Research on audit quality

1. Introduction: a framework for audit quality research

With the publication of the Green Paper titled ›Audit Policy: Lessons from the Crisis‹ in 2010, the European Commission launched a debate on the role and scope of auditing within the global financial system. Specifically, the European Commission stated that the societal role of auditors, in offering an opinion on the true and fair presentation of financial statements of audited entities, should be robust and contribute to financial stability: »A robust audit is therefore key to re-establishing trust and market confidence as it contributes to investor protection and reduces the cost of capital for companies. It is time to probe into the true fulfillment of this societal mandate.« (European Commission, 2010). In this respect, the European Commission is concerned about the structure of the audit market and potential threats to audit quality, and raised several issues relating to enhancing audit quality in the European market for audit services. Regulatory changes that are considered include the prohibition of the provision of non-audit services to audit clients, the mandatory rotation of audit firms, the introduction of joint audits, the structure and wording of audit reports, more regular communication between auditors and stakeholders to reduce the gap between year-end and the date of the audit opinion, the legal introduction of International Standards on Auditing (ISAs), and the introduction of a European passport by which auditors are licensed at a European level. After a consultation period, the European Commission is currently preparing regulatory changes with respect, for example, to the provision of non-audit services to audit clients, the mandatory rotation of audit firms, and the wording of audit reports. In some areas, the European Commission needs more evidence before making such changes, while in other areas, the European Commission is refraining from any changes (for example with respect to the introduction of a European passport).

Academic research in auditing has studied many of these (proposed) regulatory changes and the papers in this special issue contribute to the debate on the role and scope of audit in the global financial system from an audit quality perspective. Nevertheless, we first would like to give an overview of the main research avenues in audit quality research, in order to better understand and position the papers of this special issue in the context of current research approaches. We therefore will briefly discuss the probably most commonly used definition of audit quality in auditing research by DeAngelo (1981a and 1981b), and the contemporary research framework of audit quality by Francis (2011), followed by three corresponding streams of research.

A common definition of audit quality stems from DeAngelo (1981a and 1981b). She defines audit firm quality, in the context of financial statement audits, as the joint probability that a given auditor will both (1) discover a breach in the client’s accounting system, and (2) report the breach (DeAngelo, 1981b, p. 186). The first part of the definition refers to the ability to detect errors and
thus to an audit firm’s technical competency. The second part of the definition refers to the willingness of an auditor to report on material financial statement errors and omissions and therefore relates to auditor independence.

The competency part depends on the auditor’s general ability, knowledge (education, training), experience (general, industry, client-specific), and technological proficiency, all of which play a role in the auditor’s ability to provide good quality audits. The independence part consists of factors such as objectivity, integrity, the use of due professional care, and the avoidance of conflicts of interest.

This conditional probability of reporting a discovered material misstatement is the audit firm quality that users of audited financial statements appreciate. As DeAngelo (1981a and 1981b) points out, audit firm quality is not easily observable by users, who will therefore employ surrogates based on audit firms’ client portfolios. The reason why audit firm independence is affected by their client portfolios is the existence of significant client-specific start-up costs and client-specific quasi-rents. The larger the number of companies in the client portfolio, the lower the level of dependence of an audit firm on retaining any one client in the case of a conflict with that client. Furthermore, the probability that a material misstatement will be reported not only depends on the audit firms’ client portfolios, but also on the client portfolios of individual engagement partners. Partners make significant financial investments and investments in human capital in their audit firms. A substantial part of this human capital is client-specific, and includes knowledge on internal control systems and control environments of specific clients. Hence, a part of an auditor’s human capital becomes obsolete when losing a client. It can also be expected that the reputation of individual auditors within the firm depends on their ability to retain clients. Consequently, losing a client might damage a partner’s reputation and human capital. Therefore, following DeAngelo (1981a and 1981b), it can be argued that larger audit firms have fewer incentives to behave opportunistically as a means of ensuring client retention and thus provide higher audit quality than smaller audit firms. The paper by Hitz et al. (2013) in this special issue, for example, shows that larger audit firms reduce audit delay and, using audit delay as a proxy for audit quality, that larger audit firms thus enhance audit quality.

An extension of DeAngelo’s (1981a and 1981b) theory on audit quality is provided by Francis (2011), who posits that audit quality is achieved by the issuance of the »appropriate« audit report on the client’s compliance with generally accepted accounting principles (Francis, 2011, p. 127). Francis (2011) argues that DeAngelo’s (1981a and 1981b) definition, although intuitively appealing, offers no insight into the various factors that affect the ability of auditors to detect misstatements and reflects a binary view of audit quality in which auditors report or fail to report a material misstatement. Francis (2011) refers to this as the legal view of audit quality, as either an »audit failure« or »no audit failure« occurs. An audit failure occurs when an incorrect opinion is issued, and no audit failure occurs when the auditor issues the appropriate audit opinion. Evidence from studies on litigation or SEC enforcement actions against auditors point to very low binary audit failure rates of less than 1% (see e.g., Palmrose, 1988; Beasley/Carcello/Hermanson, 2010).

According to Francis (2011), this view ignores the bulk of audits which are classified homogeneously as non-failures. He therefore argues in favour of viewing audit quality as a continuum, on which audit quality can range from low to high. The two primary observable outcomes of the audit process – the audit report and the audited financial statements – can then be used to test for variations in audit quality. Both observable outcomes have been used in prior studies to test for audit quality differences: (1) studies of the likelihood of issuing a going-concern opinion that are conditional on the financial circumstances of the client (see e.g., Carey/Simnett, 2006), and (2) studies that link properties of client financial statements to characteristics of the audit (see e.g., Becker et al., 1998; Frankel/Johnson/Nelson, 2002). These outcomes are in turn affected by six units of analysis which Francis (2011) defines as audit inputs, audit processes, accounting firms, audit industry and audit markets, institutions, and economics consequences, and audit outcomes. These six factors represent the audit quality framework, as advanced by Francis (2011). A similar approach is, for example, taken by the IAASB in their consultation paper on audit quality (IAASB, 2013).

Nevertheless, both the DeAngelo (1981a and 1981b) and the Francis (2011) views can be used to classify and discuss audit quality research. From either perspective, audit quality differences can be studied in terms of human capital or auditor com-
petence. In DeAngelo’s (1981a and 1981b) definition, this is the first factor of audit quality – the ability to detect errors – and it also fits into Francis’ (2011) view, as competent auditors make appropriate judgments in the audit process. Trotman (2012) provides an overview of audit judgment and decision making research in auditing and in the next section, auditor competence research is discussed from an audit quality perspective.

Audit quality differences can also be studied from audit-firm-market or independence perspectives. This is the second dimension in DeAngelo’s (1981a and 1981b) definition – the willingness to report errors. According to Francis (2011), audit quality is affected by the audit market, which influences the behaviour of audit firms and by audit firms as they develop testing procedures and create incentives for auditors. As such, both individual auditors and audit firms have to behave independently in order to deliver high-quality audits. We provide an overview of research on audit independence in Section 3 of this Editorial.

Finally, as a separate category, we discuss audit quality from a regulatory perspective. Regulation and oversight directly affect the quality of auditors and of audit firms, and therefore impact on competence as well as on independence. Regulators can punish auditors and audit firms for misconduct and low-quality audits (Francis, 2011). Several recent studies in this area found evidence that a stricter audit environment reduces the magnitude of earnings management (see e.g., Maijoor/Vanstraelen, 2006) and that a stronger investor protection regime results in higher audit quality by large audit firms (see e.g., Francis/Wang, 2008). Given the recent regulatory development in which regulators play a much larger role in terms of oversight, conducting inspections and stricter regulations, we will discuss regulation separately in Section 4.

2. Auditor competence and audit quality

2.1. Auditor competence as a dimension of audit quality

Auditor competence is a crucial factor in the provision of high quality audit services. Francis (2011) states the obvious, but nonetheless important fact that «audits are of higher quality when undertaken by competent people.» As mentioned above, auditor competence is one of the two dimensions in defining audit quality by DeAngelo (1981a and 1981b). Her definition is also consistent with the objectives of the auditor according to ISA 200.11, which are to obtain reasonable assurance as to whether the financial statements as a whole are free from material misstatement and to report on the financial statements and to communicate in accordance with the auditor’s findings. In the following sections, we take a closer look at the concept of auditor competence and its drivers, as originally derived by DeAngelo (1981a and 1981b). We also extend our view to Francis (2011) and the framework for audit quality recently developed by the IAASB (2013), which provide further valuable insights. Furthermore, future research opportunities concerning auditor competence will be pointed out.

