however, we report a positive regression coefficient). Regarding 'investment bank' trustees, we report a negative but statistically insignificant regression coefficient. Hence, in sum we find only little evidence suggesting that reputable trustees are superior to other trustees in avoiding bond defaults and bankruptcies. This suggests that although there are significant differences in the trustees' performance/reputation (i.e. how dedicated trustees fulfill their tasks as the bondholders' monitoring device), their overall capabilities are restricted. This is in line with the described legal framework trustees in the U.S. work in. Prior to the occurrence of default, trustees only have to act in good faith and they can hardly be held liable. Thus, trustees are not obliged by law to act as dedicated as possible. Only if default occurs, trustees must act according to the prudent man rule. Yet, currently there is no real guidance on what prudence means within the legal framework and as a result - but also due to the low compensation - bond trustees are incentivized to primarily avoid personal liability rather than to protect bondholders (see Schwarcz and Sergi 2008). Therefore, it is not surprising that bond trustees, although involved in important decisions in case of default, do not seem to affect issuing firms' bankruptcy probabilities.

3.7 Conclusion

This study is the first to investigate the effectiveness and pricing of bond indenture trustees which act on behalf of bondholders. Closing a gap in the literature, we offer primary empirical evidence on the role of bond trustees and thereby contribute to the as yet limited empirical literature on delegated monitoring and reputation spillovers. The importance of our study is further well-founded by the inconclusive statements about the effectiveness of bond trustees made in the existing economic literature. Examining the high-yield corporate bond market, we focus on a market segment in which defaults occur more frequently, covenants are numerous, and monitoring is therefore particularly important to investors.

Using recent data on original U.S. high-yield corporate bonds issued between 2000 and 2008, we document that trustee identity matters to bondholders and is consequently priced in low-grade bond issues. Our results suggest that the largest, arguably most reputable, trustees in the market do not significantly influence firms' initial borrowing costs. Yet, we show that when a bank that also offers underwriting services in the high-yield debt market acts as a bond trustee, initial borrowing costs are significantly reduced by at least 25 basis points. Furthermore, using variables that interact trustee identity and bond covenants, we particularly show that investors deem these 'investment bank' trustees - but not the largest trustees - effective monitoring devices.

As not all trustees are perceived as ineffective, we argue that the ineffectiveness of large trustees may be caused rather by the compensation structure in the market for trustee services, and not so much by the legal framework. For regular trustees the incentives to act dedicated and to acquire (or protect) reputation capital may be too low. However, for banks that act as trustees but also offer underwriting services in the corporate debt market, perceived investor friendliness and overall reputation can be of high importance. Hence, we interpret our findings as evidence for potential reputation spillover effects that can occur for banks generating significant revenues with their offered underwriting services. In this case, trustees seem to have an incentive to avoid being perceived as acting in a non-investor-friendly way to protect their overall reputation. Our findings and interpretation suggest that spillover effects may be an important incentive mechanism and that measuring reputation via market shares may not always be appropriate, for example if fee levels are generally low or market concentration has considerably increased as is the case in the market for trustee services. Allowing for potential reputation spillover effects as an alternative to

the standard approach of measuring incentives to protect reputation capital by market shares, we offer evidence in favor of Smith and Warner's (1979) hypothesis that choosing a hard-to-bribe trustee is important to bond investors.

In sum, our results indicate that future research should deal with the following issues: First, to enhance our understanding of the role of bond trustees, future research should investigate the trustee's role in the renegotiation of public debt. To date, at least for the years before the crisis of 2008-09, reported cases of debt renegotiation and data availability are limited. Therefore, we are not able to provide the reader with these, as we believe, valuable insights. Second, we stipulate that studies that examine covenants of bond issues should include bond trustee information to provide a more complete picture of the monitoring of public debt.

Chapter 4: Fine Feathers Make Fine Birds? Wealth Effects and the Choice between Major and Minor Corporate Name Changes[78]

4.1 Introduction

„How vain, without the merit, is the name."

(Homer)

The search for a suitable name of a person, product or company has ever since been an omnipresent issue[79] that "has managed to capture the interest of such a disparate group of scholars" (Koku 1997, p. 392). The corporate name, as the essence of a firm's identity, is usually the first contact that investors, customers, and other stakeholders have with a firm (Tadelis 1999). With globalization, competition has not only induced an increased need for distinctiveness among firms but also a restricted availability of a 'perfect name'. The importance and the difficulty of choosing the right name for a company do not only show in the growing number of corporate-name consultancies such as Thomson CompuMark or Naming Names as well as internet naming platforms like 'NameThis' and 'Kluster'. It primarily becomes transparent by the cases of firms that returned to their former name only shortly after adopting a new one: UAL Corp. (operating United Airlines) became 'Allegis' in 1987 and changed back to UAL already in 1988, the British Royal Mail reversed its 2001 name change to 'Consignia' in 2002, and PriceWaterhouseCoopers Consulting (PWC) renamed itself 'Monday' in 2002 quickly changing back to PWC the same year.

Managers do not only have the choice to conduct a name change or not, they choose between the implementation of a major or minor name change. These two types of name-change investments do not only differ by the associated costs that are generally higher for major name changes (Horsky and Swyngedouw 1987). But like in the aforementioned examples, major name changes also result in adopting completely new and often artificial names that cannot be associated with the old firm. Thus, they are interpretable as the start of a new reputation history for both the firm and the management (Tadelis 1999 and Wu 2010). The name change of Andersen Consulting to

[78] This chapter is joint work with Patrick Göttner (Karlsruhe Institute of Technology).

[79] It ranges from actors' screen names (e.g. Walter Matuschanskavsky became Walter Matthau) and bands (Long John and the Silver Men were renamed The Beatles) to brands (Raider became Twix) and firms.

Accenture around the U.S. accounting scandals in 2001-02 exemplifies this argument. Minor name changes may be interpreted as managerial commitments to pursue certain strategies such as changes in the business focus (Wu 2010). These strategies can be signaled to stakeholders via inclusions or deletions of suffixes like ".com" (Cooper et al. 2001, 2005) or symbolic terms like "oil" (Yang et al. 2008) or "China" (Bae and Wang 2010). A well known example is the firm Apple which abandoned the word "Computer" from its name with the introduction of the iPhone in January 2007.

This study deals with both name changes in general as well as the distinction and choice between major and minor name changes. First, we show how the German stock market reacts to announcements of corporate name changes and examine the drivers of the observed stock returns, particularly past firm performance and major name changes. Second, we provide the first empirical evidence on how variables related to managerial influence and a firm's corporate governance – such as managerial ownership, block holdings, or family firms – and firm performance (i.e. reputation) affect the choice between major and minor name changes. Using most recent data (1997-2009), our study highlights the role of reputation and managerial influence in corporate investment decisions in a period of time where picking the right name has become an increasingly advanced investment due to the fact that 'good names get taken early' (Clifford 2001).[80] Hereby we add to the growing literature on corporate name changes and the literature on the role of corporate governance and reputation in (managerial) investment decisions.

When examining corporate investment decisions, management's reputation and influence as well as corporate governance structures and investor protection become crucial. Employing German data yields valuable insights due to the reported characteristics and differences of the German governance system as compared to the U.S. and the U.K. (e.g., see Achleitner et al. 2010, Andres et al. 2011). La Porta et al. (2002) state that the degree of shareholder protection in Germany is comparatively low. Hence, although the majority of quoted companies in Germany have a single shareholder with a blocking minority according to the German Stock Corporation Act (Franks and Mayer 2001, Andres 2007), corporate management's reputational concerns and the quality of

[80] Accordingly, the Office for Harmonization in the Internal Market (2010) reports registered trademarks in the European Union grew at a compound annual growth rate (CAGR) of about 90% in our sample period. Registrations from Germany account for about 25% of these trademarks.

investment decisions become even more important with lower legal protection. Therefore, in this study, we conduct the first in-depth examination of corporate name changes in Germany as a different governance system compared to the Anglo-Saxon system for which the vast majority of studies exist.[81]

Corporate name changes are important managerial investment decisions associated with significant costs to corporations. For example, PWC faced a total bill of $110 million for marketing campaigns and corporate-name consultancy (Treadwell 2003). The most cited example is Exxon's change from Esso with reported costs of about $200 million (McQuade 1984).[82] A recent example from Germany is Premiere AG's change to Sky Deutschland AG resulting in expenses of more than €330 million only due to trademark impairments (see Sky Deutschland Annual Report 2009). Besides write downs, expenses for consultants, legal advisors, or marketing, name-change related costs range from the production and design of new logos and staff uniforms as well as printing new stationery to the registration of new internet domains and the consumption of significant amounts of management's time.

With all the aforementioned costs a company has to face, name changes must also bring with them some benefits. Evidently, one effect of name changes on corporations is attraction of and recognition by stakeholders. Some of today's global players, like Google (project name 'Backrub') or EBay ('Auction Web'), rose out of anonymity with their new labeling. Accordingly, Karpoff and Rankine (1994) state that many investment analysts claim that investors have preferences for certain types of names. Empirical findings by Cooper et al. (2001) and (2005) lend evidence to this argument. Additionally, Manning et al. (1985) report that 54% of surveyed analysts stated that a company's name affects its price-earnings ratio.

Predominantly, name changes are considered signaling devices used by corporate management to convey information to stakeholders (Spence 1973, Bergen et al. 1992).[83] In this sense, a firm's

[81] In fact, all published studies on corporate name changes examine data from countries with an Anglo-Saxon system (see Table 4.1). Thus, the corporate governance perspective and also general data snooping concerns (Leamer 1983, Lo and MacKinlay 1990) suggest considering other markets as well.

[82] Other examples like the amount of $100 million for Andersen Consulting becoming Accenture in 2001 (reported in Mase 2009 and Wu 2010) or the $45 million spent by KPMG Consulting to change to Bearing Point (reported in Liu 2010) testify to outstanding costs.

[83] Signals must be expensive to be credible. In this context, Wu (2010) argues that name changes are strong signals because they are "quite expensive" (p. 1346) and, in most cases, only appear once. The author reports that less

name is changed to convey information to the market, either about changes in the firm's lines of business or as signals of management's private information about the firm's future performance (Karpoff and Rankine 1994). The studies by Cooper et al. (2001 and 2005) reason managers are able to time corporate name changes to move the firm's name away from (or into) out-of-favor (in-favor) industries resulting in positive value effects.

Alternatively, name changes by corporations can be understood as investments in intangible assets (i.e. brand name capital or reputation) as argued, inter alia, in Tadelis (1999). In this sense, a firm name is considered to be a utility-producing attribute. Name changes may lead to positive changes in market position and identification (Kilic and Dursun 2006). Investments in new names, for example, can increase consumer preferences for the firm's products, shift cost functions and demand curves, or improve firm profitability by enhancing employee morale as well as investor and potential employee attraction (e.g. Horsky and Swyngedouw 1987, Dowling 1988, Fombrun and Shanley 1990, Riordan et al. 1997, Kay 2006). Tadelis (1999) and Dowling (2006), in particular, emphasize the reputational aspect of names. While the former states that the name is one of the strongest representatives of the past performance and corporate characteristics in the stakeholders' mind, the latter claims that corporate reputation is part of the firm's intrinsic value and is thus incorporated in the firm's stock price (for empirical evidence, see Einwiller and Will 2002).

The empirical literature yields ambiguous results on the effects of corporate name changes. While studies initially documented insignificant stock market reactions to announcements of name changes (e.g. Bosch and Hirschey 1989, Karpoff and Rankine 1994), recent studies report significant positive returns (e.g. Wu 2010, Liu 2010). Hence, wealth effects of corporate name changes remain an unanswered empirical question. Although several news sources reported positive effects of name changes for German and other European firms in the past[84], neither the German nor other Continental European markets have been examined yet. More important, general academic evidence on variables that drive name-change decisions and the observed stock

than 25% of sample firms conduct repeated name changes. The literature generally agrees that corporations incur significant costs to change their names (see Karpoff and Rankine 1994).

[84] The change of German IWKA AG to KUKA AG was accompanied by analyst recommendations and positive stock returns (Reuters on July 9, 2007). Additionally, the newspaper 'Neue Züricher Zeitung' on October 7, 2003 featured a report on corporate name changes stating these events result in positive valuation effects.

returns to name-change announcements is extremely scarce, leading to a rather poor understanding of these corporate events.

This study reports a significant 2.8% cumulated abnormal return (CAR) for the 40 days symmetrically surrounding the announcement of a name change, in line with previous studies, as well as a significant day-zero abnormal return of 0.3%. Separate examination reveals that firms announcing minor name changes exhibit a negative average stock-price reaction, whereas firms that conduct major name changes show continuous pre-event run-ups and an average CAR of 6.8% for the overall event window [-20,20]. Results are affected by internet-related corporate name changes but not biased upwards. We find a significant positive relation between prior firm performance and observed stock returns. Furthermore, the presence of family shareholders positively affects abnormal returns. Yet, the documented short-term effects of major name changes turn out to be transitory as both types of name-changing firms significantly underperform the German CDAX in the six and twelve months after the event month. Thus, results point to some degree of investor credulity in the German stock market.

Motivated by the identified differences across the firms in our subsamples, we run binomial logistic regressions on the choice between major and minor name changes. In line with reports in the business press[85], results suggest that managers instigate major name changes as a reaction to poor firm performance. We report a significant negative relation between a firm's (or management's) performance and the probability of major name changes. This is interpretable as an attempt to start a new reputation history - for both the firm and the manager - to cloud poor past performance. The findings point to the management's incentive to spend firm resources on more expensive major name changes for reputational reasons. This interpretation is backed by additional results documenting a positive relation between the management's influence, particularly measured by managerial ownership and the number of a firm's blockholders, and the probability of major name changes.

The remainder of this chapter is organized as follows. Section 2 reviews the related literature and provides the reader with the empirical implications and the used variables. Section 3 discusses our data and the applied methodology. Section 4 presents our analyses of the wealth effects of

[85] For example, German newspaper 'Frankfurter Allgemeine Zeitung' on September 16, 2010 reported former Gericom AG changed to Quanmax AG as the firm's old name was associated with poor past performance.

corporate name changes, while section 5 presents an analysis of the management's choice between major and minor name changes. Conclusions follow.