2.2. Dimensions of competence

The use of the term auditor «competence» raises the issue of how «competence» can be defined and how it differs from «competency» – particularly since both terms are sometimes used synonymously. Competence usually refers to measurable and objective requirements, which have to be fulfilled to achieve the objectives of a specific profession. In contrast, competency focuses on competent people’s individual knowledge, skills, and characteristics (Teodorescu, 2006, p. 28). In the context of audit quality, competency in fact is the more appropriate term, since the primary question is what kind of knowledge and characteristics auditors should have in order to discover breaches in the client’s accounting system and, hence, to provide high audit quality. However, since the notion of competence is well-established in audit literature, we use the two terms interchangeably.

In auditing research, knowledge and experience describe distinguishable auditor attributes, whereas individual characteristics and professional skepticism are associated with personal and cognitive aspects (Nelson/Tan, 2005, p. 50).

2.2.1. Knowledge and experience

From an audit quality perspective, necessary knowledge and understanding relate first of all to relevant financial reporting frameworks, as well as
relevant laws or regulations. In addition, the knowledge and understanding of relevant auditing standards is essential, because auditing standards provide an important basis for improving audit quality (IAASB, 2013, p. 13). Furthermore, proficiency in areas like management accounting, finance, taxation, corporate governance, risk management, business laws, information technology, strategic management, and economics complete the essential knowledge set of a competent auditor (IAESB, 2012, pp. 11–17). Whereas these aspects can be regarded as general domain knowledge for the audit profession, specific knowledge, such as industry expertise, also contributes to performing a high quality audit, given that industry experts are assumed to provide higher effectiveness and efficiency. Empirical evidence shows that audited financial statements are of higher quality when audited by an industry expert (e.g., O’Keefe/King/Gaver, 1994; Payne, 2004). Additionally, Reichelt and Wang (2010) find that auditors with industry expertise provide higher audit quality at both national and office levels than auditors without industry expertise. However, using a more sophisticated statistical method to examine the effects of firm-wide and office-specific industry specialization on audit quality Koch and Hardies (2013) show that firm-wide factors play a more important role than office-specific factors.

In addition, auditor experience plays an important role, since some vital knowledge can be gained only through experience (Bonner/Lewis, 1990, p. 1). In particular, task-specific experience is another important factor influencing the quality of auditor judgments. As Bonner and Lewis (1990) demonstrate, task-specific knowledge contributes more to audit quality than general experience measured in terms of seniority (e.g., senior manager vs. senior assistant vs. student).

2.2.2. Individual characteristics and professional skepticism

Beyond knowledge and experience, individual auditor characteristics affect audit quality. Francis (2011) argues that we might reasonably assume that auditors are sufficiently competent, due to their audit-specific education, but we know little about actual decision-making in the audit context. Therefore, audit quality research should also consider psychological aspects, especially behavioral aspects.

For instance, Pincus (1990) finds that auditors who are able to »get to the key issue« (field independence) and who are uncomfortable with ambiguous situations (ambiguity-intolerance) are more likely to discover accounting errors than auditors who are field-dependent and ambiguity-tolerant. In other words, professional skepticism enhances audit quality. The IAASB (2013) defines professional skepticism as »an attitude that includes the application of a questioning mindset in the context of an appropriate understanding of the entity, its business and the environment in which it operates.« Following a similar notion, Nelson (2009) developed a model of professional skepticism in audit performance comprising the determinants »experience«, »knowledge«, »incentives«, and »traits«. Particularly the last three determinants are directly associated with skeptical judgment and skeptical action. Hurt (2010) has even developed a scale to measure professional skepticism, assuming that the dimensions of auditor’s professional skepticism are a questioning mind, the suspension of judgment, the search for knowledge, interpersonal understanding, autonomy, and self-esteem. The first three dimensions relate primarily to how an auditor obtains audit evidence. Interpersonal understanding refers rather to understanding the motivation and integrity of individuals who provide audit evidence (e.g., management). The last two dimensions address the ability of the auditor to take decisions based on the evidence obtained.

However, cognitive limitations can affect audit judgment in a negative manner and, hence, lower the level of professional skepticism. Research shows that there are cases where auditors are susceptible to bias and heuristics (Nelson/Tan, 2005, p. 51). For example, they might not recognize interdependencies among audit procedures which eventually lead to overauditing, but they might also stop obtaining audit evidence too early, resulting in underauditing. Another example is the dilution effect, which occurs when judgments are biased in the presence of both diagnostic and nondiagnostic information. This scenario means that auditors also consider nondiagnostic information although judgments should only be influenced by diagnostic information. However, Shelton (1999) shows that more experienced auditors (partners and managers) take less irrelevant evidence into account than inexperienced ones. A possible explanation is that experienced auditors have more knowledge and use a more sophisticated diagnostic-directed approach.
2.3. Future research opportunities

In the two previous sections, we introduced the most prominent dimensions of auditor competence in the context of audit quality. Of course, more dimensions exist, including especially communication and interpersonal skills, as well as problem-solving abilities. Research has so far generally neglected these dimensions, presumably because they are assumed to be important for many other professions as well. However, the importance of these dimension is growing rapidly, since audits are increasingly organized in a decentralized manner, and audit firms deliberately outsource individual audit procedures to audit team members who have no or only little contact with the management of the audited entity. One can therefore argue that research on the management of audit processes and the coordination and communication problems involved should be of great importance. From a more general perspective, it would be helpful to better understand the details of auditor judgments and decision-making within the audit process, particularly within audit planning, risk assessment, audit review, and audit-quality control review (Francis, 2011, p. 137). Regarding the latter, we should also better understand how auditors assess the competence of other auditors (Harding/Trotman, 2009, p. 54).

While numerous papers have investigated audit quality at the audit firm or office level, there is still little research about the individual auditors who conduct audits (Francis, 2011, p. 134). The study by Hardies/Breesch/Branson (2013), which is published in this special issue, contributes to this field by investigating the association between audit engagement partners attributes and audit quality, using audit fees as a proxy for audit quality. Analyzing a sample of Belgian companies, the findings indicate that partners earn fee premiums based on their sex, linguistic affiliation, experience, the size of their client portfolio, and their market share. However, the authors state that gaps still prevail in theoretical explanations, so that there is plenty of room for future research.

One further fruitful avenue for future research should be to examine potential interdependencies between the dimensions described. As argued above, highly competent auditors are more likely to discover accounting errors. However, they are also more likely to develop non-error explanations (Nelson, 2009, p. 22). Therefore, professional skepticism can be undermined by knowledge. Following the notion introduced by DeAngelo, auditor competence and auditor independence are dependent rather than independent determinants of audit quality. As Lee and Stone (1995) point out, auditor competence can be regarded as a condition for auditor independence, because auditors cannot simply choose to be independent, unless they are competent. Thus, future research is needed to disentangle the effects of a lack of auditor competences, as well as potential measures for enhancing auditor competence and audit quality, especially regarding the auditor’s professional skepticism.