4.2 Related Literature, Empirical Implications, and Employed Variables

A. Related Literature

The empirical literature on wealth effects of corporate name changes can roughly be separated into two groups: those studies that investigate name changes in general and those studies examining certain types of name changes conducted to move the firm's name into (or away from) in-favor (out-of-favor) industries.[86] The latter predominantly focus on the internet industry. An overview of the main studies is provided in Table 4.1.

Table 4.1: Overview of the Short-Term Wealth Effects of Corporate Name Changes

This table provides an overview of the main studies that investigate the short-term wealth effects of announcements of corporate name changes. Letters *a* and *b* denote significance at the 1% and 5% level, respectively. The asterisk (*) denotes studies that do not consider corporate name changes in general, but announcements of special types of name changes such internet-related name changes (e.g. dotcom inclusions).

Study	Country	Period	N	CAR	Pre-event run-ups
Howe (1982)	US	1962-1980	121	~ 0 [weekly returns]	
Horsky and Swyngedouw (1987)	US	1981-1985	58	0.6^{b} [0]	12.0 [-30,0]
Bosch and Hirschey (1989)	US	1979-1986	79	0.5 [0]	2.3^{b} [-10,0]
Karpoff and Rankine (1994)	US	1979-1987	147	0.4 [-1,0]	4.8^{b} [-30,-2]
Lee (2001)*	US	1995-1999	56	2.7^{a} [-1,1]	not reported
Cooper et al. (2001)*	US	1998-1999	95	18.0^{a} [0,1]	31.0^{a} [-15,-2]
Josev et al. (2004)	AUS	1995-1999	107	0.0 [-1,1]	-0.04^{b} [-10,10]
Cooper et al. (2005)*	US	1998-2001	61	8.3^{a} [0,1]	58.0^{a} [-15,2]
Kot and Zhang (2008)	HK	2001-2007	168	1.6 [0,1]	3.2^{b} [-2,2]
Mase (2009)	UK	1994-2004	244	0.23 [0,1]	0.52 [-15,-1]
Yang et al. (2009)*	US/CA	2000-2007	114	5.9 [0]	5.4 [-15,-1]
Liu (2010)	US	1978-2008	4,287	1.2^{a} [0]	3.3^{a} [-60,-2]
Wu (2010)	US	1980-2000	1,932	1.4^{a} [-1,0]	1.9^{a} [-3,0]

[86] The same distinction is sometimes also denoted the rationality and the irrationality perspective (see Liu 2010) given the interpretations the authors in these studies make.

Initially the vast majority of the first group of studies (Howe 1982, Bosch and Hirschey 1989, Karpoff and Rankine 1994, Mase 2009) report insignificant stock-price reactions to name-change announcements, indicating that these corporate actions are neutral financial or well predictable events. Yet, the most recent papers, Wu (2010) and Liu (2010), report significant announcement effects of 1.5% and 1.2%, respectively.

Among this group of studies, Bosch and Hirschey (1989) were the first to separately examine announcements of major and minor name changes and offered empirical indications of considerable differences between these two types of name changes. The authors report that firms announcing major name changes witness an excess return of 2.5% significant at the 5% level for the ten days prior to the name-change event, while minor-name-change firms exhibit insignificant returns of 2.1%. They also show that post-event performance is different for these two types of firms. For the ten days following the event, firms that announced minor name changes exhibit significant average abnormal returns of -2.71% compared to insignificant -0.88% average abnormal returns for those firms that announced major changes. Mase (2009) corroborates these results in his study of corporate name changes in the United Kingdom. For the sample period 1994-2004, the author reports that major name changes result in an abnormal return of 1.2% significant at the 5% level, while minor name changes lead to an insignificant near-to-zero abnormal return for the event window [-1,1].

Although the studies mentioned above offer mixed evidence on the existence of a significant announcement effect of corporate name changes, almost all investigations document large run-ups ten to thirty days before the event. These findings seem to be compatible with Howe's (1982) conclusion that market participants anticipate firm name changes (see also Karpoff and Rankine 1994). Another common finding is the existence of post-announcement drifts. Bosch and Hirschey (1989) and Liu (2010) report significant cumulated abnormal returns of -1.86% and -1.14% for the ten and fourty days after the event, respectively. This transitory effect is also reported in Karpoff and Rankine (1994). The aforementioned results are backed by several non-U.S. studies, for example Josev et al. (2004) for the Australian market, Karbhari et al. (2004) for Malaysia, and Kot and Zhang (2008) for Hong Kong.

The second group of studies argues that positive valuation effects of corporate name changes are driven by investor irrationality rather than rational pricing as many name changes appear to be

only cosmetic, i.e. not accompanied by any real changes in the firm. The two most prominent studies are Cooper et al. (2001) and (2005). While the former examine the stock-market reaction of firms announcing ".com"-inclusions in the years 1998-99, the latter investigate the effect of ".com"-deletions in the period 1998-2001. Cooper et al. (2001) report significant CARs of 18% on the event and the subsequent day with significant pre-event run-ups of 31% in the event window [-15,-2]. As these returns are similar across all 95 sample firms, no matter if a firm is actually involved in the internet industry, the authors conclude that 'investor mania' must drive these results. For the same event windows, Cooper et al. (2005) document significant CARs of 8% and 22% for their sample of 61 firms announcing ".com" deletions. The authors report significantly larger excess returns for firms announcing major name changes. In both studies the observed stock-price reaction appears to be non-transitory in the short run as cumulated abnormal returns even increase after the event date. Other papers that belong to this group of studies deal with high-tech sounding firm names (Ferris 1988), fund name changes and inflows (Cooper, Gulen and Rau 2005), oil-related name changes (Yang et al. 2008), and the performance of china-name stocks (Bae and Wang 2010). Results offer additional evidence on the existence of investor irrationality in hot markets.

To date, only Wu (2010) has tried to explain the observed stock returns in reaction to name-change announcements. The author reports that brand adoptions have a positive impact on abnormal returns, while radical name changes (unrelated to brands) have no explanatory power for abnormal returns.[87] Variables directly related to firm performance or corporate governance are not employed.[88]

With respect to long-term performance of name-change firms, only few studies exist. For the United Kingdom, Andrikopoulos et al. (2007) report abnormal returns (relative to the FTSE All Share Index) of 1.6%, -6.8% and -13.8% for the 12, 24 and 36 month (respectively) following name-change announcements. For the United States, Lee (2001) reports strongly negative abnormal returns in the year following ".com"-inclusion announcements. For general corporate name changes, Wu (2010) documents significantly negative cumulated abnormal returns in the six and twelve months after the name-change announcement amounting to -8.1% and -16.6%,

[87] We do not further address this issue as only 2% of the firms in our sample announce brand adoptions.

[88] In this context, Liu (2010) reports a significant negative relation between a firm's earnings per share and its abnormal returns to name-change announcements for the event window [-60,40]. However, he does not investigate abnormal returns on or around the announcement day.

respectively. Additionally, the author, as the first, reports significant returns of -40% (-14%) in the twelve months following announcements of radical name changes (brand adoptions) and significant returns of -11% to -17% for minor name changes indicating either a broader or a narrower firm focus.

B. Empirical Implications

We refrain from providing a detailed hypotheses section because the existing literature, presented in the previous subsection, yields ambiguous results on the wealth effects of corporate name changes. However, we make the following predictions:

First, in line with the literature, we expect overall abnormal returns to name-change announcements to be non-negative and different for major and minor name changes. In this context, we expect returns to be more positive for major name changes due to the "reputation start-up effect" proposed by Tadelis (1999). The author argues that it is easier for good types of firms to build their own name/reputation as it is for the bad types of firms. Hence, the market may interpret announcements of major name changes as credible signals of good firms that are rather capable of (re)building firm reputation.[89] This is in line with earlier evidence presented in Bosch and Hirschey (1989), Cooper et al. (2005), and Liu (2010).

Second, we expect firms with better past performance to exhibit larger stock-price reactions to announcements of name changes as investors more likely believe in the managements' skills and ability to select positive-NPV projects. Firms with more available cash (and cash equivalents) may exhibit either a positive or negative stock market reaction depending on the market's assessment of how efficiently this cash is used (when used to finance a name change). With respect to a company's ownership structure and governance, we generally expect a positive relation between the observed stock returns to name-change announcements and the quality (or intensity) of a firm's corporate governance in line with its role to assure that managers act in the interest of the firm's shareholders (e.g. Shleifer and Vishny 1997). However, we acknowledge that name changes may also be perceived as good signals by the stock market when announced by less or badly governed firms. Thus, the effect of a firm's ownership and governance on

[89] The prediction that major name changes lead to larger stock returns is also in line with the assumption that major name changes are generally more expensive than minor name changes (and thus more credible signals) and often result in artificial names. In this context, Kohli and Hemnes (1995) conclude the optimal name for a company is an artificial name.

observed stock returns is an empirical question. The choice of the variables we employ to examine the effect of a firm's ownership structure and corresponding governance quality is motivated in the following data section.

C. Employed Variables

We distinguish firms that conduct major name changes from those conducting minor name changes. Doing so, we use the definition of Bosch and Hirschey (1989) who initially examined these two groups of name-changing firms. Major name changes are name changes where the new name is entirely different from the old one, e.g. Karstadt Quelle AG versus Arcandor AG.[90] Minor name changes do not completely affect firm recognition, e.g. KWS Kleinwanzlebener Saatzucht AG versus KWS Saat AG.

Following Koku (1997), we use an indicator variable *service firm* set to one for those firms that do not produce goods, for example firms offering financial services. This is done because the signalled changes of these firms cannot be verified as easily as for manufacturing firms where changes in product quality can generally be examined in a shorter period of time. In line with Wu (2010), we control for CEO turnover prior to the announcement of the name change. We assign a value of one to the indicator variable *CEO turnover* if the chairman of the board changed in the year the name change was announced or the year before. We additionally control for firms in the internet industry (e.g., see Cooper et al. 2001 and 2005) using the indicator variable *internet related*.

Horsky and Swyngedouw (1987) hypothesize that larger firms benefit more from name changes than smaller ones because some of the costs of changing a corporation's name are fixed (e.g. market research or legal costs). Although the authors do not find evidence for their hypothesis, there may well exist a negative relation between *firm size* and relative costs of name changes due to economies of scale. We control for firm size using the natural logarithm of a firm's total assets.

As measures of firm/management performance, we use the return on assets (*ROA*) and free cash flow – defined as net income plus depreciation and amortization (similar to Brav et al. 2008) – as a percentage of total assets (*FCF*). Additionally, we employ the indicator variables *FCF negative* and *earnings negative* that obtain a value of one if the firm's free cash flow or net income is

[90] This also exemplifies our definition of artificial name changes. Artificial names do not have a direct meaning; they are artificial on linguistic grounds. Thus, artificial names are a subcategory of major name changes.

negative. Comparable performance variables are used in Köke (2004) and Franks and Mayer (2001), respectively.[91] Finally, we control for market-based performance using the relative performance of the firms' stock in the six months prior to the event month. In several reported regressions we additionally control for the firm's *cash* measured as cash and equivalents to total assets.

To measure managerial influence and governance quality, we employ the following variables: First, in line with recent theoretical studies demonstrating that multiple blockholders improve a firm's governance (Edmans and Manso 2010, Edmans 2009), we use the *number of blockholders* as a measure for governance quality. Blockholders are those shareholders owning at least a 5% block of shares (e.g. Kim 2010). Empirical evidence for Europe shows that the number of blockholders improves a firm's governance (Attig et al. 2008). In another context, McCahery and Schwienbacher (2010) also measure a firm's monitoring intensity by the number of blockholders. Second, to account for incentive realignment between shareholders and the management, we primarily employ the indicator variable *managerial participation* that obtains a value of one if the management owns a stake in the firm's equity.[92] Finally, we control for firms with family names employing an indicator variable that obtains a value of one if the firm has a *family name* prior to the name change. Signals may be different for family firms due to the reported differences with respect to the firms' corporate governance, investment decisions, performance, and the cost of debt (see, for instance, Anderson and Reeb 2003, Anderson et al. 2003 as well as Andres 2008 for German evidence). A name change where a family name is abolished may be a stronger signal of future changes in the firm's course.[93] In this context, we also examine the effect of family shareholders by employing an indicator variable *family* set to one if a family (or founding family) owns a stake in the firm's equity.[94]

[91] Köke (2004) uses the variable 'Earnings loss' (i.e. negative EBITDA) as a performance variable.

[92] We also control for the amount and the squared amount of shares held by the management as earlier empirical studies suggest that high managerial ownership has a negative effect on firm performance (e.g., see Morck et al. 1988 and McConnell and Servaes 1990 for the U.S. and Weir et al. 2002 for the U.K.).

[93] Note that only one of the family-name firms in our sample abolished its name due to a change in control.

[94] As we can only examine a limited number of observations, we focus on the aforementioned variables that are able to measure managerial influence (or leeway) and complement our analysis of managerial incentives and reputation. We do not investigate the impact of additional variables capturing ownership structures such as the identity of the firm's controlling shareholders. Although possible, corresponding indicator variables would (each) be based on very few observations only. This in turn would not allow us to draw reliable inferences.

4.3 Data and Methodology

A. Data Selection

To determine our initial sample, we use a list of all corporate name changes implemented by German firms between 1995 and 2009 available in Standard and Poor's Capital IQ database. We check this list with a comparable list of name-change firms available in Bloomberg. Additionally, we screen the annual German Hoppenstedt catalogues for the years of our sample period. Hoppenstedt lists all quoted firms on the German stock market in each year and offers a feature called 'former name' for firms that changed their name. We thereby conduct a check of the completeness of our initial sample and account for firms that exhibited a delisting within the sample period. The initial sample consists of more than 200 firms. We then exclude – in line with prior research – all unlisted firms and all firms that changed their name due to a merger or acquisition, or due to a change of only their legal form (e.g. from German AG to European SE). Further, we exclude those firms that only changed their name at the product or subsidiary level. For the remaining events we define the announcement date of a corporate name change as the first date the name change was announced in the LexisNexis database. To make sure we identify the earliest date and thus are able to isolate the announcement effect, we also check other publicly available data sources on the internet.[95] In case we identify an earlier date on the alternative data sources, we define this date as the announcement date. In a last step, we screen the sample for confounding events such as synchronous earnings announcements, stock splits, share repurchases or M&A transactions. We are left with a final sample of 69 corporate name changes between 1997 and 2009.[96] We cannot find any synchronous announcements of starts or completions of corporate restructurings for these 69 events.[97]

[95] We mainly use the websites of the ‚Deutsche Gesellschaft für Ad-hoc Publizität' (www.dgap.de) and the ‚Bundesanzeiger' (www.ebundesanzeiger.de) provided by the German Federal Ministry of Law.