Another interesting question is how auditors actually build up knowledge and cognitive characteristics as a means of providing high(er) audit quality. In this regard, effective professional development programs in audit firms play an important role. This issue also extends to audit teams, including issues of team composition and team communication. Similarly important are communication and interaction processes with respect to management and audit committees. Nelson and Tan (2005) state that »the interaction category is the most under-researched in auditing.«

3. Auditor independence

3.1. Background

Auditor independence is a necessary prerequisite for the value of an audit from a public interest perspective, and thus, robust regulation to ensure auditor independence is essential (European Commission, 2010). The IFAC distinguishes between independence of mind1 and independence in appearance (IFAC, 2012, Sec. 290.6). Independence of mind is defined as the state of mind that permits the provision of an opinion without being affected by influences that compromise professional judgment, allowing an individual to act with integrity, and to exercise both objectivity and professional skepticism. Independence in appearance is defined as the avoidance of facts and circumstances that are so significant that a reasonable and informed third

1 The AICPA Code of Professional Conduct (ET Section 55, Article IV.03) uses the term »independent in fact« (AICPA, 2012).
party would reasonably conclude that an auditor's integrity, objectivity or professional skepticism has been compromised. The requirement that a statutory auditor should be independent addresses both (Mautz/Sharaf, 1961, p. 204). If auditors are not perceived as independent, financial statements are perceived as less reliable and thus, social costs are incurred. Investments are seen as riskier, investors demand higher risk premiums, so that the cost of capital increases.²

Since incoming auditors face considerable start-up costs, incumbent auditors have a comparative advantage over competitors. Entity-specific transaction costs associated with auditor change provide an additional advantage for them (DeAngelo, 1981a, p. 118). As a consequence, incumbent auditors are in a position to realize future benefits by setting future audit fees above the unavoidable costs of producing audits, i.e., the auditor can realize future quasi-rents. DeAngelo used the term quasi-rents because at market equilibrium, the present value of each potential auditor's profit from obtaining the initial engagement for a given client is zero (DeAngelo, 1981a, p. 122). The existence of client-specific quasi-rents leads to competition among potential incoming auditors and pushes fees below costs in the initial audit period (lowballing). Thus, the auditors make an "investment" in order to realize future pay-offs (quasi-rents). This investment will fail, however, if the audit engagement is terminated too soon. Since the audit client can use the threat of termination in his own interest, the existence of client-specific quasi-rents may constitute a threat to auditor independence.

Apart from such a self-interest threat which may occur as a result of an auditor's financial or other interests, e.g., an undue dependence on the total fees from one client or an undue concern of losing a particular client, auditor independence is also subject to further threats (IFAC 2012, Sec. 100.12). Familiarity threats may occur due to a long or close relationship between the auditor and the client, since the auditor may become too sympathetic to the interests of the client. This situation may result in inappropriate trust in the client and a failure to obtain sufficient and appropriate audit evidence. Familiarity threats may be caused, for instance, by a member of the engagement team having a close relationship with an employee of the client who is in a position to exert direct and significant influence over the financial statements or by a long association of senior personnel with the audit client. Self-review threats may occur when a previous auditor judgment needs to be reconsidered by the auditor who was also responsible for that judgment. If the auditor also provides consulting services to the client, the auditor may have to consider facts which were influenced by his or her own recommendations. In such a situation, the auditor may fail to maintain professional skepticism. Circumstances that may create self-review threats include performing a design or implementation service for accounting systems that provide the basis for the financial statements that are subsequently subject to the audit. Advocacy threats may occur when an auditor promotes a client's position or opinion to the point that professional skepticism may be impaired. An example would be acting as an agent on behalf of an audit client in litigation cases or other disputes with third parties. Intimidation threats may occur if the auditor is deterred from acting objectively by pressures, actual or perceived, including attempts to exercise undue influence. An example of a situation which may create an intimidation threat is being threatened with dismissal or replacement in relation to an audit engagement.

There are four typical situations that can impair auditor independence:
- Personal interaction (e.g., the auditor is director, supervisory board member or client employee; a former employee in the audit firm now has an accounting position in the client company)
- Financial interest (e.g., the auditor is shareholder, lender to or borrower from the client; high percentage of total fees obtained from one client)
- Personal relationships (e.g., based on social contacts)
- Provision of non-audit services

3.2. Non-audit services

The provision of non-audit services is the most frequently discussed and investigated scenario that can impair auditor independence. In the regulatory arena, the European Commission has pre-

² The association between the quality of annual reports and the cost of capital is examined, for example, by Botosan (1997) and Botosan and Plumlee (2002).
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Presented a draft regulation suggesting prohibiting audit firms from providing non-audit services to audit clients. In addition, large audit firms should be obliged to separate audit activities from non-audit activities in order to avoid all potential of conflicts of interest (European Commission, 2011). As a response, on September 5th, 2012, the Committee on Legal Affairs of the European Parliament (JURI) has published a Draft Report on the Commission’s proposal which by contrast does not include the audit-only firms approach (European Parliament, 2012). On April 25th, 2013, the JURI voted in favour of an audit reform package to strengthen the role of auditors and retrieve investor’s confidence, claiming that a general prohibition of offering non-audit services would in fact be counterproductive for audit quality (European Parliament, 2013).

From an economic perspective, on the one hand, if the statutory auditor provides consulting services to the audit client, the information gained as a consultant can be used to reduce audit costs. As a result, the economic bond between the auditor and the client is strengthened, since quasi-rents from auditing services increase. Thus, the risk of reduced auditor independence may increase (Beck/Frecka/Solomon, 1988). Moreover, the auditor can use the information gained as an auditor to lower consulting costs. Thus, the total quasi-rents from auditing and consulting services are higher than the quasi-rents from audits only. This further jeopardizes auditor independence (Ostrowski/Söder, 1999). Moreover, the provision of non-audit services may create other threats, in particular self-review and familiarity threats.

On the other hand, many arguments have been raised in favor of providing advisory services to audit clients. As a consultant, the statutory auditor obtains additional insights into the enterprise, which may increase audit effectiveness. Furthermore, the provision of non-audit services reduces the clients’ consulting risk. Not only is the auditor highly qualified and required to comply with relevant ethical standards, but the client also knows the capability of the statutory auditor from the audit services (Böcking/Löcke, 1997, p. 466). In addition, consulting services smooth out seasonal variations in the demand for audit services (Fleischer, 1996, p. 7). Supporters of non-audit services also argue that the provision of consulting services increases the attractiveness of the audit profession to graduates (Jacobs, 1975, p. 2239). Finally, it can be argued that the provision of consulting services strengthens the position of the statutory auditor, because the client is interested in a long-term relationship for efficiency reasons (Ballwieser, 2001, pp. 109–110).

Because the effect of the provision of non-audit services on independence in fact is difficult to measure, many archival studies in this area used proxies for independence. Non-audit services were related to qualified or going-concern opinions, the degree of earnings management, restatements, and litigation. There are also a few experimental studies. The majority of these studies did not find a negative effect of the provision of non-audit services on auditor independence. However, the auditor can only fulfill his/her economic function when he/she also is perceived as independent. Numerous studies have investigated the effect of the provision of non-audit services on independence in appearance. These studies are based on surveys, experiments, and archival data. The latter category mainly consists of market-reaction studies. Most studies reported a negative effect on perceived independence, but some failed to find any significant impact at all, and a few studies even found a positive impact. These conflicting research findings could be the result of different research designs. Results from different subject groups were analyzed, e.g., bank loan officers, financial analysts, shareholders, board members, financial executives, and auditors, and it is not surprising that differences in perceived independence exist, given that the interests of these groups vary. Previous research also used different types of consulting services, e.g. bookkeeping, IT-services, design and installation of financial and cost accounting systems, tax planning and preparation, purchase acquisition assistance, human resource management, actuarial services and outsourcing of the internal audit function. The likely impact of these different advisory services on perceived auditor independence seems to vary. For example, Quick and Warming-Rasmussen (2009) found that the degree to which perceived auditor independence is impaired depends on the type of non-audit service.3

3 An extensive overview of prior research is provided by Quick and Warming-Rasmussen (2005) and by Quick (2012).
3.3. Audit firm tenure

Another prominent suggestion for strengthening auditor independence is the mandatory rotation of audit firms. The European Commission suggested requiring audit firms to rotate after a maximum engagement period of six years and to extend this period to nine years, if joint audits are performed (European Commission, 2011). Recently, the JURI approved a mandatory rotation rule whereby an auditor may inspect a company’s financial statements for no more than fourteen years, which could be increased to 25 years if safeguards, e.g. a joint audit, are put in place (European Parliament, 2013).

Long audit tenure could impair the independence of audit firms due to the familiarity threat. A mandatory rotation of audit firms limits quasi-rents from individual audit engagements and thus the negative economic consequences from losing a client. As a consequence, the risk of an impairment of independence decreases (Arrunada/Paz-Ares, 1997). However, audit quality is also influenced by the probability of a given auditor discovering a breach in the client’s accounting system, which is expected to be negatively affected by a mandatory rotation of audit firms (e.g., Catanach/Walker, 1999). In initial audit engagements, client-specific knowledge and experience is lacking and, thus, the probability of unintentionally overlooking misstatements increases. Furthermore, the auditor depends more on client information in initial audits. Finally, the incentives to invest in client-specific resources decline, since the operating life of such assets is reduced (Quick, 2012).

Prior research includes (1) experimental studies, (2) archival studies on the relationship between auditor tenure and audit quality, using different proxies for audit quality, such as qualified audit opinions and going-concern opinions, litigation and the results of SEC oversight, and earnings management, (3) a few studies performed in the Spanish and Italian setting in which a mandatory rotation regime was or is in place, (4) studies which used the failure of Arthur Andersen to simulate a mandatory rotation of audit firms, and (5) numerous studies which performed surveys, experiments or content analysis and investigated the effect of the length of the auditor-client relationship or of the introduction of a mandatory rotation regime on independence in appearance or perceived audit quality. Overall, no conclusive evidence was found. The mixed results may be caused by the opposing effects of audit tenure on auditor competence and on auditor independence.4

3.4. Lessons learned, further issues, and future research opportunities

In the light of prior research findings, a general prohibition of non-audit services seems unnecessary. Instead, the European Commission should evaluate the effect of each specific non-audit service on auditor independence, before banning audit firms from providing it to their audit clients.

The research findings do not unconditionally promote the mandatory rotation of audit firms, probably due to the opposing impacts of auditor tenure on auditors’ ability to discover a breach and auditors’ willingness to report such a breach. Thus, regulators must strengthen auditors’ ability to detect material misstatements, if they wish to introduce a mandatory rotation of audit firms. Joint audits could be an appropriate means. Additional research should be conducted to investigate the combined effect of a mandatory rotation regime and joint audits (Ratzinger-Sakel et al., 2012).

Further current issues related to the enhancement of auditor independence refer to the appointment and remuneration of auditors by a third party, a cap on audit fees from a single audit client compared to the total audit revenues of the firm, and multi-year appointment of auditors. These topics can be regarded as fruitful avenues for future research. Another relevant issue is whether non-audit fees should be capped. In addition, personal interaction, such as staff of the audit firm subsequently being employed by the client, provides another path for research.

In the past, independence threats were mainly analyzed at the audit firm level. However, there is an economic bonding between firm office and client, as well as between audit partner and client. This problem provides further material for future research.

4 A comprehensive overview of such studies can be found in Quick (2004), Quick (2012), Quick/Wiemann (2013), and Wiemann (2011)
4. Audit quality and inspections

4.1. Do inspections improve audit quality?

4.1.1. Background

«Trust, but verify». This famous saying was frequently used by Ronald Reagan and could also serve as a motivation for PCAOB inspections. Taking into account that verification requires operational and administrative effort, it has to be justified by appropriate benefits. Hence, academic research in this field creates high informational value by examining the two aspects of effectiveness, as well as the efficiency of inspections. Put differently, research in this area ideally attempts to answer the following questions: Do inspections improve audit quality? And do they have an impact on audit market structure? Assuming that clear answers to these questions could be found, there would be three possible implications: To continue, modify, or abandon inspections.

The question of whether (PCAOB) inspections have a positive impact on audit quality is directly linked to the definition of audit quality. The discussion in this regard is ongoing. While there are both common definitions of audit quality and approaches capturing audit quality adequately, as discussed in the »Framework Section«, the auditing literature still lacks a single and generally accepted definition of audit quality. The main reason is that audit quality is essentially unobservable and complex, so that providing a single definition remains unsatisfactory. However, there are four frequently used attributes of audit quality: (a) compliance with standards, (b) auditor competency, (c) auditor effort, and (d) auditor independence, two of which are explicitly part of the DeAngelo (1981a and 1981b) audit quality definition. The other two attributes, compliance with standards and audit effort, can also be linked to this definition. If we attempt to transfer compliance with standards to the DeAngelo (1981a and 1981b) definition, the second component of this definition, i.e., reporting the breach, should be met if the auditor complies with standards. If we attempt to transfer audit effort to this definition, the first component, i.e., discovering the breach, is at least influenced by audit effort. Therefore, extending our understanding of the DeAngelo (1981a and 1981b) definition also captures the other two attributes. Each of the mentioned attributes could be influenced directly, or at least indirectly, by inspections.

Compliance with standards is one major issue of importance in the context of inspections and can be further divided into two sub-categories: compliance with the applicable financial reporting framework and compliance with relevant auditing standards. It is notable that compliance with standards is also affected by the quality of the standards themselves. In this regard, the paper by García-Benau/Zori/Novejarque (2013) in this special issue provides insights into whether the clarified International Standards on Auditing (ISAs) are readable. It is very likely that inspectors will challenge any divergence from standards and, therefore, inspections do indeed provide strong incentives for auditors to comply.

As discussed earlier, competency is one of the two elements referred to in the DeAngelo (1981a and 1981b) audit quality definition. However, this element of audit quality is rather indirectly, if at all, influenced by inspections. Inspections could provide incentives for auditors to improve their competency to maintain standards, for to the reasons discussed above.

Auditor effort could be influenced by inspections, because an audit requires the auditor to obtain sufficient and appropriate audit evidence to draw reasonable conclusions. Therefore, inspections could create an incentive to increase or extend audit procedures, as inspectors are much more likely to criticize «underauditing» than to simply note low audit efficiency because of «overauditing».

Auditor independence is the second element in the DeAngelo (1981a and 1981b) audit quality definition. However, it is not the primary objective of inspections to increase auditor independence. Rather, the inspector must examine whether or not the independence requirements were met.

To conclude, only two attributes of audit quality appear to be directly influenced by inspections: compliance with standards and audit effort.

4.1.2. Empirical evidence

Up to the present (May 2013), the PCAOB has conducted around 2,200 inspections; quality control issues were not addressed satisfactorily in 147 of these inspections. The PCAOB has also reached settlement on 53 disciplinary orders with registered
firms or their associated persons (PCAOB, 2013). This clearly indicates that problems with audit quality do exist, at least to some extent. However, merely identifying problems in terms of audit quality is not sufficient to justify the total inspection fees of 187 million USD in 2011 (PCAOB, 2012, pp. 27/33); more important is that inspections improve audit quality.

The following paragraphs provide a useful selection of prior evidence in this regard. In the existing literature, there is some evidence that inspections have a positive impact on audit quality. Hermanson and Houston (2009) document a significant decrease in audit deficiencies and internal quality control defects noted in the second inspection report. Hence, a significant improvement can be documented for firms inspected for a second time (Hermanson/Houston, 2009, p. 59). The authors conclude that this finding can be interpreted as an improvement of audit quality caused by inspections, because audit firms do really seem to adjust procedures after receiving a critical inspection report (Hermanson/Houston, 2009, p. 58). In addition, Church and Shefchik (2012) report a significant linear downward tendency of revealed audit deficiencies since the beginning of PCAOB inspections in 2004 (Church/Shefchik, 2012, p. 61).

The research mentioned above provide rather indirect indicators of audit quality improved due to inspections, because the decrease in identified audit deficiencies could also result from a smaller scope of inspections (Lennox, 2009, p. 16). However, there is also evidence that inspections can increase audit quality. For the German setting, Maccari-Peukert (2011) shows that auditors are more likely to issue a going-concern opinion for financially stressed companies, beginning with the date on which the German public auditor oversight system implemented inspections (Maccari-Peukert, 2011, p. 1139). Similar evidence is provided for the US with Gramling/Krishnan/Zhang (2011) demonstrating that the likelihood of issuing a going-concern opinion increases if the first inspection has revealed audit deficiencies (Gramling/Krishnan/Zhang, 2011, pp. 75–76). Furthermore, this study indicates that inspections not only increase the likelihood of issuing a going-concern opinion, but also enhance the accuracy of going-concern opinions.

It is important to note that analyzing the likelihood of issuing a going-concern opinion aims at auditor independence (as an attribute of audit quality) while by contrast, analyzing the accuracy of issuing a going-concern opinion aims directly at audit quality (Francis, 2011, p. 129). Consequently, Gramling/Krishnan/Zhang (2011) suggest directly higher audit quality due to greater accuracy of going-concern opinions, whereas Maccari-Peukert (2011) suggests indirectly higher audit quality, due to greater auditor independence.

Another issue about inspections and audit quality is whether a potential improvement in audit quality caused by inspections is also perceived by audit committees and investors. Put differently, do members of audit committees and investors really consider inspection reports and react to them? Since this question is partially linked to the impact of inspections on audit market structure, which is discussed in the next section, as a brief overview of this research area, two experimental studies will be discussed.