[96] Other studies (e.g. Bosch and Hirschey 1989, Wu 2010) also report reductions of 60% or more of their initial sample size. In fact, most studies (e.g. Howe 1982, Horsky and Swyngedouw 1987, Karpoff and Rankine 1994, Cooper et al. 2001 and 2005) examine final samples comprising about 50 to 100 events.

[97] In this context, Josev et al. (2004) state that in case a name change is part of a restructuring, this restructuring usually starts long before the announcement of the name change - the authors report a corresponding time lag of 79 business days on average.

B. Methodology

Event Studies

To detect the short-term wealth effects of corporate name changes, we employ standard market-model methodology in our event study using an estimation window of 180 trading days that ends 21 trading days prior to the event. The abnormal returns are computed using the German Composite DAX (CDAX)[98] as our relevant benchmark portfolio. To test whether computed returns are significantly different from zero, we use the Z-statistic (Patell 1976) as well as the BMP-statistic (Boehmer et al. 1991) to account for the potential problems of event clustering and event-induced variance.

In addition, we analyze long-term stock performance via the buy-and-hold approach suggested by Barber and Lyon (1997) and Kothari and Warner (1997). Abnormal returns (BHARs) are computed relative to the CDAX.[99] We examine the period of one year before to one year after the month when the name change was first announced. Analytically, the excess performance of our name-changing firms, measured with BHARs, is calculated as:

$$BHAR_{i,k} = \left[\prod_{t=1}^{k}\left[\left(1+r_{i,t}\right)\right]-1\right]-\left[\prod_{t=1}^{k}\left[\left(1+r_{M,t}\right)\right]-1\right]$$

where i stands for firm i, r is the raw return, M stands for the market portfolio, t denotes the month, and k denotes the k-months holding period.
The average buy-and-hold abnormal returns (ABHARs) for N securities and a holding period of k months are estimated in the following way:

$$ABHAR_{N,k} = \frac{1}{N}\sum_{i=1}^{N} BHAR_{i,k}$$

Data on stock prices is provided by the 'Karlsruher Kapitalmarktdatenbank' (KKMDB) which receives data directly from the Frankfurt Stock Exchange (Deutsche Boerse AG).

[98] The CDAX is the broadest German stock index. It contains all German firms listed in the 'General Standard' and 'Prime Standard' of the Frankfurt Stock Exchange. For more information, see www.deutsche-boerse.com.
[99] We explicitly employ the long-term study to complement and assess our short-term findings. Hence, we do not use more sophisticated matching approaches as, for example, in Karpoff et al. (1996).

Binomial Logit Regressions

Running logistic regressions, we further investigate how firm characteristics, mainly prior performance and ownership structures, affect the probability of major name changes. The methodology we employ consists of the following binomial logit:

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = Z_i$$

In the logit the dependent variable is set to one if the firm conducts a major name change and zero otherwise (i.e. for minor name changes).

C. Descriptive Statistics

With respect to our sample firms' characteristics, we report that 56.5% of the firms in our sample conduct a major name change. The average firm size, as measured by total assets, is Euro 566 million when we exclude the three smallest and the three largest firms in our sample as these firms represent outliers. Average firm age (as measured in years from IPO) is 17.6 years, however upwardly biased by a fraction of 21.7% of firms that have been listed for 50 years or more at the time of the name change was announced. Accordingly, the median firm age is 7.1 years. Regarding managerial participation, we report that the management board owns a stake in the company in 43.5% of all cases. For those firms in which the management participates, the median amount of shares held by the management is 26%.[100] The average number of a firm's blockholders is 2.4, the median is 2. The median amount of shares held by the firm's largest shareholder is 35.9%. However, 39% of the sample firms have more than one blockholder owning a stake in the company of at least 10%. All firm data refers to the fiscal year prior to the name-change announcement. Data is gathered from the Hoppenstedt and checked via Capital IQ. Table 4.2 provides an overview of the sample statistics.

[100] This may, at least partly, be explained by the relatively high fraction of young firms (in terms of years from IPO). We account for this result in our econometric analyses.

Table 4.2: Summary of Sample Statistics

This table provides summary statistics for the 69 firms in our sample. The statistics include name-change specific attributes, financial and ownership data, and the sample's industry distribution by first-digit SIC codes.

Attribute	% of sample	Attribute	Median
Major name changes	56.5%	Firm age (from IPO)	7.1 yrs.
Artificial name changes	23.2%	Leverage (debt/total assets)	58.2%
Service firms	60.9%	Net income/Total assets	1.5%
Firms in internet industry	7.2%	FCF/Total assets	4.9%
Firms with family names	8.7%	Cash & Equ./Total assets	7.5%
CEO turnover 1year prior	10.1%	% Cash-flow rights held by largest shareholder	35.9%
Managerial participation	43.5%	Free float	37.0%
Free-cash-flow negative	27.5%	No. of blockholders	2

Industry distribution of sample firms by first-digit SIC codes:

SIC 0	1.4%	SIC 3	18.8%	SIC 6	23.2%
SIC 1	2.9%	SIC 4	8.7%	SIC 7	24.6%
SIC 2	10.1%	SIC 5	7.2%	SIC 8	2.9%

Table 4.3 contains a list of all variables used in the empirical analysis as well as a detailed definition.

Table 4.3: Description of Key Analyses Variables

Variable	Definition
Cash	The firm's cash and cash equivalents relative to the firm's total assets of the same fiscal year.
CEO turnover	Indicator variable that obtains a value of one if the firm's CEO was replaced in the year of the name-change announcement or the year prior, zero otherwise.
Earnings negative	Indicator variable that obtains a value of one if the firm reported a negative net income in the year prior to the name-change announcement, zero otherwise (see Franks and Mayer 2001).
Family	Indicator variable that obtains a value of one if one of the firm's shareholders is a family, zero otherwise.
Family Name	Indicator variable that obtains a value of one if the firm has a family name prior to the name change, zero otherwise.
FCF negative	Indicator variable that obtains a value of one if the firm was free-cash-flow negative in the year prior to the name-change announcement, zero otherwise (comparable to Köke 2004).
FCF	The firm's free cash flow standardized by the firm's total assets of the same fiscal year. FCF is defined as net income plus depreciation and amortization ("bankers' cash flow", similar to Brav et al. 2008).
Firm size	The natural logarithm of the firm's total assets in the year prior to the name-change announcement.
Internet related	Indicator variable that obtains a value of one if the firm operates in the internet-related business, zero otherwise.
Major	Indicator variable that obtains a value of one if the firm conducts a major name change, zero otherwise.
Managerial participation	Indicator variable that obtains a value of one if the firm's management ('Vorstand') owns a stake in the firm's equity.
No. of bockholders	The number of shareholders owning at least a block of 5% of the firm's stock.
ROA	The firm's return on assets in the year prior to the name-change announcement.
Prior stock performance	The 6-month buy-and-hold abnormal return prior to the month of the name-change announcement.
Service firm	Indicator variable that obtains a value of one if the firm is a service firm, zero otherwise.

4.4 Wealth Effects of Corporate Name Changes

A. Short-Term Wealth Effects

We document a significant abnormal return of 0.33% on the announcement date (day zero) and significant pre-event run-ups of 4.4% for the event window [-20,0] in line with the literature (e.g. Bosch and Hirschey 1989, Karpoff and Rankine 1994, Cooper et al. 2001, and Liu 2010) and our prediction in section 2. For the overall event window [-20,20], we report a significant 2.8% cumulated abnormal return. Results are presented in Table 4.4.

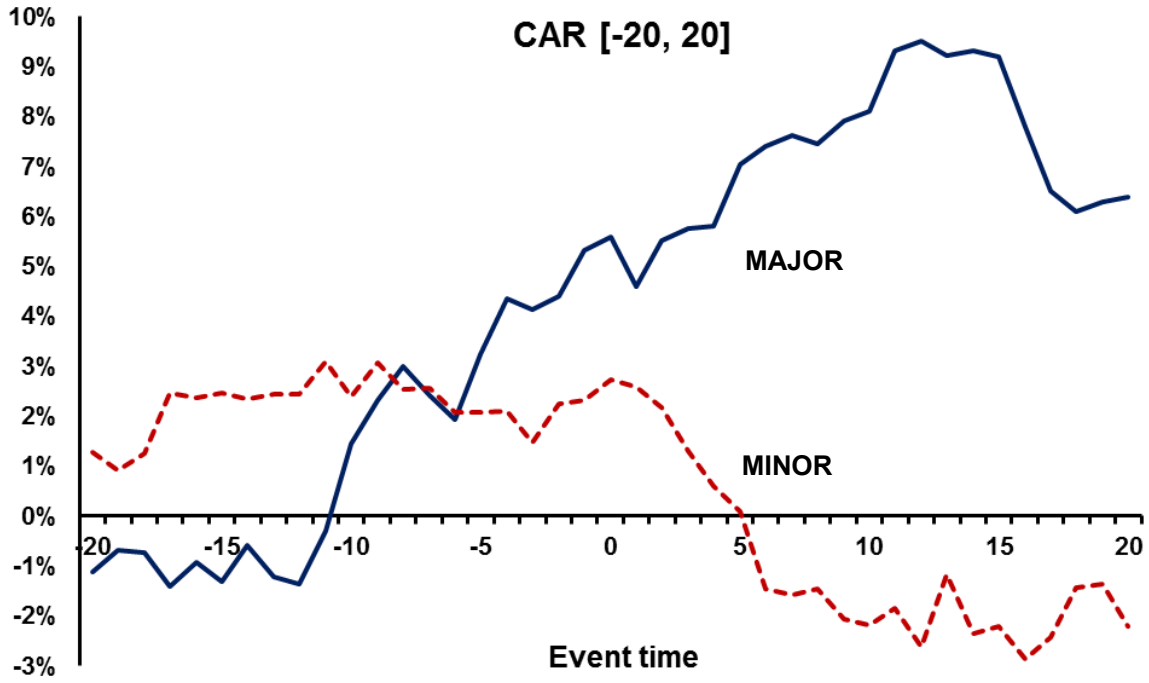
Table 4.4: Results of the Short-Term Event Study

Asterisks denote statistical significance at the 0.01(***), 0.05(**) and 0.10(*)-level.

Window	CAAR	Patell Z	p-value	BMP	p-value
[-20,0]	0.0439	3.2229***	0.0013	2.5296**	0.0114
[0]	0.0033	2.4059**	0.0161	1.8889*	0.0589
[0,20]	-0.0128	1.3615	0.1734	1.1326	0.2574
[-20,20]	0.0278	2.9052***	0.0037	2.2999**	0.0215

Separate investigation of major and minor name changes reveals that firms conducting minor name changes do not exhibit pre-event run-ups, while firms with major name changes show continuous pre-event and post-event (!) run-ups. Minor-name-change firms exhibit significantly negative market reactions with cumulated abnormal returns of -4.6% in the event window [0,10] that remain at this level (-4.7% for the window [0,20]). Those firms announcing major name changes exhibit CARs of 5.8% in the event window [-20,0] and 3.0% in the event window [0,10], both significantly larger than zero. For the overall event window, major-name-change firms have CARs amounting to 6.8%, while firms announcing minor name changes exhibit CARs of -2.5% on average. Thus, the findings corroborate our prediction on the different effects of major and minor name changes and are in line with prior work (e.g. Bosch and Hirschey 1989, Cooper et al. 2005). Results are illustrated in Figure 4.1.

Figure 4.1: Short-Term Wealth Effects - Major versus Minor Name Changes



The phenomenon of pre-event stock-price reactions reported in almost all of the previous studies is also apparent in our study. These run-ups appear so frequently that it is rather implausible that most researchers, so far, have failed to identify the exact announcement date. Like in this study, the run-ups generally appear about ten to thirty days prior to the announcement. This is little of a surprise as changing a firm's name is not an ad-hoc decision. It needs thorough planning and preparation which takes place many weeks in advance. We believe that at least some firms communicate their name change in advance to their clients, customers, and other stakeholders to avoid potential confusion. This reasoning also explains why pre-event run-ups are rather a phenomenon of major name changes (e.g. Cooper et al. 2005, Liu 2010) where planning and preparation is of particular importance.

B. Long-Term Wealth Effects

To give a more comprehensive picture of stock market reactions to corporate name changes, we further investigate the long-term stock performance of these corporate actions. As some name changes were announced only recently (in 2008 and 2009) and because a few firms changed their

name within their first or second year of being public, we only investigate the one-year stock-price performance symmetrically surrounding the event month. Results are shown in Table 4.5.

Table 4.5: Results of the Long-Term Event Study

Asterisks denote statistical significance at the 0.01(***) and 0.05(**)-level, t denotes the event month.

Window	ABHAR	t-statistic	negative
[t-12, t-1]	-7.6%	-0.866	66%
[t+1, t+12]	-16.4%**	-2.392	72%
[t-12, t+12]	-17.9%***	-2.995	72%
[t+1, t+6]	-15.8%***	-3.701	70%

Our findings indicate a large negative post-event and overall performance that is significantly different from zero. We document ABHARs of -15.8% and -16.4% for the six and twelve months, respectively, after the month of the name-change announcement.[101] For the six months before the announcement, abnormal returns are insignificant and around zero. Hence, results for the German stock market are in line with previous studies, especially Wu (2010) for the United States. To account for outliers and as a robustness check, we recalculate abnormal returns using a winsorization approach.[102] Results (not reported for brevity) remain significant and even become more negative. We also check the sample for firms that run into bankruptcy at some point in time after the announced name change. This is the case for five of our sample firms. None of these firms become bankrupt in the year after the announcement.