Looknanan-Brown (2009) finds some evidence that in choosing an auditor, members of audit committees, simulated by students, consider deficiencies of internal quality systems of audit firms revealed by inspections reports. However, any other deficiencies revealed by inspections have no impact on auditor choice (Looknanan-Brown, 2009, p. 27). In addition, Robertson/Houston (2010) show that investors, simulated by students, anticipate higher future audit quality if an audit firm was inspected by the PCAOB (Robertson/Houston, 2010, pp. 47/50).

4.2. Do inspections affect audit market structure?

4.2.1. Theoretical reflections

A common problem in markets with complex and unobservable products is adverse selection (Akerlof, 1970, pp. 488–490). Audits are indeed complex and at least partially unobservable and therefore likely to provoke adverse selection. A priori, a company can only, if at all, roughly estimate the audit quality provided by an audit firm (Moizer, 1992, p. 335). This lack of transparency might result in an auditor choice of a cheaper auditor, although this auditor might provide lower audit quality. Thus, auditors who provide lower audit quality could crowd out auditors who offer higher audit quality.
If inspections reduce the information asymmetry relating to audit quality and enable audit firms to signal superior audit quality to the audit market, inspections foster a fair competition between auditors.

4.2.2. Empirical evidence

There is some evidence that inspections do indeed reduce the information asymmetry with respect to audit quality. Abbott/Gunny/Zhang (2008) and Daugherty/Dickins/Tervo (2009) observe that a client is likely to change his/her auditor if inspections reveal serious audit deficiencies in their audit. Those authors conclude that inspection reports are used by clients as a signal of audit quality (Abbott/Gunny/Zhang, 2008, pp. 36–37; Daugherty/Dickins/Tervo, 2009, p. 17). For small audit firms, Gunny/Zhang (2013) show that inspection reports can be used as an indicator of audit quality, since abnormal accruals are higher and restatements of financial statements are more frequent for clients whose audit firms had audit deficiencies (Gunny/Zhang, 2013, p. 157). Moreover, Read/Rama/Raghunandan (2004) document that some audit firms use a voluntary PCAOB registration and inspection to signal high audit quality to both their existing and potential clients (Read/Rama/Raghunandan, 2004, p. 253).

However, the evidence on market structure is mixed. Lennox/Pittman (2010) do not observe an impact of inspections on audit firms’ market shares. The authors conclude that clients do not consider information provided by inspection reports as proof of quality (Lennox/Pittman, 2010, p. 101). In contrast, McMullin (2009) notes that some audit firms themselves refrained from auditing of public companies, due to regulatory scrutiny. However, the author expects a positive impact on market structure, because audit firms that provide lower audit quality exit the audit market (McMullin, 2009, p. 16).

4.3. Future research opportunities

As discussed above, compliance with standards and auditor effort are the attributes of audit quality most likely to be influenced by inspections. Indeed, the most frequent audit deficiency revealed by inspection reports is the failure of an accounting firm to perform or to document sufficient procedures during testing (Church/Shefchik, 2012, p. 51). While failing to perform sufficient procedures can refer both to auditor competency and auditor effort as attributes of audit quality, a lack of documentation of audit procedures clearly implies a lack of auditor effort. The second most common audit deficiency revealed by inspection reports is the failure of an accounting firm to adequately evaluate an accounting issue or to evaluate whether the accounting treatment was appropriate (Church/Shefchik, 2012, p. 51). Although one cannot rule out the possibility that an inadequate evaluation of an accounting issue is caused by limited auditor effort, interestingly, this audit deficiency seems to aim more at auditor competency as an attribute of audit quality. Future research could evaluate whether audit effort and auditor competency are indeed the most neglected drivers of audit quality and how they are affected by inspections.

Another research opportunity would be to investigate the incentives provided by the regulation concerning internal quality control deficiencies of audit firms. The U.S. Congress intended to create incentives to take corrective actions, rather than to name and shame audit firms with internal quality control deficiencies (Roybark, 2012, p. 39). Therefore, an audit firm which has an internal quality control system with some deficiencies can use a 12-month remediation period to improve its internal quality control system (section 104(g) (2) SOX). Only if the audit firm does not do so within this period, does the PCAOB publicly announce the deficiencies. It would be interesting to examine the question whether especially small audit firms use the remediation period as part of their strategy to reduce their costs for internal quality control systems.

Finally, while there is some evidence on the individual characteristics of auditors and their impact on audit fees and audit quality (Hardies/Breesch/Branson of this special issue), we know very little about the individual characteristics of inspectors and their perceptions of audit quality. A fruitful avenue for future research could therefore be to examine the influence of individual inspector characteristics on inspection results.
5. Outlook

As demonstrated in the previous sections, audit quality is a very broad and heterogeneous field of research which is still subject to numerous gaps. This heterogeneity is reflected in the papers of this special issue that are directly and/or indirectly linked to audit quality, such as audit quality differentiation at both the level of the individual audit engagement partner and between Big4, mid-tier, and smaller audit firms; the valuation of takeover target and auditor quality; the determinants of audit delay; and the readability of clarified ISAs. However, it is not possible to reflect comprehensively and exhaustively on audit quality research in one issue. Nonetheless, the papers reflect numerous important facets and implications of audit quality and we wish you both interesting and inspiring reading.

Annette G. Köhler, Kai-Uwe Marten, Roger Mewissen, Reiner Quick

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Individual auditor characteristics and audit quality differentiation: evidence from audit fees

Individuelle Prüfercharakteristiken und Differenzierung der Prüfungsqualität: Evidenz anhand von Prüfungshonoraren

Schlüsselbegriffe
Abschlussprüfung; Honorarprämie; Prüfungshonorar; Prüfungspartner; Prüfungsqualität; Reputation

Keywords
Auditing; audit fees; audit partners; audit quality; fee premiums; reputation

Zusammenfassung
Anhand von Prüfungshonorardaten des belgischen Abschlussprüfungsmarktes wird analysiert, ob eine Differenzierung der Prüfungsqualität auf der Ebene der individuell beauftragten Prüfungspartner existiert. Die empirischen Ergebnisse zeigen, dass der Markt für Abschlussprüfungen eine Differenzierung der Prüfungsqualität innerhalb Prüfungsgesellschaften anerkennt, indem individuellen Prüfungspartnern, die weiblich und weniger erfahren sind, zur Französisch sprechenden Bevölkerung gehören, weniger Kunden oder einen größeren Marktanteil haben, durch eine Honorarprämie honoriert werden.

Abstract
We investigate if audit quality differentiation exists at the level of the individual audit engagement partner by studying audit fee data from the Belgian audit market. The empirical results show that the audit market recognizes audit quality differentiation within audit firms by rewarding individual audit partners with fee premiums when they are female, are less experienced, have indicated a French-speaking affiliation, have less clients or have a larger market share.

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1. Introduction

In this paper, we investigate if audit quality differentiation exists at the level of the individual audit engagement partner by studying audit fee data from the Belgian audit market.

Auditing researchers have traditionally assumed that the terms «audit quality» and «auditor quality» are synonymous (Clarkson/Simunic, 1994, p. 208). That is, quality differentiation is assumed to exist across but not within audit firms. Yet, it is unlikely that the supplied level of audit quality is uniform across auditors (even within the same firm): «Given the broad nature of GAAS [...] there is no single correct audit approach to the planning, gathering and interpretation of audit evidence that culminates in the audit report» (DeFond/Francis, 2005, p. 10). Especially Francis and co-authors have therefore argued that it may be more insightful to isolate intra-firm differences in audit quality (e.g., Ferguson/ Francis/Stokes, 2003; Francis/Reichelt/Wang, 2005; Reynolds/Francis, 2000; see also Humphrey, 2008; Watkins/Hillison/Morecroft, 2004). The reason for this view is that individual audit engagements are administered by an office-based engagement partner (Francis, 2004). It is increasingly acknowledged that the audit production process is affected by individual auditor factors (e.g., unique expertise of local clients), which cannot be fully captured and distributed across other partners within an audit firm (or office). Consequently, audit quality differentiation could exist at the level of individual audit engagement partners. Because audits are administered by individual engagement partners—and because audits cannot be completely commoditized, routinized, and proceduralized—within audit firm partner effects are likely to occur (Carpenter/Dirsmith/Gupta, 1994; FRC, 2008; ICAEW, 2002; Zerni, 2012). From the social psychology literature, we also know that demographic, physiological, and cognitive characteristics can affect an individual's performance (and hence audit quality). Unfortunately, as recently noted by Francis (2011, p. 134), «the fact remains that we know very little about the people who conduct audits.» Auditing researchers are, therefore, increasingly studying partner signing information on the audit report to evaluate the effects of audit engagement partner characteristics on audit quality (e.g., Bedard/Johnstone, 2010; Chen/Sun/Wu, 2010; Chi/Douthett/Lisic, 2011; Chi/Chin, 2011; Zerni, 2012). These recent studies clearly illustrate the importance of knowing more about the people who conduct audits (i.e., individual auditor characteristics) and the effect it may have on audit quality (cf. Francis, 2011).