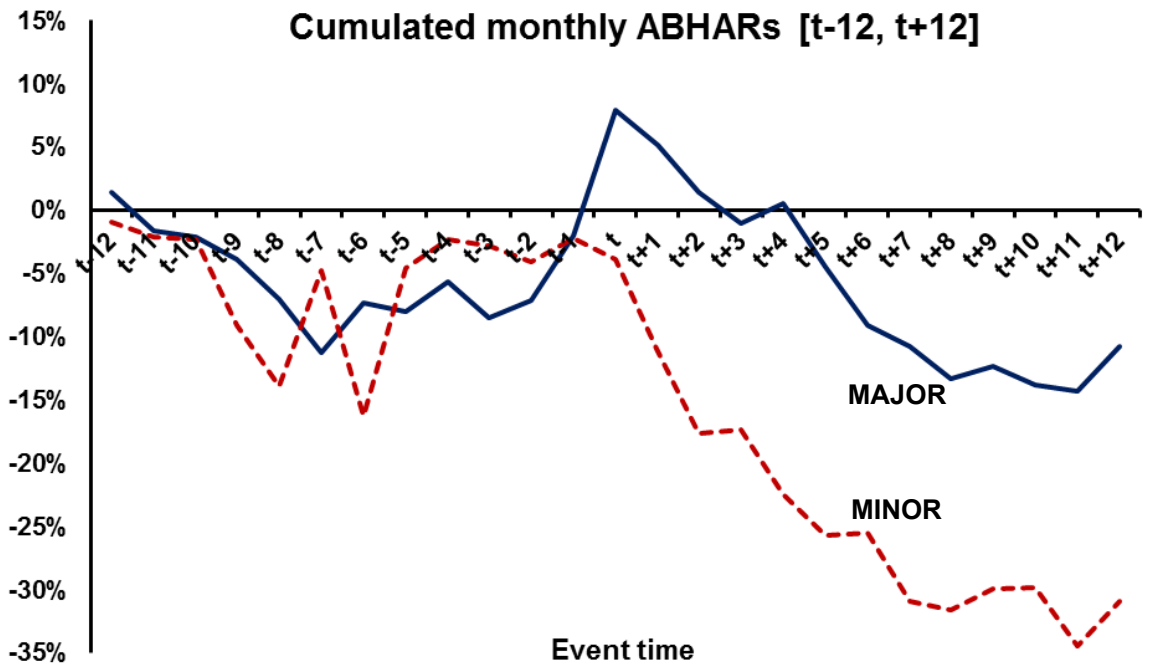
From the results found in both the short and long-term studies, we can (on average) draw the following conclusions about corporate name changes: first, name-change investments appear to have no (direct or mid-term) positive effect on firm value. Indeed, in terms of relative stock-price performance, firms perform very poorly in the year after the name-change announcement.

[101] For reasons such as confounding events we cannot include all 69 event firms in all of our calculations due to missing data or contamination. However, for all windows we use more than 60 firms to calculate ABHARs.

[102] The winsorization approach sets a limit on how far away from the rest of the sample an extreme observation is allowed to be (as the limit we use the fourfold standard deviation of the firms' stock returns). More extreme observations are set equal to this limit, giving the most extreme observations a lower weight without removing them from the sample. Cowan and Sergeant (2001) show that this procedure yields correct specifications in case the data suffer a skewness bias described by Barber and Lyon (1997).

Second, positive short-term effects appear to be transitory. These findings are in line with the results of Andrikopoulos et al. (2007) for the U.K. Like in our study, the authors report that stock prices peak around the announcement of a name change with the relative stock performance of name-change firms being poor before and after the event month. Figure 4.2 illustrates the different wealth effects of major versus minor name changes. For illustrative means, cumulated monthly ABHARs are shown.

Figure 4.2: Average Stock Performance around Major and Minor Name Changes



While both types of name changes result in almost equal significant six-month ABHARs of -16% (major) and -15% (minor) in the period after the event month, firms conducting major name changes exhibit more negative (post-event) twelve-month ABHARs of -19.5% compared to -12.5% for those firms that implement minor name changes.

In sum, we conclude that the announcement of a major name change appears to be good news to the stock market as opposed to a minor name change. As the relative stock performance of major-name-change firms is very positive in the short run (in line with the "reputation start-up effect")

but strongly negative in the long run (in line with management's leeway in building up reputation), we present evidence on investor credulity in the German stock market.

C. Explaining Abnormal Returns

We now investigate which firm characteristics explain the observed stock market reaction described in subsection 4.1. Therefore, we estimate the following basic equation using the method of ordinary least squares (OLS):

$$AR_i = c_0 + c_1\, CEO\ turnover_i + c_2\, family\ name_i + c_3\, firm\ size_i + c_4\, internet\ related_i + c_5\, major_i + c_6\, service\ firm_i + \ldots\ performance\ measures + \ldots ownership\ measures + e_i$$

To avoid the problem of heteroscedasticity, we use White's (1980) heteroscedasticity-consistent covariance matrix estimator to obtain unbiased estimates of the coefficient covariances.[103] No evidence can be found for multicollinearity between the independent variables.[104] The results of our OLS regressions are presented in Table 4.6.

[103] Tests for heteroscedasticity were conducted using the White Heteroscedasticity Test (without cross-terms). The test statistic of almost all models lies above the 0.05-critical Chi-Square value.

[104] The absence of multicollinearity can be supported by looking at the pair-wise correlation matrix of the explanatory variables (see Table 4.8 in the appendix). There are no high pair-wise correlations among the independent variables employed in each of the regressions except for the correlation between firm size and cash. Variance inflation factors are below critical values in all regressions.

Table 4.6: Multivariate Regression Results for Observed Short-Run Abnormal Returns

This table contains results of OLS regressions of the firm's abnormal returns on the announcement day (AR [0]) and over the entire event window (CAR [20,20]) (specifications 7-10). The number of observations is 69 in all regressions. All variables are defined as explained in Table 4.3. A constant term (not reported) is included in all regressions. T-Statistics (in parentheses) are based on White-robust standard errors. Asterisks denote significance at the 0.01(***), 0.05(**) and 0.10(*)-level.

	AR [0]						CAR [20,20]			
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
FCF	0.036 (3.96) ***	0.032 (2.53) **	0.034 (3.29) ***	0.034 (3.47) ***	0.034 (3.33) ***		-0.061 (-0.73)			
ROA						0.064 (1.72) *		0.517 (1.89) *		
Earnings negative									-0.200 (-2.40) **	-0.189 (-2.09) **
Cash	-0.037 (-1.04)	-0.050 (-1.33)	-0.038 (-0.97)	-0.040 (-1.11)	-0.043 (-1.25)	-0.042 (-1.16)	-0.390 (-2.76) ***	-0.421 (-2.83) ***		
Internet related	-0.035 (-2.24) **	-0.038 (-2.27) **	-0.036 (-2.18) **	-0.038 (-2.50) **	-0.038 (-2.52) **	-0.038 (-2.27) **	-0.242 (-2.15) **	-0.182 (-1.67)	-0.155 (-1.42)	-0.163 (-1.32)
Managerial participation					-0.003 (-0.25)					0.069 (0.76)
Managerial participation x Cash									0.317 (1.31)	
No. of blockholders				-0.003 (-0.86)						

Family				0.025 (1.70) *	0.025 (1.70) *					-0.106 (-0.88)
Family Name	-0.008 (-0.41)	-0.008 (-0.35)	-0.001 (-0.03)	-0.013 (-0.76)	-0.012 (-0.68)	-0.010 (-0.55)	0.182 (1.71) *	0.162 (1.39)	0.090 (0.64)	0.137 (0.92)
CEO turnover	-0.013 (-0.81)	-0.014 (-0.71)	-0.013 (-0.83)	-0.013 (-0.75)	-0.015 (-0.77)	-0.020 (-1.36)	0.239 (1.54)	0.188 (1.30)	0.347 (2.06) **	0.303 (1.81) *
Major	0.007 (0.74)	0.008 (0.72)	0.004 (0.37)	0.002 (0.24)	0.003 (0.28)	0.006 (0.59)	0.138 (2.03) **	0.177 (2.28) **	0.130 (1.91) *	0.168 (1.97) *
Service Firm	0.002 (0.20)	0.004 (0.29)	-0.000 (-0.03)	-0.000 (-0.02)	0.000 (0.01)	0.003 (0.23)	0.086 (1.05)	0.127 (1.24)	0.112 (1.42)	0.153 (1.44)
Firm size	-0.001 (-0.49)	-0.001 (-0.47)	-0.000 (-0.17)	-0.001 (-0.64)	-0.002 (-0.67)	-0.002 (-0.81)	0.015 (1.13)	0.007 (0.54)	0.029 (2.13) **	0.024 (1.73) *
Industry controls	No	Yes	No	No	No	No	No	Yes	No	Yes
Year controls	No	No	Yes	No	No	No	No	No	No	No
Adjusted R-squared	0.1556	0.1867	0.1867	0.1904	0.1911	0.1290	0.2947	0.4024	0.2959	0.3773
F-statistic (p-value)	0.001***			0.0011 ***	0.0014 ***	0.0379 **	0.0002 ***		0.0006 ***	

The Impact of Prior Performance on Abnormal Returns

The results of our regression analysis indicate a significant positive relation between the day-zero as well as overall event-window stock returns and prior firm (or management) performance as measured by free cash flow to total assets (FCF), return on assets (ROA), and the 'earnings negative' indicator variable. While the regression coefficients of the variable FCF are significant at the 1% level in almost all regressions (model 1 and models 3-5), the coefficient of the variable ROA is significant at the 10% level in models 6 and 8. Additionally, and in line with the results for the other performance measures, the regression coefficient of the negative-earnings indicator variable is negative and significant at the 5% level in models 9 and 10. This variable is negative but not significant when used to explain day-zero stock returns (not reported for brevity). Results hold when we control for industry or year effects in some regressions. Hence, we find support for our prediction (made in section 2.2) that those firms with better prior performance witness larger returns when announcing a name change. Employing the indicator variable 'FCF negative', the ratio of net income to total sales, return on equity (ROE) or prior stock performance in additional unreported regressions, the resulting coefficients are insignificant.

The Impact of Managerial Influence and Controls on Abnormal Returns

In models 4, 5, 9 and 10 we examine the impact of variables capturing governance and managerial influence on the sample firms observed stock market reaction. Against our predictions made in section 2, neither the variable managerial participation or an interaction term of managerial participation with the firm's cash nor the number of blockholders have any explanatory power for the observed stock returns, neither from a statistical point of view nor from an economic one. However, in line with the literature, the presence of family shareholders has a positive effect on the firms' stock returns significant at the 10% level (models 4 and 5).

Finally, with regard to our control variables, the coefficient of the variable 'major' is positive and significant (at least at the 10% level) in all regression models explaining the overall ([-20,20]) stock market reaction to name changes. This finding corroborates our prediction made in section 2 and is in line with the results documented subsection 4A.

Results do not considerably change when we control for the firms' gearing (total debt to total assets). Also, our main findings hold when we control for industry or year effects (see models 1,

2, 8 and 10). The statistical power of the regressions is backed by the corresponding values of the adjusted R^2 and particularly the F-statistic.

4.5 Major versus Minor Name Changes

From our findings in the last section and the evidence documented in previous studies, we conclude that empirical examinations that do not distinguish between major and minor name changes do not only lack an important detail in their analyses of wealth effects of corporate name changes but may also draw misleading conclusions from the overall results. Major name changes can be considered a different type of investment with respect to the associated costs (e.g. more advertisement or more potential revenue loss). Hence, the unanswered question arises why some managers choose to implement the costly major name changes while others prefer minor name changes instead?

A major name change may be interpreted as the start of a new reputation history (Tadelis 1999). This particularly holds as many major name changes are artificial name changes that result in the implementation of names that can only hardly be associated with the original firm or any direct meaning at all.[105] The new reputation starting with a major name change is not only the firm's but also the management's reputation, an important fact not considered in earlier studies. We hypothesize that a firm's management may have incentives to spend firm resources (i.e. available cash) to radically change the firm's name to alter or obfuscate the management's reputation by clouding poor past performance (even if this does not increase shareholder value).[106] Accordingly, Wu (2010) offers empirical evidence for the existence of a negative relation

[105] Accordingly, Cooper et al. (2005) state that „[…] it is possible that investors view the firm with a major name change as a potentially 'new firm' […]" (p. 329).
Anecdotal evidence supports this idea: the Financial Times, in its German edition on September 24, 2010, reported that in about 20 cases of stock market manipulation in Germany the names of penny-stocks were intentionally changed just to subsequently push stock prices by spreading false information.

[106] This strategy can be valuable for the manager when it increases the value of its outside option in the job market, keeps him from being fired, or enables him to reduce his effort. Even new managers who are not responsible for the past performance may want to start a new reputation history in order not to be associated with the firm's old name and/or poor performance. Thomas Middelhoff, for example, was appointed the new CEO of Karstadt Quelle AG in May 2005 - within the following year the firm first announced to plan a name change. To make sure our reasoning holds and name changes are not, in fact, driven by new CEOs, we control for CEO turnover prior to name-change announcements.

between accounting-based firm performance and the probability of both radical and general corporate name changes.[107]

To test whether the aforementioned reasoning holds for "new-reputation" name changes and to understand how a firm's past performance and management's influence affect the name-change decision, we run several binary logistic regressions.[108] Results indicate which factors drive the probability of a major name change. Table 4.7 summarizes our main results.

[107] However, Wu (2010) does not directly investigate the management's choice between major and minor corporate name changes. The author, within the group of major name changes, compares radical name changes to brand adoptions as the reference group.