If audit engagement partners should not be treated as a homogenous group but as individuals who are capable of producing audits of differing quality, the audit service market should reward individual audit partners with fee premiums or discounts based on an assessment of the quality of their audits (Taylor, 2011). After all, audit fees reflect the market’s ex-ante assessment and valuation of the auditor’s reputation for producing audits of a certain quality. Although empirical (survey-based) studies indeed show that perceptions of overall audit quality are influenced by the identity of the audit partner (e.g., Beattie/Fearnley, 1995; Carcello/Hermanson/McGrath, 1992; Schroeder/Solomon/Vickery, 1986), there is scant evidence on the ability of individual auditors to charge a premium price to their clients. The reason for the dearth of (archival-based) research on this topic is of course the absence of relevant data: Only in a limited number of countries does the audit report disclose the identity of the audit engagement partner and in most countries data on audit fees are not readily available.

The work that is closest to the current study is the recent paper by Taylor (2011) which showed that individual audit partners earn widely differing fee premiums (even within the same audit firm). In this paper, we extend the study of Taylor (2011) in a number of ways. First, instead of merely documenting that individual audit partners earn fee premiums (or discounts), we link a number of specific individual auditor characteristics to the level of the audit fee. More specifically, we document that audit fees are higher when the audit engagement partner is less experienced, is a woman, has less clients, or has a larger market share. Second, we contribute to the external validity of the results of Taylor (2011) by replicating the observation that individual audit partners earn individual audit fee premiums in a completely different institutional setting. More precisely, where Taylor (2011) studied Australian listed companies, this study examines the entire Belgian audit market (which, like most European markets, consists almost entirely of private companies). Compared with the large literature on audit pricing in publicly listed companies, there is far less re-
search on private companies. Findings from research on publicly listed companies might, however, not generalize to private companies because important differences exist between publicly listed and private companies (see, e.g., Beatty/Ke/Petroni, 2002; Chaney/Jeter/Shivakumar, 2004; Ball/Shivakumar, 2005). The study of (audit pricing in) private companies is, however, important because private companies constitute the majority of the EU economy and the EU market for audit services. Additionally, it is often assumed that price competition prevails in the small client segment of the audit market because of its low concentration (see, e.g., Simunic, 1980). In such an environment, clients might be mainly concerned with getting the lowest audit fee possible (and are willing to accept a lower-quality service to save money).

The remainder of this paper is organized as follows: In the next section, we provide background information and the underlying theory. In the third section, we describe our research method and data collection. The fourth section reports our overall results, followed with extensive supplementary analyses in the fifth section. Finally, we conclude with a general discussion of our results, the limitations of our research, and possibilities for future research.

2. Theoretical development

2.1. Audit quality and audit fees

Audit quality is difficult to observe directly. Even in the end (i.e., after the audit), the achieved level of assurance that the financial statements are not materially misstated is unobservable (Barton, 2005; Francis, 2004).

Economists have argued that when it is difficult to measure quality of services in quality differentiated markets, market participants have incentives to devise arrangements (e.g., surrogates for quality) that minimize measurement costs for buyers (e.g., Akerlof, 1970; Barzel, 1982). The reputation of the supplier, for example, provides a mechanism that signals superior quality (Klein/Leffier, 1981; Riley, 2001; Shapiro, 1983). It has, therefore, been argued by Dopuch and Simunic (1982) that large audit firms’ investment in brand names represents an effort to credibly position themselves as producers of quality-differentiated (i.e., higher quality) audits. The empirical accounting literature supports this assertion. For example, managers name reputation as a key factor in the choice of an auditor (GAO, 2003; Moizer, 1997; Oxera, 2006). Moreover, there is also abundant evidence that the market differentiates (and prices) between Big 4 and non-Big 4 audit firms (e.g., Francis/Krishan, 1999; Lennox, 1999; Niemi, 2002; Palmrose, 1988; Teoh/Wong, 1993; Shockley/Holt, 1983; Weber/Willenborg, 2003; but see Lawrence et al., 2011).

The auditor’s brand name, or reputation, is an observable characteristic that serves as a surrogate for audit quality. As noted by Stigler (1961, p. 79) “reputation” is a word which denotes the persistence of quality, and reputation commands a price (or exacts a penalty) because it economizes on search. The accounting literature indeed shows that client’s willingness to pay for an audit is affected by the reputation of the supplier (Chaney/Philipich, 2002). That is, auditors of high reputation can charge a premium price to their clients (e.g., Beatty, 1989; Krishnan/Schauer, 2000). Hence, higher audit fees indicate higher audit quality (Francis, 2004; Niemi, 2004; Reichelt/Wang, 2010; Schneider 2010). These observations are of course well in line with the longstanding argument in the marketing literature that consumers infer quality from price (Monroe, 1973), especially when other quality signals are absent or noisy (Jones/Hudson, 1996).

2.2. Individual auditor pricing

In considering the effect of (producer-specific) reputation on the level of the audit fee, the accounting literature has traditionally investigated the effect of brand name reputations. According to this perspective, the Big 4 firms have credibly positioned themselves as producers of quality-differentiated audits by developing brand name reputations (Craswell/Francis/Taylor, 1995; Dopuch/Simunic, 1982; Francis/Wilson, 1988; Simunic/ Stein, 1987). Because audits are administered by individual engagement partners, also individual auditors should however be able to develop producer-specific reputations (Taylor, 2011). Empirical studies indeed show that the market perceives audit quality differentiation between individual auditors, based upon characteristics such as the technical competence of the audit partner(s) and the ethical standards of audit partner(s) (e.g., Beattie/Fearnley, 1995; Zerni, 2008).
If audit partners have different reputations for audit quality, then market forces should ensure that those auditors with reputations for higher levels of audit quality will be able to earn higher fees than auditors who have a reputation for lower levels of audit quality. Due to the unavailability of data on both audit engagement partners identity and audit fees, there is, however, scant evidence on the ability of individual auditors to charge a premium price to their clients due to greater producer-specific reputation. To the best of our knowledge, so far only three published studies and three working papers have considered this relationship. Based upon data from 822 Australian publicly listed companies, Taylor (2011) very recently showed that individual audit partners earn widely differing fee premiums (even within the same firm). Based on 1,044 observations of Swedish listed companies, Zerni (2008) found audit fees to be positively related to the size of the audit engagement partner’s clientele, negatively related to the audit engagement partner’s experience, and unclearly related to engagement partner-level industry specialization. In a related study, Zerni (2012) examined the client portfolios of the Big 4 audit partners in Sweden and found audit fees to be higher when the audit engagement partner is an industry specialist. Both Ittonen et al. (2010) and Koch (2011) report results that are consistent with this latter finding, based on 893 observations of Swedish and Finnish listed companies, and 1,279 observations of German listed companies, respectively. Finally, based on 715 observations, Ittonen and Peni (2012) found that companies (in the Nordic countries) with female audit engagement partners paid significantly higher audit fees than companies with male audit engagement partners.

A drawback of all the above mentioned studies is that they all were based on (relatively small) samples from the public audit market segment. To date, it remains uncertain to which extent the results of these studies can be generalized to settings in which the majority of firms are privately held (as is the case in most EU markets).