[108] In a first step prior to these examinations, we run binary logistic regressions to find out which variables drive a firm's overall probability of conducting a name change (not reported for brevity). The control group in these regressions consists of a sample of 69 matched German firms that have not changed their name. We use the following matching criteria: book value of total assets, SIC code, stock quotation, no M&A deals. We do not find that any of our employed variables significantly drive the overall name-change probability.

Table 4.7: Results of the Binomial Logit Regressions

This table contains results of logit regressions. The dependent variable is the indicator variable 'Major'. In some regressions first-digit SIC or year indicator variables are excluded because they perfectly predict failure. We thus have separation which makes estimation of the model infeasible. Omission of the variables that cause separation is a standard procedure (see Zorn 2005). All variables are defined as explained in Table 4.3. Each regression includes a constant term (not reported). Z-Statistics are in parentheses. Asterisks denote significance at the 0.01(***), 0.05(**) and 0.10(*)-level.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
FCF negative	1.967 (2.49) **					2.376 (2.66) ***	1.982 (2.43) **		1.982 (2.27) **	
Earnings negative		1.278 (1.88) *						1.947 (2.59) ***		2.302 (2.54) **
ROA			-2.290 (-0.98)							
Prior stock performance				0.636 (0.80)						
FCF					-1.337 (-1.26)					
Cash	2.122 (1.31)	1.620 (0.98)	3.376 (1.92) *							
Internet related	0.141 (0.12)	-0.417 (-0.37)	-0.168 (-0.15)	0.083 (0.07)	-0.183 (-0.17)	-0.082 (-0.07)	0.057 (0.05)	-0.511 (-0.44)	-0.038 (-0.03)	0.001 (0.00)
Managerial participation			1.327 (2.03) **				1.374 (2.00) **		1.339 (1.81) *	1.702 (2.14) **
No. of blockholders	-0.453 (-2.11) **	-0.342 (-1.80) *	-0.302 (-1.51)	-0.410 (-1.74) *	-0.353 (-1.96) **	-0.753 (-2.68) ***	-0.427 (-1.90) *	-0.570 (-2.40) **	-0.427 (-1.90) *	-0.313 (-1.34)
Family				1.507 (1.62)						
Family Name	-1.631 (-1.33)	-0.982 (-0.90)	-1.408 (-1.30)	-0.615 (-0.55)	-0.756 (-0.77)	-1.154 (-0.95)	-1.912 (-1.59)	-0.552 (-0.51)	-1.636 (-1.36)	-1.426 (-1.21)

CEO turnover	0.549	0.346	1.606	1.167	0.565	0.975	1.321	0.430	1.335	1.274
	(0.55)	(0.35)	(1.55)	(1.22)	(0.60)	(0.90)	(1.19)	(0.39)	(1.02)	(0.90)
Service Firm	-0.588	-0.509	-0.447	-0.607	-0.300	-0.387	-0.716	-0.780	-0.727	-1.003
	(-0.90)	(-0.81)	(-0.71)	(-0.69)	(-0.50)	(-0.45)	(-1.05)	(-0.87)	(-0.85)	(-1.14)
Firm size	-0.022	-0.025	0.056	-0.154	-0.142	-0.175	0.079	-0.114	-0.090	-0.011
	(-0.17)	(-0.20)	(0.41)	(-1.12)	(-1.30)	(-1.18)	(0.55)	(-0.80)	(-0.66)	(-0.08)
Industry controls	No	No	No	Yes	No	Yes	No	Yes	No	No
Year controls	No	No	No	No	No	No	No	No	Yes	Yes
NObs	69	69	69	66	69	68	69	68	64	64
Pseudo R-squared	0.1753	0.1354	0.1564	0.2182	0.0929	0.2785	0.2209	0.2616	0.2850	0.3057
Chi square (p-value)	0.0351 **	0.1191	0.0973 *	0.1422	0.2689	0.0271 **	0.0132 **	0.0425 **	0.0346 **	0.0203 **

The Impact of Prior Performance on the Probability of Major Name Changes

To examine whether there exists a negative relation between the probability of major name changes and firm performance, and to investigate if managers spend their firms' resources to implement name changes for reputational reasons, we employ several variables as proxies for firm/management performance. These are the return on assets (ROA), the free cash flow to total assets (FCF), and two indicator variables 'FCF negative' and 'earnings negative'.[109] The results of our logistic regressions indicate that managers react to poor firm performance (and hence their own poor performance in case they were in charge of the firm in the past) by implementing major (rather than minor) name changes. The regression coefficient of the indicator variable 'FCF negative' is largely positive and statistically significant at least at the 5% level in models 1, 6, 7 and 9. Also the coefficient of the indicator variable 'earnings negative' is statistically significant in models 2, 8 and 10. In regression model 3 the coefficient of the variable ROA is insignificant but considerably negative pointing to a lower probability of a major name change with increasing firm performance. This is in line with the aforementioned results. The same holds when we control for the variable FCF (model 5) or for the return on equity (in unreported regressions). We also control for the effect of prior stock performance on the probability of a major name change. The coefficient is positive but statistically insignificant.

The Impact of Managerial Influence and Controls on the Probability of Major Name Changes

In all regressions we examine the impact of the number of blockholders on the management's decision to implement a major name change. In eight of ten models the corresponding coefficient is negative and statistically significant suggesting that when managers have less influence or leeway (as they are controlled by blockholders) they instigate major name changes with a considerably lower probability. Correspondingly, our results for the indicator variable 'managerial participation' further indicate that when managers own a stake in the firm's equity (and accordingly have more influence) they instigate major name changes with a higher probability.[110] In sum, these findings suggest that the probability of a major name change is

[109] Fombrun and Shanley (1990) and Wu (2010) reason that there exists a positive relation between a firm's performance or past accounting profitability and its reputation. See also Tadelis (1999) and Cabral (2000). McGuire et al. (1988) show that the return on assets is highly correlated with a firm's reputation.

[110] We also examine the impact of *managerial ownership* (i.e. the percentage of shares held by the management) and an interaction term of the variables *managerial participation* and *cash*. The coefficient of the ownership

increasing with managerial influence (or leeway) and offer evidence in favour of Fombrun and Shanley's (1990) conclusion that a firm's reputation can increase in the number of blockholders (making a major name change rather less plausible).

The major findings hold when we control for industry or year effects in some regressions as well as for the firms' gearing (except for managerial participation, not reported). We do not find any evidence that the probability of major name changes is driven by CEO turnover, firm size, or other control variables. Overall, the statistical quality of the performed regressions is backed by the corresponding values of the regressions' Wald Chi-square statistics that are significant for seven of ten models.

Reconciling the results of our OLS and logit regressions, we document that the abnormal returns observed for the entire event-window (CAR [-20,20]) are significantly lower for firms with negative earnings. This is in line with our hypothesis that managers instigate major name changes for reputational reasons, i.e. when past firm performance was poor. Seemingly, the stock market is aware of the managers' incentives and doubts the implementation of value-enhancing changes within earnings-negative firms.

4.6 Conclusion

By investigating the German market, this study provides the first empirical evidence on wealth effects of corporate name changes in Continental Europe as a different governance system compared to the Anglo-Saxon countries. Results suggest there are significant differences between those firms announcing major and those announcing minor name changes. While the former exhibit transitory positive abnormal returns, for the latter a name-change announcement seems to be no good signal to the stock market. Different valuation effects for these two groups (i.e. netting out) may account for the near-to-zero abnormal returns documented in the early studies where only Bosch and Hirschey (1989) made the major-minor distinction. Our study is the first that investigates the impact of firm governance/ownership structures on the observed stock returns and the first that examines management's decision to implement a major or a minor corporate name change. Results offer evidence that market participants regard name changes as real corporate investment decisions. We find a positive and significant relation between prior

variable is not significant (this also holds for the squared value). Regarding the interaction term, the results are significant but the corresponding regression coefficients reach suspiciously high values of more than 10 (most probably driven by the rather small sample size). Hence, we do not report these results.

firm performance and stock returns. Furthermore, the presence of family shareholders is associated with positive stock returns to announcements of name changes. This is in line with prior work documenting that family-controlled firms make better investment decisions. With respect to long-term effects of corporate name changes, our study documents an average stock-price peak around the event month similar to findings for the U.K. Post-event stock performance is considerably poor with both types of firms (announcing either major or minor name changes) underperforming the CDAX in the year after the name-change announcement.

This chapter further provides an analysis of the management's choice between major and minor corporate name changes motivated by the differences found in the wealth-effect analyses and the earlier literature. Our results suggest that managers instigate more expensive major name changes to disassociate with poor past performance. This finding seems logical because the worse a firm's/manager's performance (i.e. reputation), the less the firm/manager will have to lose from abandoning the old firm name to start a new reputation history. The "reputational restart" leaves the manager with leeway on actively building up a new reputation or not. This is in line with the fact that major name changes signify managerial activity that can only hardly be comprehended, whereas minor name changes such as inclusions or deletions, signal a certain strategy to be pursued in the future (e.g. business focusing or broadening), i.e. a direct managerial obligation. Of course, we cannot tell for sure whether managers conduct these name changes to help their firm or just to rebuild their own reputation (or both). However, results advert to the idea that managers are tempted to spend their firm's resources to start their own new reputation history even if it does not help the firm in the long run as the results of our long-term event study indicate. In this context, we show that the probability of major name changes increases with managerial participation and the firm's available cash. Nevertheless, corroborating existing studies, we show that enhanced governance through a firm's number of blockholders (reducing management's leeway) mitigates this problem. Thus, our study offers evidence on the importance of managerial influence and reputation in firms' investment decisions.

Overall, our findings are in line with the opinion of many economists that the market believes a firm with a completely new name is a new firm (Cooper et al. 2005, Wu 2010) and that major name changes may be interpreted as means of obfuscation by the corporate management. Managers who are aware of this apparent market irrationality might rationally implement major name changes for both reputational and cosmetic reasons. Our findings on major name changes,

at least, point to some degree of investor credulity and thereby particularly lend evidence to the irrationality perspective on corporate name changes as proposed, among others, by Cooper et al. (2001 and 2005).

We believe future research should deal with the exact costs as well as the choice between major and minor name changes. We find it plausible that major name changes are a form of investment distortion that stems from reputational incentives of corporate managers. In this context, it further seems worth investigating the stock-price reactions to first-time versus repeated and reverse corporate name changes.

Chapter 5: General Conclusion and Outlook

While it is certainly indisputable that reputation is an important issue in corporate finance and financial intermediation, the exact role of reputation in today's capital markets appears to be rather uncertain. Contrary to the classical view (e.g. Klein and Leffler 1981, Milgrom and Roberts 1982), recent theoretical models and anecdotal evidence suggest that reputation capital at stake may not always work as an incentivizing mechanism. Theorists have demonstrated that reputable intermediaries can be tempted to take advantage of their acquired reputation and to accept bribes. Several cases of auditing and underwriting fraud as well as the many inaccurate credit ratings in the 2008-09 financial crisis further point to this conclusion. In addition, the economic literature is inconclusive with regard to the effect of competition on long-run players' incentives.

In this context, chapters 2 and 3 of this dissertation examine the role and incentives of financial intermediaries, particularly banks, in a period of increased competition, especially in the underwriting market. While chapter 2, in line with recent evidence, suggests that banks acting as underwriters in the corporate bond market take advantage of their built-up reputation (i.e. "reputation milking"), chapter 3 shows that these banks act more investor-oriented when they provide trustee services to bondholders. Reconciling these two findings, the evidence presented in chapters 2 and 3 indicates that banks seem to primarily care for generating business and maintaining their league table positions. On the one hand, underwriting banks appear to lower their underwriting standards (with respect to issuer default risk) to generate more business. On the other hand, these banks, when acting as bond trustees, seem to care for their perceived investor orientation to avoid (simultaneous) negative spillover effects on their underwriting business. While it can take investors some time to distinguish - if distinguishable at all - whether reputable banks misuse their reputation (as in the first case, chapter 2), investors may more easily draw inferences about banks' investor orientation and the overall quality of their services when the banks offer several services in a market segment (as argued in chapter 3). Results indicate that from the investors' perspective market shares might not always be a reliable measure of banks' reputations or incentives. The findings in chapter 3 lend evidence to this interpretation as the trustees with the largest market shares are not perceived as effective (or dedicated) monitoring

devices, while the trustees that also act as underwriters in the same market segment are priced in bond issues.

In addition to the findings on reputation, both chapters offer valuable insights that can improve future research on bond markets, certification, and delegated monitoring. First, the results of chapter 2 suggest that examining all relevant certification devices simultaneously may improve the accuracy of empirical studies as "certification among certifiers" seems to exist. Auditor quality, for example, can be interpreted as an underwriting standard in the corporate bond market according to our results. Hence, studies that do not account for the interactions of certifiers might draw misleading conclusions and suffer from an omitted variable bias. Second, it can be advantageous for investors to conduct intensive due diligence (particularly in boom phases when incentives to do so can be generally lower, as stated in Bolton et al. 2009) and to doubt the basic argument of reputation capital at stake. Third, as argued in chapter 3, not all bond trustees are perceived as ineffective monitoring devices. Reputation spillover effects may potentially incentivize banks with related business in the same market segment (i.e. the same investor base) to act more dedicated. Hence, issuing firms in the bond market should care for their trustee's identity. In addition, empirical studies on bond covenants should incorporate the bond trustee to avoid a potential omitted variable bias. Fourth, an overview about the covenant structure of U.S. high-yield corporate bonds for the period 2000-08 is provided suggesting that these bonds have become less "covenant-light" as compared to the reported high-yield bond covenant structure in Gilson and Warner (1998).

Finally, chapter 4 of this dissertation examines the role of reputation in another context of corporate finance: the corporation's name and the management's incentives to change that name. Results suggest that stockholder wealth effects are considerably different for major and minor name changes in the short run and that the stock market reacts more favorably to a name change if the announcing firm reported positive earnings in the year before. Furthermore, the analyses in this chapter indicate that managers tend to instigate costly major name changes (which are less binding with respect to future changes in the firm) as a reaction to poor firm performance, particularly negative earnings. This can be interpreted as an attempt to obfuscate past performance, a strategy that can be reasonable for the firm's management from a reputational perspective but may not be profitable for investors (as buy-and-hold returns suggest). Accordingly, the results offer evidence that the probability of a major name change is

significantly increased if the management has more leeway (or more control) as measured by several corporate governance variables.

Building upon the main findings of this dissertation as summarized before, several interesting and unanswered questions for future research arise. Some of these questions are:

1.) Is there an optimal level of competition that ensures reputation capital is protected and high-quality services are provided?
2.) Is there a way of measuring intermediaries' reputation (and their incentives to protect built-up reputation) other than using market shares, i.e. league table positions? And is it really useful to consider industry and market-segment specific league tables to measure reputation given that customers/investors can observe the quality of a part of the other services that a bank offers?
3.) How much do banks care for their league table positions and how does this affect the structure of underwriting syndicates and the credibility of certification?
4.) Do reputable firms or firms with a high level of corporate governance need reputable (i.e. more expensive) intermediaries? Or can the firms' built-up reputation serve as a bonding device that ensures credible and truthful information provision? More generally, are corporate governance and reputation substitutes or do they complement each other?
5.) Does a firm's level of corporate governance affect investors' perceptions of this firm, e.g. is the firm perceived as more credible? Can investors really be fooled? Do investors, for example, believe that a firm with a new name is a new firm?
6.) How does the stock market react to firms repeatedly changing their names? And why do managers instigate repeated name changes?

Answering the questions mentioned above would further improve economists' understanding of reputation and corporate governance, and could help investors, managers, and regulators make accurate and particularly value-increasing decisions. Trying to address these questions, research may build upon the insights provided in this dissertation.

Bibliography

Acharya, V.V., S.C. Myers and R.G. Rajan (2011): The Internal Governance of Firms, Journal of Finance 66, 689-720.

Achleitner, A.-K., C. Andres, A. Betzer and C. Weir (2010): Wealth Effects of Private Equity Investments on the German Stock Market, European Journal of Finance 17, 217-239.

Affleck-Graves, J., S.P. Hedge, R.E. Miller and F.K. Reilly (1993): The Effect of the Trading System on the Underwriting of Initial Public Offerings, Financial Management 22, 99-108.

Albano, G.L. and A. Lizzeri (2001): Strategic Certification and Provision of Quality, International Economic Review 42, 267-283.

Alexander, G.J., A.K. Edwards and M.G. Ferri (2000a): The Determinants of Trading Volume of High-Yield Corporate Bonds, Journal of Financial Markets 3, 177-204.

Alexander, G.J., A.K. Edwards and M.G. Ferri (2000b): What Does Nasdaq's High-Yield Bond Market Reveal about Bondholder-Stockholder Conflicts?, Financial Management 29, 23-39.

Allen, F. (1990): The Market for Information and the Origin of Financial Intermediation, Journal of Financial Intermediation 1, 3-30.

Altman, E.I. (1989): Measuring Corporate Bond Mortality and Performance, Journal of Finance 44, 909-922.

Amihud, Y., K. Garbade and M. Kahan (2000): An Institutional Innovation to Reduce the Agency Costs of Public Corporate Bonds, Journal of Applied Corporate Finance 13, 114-121.

Anand, B.N. and A. Galetovic (2000): Information, Nonexcludability, and Financial Market Structure, Journal of Business 73, 357-402.

Andersen, R.C. and D.M. Reeb (2003): Founding Family Ownership and Firm Performance: Evidence from the S&P 500, Journal of Finance 58, 1301-1328.

Andersen, R.C., S.A. Mansi and D.M. Reeb (2003): Founding Family Ownership and the Agency Cost of Debt, Journal of Financial Economics 68, 263-285.

Andres, C. (2008): Large Shareholders and Firm Performance – An Empirical Examination of Founding-Family Ownership, Journal of Corporate Finance 14, 431-445.

Andres, C. (2007): Family Ownership, Financing Constraints and Investment Decisions, Working Paper University of Bonn.

Andres, C., A. Betzer and I. van den Bongard (2011): Das Ende der Deutschland AG, Kredit und Kapital 44, 185-216.

Andres, C., A. Betzer and P. Limbach (2011): Certification and Reputation Milking: Comprehensive Evidence from Corporate Bonds, Working Paper WHU Vallendar, University of Wuppertal, and Karlsruhe Institute of Technology.

Andrikopoulos, P., A. Daynes and P. Pagas (2007): The Long-Term Market Performance of UK Companies Following Corporate Name Changes, Working Paper University of Portsmouth.

Anginer, D., A.J. Warburton and C. Yildizhan (2011): Corporate Reputation and Cost of Debt, Working Paper Syracuse University, University of Michigan, and The World Bank.

Asker, J. and A. Ljungqvist (2005): Sharing Underwriters with Rivals: Implications for Competition in Investment Banking, Working Paper Series Financial Institutions Research Group, Working Paper S-FI-05-03, Stern School of Business, New York University.

Asquith, P., D.W. Mullins and E.D. Wolff (1989): Original Issue High-Yield Bonds: Aging Analysis of Defaults, Exchanges, and Calls, Journal of Finance 44, 923-952.

Asthana, S., S. Balsam and S. Kim (2009): The Effect of Enron, Andersen, and Sarbanes-Oxley on the US Market for Audit Services, Accounting Research Journal 22, 4-26.

Attig, N., O. Guedhami and D. Mishra (2008): Multiple Large Shareholders, Control Contests, and Implied Cost of Equity, Journal of Corporate Finance 14, 721-737.

Bae, K.-H. and W. Wang (2010): What's in a "China" Name? A Test of Investor Sentiment Hypothesis, Financial Management, Forthcoming.

Baker, H.K., G.E. Powell and D.G. Weaver (1999): Does NYSE Listing Affect Firm Visibility?, Financial Management 28, 46-54.

Balvers, R.J., B. McDonald and R.E. Miller (1988): Underpricing of New Issues and the Choice of Auditor as a Signal of Investment Banker Reputation, The Accounting Review 63, 605-622.

Bao, J., J. Pan and J. Wang (2011): The Illiquidity of Corporate Bonds, Journal of Finance 66, 911-946.

Barber, B.M. and J.D. Lyon (1997): Detecting Long-Run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics, Journal of Financial Economics 43, 341-372.

Beatty, R.P. and J.R. Ritter (1986): Investment Banking, Reputation, and the Underpricing of Initial Public Offerings, Journal of Financial Economics 15, 213-232.

Beatty, R.P. (1989): Auditor Reputation and the Pricing of Initial Public Offerings, The Accounting Review 64, 693-709.

Beatty, R.P. and I. Welch (1996): Issue Expenses and Legal Liability in Initial Public Offerings, Journal of Law and Economics 39, 545-602.

Becker, B. and T. Milbourn (2011): How Did Increased Competition Affect Credit Ratings?, Journal of Financial Economics 101, 493-514.

Benabou, R. and G. Laroque (1992): Using Privileged Information to Manipulate Markets: Insiders, Gurus, and Credibility, Quarterly Journal of Economics 107, 921-958.

Bergen, M., S. Dutta and C.O. Walker (1992): Agency Relationships in Marketing: A Review of the Implications and Applications of Agency and Related Theories, Journal of Marketing 56, 1-24.

Billings, M., A. Klein and E. Zur (2011): Shareholder Class Action Suits and the Bond Market, Working Paper New York University Stern School of Business and Baruch College of CUNY.

Black, F. (1976): The Dividend Puzzle, Journal of Portfolio Management 2, 5-8.

Blackwell, D.W., M.W. Marr and M.F. Spivey (1990): Shelf Registration and the Reduced Due Diligence Argument: Implications of the Underwriter Certification and the Implicit Insurance Hypotheses, Journal of Financial and Quantitative Analyses 25, 245-259.

Bloomberg Business Week (2003): Creditors Take on Kmart's "Frat Boys", by K. Kerwin, November 21, 2003.

Bloomberg (2010): Ernst & Young Said to Face Fraud Lawsuit From Cuomo Over Lehman Audits, Bloomberg.com on December 20, 2010.

Bloomberg (2011): Goldman Sachs Viewed Unfavorably by 54% in Poll, Bloomberg.com on May 12, 2011.

Boehmer, E., J. Musumeci and A.B. Poulsen (1991): Event-Study Methodology under Conditions of Event-Induced Variance, Journal of Financial Economics 30, 253-272.

Bolton, P., X. Freixas and J. Shapiro (2009): The Credit Ratings Game, NBER Working Paper No. 14712.

Booth, J.R. and R.L. Smith (1986): Capital Raising, Underwriting, and the Certification Hypothesis, Journal of Financial Economics 15, 261-281.

Bosch, J.-C. and M. Hirschey (1989): The Valuation Effects of Corporate Name Changes, Financial Management 18, 64-73.

Bouvard, M. and R. Levy (2010): Humouring Both Parties: A Model of Two-Sided Reputation, Working Paper McGill University and University of Mannheim.

Bradley, M. and D. Chen (2011): Corporate Governance, Credit Conditions, and the Cost of Debt, Working Paper Duke University and University of Baltimore.

Brav, A., W. Jiang, F. Partnoy and R. Thomas (2008): Hedge Fund Activism, Corporate Governance, and Firm Performance, Journal of Finance 63, 1729-1775.

Briggs, D.C. (2004): Causal Inference and the Heckman Model, Journal of Educational and Behavioral Statistics 29, 397-420.

Cabral, L.M.B. (2000): Stretching Firm and Brand Reputation, Rand Journal of Economics 31, 658-673.

Carter, R. and S. Manaster (1990): Initial Public Offerings and Underwriter Reputation, Journal of Finance 45, 1045-1067.

Carter, R., F.H. Dark and A.J. Singh (1998): Underwriter Reputation, Initial Returns, and the Long-Run Performance of IPO Stocks, Journal of Finance 53, 285-311.

Chaney, P.K., D.C. Jeter and L. Shivakumar (2004): Self-Selection of Auditors and Audit Pricing in Private Firms, The Accounting Review 79, 51-72.

Chemmanur, T.J. and P. Fulghieri (1994): Investment Bank Reputation, Information Production, and Financial Intermediation, Journal of Finance 49, 57-79.

Clifford, L. (2001): What's In A (Hip, New) Name?, Fortune Magazine, April 16, 2001.

Cooney, J.W., A.K. Singh, R.B. Carter and F.H. Dark (2001): IPO Initial Returns and Underwriter Reputation: Has the Inverse Relationship Flipped in the 1990s?, Working Paper University of Kentucky, Case Western Reserve, and Iowa State University.

Cooper, M.J., O. Dimitrov and P.R. Rau (2001): A Rose.com by Any Other Name, Journal of Finance 56, 2371-2388.

Cooper, M.J., A. Khorana, I. Osobov, A. Patel and P.R. Rau (2005): Managerial Actions in Response to a Downturn: Valuation Effects of Name Changes in the dot.com Decline, Journal of Corporate Finance 11, 319-335.

Cooper, M.J., H. Gulen and P.R. Rau (2005): Changing Names with Style: Mutual Fund Name Changes and Their Effect on Fund Flows, Journal of Finance 60, 2825-2858.

Covitz, D.M. and P. Harrison (2003): Testing Conflicts of Interest at Bond Ratings Agencies with Market Anticipation: Evidence that Reputation Incentives Dominate, Working Paper Federal Reserve Board.

Cowan, A.R. and A.M.A. Sergeant (2001): Interacting Biases, Non-Normal Return Distributions and the Performance of Tests for Long-Horizon Event Studies, Journal of Banking and Finance 25, 741-765.

Daniels, K.N., D. Ejara and J. Vijayakumar (2009): An Empirical Analysis of the Determinants and Pricing of Corporate Bond Clawbacks, Journal of Corporate Finance 15, 431-446.

Datar, S.M., G.A. Feltham and J.S. Hughes (1991): The Role of Audits and Audit Quality in Valuing New Issues, Journal of Accounting and Economics 14, 3-49.

Datta, S., M. Iskandar-Datta and A. Patel (1997): The Pricing of Initial Public Offerings of Corporate Straight Debt, Journal of Finance 52, 379-396.

DeAngelo, L.E. (1981): Auditor Size and Audit Quality, Journal of Accounting and Economics 3, 183-199.

Diamond, D. (1984): Financial Intermediation and Delegated Monitoring, Review of Economic Studies 51, 393-414.

Dichev, I.D. and J.D. Piotroski (2001): The Long-Run Stock Returns Following Bond Ratings Changes, Journal of Finance 56, 173-203.

Dong, M., J.-S. Michel and J.A. Pandes (2011): Underwriter Quality and Long Run IPO Performance, Financial Management 40, 219-251.

Dowling, G. (2006): How Good Corporate Reputations Create Corporate Value, Corporate Reputation Review 9, 134-143.

Dowling, G. (1988): Measuring Corporate Images: A Review of Alternative Approaches, Journal of Business Research 17, 27-34.

Dranove, D. and G.Z. Jin (2010): Quality Disclosure and Certification: Theory and Practice, NBER Working Paper No. 15644.

Drucker, S. and M. Puri (2006): Banks in Capital Markets: A Survey, in Eckbo, B.E. (ed.): Handbook in Corporate Finance: Empirical Corporate Finance, Elsevier/North-Holland.

Duarte-Silva, T. (2010): The Market for Certification by External Parties: Evidence from Underwriting and Banking Relationships, Journal of Financial Economics 98, 568-582.

Dyck, A., A. Morse and L. Zingales (2010): Who Blows the Whistle on Corporate Fraud?, Journal of Corporate Finance 65, 2213-2253.

Dye, R.A. (1993): Auditing Standards, Legal Liability, and Auditor Wealth, Journal of Political Economy 101, 887-914.

Edmans, A. (2009): Blockholder Trading, Market Efficiency, and Managerial Myopia, Journal of Finance 64, 2481-2513.

Edmans, A. and G. Manso (2010): Governance Through Trading and Intervention: A Theory of Multiple Blockholders, Review of Financial Studies 24, 2395-2428.

Einwiller, S. and M. Will (2002): Towards an Integrated Approach to Corporate Branding – An Empirical Study, Corporate Communications 7, 100-109.