2.3. Private firms and institutional setting

Although audit quality is mainly considered to be important for public companies, auditing can also be functional in private companies (i.e., high-quality auditing could signal financial reporting quality). The evidence on the effects of financial reporting quality and auditing in private companies is nevertheless scant and often contradictory (e.g., Hope/Langli, 2010; Knechel/Vanstraelen, 2007; Vander Bauwhede/Willekens, 2004; Van Tendeloo/Vanstraelen, 2008; Willekens/Achmadi, 2003). Rather than being willing to pay more for a higher-quality service, clients in the private audit market segment might be willing to accept a lower-quality service to save money. Simultaneously, auditors might be willing to deliver a lower-quality service (to gain clients and enhance profits) in settings that, like the Belgian audit market, are characterized by a combination of low reputation risk (i.e., private companies) and low litigation risk.

In Belgium, both supply-side and demand-side of the audit market are heavily regulated. The statutory audit of companies in Belgium is primarily regulated by Company Law. Additionally, the Institute of Registered Auditors (IBR-IRE) plays a central role in quality control, the enforcement of regulations, and in disciplinary sanctioning. According to Belgian Company Law, companies are required to have their financial statements audited by a registered auditor, if these companies are «large», that is, exceed at least two of the following criteria: (1) turnover (excluding VAT) >7,300,000 euro, (2) total assets >3,650,000 euro, and (3) number of employees (yearly average) >50. These criteria need to be considered on a consolidated basis if the company belongs to a group that publishes consolidated statements or if the company is a holding or a listed company. If the total number of employees exceeds 100, the company is always considered to be large and must appoint an auditor even if the other criteria are not met. Companies that are not considered large are not obliged but have the option to appoint an auditor. Listed companies, whatever their size, are obliged to appoint an auditor. Because the thresholds of these criteria are not that large, many relatively small companies are legally required to appoint a statutory auditor. Consequently, in contrast to Anglo-Saxon markets, demand for audit services is not voluntary for many privately held companies in Belgium—prin-

1 Compared to publicly listed companies in the U.S. these companies would still be deemed to be small to moderate.
Private companies constitute more than 99 percent of Belgian companies subject to audit (Willekens/Gaeremynck, 2005).

Belgian data have three general advantages compared to data from the U.S., the U.K., and many other countries. First, the audit report in Belgium must be signed by the audit engagement partner, even if an audit firm is appointed. This is, of course, a necessary prerequisite to investigate audit quality differentiation at the individual level. Second, the auditor’s report and the financial statements (which have to be deposited at the National Bank of Belgium) as well as data on registered auditors are publically available. Third, as from 2007 onwards Belgian companies are required by law to disclose audit fees in the notes to their financial statements.

3. Sample and research design

3.1. Sample

We used a sample of 13,828 Belgian companies for our empirical analysis. Our sample was developed starting with the entire population of Belgian companies from 2008 that were subject to control by an external auditor (either mandatory or voluntary). There were 17,066 companies in 2008 for which a statutory audit was required or who voluntarily appointed an external auditor. We dropped companies that appointed more than one auditor (joint-audits), financial institutions, public administrative institutions, and companies with missing data for either the identity of the audit engagement partner or audit fees. This process yielded a total sample of 13,828 firms. Data were provided to us by «Graydon Belgium», a provider of credit information, or collected with the cooperation of the Belgian National Bank, which maintains publicly available archives of financial reports. Additional information about the individual auditors was retrieved from the public register of auditors.

3.2. Regression model

Following the seminal paper of Simunic (1980), a common methodology has been developed for examining the determinants of audit fees that has been used in well over 100 published journal arti-

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<table>
<thead>
<tr>
<th>Description</th>
<th>Sample Size for Audit Fees Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audited Companies in 2008</td>
<td>17,066</td>
</tr>
<tr>
<td>Less Observations with More Than One Auditor (Joint-Audits)</td>
<td>(457)</td>
</tr>
<tr>
<td>Less Financial Institutions</td>
<td>(707)</td>
</tr>
<tr>
<td>Less Public Administrative Institutions</td>
<td>(8)</td>
</tr>
<tr>
<td>Less Observations with Missing Data on the Identity of the Audit Engagement Partner</td>
<td>(7)</td>
</tr>
<tr>
<td>Less Observations with Missing Data for Audit Fee</td>
<td>(2,059)</td>
</tr>
<tr>
<td>Companies Available for Final Sample</td>
<td>13,828</td>
</tr>
</tbody>
</table>

a Financial institutions are excluded because of their specific accounting requirements, which differ substantially from those of industrial and commercial companies.

b Public administrative institutions are excluded because of their specific nature.

c Including four cases for which a highly implausible audit fee was reported in the financial statements (ranging between 1 and 24 euros). These data are missing despite the fact that companies are required by law to disclose audit fees in the notes to their financial statements.

Table 1: Derivation of Sample
Individual auditor characteristics and audit quality differentiation

cles (Hay/Knechel/Wong, 2006). Typically, an estimation model is developed by regressing fees against a variety of measures surrogating for attributes that are hypothesized to relate to audit fees, either negatively or positively (Hay/Knechel/Wong, 2006).

Consistent with the existing body of literature on audit fees (for overviews, see Causholli/De Martinis/Hay/Knechel, 2010; Cobbin, 2002; Hay/Knechel/Wong, 2006), our regression model to estimate the relationship between the level of the audit fee and the identity of the audit engagement partner therefore includes client attributes (e.g., size), engagement attributes (e.g., the provision of NAS), and audit firm attributes (e.g., B4/NB4). Specifically, we estimate and discuss the following model:

$$LAF_i = \alpha_0 + \beta_1 LSALES + \beta_2 LTA + \beta_3 IRISK + \beta_4 LOSS + \beta_5 PROBF + \beta_6 LIST + \beta_7 NAS + \beta_8 BIG4 + \beta_9 SPECF + \beta_{10} SEX + \beta_{11} LANG + \beta_{12} LEXP + \beta_{13} LNUM + \beta_{14} LSFEE_i + \beta_{15} IndustryDummies + \varepsilon_i$$

With respect to the 9 control variables in our model, higher fees are expected (positive coefficients) for larger clients (LSALES and LTA), for clients with greater audit risk (IRISK and LOSS), and for listed companies (LIST). Given prior research, a positive association is also expected between non-audit fees (NAS) and audit fees (Whisenant/Sankaraguruswamy/Raghunandan, 2003). Because many studies document a Big 4 fee premium (e.g., Palmrose, 1986; see Francis, 2004), a positive coefficient is also expected for BIG4. Industry specialists are also expected to charge higher audit fees (e.g., DeFond/Ernst & Young, 2000; Dutillieux/Willekens, 2009; Ferguson/Ernst & Young, 2003). Audit firms were classified as auditor specialist (SPECF) when they were either »dominant« (i.e., the auditor is an industry leader in an audit market and its market share is at least 10 percent greater than the second largest auditor in this market) or when they possessed »sufficient industry market share« (i.e., the auditor has a market share greater than 30 percent in a two-digit NACE-BEL category). PROBF is the score of a standardized bankruptcy prediction model developed for Belgian companies. A negative coefficient is expected for the variable PROBF because a higher value indicates a healthier company (when companies experience financial problems, it is likely that additional audit effort is required). Finally, we add industry controls (NACE-BEL industry indicators) in order to account for systematic differences in the riskiness or complexity of the audit function across industries.

To test if individual auditor characteristics are related to audit fee premiums and discounts, we include 5 experimental variables in our model. First, we included the demographic variables SEX and LANG. SEX is a dummy variable that takes value 1 for companies that had a female audit engagement partner and 0 for companies that had a male audit engagement partner. LANG is a dummy variable that takes value 1 for companies audited by an auditor who has indicated a French-speaking affiliation and 0 for other companies. Second, we include LEXP which signifies the number of years the company’s auditor has been legally authorized to sign audit opinions (in its natural logarithm form). More experienced audit partners might earn fee premiums (because they have had more time to earn a reputation among corporate boards and senior executives) or fee discounts (because learning effects may result in auditor efficiency, reducing costs and thus lowering audit fees). Third, we include the total number of clients of the audit engagement partner (LNUM). Auditors could choose to differentiate themselves as »product specialists« and to audit only a small proportion of firms (charging fee premiums to recoup their investments) or they can pursue cost minimization strategies by auditing a large number of clients (producing lower cost, lower quality audits) (Cahan/Jeter/Naiker, 2011). Finally, audit fees could be higher when the audit engagement partner has a larger market share (LSFEE) which gives her or him more market power. As in previous research (e.g., Zerni, 2008), LSFEE is the size of the audit engagement partner’s total clientele based on audit fees (in its natural logarithm form).