Ellis, K., R. Michaely and M. O'Hara (2006): Competition in Investment Banking, Working Paper Cornell University.

Ely, J. and J. Valimaki (2003): Bad Reputation, Quarterly Journal of Economics 118, 758-814.

Erickson, M., M. Hanlon and E.L. Maydew (2006): Is There a Link between Executive Equity Incentives and Accounting Fraud?, Journal of Accounting Research 44, 113-143.

Fabozzi, F.J. (2010): Bond Markets, Analysis and Strategies, 7th Edition, Pearson, New Jersey.

Fama (1990): Contract Costs and Financing Decisions, Journal of Business 63, S71-S91.

Fang, L.H. (2005): Investment Bank Reputation and the Price and Quality of Underwriting Services, Journal of Finance 60, 2729-2761.

Farhi, E., J. Lerner and J. Tirole (2008): Fear of Rejection? Tiered Certification and Transparency, NBER Working Paper No. 14457.

Fenn, G.W. (2000): Speed of Issuance and the Adequacy of Disclosure in the 144A High-Yield Debt Market, Journal of Financial Economics 56, 383-405.

Ferris, S.P. (1988): The Effect of Corporate Name Changes on Shareholder Wealth, Journal of Applied Business Research 4, 40-49.

Fombrun, C. and M. Shanley (1990): What's in a Name? Reputation Building and Corporate Strategy, The Academy of Management Journal 33, 233-258.

Francis, J.R. (2004): What Do We Know About Audit Quality?, The British Accounting Review 36, 345-368.

Franks, J. and C. Mayer (2001): Ownership and Control of German Corporations, Review of Financial Studies 14, 943-977.

Fridson, M.S. and M.C. Garman (1998): Determinants of Spreads on New High-Yield Bonds, Financial Analysts Journal 54, 28-39.

Friedman, H.M. (1974): Updating the Trustee Indenture Act, University of Michigan Journal of Law Reform 7, 329-357.

Gande, A., M. Puri and A. Saunders (1999): Bank Entry, Competition, and the Market for Corporate Securities Underwriting, Journal of Financial Economics 54, 165-195.

Gatti, S., S. Kleimeier, W.L. Megginson and A. Steffanoni (2008): Arranger Certification in Project Finance, Working Paper Bocconi Milano, Maastricht University, and University of Oklahoma.

Geyfman, V. and T.J. Yeager (2009): On the Riskiness of Universal Banking: Evidence from Banks in the Investment Banking Business Pre- and Post-GLBA, Journal of Money, Credit and Banking 41, 1649-1669.

Gillan, S.L. and J.D. Martin (2007): Corporate Governance Post-Enron: Effective Reforms, or Closing the Stable Door?, Journal of Corporate Finance 13, 929-958.

Gillan, S.L., J.C. Hartzell and L.T. Starks (2007): Tradeoffs in Corporate Governance: Evidence from Board Structures and Charter Provisions, Working Paper University of Texas.

Gilson, S.C. and J.B. Warner (1998): Junk Bonds, Bank Debt, and Financing Corporate Growth, Working Paper Harvard Business School.

Golubov, A., D. Petmezas and N.G. Travlos (2010): When It Pays to Pay Your Investment Banker: New Evidence on the Role of Financial Advisors in M&As, Journal of Finance, Forthcoming.

Gopalan, R., V. Nanda and A. Seru (2007): Affiliated Firms and Financial Support: Evidence from Indian Business Groups, Journal of Financial Economics 86, 759-795.

Gosh, A. and R. Pawlewicz (2008): The Impact of Regulation on Auditor Fees: Evidence from the Sarbanes-Oxley Act, Working Paper City University of New York.

Goyal, V.K., N. Gollapudi and J.P. Ogden (1998): A Corporate Bond Innovation of the 90s: The Clawback Provision in High-Yield Debt, Journal of Corporate Finance 4, 301-320.

Grosskopf, B. and R. Sarin (2010): Is Reputation Good or Bad? An Experiment, American Economic Review 100, 2187-2204.

Guedhami, O. and J. Pittman (2008): The Importance of IRS Monitoring to Debt Pricing in Private Firms, Journal of Financial Economics 90, 38-58.

Güttler, A. and M. Wahrenburg (2007): The Adjustment of Credit Ratings in Advance of Defaults, Journal of Banking and Finance 31, 751-767.

Hall, P. (1989): Bond Trustees Reexamine Role, ABA Banking Journal (August), 42-47.

Hand, J.R.M., R.W. Holthausen and R.W. Leftwich (1992): The Effect of Bond Rating Agency Announcements on Bond and Stock Prices, Journal of Finance 47, 733-752.

Heckman, J.J. (1979): Sample Selection as a Specification Error, Econometrica 47, 153-161.

Helwege, J. and C.M. Turner (1999): The Slope of the Credit Yield Curve for Speculative-Grade Issuers, Journal of Finance 54, 1869-1884.

Hirshleifer, D. (1993): Managerial Reputation and Corporate Investment Decisions, Financial Management 22, 145-160.

Hite, G. and A. Warga (1997): The Effect of Bond-Rating Changes on Bond Price Performance, Financial Analyst Journal May/June 1997, 35-51.

Hong, H. and M. Kacperczyk (2010): Competition and Bias, Quarterly Journal of Economics 125, 1683-1725.

Horsky, D. and P. Swyngedouw (1987): Does It Pay to Change Your Company's Name? A Stock Market Perspective, Marketing Science 6, 320-335.

Howe, J. (1982): A Rose by Any Other Name? A Note on Corporate Name Changes, Financial Review 17, 271-278.

Huang, R. and G.G. Ramirez (2010): Speed of Issuance, Lender Specialization, and the Rise of the 144A Debt Market, Financial Management 39, 643-673.

Huff, C.A. (2010): SECURITIES REGULATION, in Insights: The Corporate & Securities Law Advisor 24, 2-12.

Jensen, M.C. and W.H. Meckling (1976): Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, Journal of Financial Economics 3, 305-360.

John, K., A.W. Lynch and M. Puri (2003): Credit Ratings, Collateral, and Loan Characteristics: Implications for Yield, Journal of Business 76, 371-409.

John, K., S.A. Ravid and N. Reisel (2010): The Notching Rule for Subordinated Debt and the Information Content of Debt Rating, Financial Management 39, 489-513.

Johnson, R.E. and C.M. Boardman (1998): The Bond Indenture Trustee: Functions, Industry Structure, and Monitoring Costs, Financial Practice and Education 8, 15-28.

Johnson, W.A. (1970a): Default Administration of Corporate Trust Indentures: The General Nature of the Trustee's Responsibility and Events of Default, St. Louis University Law Journal 15, 203-236.

Johnson, W.A. (1970b): Default Administration of Corporate Trust Indentures: Defaulty Remedial Provisions, St. Louis University Law Journal 15, 374-397.

Josev, T., C. Howard and R. Faff (2004): What's in a Name? Evidence on Corporate Name Changes from the Australian Capital Market, Pacific Accounting Review 16, 57-76.

Karbhari, Y., Z. Sori and S. Mohamad (2004): Shareholder Wealth Effects and Corporate Name Changes: Evidence from Malaysia, Corporate Ownership and Control 2, 38-49.

Karpoff, J.M. and G. Rankine (1994): In Search of a Signaling Effect: The Wealth Effects of Corporate Name Changes, Journal of Banking and Finance 18, 1027-1045.

Karpoff, J.M., P.H. Malatesta and R.A. Walkling (1996): Corporate Governance and Shareholder Initiatives: Empirical Evidence, Journal of Financial Economics 42, 365-395.

Karpoff, J.M., D.S. Lee and G.S. Martin (2008): The Cost to Firms of Cooking the Books, Journal of Financial and Quantitative Analyses 43, 581-611.

Kashyap, A., R. Rajan and J. Stein (2009): The Global Roots of the Current Financial Crisis and its Implications for Regulation, Working Paper University of Chicago and Harvard University.

Kay, M. (2006): Strong Brands and Corporate Brands, European Journal of Marketing 40, 742-760.

Kilic, C. and T. Dursun (2006): The Effect of Corporate Identity Changes on Firm Value: An Empirical Investigation, Journal of the American Academy of Business 10, 234-240.

Kim, K. (2010): Blockholder Monitoring and the Efficiency of Pay-Performance Benchmarking, Journal of Corporate Finance 16, 748-766.

Kisgen, D.J. (2006): Credit Ratings and Capital Structure, Journal of Finance 61, 1035-1072.

Klein, B. and K. Leffler (1981): The Role of Market Forces in Assuring Contractual Performance, Journal of Political Economy 89, 615-641.

Klein, A. and E. Zur (2011): The Impact of Hedge Fund Activism on the Target Firm's Existing Bondholders, Review of Financial Studies 24, 1735-1771.

Kohli, C. and T.M. Hemnes (1995): A Corporation By Any Other Name…?, Business Horizons, November-December 1995.

Köke, J. (2004): The Market for Corporate Control in a Bank-Based Economy: A Governance Device?, Journal of Corporate Finance 10, 53-80.

Koku, P.S. (1997): Corporate Name Change Signaling in the Services Industry, Journal of Services Marketing 11, 392-408.

Kot, H.W. and J. Zhang (2008): Price Reactions to Corporate Name Changes, Working Paper Hong Kong Baptist University.

Kothari, S.P. and J.B. Warner (1997): Measuring Long-Horizon Security Price Performance, Journal of Financial Economics 43, 301-339.

Kreps, D. and R. Wilson (1982): Reputation and Imperfect Information, Journal of Economic Theory 27, 253-279.

Kroszner, R.S. and R. Rajan (1994): Is the Glass-Steagall Act Justified? A Study of the U.S. Experience with Universal Banking Before 1933, American Economic Review 84, 810-832.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R.W. Vishny (2002): Investor Protection and Corporate Valuation, Journal of Finance 57, 1147-1170.

Lando, D. and T.M. Skødeberg (2002): Analyzing Rating Transitions and Rating Drift with Continuous Observations, Journal of Banking and Finance 26, 423-444.

Leamer, E. (1983): Let's Take the Con Out of Econometrics, American Economic Review 73, 31-43.

Lee, P.M. (2001): What's in a Name.com?: The Effects of '.com' Name Changes on Stock Prices and Trading Activity, Strategic Management Journal 22, 793-804.

Lennox, C.S. (1999): Are Larger Auditors More Accurate than Small Auditors?, Accounting and Business Research 29, 217-227.

Li, K. and N.R. Prabhala (2005): Self-Selection Models in Corporate Finance, in Eckbo, B.E. (ed.): Handbook in Corporate Finance: Empirical Corporate Finance, Elsevier/North Holland.

Liu, Y. (2010): The Valuation Effect of Corporate Name Changes: A 30-Year Perspective, European Journal of Management, Forthcoming.

Livingston, M. and R.E. Miller (2000): Investment Bank Reputation and the Underwriting of Nonconvertible Debt, Financial Management 29, 21-34.

Livingston, M. and L. Zhou (2002): The Impact of Rule 144A Debt Offerings Upon Bond Yields and Underwriter Fees, Financial Management 31, 5-27.

Livingston, M., A. Naranjo and L. Zhou (2008): Split Bond Ratings and Rating Migration, Journal of Banking and Finance 32, 1613-1624.

Livingston, M. and L. Zhou (2010): Split Bond Ratings and Information Opacity Premium, Financial Management 39, 515-532.

Ljungqvist, A., F. Marston and W.J. Wilhelm, Jr. (2006): Competing for Securities Underwriting Mandates: Banking Relationships and Analyst Recommendations, Journal of Finance 61, 301-340.

Lo, A. and C. MacKinlay (1990): Data Snooping Biases in Tests of Financial Asset Pricing Models, Review of Financial Studies 3, 431-467.

Logue, D.E., R.J. Rogalski, J.K. Seward and L. Foster-Johnson (2002): What Is Special about the Roles of Underwriter Reputation and Market Activities in Initial Public Offerings?, Journal of Business 75, 213-243.

Lowry, M. and S. Shu (2002): Litigation Risk and IPO Underpricing, Journal of Financial Economics 65, 309-335.

Lu, T. and K. Sivaramakrishnan (2010): Does Mandatory Audit Firm Rotation Improve or Impair Corporate Investment Efficiency?, Working Paper University of Houston.

Macey, J.R. (2010): The Value of Reputation in Corporate Finance and Investment Banking (and the Related Roles of Regulation and Market Efficiency), Journal of Applied Corporate Finance 22, 18-29.

Macey, J.R. and M. O'Hara (2002): The Economics of Stock Exchange Listing Fees and Listing Requirements, Journal of Financial Intermediation 11, 297-319.

Manning, Selvage & Lee (1985): A Nationwide Survey on Corporate Names, New York, NY.

Mansi, S.A., Y. Qi and J.K. Wald (2011): Debt Covenants, Bankruptcy Risk, and Issuance Costs, Working Paper Virginia Tech, Concordia University, and the University of Texas at San Antonio.

Mansi, S.A., W.F. Maxwell and D.P. Miller (2004): Does Auditor Quality and Tenure Matter to Investors? Evidence from the Bond Market, Journal of Accounting Research 42, 755-793.

Mase, B. (2009): The Impact of Name Changes on Company Value, Managerial Finance 35, 316-324.

Mathis, J., J. McAndrews and J.-C. Rochet (2009): Rating the Raters: Are Reputation Concerns Powerful Enough to Discipline Rating Agencies?, Journal of Monetary Economics 56, 657-674.

McCahery, J. and A. Schwienbacher (2010): Bank Reputation in the Private Debt Market, Journal of Corporate Finance 16, 498-515.

McConnell, J.J. and H. Servaes (1990): Additional Evidence on Equity Ownership and Corporate Value, Journal of Financial Economics 27, 595-613.

McGuire, J., A. Sundgren and T. Schneeweiss (1988): Corporate Social Responsibility and Firm Financial Performance, Academy of Management Journal 31, 854-872.

McQuade, W. (1984): Cosmetic Surgery for the Company Name, Fortune Magazine, April 30, 1984.

Megginson, W.L. and K.A. Weiss (1991): Venture Capitalist Certification in Initial Public Offerings, Journal of Finance 46, 879-903.

Michaely, R. and W.H. Shaw (1995): Does the Choice of Auditor Convey Quality in an Initial Public Offering?, Financial Management 24, 15-30.

Michaely, R. and K.L. Womack (1999): Conflict of Interest and the Credibility of Underwriter Analyst Recommendations, Review of Financial Studies 12, 653-686.

Milgrom, P. and J. Roberts (1982): Predation, Reputation and Entry Deterrence, Journal of Economic Theory 27, 280-312.

Morck, R., A. Shleifer and R.W. Vishny (1988): Management Ownership and Market Valuation – An Empirical Analysis, Journal of Financial Economics 20, 293-315.

Morrison, M.A. (2004): Rush to Judgment: The Lynching of Arthur Andersen & Co., Critical Perspectives on Accounting 15, 335-375.

Myers, S.C. (1977): Determinants of Corporate Borrowing, Journal of Financial Economics 5, 147-175.

Office for Harmonization in the Internal Market (2010): Statistics of Community Trade Marks 2010, available at: http://oami.europa.eu/ows/rw/pages/*OHIM/statistics.en.do*, September 15, 2010.

Ottaviani, M. and P.N. Sørensen (2006): Reputational Cheap Talk, Rand Journal of Economics 37, 155-175.

Patell, J.M. (1976): Corporate Forecasts of Earnings per Share and Stock Price Behavior: Empirical Test, Journal of Accounting Research 14, 246-276.

Peterson, M.A. (2009): Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches, Review of Financial Studies 22, 435-480.

Pillsbury (2011): Shielding Indenture Trustees from Liability for Fraud Perpetrated by Others, Pillsbury Winthrop Shaw Pittman LLP, www.pillsburylaw.com, June 15, 2011.

Pittman, J.A. and S. Fortin (2004): Auditor Choice and the Cost of Debt Capital for Newly Public Firms, Journal of Accounting and Economics 37, 113-136.

Platt, H.D. and M.B. Platt (1990): Development of a Class of Stable Predictive Variables: The Case of Bankruptcy Prediction, Journal of Business Finance and Accounting 17, 31-51.

Platt, H.D. (1993): Underwriter Effects and the Riskiness of Original-Issue High-Yield Bonds, Journal of Applied Corporate Finance 6, 89-94.

Puri (1994): The Long-Term Default Performance of Bank Underwritten Security Issues, Journal of Banking and Finance 18, 397-418.

Puri, M. (1996): Commercial Banks in Investment Banking: Conflict of Interest or Certification Role?, Journal of Financial Economics 40, 373-401.

Puri, M. (1999): Commercial Banks as Underwriters: Implications for the Going Public Process, Journal of Financial Economics 54, 133-163.

Rajan, R.G. and A. Winton (1995): Covenants and Collateral as Incentives to Monitor, Journal of Finance 50, 1113-1146.

Ramchand, L. and S. Chaplinsky (2004): The Impact of SEC Rule 144A on Corporate Debt Issuance by International Firms, Journal of Business 77, 1073-1097.

Reisel, N. (2010): On the Value of Restrictive Covenants: An Empirical Investigation of Public Bond Issues, Working Paper Southern Methodist University.

Renneboog, L., T. Simons and M. Wright (2007): Why Do Public Firms Go Private in the UK? The Impact of Private Equity Investors, Incentive Realignment and Undervaluation, Journal of Corporate Finance 13, 591-628.

Rhee, M. and M.E. Valdez (2009): Contextual Factors Surrounding Reputation Damage with Potential Implications for Reputation Repair, Academy of Management Review 34, 146-168.

Riordan, C., R. Gatewood and J. Bill (1997): Corporate Image: Employee Reactions and Implications for Managing Corporate Social Performance, Journal of Business Ethics 16, 401-412.

Ross, D.G. (2010): The "Dominant Bank Effect": How High Lender Reputation Affects the Information Content and Terms of Bank Loans, Review of Financial Studies 23, 2730-2756.

Roten, I.C. and D.J. Mullineaux (2002): Debt Underwriting by Commercial Bank-Affiliated Firms and Investment Banks: More Evidence, Journal of Banking and Finance 26, 689-718.

Santos, J.A.C. (2006): Why Firm Access to the Bond Market Differs Over the Business Cycle: A Theory and Some Evidence, Journal of Banking and Finance 30, 2715-2736.

Schwarcz, S.L. and G.M. Sergi (2008): Bond Defaults and the Dilemma of the Indenture Trustee, Alabama Law Review 59, 2008.

Shivdasani, A. and W.-L. Song (2011): Breaking Down the Barriers: Competition, Syndicate Structures, and Underwriting Incentives, Journal of Financial Economics 99, 581-600.

Shleifer, A. and R.W. Vishny (1997): A Survey of Corporate Governance, Journal of Finance 52, 737-783.

Sialm, C. and T.M. Tham (2011): Spillover Effects in Mutual Fund Companies, Working Paper University of Texas at Austin and Nanyang Technological University.

Sklar, M.D. (1988): The Corporate Indenture Trustee: Genuine Fiduciary or Mere Stakeholder?, The Banking Law Journal 105, 42-61.

Smith, C.W. and J.B. Warner (1979): On Financial Contracting: An Analysis of Bond Covenants, Journal of Financial Economics 7, 117-161.

Song, W.-L. (2004): The Industrial Organization of Bond Underwriting Market with Bank Entry: Evidence from Underwriting Fees, Working Paper Drexel University.

Spence, M. (1973): Job Market Signaling, Quarterly Journal of Economics 87, 355-374.

Spiotto, J.E. (2008): The Role of the Municipal Bond Trustee, in Fabozzi, F.J. and S.G. Feldstein (eds.) (2008): The Handbook of Municipal Bonds, John Wiley and Sons, Inc., New Jersey.

Standard and Poor's (2007): High-Yield Bond Market Primer, The McGraw-Hill Companies.

Strausz, R. (2005): Honest Certification and the Threat of Capture, International Journal of Industrial Organization 23, 45-62.

Tadelis, S. (1999): What's in a Name? Reputation as a Tradable Asset, American Economic Review 89, 548-563.

The New York Times (2010): U.S. Said to Open Criminal Inquiry Into Goldman, nytimes.com on April 29, 2010.

Tinic, S.M. (1988): Anatomy of Initial Public Offerings of Common Stock, Journal of Finance 43, 789-822.

Tirole, J. (1986): Hierarchies and Bureaucracies: On the Role of Collusion in Organizations, Journal of Law, Economics, and Organization 2, 181-214.

Titman, S. and B. Trueman (1986): Information Quality and the Valuation of New Issues, Journal of Accounting and Economics 8, 159-172.

Treadwell, D.F. (2003): Can Your Institution's Name Influence Constituent Response? An Initial Assessment of Consumer Response to College Names, Public Relations Review 29, 185-197.

Wall Street Journal (2005): Arthur Andersen's 'Victory', WSJ.com on June 1, 2005.

Wall Street Journal (2007): Gaming the Game: How Street Plays the 'League Tables', WSJ.com on April 10, 2007.

Wansley, J.W., J.L. Glascock and T.M. Clauretie (1992): Institutional Bond Pricing and Information Arrival: The Case of Bond Rating Changes, Journal of Business Finance and Accounting 19, 733-750.

Weir, C., D. Laing and P.J. McKnight (2002): Internal and External Governance Mechanisms: Their Impact on the Performance of Large UK Public Companies, Journal of Business Finance and Accounting 29, 579-611.

White, H. (1980): A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity, Econometrica 48, 817-838.

Wu, Y. (2010): What's in a Name? What Leads a Firm to Change its Name and What the New Name Foreshadows, Journal of Banking and Finance 34, 1344-1359.

Yang, S.-A., R. Fok and Y. Chang (2008): The Wealth Effects of Oil-Related Name Changes on Stock Prices: Evidence from the U.S. and Canadian Stock Markets, Working Paper University of Wisconsin-Parkside and National Chengchi University (Taiwan).

Yasuda, A. (2005): Do Bank Relationships Affect the Firm's Underwriter Choice in the Corporate-Bond Underwriting Market?, Journal of Finance 60, 259-1292.

Yu, F. (2005): Accounting Transparency and the Term Structure of Credit Spreads, Journal of Financial Economics 75, 53-84.

Zorn, C. (2005): A Solution to Separation in Binary Response Models, Political Analysis 13, 157-170.

Appendix

Table 2.5: Pair-wise Correlations (Chapter 2)

This table reports the pair-wise correlations of the key analyses variables employed in chapter 2.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Big 4 Auditor	1																
2 Mills Auditor	-0.29	1															
3 Callable	-0.11	0.35	1														
4 Clawback	-0.10	0.19	0.57	1													
5 First-time issuer	-0.11	0.44	0.22	0.14	1												
6 Maturity	0.03	-0.01	0.25	0.22	0.05	1											
7 No. Lead Underwriters	0.07	-0.17	-0.02	0.02	-0.12	0.12	1										
8 NYSE/AMEX	0.11	-0.38	-0.35	-0.19	-0.20	-0.04	0.05	1									
9 Public Firm	0.12	-0.43	-0.30	-0.13	-0.29	0.02	0.04	0.71	1								
10 Rating	0.09	-0.28	-0.56	-0.39	-0.16	0.06	0.05	0.31	0.24	1							
11 Rule 144A	-0.02	0.16	0.30	0.13	0.19	0.07	0.15	-0.22	-0.20	-0.22	1						
12 Split Rating	0.11	-0.09	-0.03	-0.04	-0.04	-0.04	-0.02	0.03	0.05	0.06	-0.01	1					
13 Subordinate	-0.03	0.10	0.23	0.17	0.04	0.33	0.08	-0.11	-0.1	-0.18	0.06	-0.13	1				
14 Top 3 Lead Underwriter	0.09	-0.19	-0.05	0.01	-0.12	0.12	0.29	0.10	0.09	0.06	0.01	-0.01	0.03	1			
15 Top 10 Lead Underwriter	0.15	-0.35	-0.10	0.00	-0.14	0.29	0.27	0.16	0.09	0.13	-0.04	0.06	0.17	0.34	1		
16 Mills Underwriter	-0.41	0.57	0.15	0.10	0.21	-0.21	-0.24	-0.11	-0.06	-0.15	0.06	-0.06	-0.42	-0.16	-0.45	1	
17 Volume	0.14	-0.49	-0.21	-0.09	-0.17	0.16	0.26	0.21	0.26	0.27	-0.07	0.12	-0.14	0.13	0.23	-0.51	1
18 Zero or Step-up	0.05	-0.03	0.11	0.05	-0.06	0.01	-0.01	-0.16	-0.12	-0.13	0.05	0.11	-0.09	0.01	0.03	-0.04	0.04

Table 3.3: Pair-wise Correlations (Chapter 3)

This table reports the pair-wise correlations of the key analyses variables employed in chapter 3.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Public Firm	1													
2 I-Bank Trustee	0.12	1												
3 Top 3 Trustee	-0.20	-0.54	1											
4 Mills I-Bank Trustee	-0.66	-0.20	0.25	1										
5 Mills Top 3 Trustee	0.65	0.17	-0.30	-0.83	1									
6 First-time Issuer	-0.29	-0.02	0.09	0.07	-0.29	1								
7 Rule 144A	-0.20	-0.07	0.16	0.34	-0.51	0.19	1							
8 Callable	-0.30	-0.02	0.19	0.30	-0.58	0.22	0.30	1						
9 HY Index Spread	0.13	0.04	-0.04	-0.28	0.29	-0.09	-0.03	-0.05	1					
10 Maturity	0.02	0.03	-0.02	-0.13	0.08	0.05	0.07	0.25	0.45	1				
11 Subordinated	-0.10	0.03	0.01	-0.17	-0.03	0.04	0.06	0.23	0.20	0.33	1			
12 Zero-coupon or Step-up	-0.12	-0.04	0.07	0.17	-0.12	-0.06	0.05	0.11	-0.03	0.01	-0.09	1		
13 Volume	0.26	-0.03	-0.07	0.10	0.18	-0.17	-0.07	-0.21	0.19	0.16	-0.14	0.04	1	
14 Rating	0.24	0.09	-0.20	-0.46	0.64	-0.16	-0.22	-0.56	0.34	0.06	-0.18	-0.13	0.27	1
15 Split Rating	0.05	-0.01	-0.03	0.05	0.04	-0.04	-0.01	-0.03	0.03	-0.04	-0.13	0.11	0.12	0.06

Table 4.8: Pair-wise Correlations (Chapter 4)

This table shows the pair-wise correlations of the key analyses variables employed in chapter 4.

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Cash	1													
2	CEO turnover	0.018	1												
3	Earnings negative	0.375	0.222	1											
4	Family	0.076	0.012	0.130	1										
5	Family name	0.222	0.066	0.068	0.185	1									
6	FCF negative	0.161	0.115	0.702	0.146	0.155	1								
7	FCF	-0.076	-0.174	-0.434	-0.065	-0.038	-0.477	1							
8	Firm size	-0.576	0.002	-0.369	-0.038	-0.239	-0.224	-0.008	1						
9	Gearing	-0.546	0.036	-0.396	-0.224	-0.154	-0.234	0.179	0.649	1					
10	Internet related	0.083	-0.093	0.234	0.057	0.112	0.078	-0.059	-0.204	-0.284	1				
11	Major	0.241	0.101	0.283	0.166	-0.040	0.278	-0.148	-0.161	-0.215	0.019	1			
12	Managerial participation	-0.158	-0.286	0.039	0.106	0.154	0.066	-0.079	-0.200	-0.077	0.101	0.154	1		
13	No. of blockholders	-0.226	-0.032	-0.033	0.002	0.012	0.140	-0.103	0.151	0.332	-0.114	-0.243	-0.049	1	
14	ROA	-0.057	0.044	-0.751	-0.107	0.001	-0.691	0.514	0.140	0.219	-0.199	-0.101	-0.115	-0.169	1
15	Service firm	0.226	0.072	0.399	0.046	-0.068	0.228	-0.098	-0.387	-0.343	0.224	0.075	0.141	-0.195	-0.207