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2 In this model (the »FITO-metric«), eight variables are first logit-transformed and then equally weighted. These variables are: (1) Gross added value / personnel employed, (2) Net return on total assets before taxes, (3) Net return on equity after taxes, (4) Self-financing level, (5) General level of financial independence, (6) Short term financial debt level, (7) Free cash flow, and (8) Cash + short-term investments – short-term financial debt / current assets. A higher score on the FITO-metric indicates a healthier company (Ooghe/Spaenjers, 2005).

3 Belgium is divided into two large regions, the Dutch-speaking region of Flanders in the north and the French-speaking southern region of Wallonia. Registered auditors have to indicate their linguistic affiliation.
4. Primary results

4.1 Descriptive statistics

As has been observed in previous research (e.g., Willekens/Gaeremynck, 2005), there exists a great degree of heterogeneity in the Belgian audit market with respect to the level of the audit fee, client size, the provision of non-audit services, and the number of clients of an individual auditor; this is clear from the large differences between the mean and the median value (Table 2), and from the large interquartile range (not tabulated).

In 2008, a Belgian audit engagement partner had on average sixteen and a half years' experience (i.e., had been legally authorized to sign audit opinions), audited 67 clients, and had an individual market share of 0.42 percent. The vast majority of audit engagement partners were male (91 percent) and had indicated a Dutch-speaking affiliation (72 percent).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEE</td>
<td>13,714</td>
<td>29,723</td>
<td>6,250</td>
</tr>
<tr>
<td>SALES</td>
<td>39,243</td>
<td>408,400</td>
<td>5,981</td>
</tr>
<tr>
<td>TA</td>
<td>89,898</td>
<td>914,800</td>
<td>7,129</td>
</tr>
<tr>
<td>IRISK</td>
<td>0.120</td>
<td>0.197</td>
<td>0.008</td>
</tr>
<tr>
<td>LOSS</td>
<td>0.29</td>
<td>0.45</td>
<td>0.00</td>
</tr>
<tr>
<td>PROBF</td>
<td>0.552</td>
<td>0.071</td>
<td>0.563</td>
</tr>
<tr>
<td>LIST</td>
<td>0.01</td>
<td>0.08</td>
<td>0.00</td>
</tr>
<tr>
<td>NAS</td>
<td>0.29</td>
<td>0.46</td>
<td>0.00</td>
</tr>
<tr>
<td>BIG4</td>
<td>0.50</td>
<td>0.50</td>
<td>1.00</td>
</tr>
<tr>
<td>SPECF</td>
<td>0.06</td>
<td>0.24</td>
<td>0.00</td>
</tr>
<tr>
<td>LANG</td>
<td>0.28</td>
<td>0.45</td>
<td>0.00</td>
</tr>
<tr>
<td>EXP</td>
<td>16.47</td>
<td>6.83</td>
<td>17.00</td>
</tr>
<tr>
<td>NUM</td>
<td>67.03</td>
<td>48.92</td>
<td>57.00</td>
</tr>
<tr>
<td>SFEES</td>
<td>0.42</td>
<td>0.39</td>
<td>0.29</td>
</tr>
</tbody>
</table>

\( FEE = \text{audit fee (in euros)}; \)
\( \text{SALES} = \text{total sales (in thousands euros)}; \)
\( \text{TA} = \text{total assets (in thousands euros)}; \)
\( \text{IRISK} = \text{combination of inventory and receivables divided by total assets} ; \)
\( LOSS = \text{dummy variable: LOSS} = 1, \) in case the company experienced losses;\)
\( PROBF = \text{score of a standardized bankruptcy prediction model developed for Belgian companies; } \)
\( LIST = \text{dummy variable: LIST} = 1, \) in case the company is publicly traded;\)
\( NAS = \text{dummy variable: NAS} = 1, \) in case NAS are provided;\)
\( BIG4 = \text{dummy variable: BIG4} = 1, \) in case of a Big 4 auditor;\)
\( SPECF = \text{dummy variable: SPEC} = 1, \) in case the audit firm is an industry specialist;\)
\( LANG = \text{dummy variable: LANG} = 1, \) in case the auditor has indicated a French-speaking affiliation;\)
\( EXP = \text{experience of the auditor measured in years;} \)
\( NUM = \text{total number of clients of the auditor;} \)
\( SFEES = \text{market share of the auditor (as percent of total audit fees).} \)

Table 2: Descriptive Statistics for Variables in Audit Fee Model
### Pearson Correlation Matrix (Audit Fee Variables)

<table>
<thead>
<tr>
<th></th>
<th>LAF</th>
<th>LSALES</th>
<th>LTA</th>
<th>IRISK</th>
<th>LOSS</th>
<th>PROBF</th>
<th>LIST</th>
<th>NAS</th>
<th>BIG4</th>
<th>SPECF</th>
<th>SEX</th>
<th>LANG</th>
<th>LEXP</th>
<th>LNUM</th>
<th>LSFEES</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAF</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSALES</td>
<td>.616</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.084</td>
<td></td>
</tr>
<tr>
<td>LTA</td>
<td>.567</td>
<td>.608</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.952</td>
<td></td>
</tr>
<tr>
<td>IRISK</td>
<td>.076</td>
<td>.187</td>
<td>.128</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.244</td>
<td></td>
</tr>
<tr>
<td>LOSS</td>
<td>–.059</td>
<td>–.134</td>
<td>–.131</td>
<td>–.013</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.527</td>
<td></td>
</tr>
<tr>
<td>PROBF</td>
<td>.090</td>
<td>.096</td>
<td>.182</td>
<td>–.025</td>
<td>–.595</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.531</td>
<td></td>
</tr>
<tr>
<td>LIST</td>
<td>.116</td>
<td>.036</td>
<td>.141</td>
<td>–.007</td>
<td>–.016</td>
<td>.016</td>
<td>.088</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.029</td>
<td></td>
</tr>
<tr>
<td>NAS</td>
<td>.396</td>
<td>.241</td>
<td>.257</td>
<td>.003</td>
<td>–.002</td>
<td>.016</td>
<td>.088</td>
<td>.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.157</td>
<td></td>
</tr>
<tr>
<td>BIG4</td>
<td>.307</td>
<td>.054</td>
<td>.092</td>
<td>–.105</td>
<td>.063</td>
<td>–.091</td>
<td>.023</td>
<td>.124</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.189</td>
<td></td>
</tr>
<tr>
<td>SPECF</td>
<td>.161</td>
<td>.097</td>
<td>.104</td>
<td>–.61</td>
<td>.010</td>
<td>.001</td>
<td>.040</td>
<td>.061</td>
<td>.246</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.148</td>
<td></td>
</tr>
<tr>
<td>SEX</td>
<td>.017</td>
<td>–.003</td>
<td>–.001</td>
<td>.006</td>
<td>–.006</td>
<td>.020</td>
<td>–.015</td>
<td>–.032</td>
<td>–.007</td>
<td>.009</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1.927</td>
<td></td>
</tr>
<tr>
<td>LANG</td>
<td>–.003</td>
<td>–.045</td>
<td>.018</td>
<td>–.042</td>
<td>–.024</td>
<td>–.044</td>
<td>.012</td>
<td>–.044</td>
<td>–.055</td>
<td>–.017</td>
<td>.055</td>
<td>1</td>
<td></td>
<td></td>
<td>1.073</td>
<td></td>
</tr>
<tr>
<td>LEXP</td>
<td>–.100</td>
<td>–.009</td>
<td>.000</td>
<td>.030</td>
<td>.023</td>
<td>.042</td>
<td>.008</td>
<td>–.052</td>
<td>.249</td>
<td>.061</td>
<td>–.130</td>
<td>–.019</td>
<td>.028</td>
<td>1</td>
<td>1.122</td>
<td></td>
</tr>
<tr>
<td>LNUM</td>
<td>.042</td>
<td>–.024</td>
<td>–.008</td>
<td>–.035</td>
<td>.061</td>
<td>–.059</td>
<td>.006</td>
<td>.053</td>
<td>.436</td>
<td>.070</td>
<td>–.098</td>
<td>.223</td>
<td>.061</td>
<td>1</td>
<td>3.917</td>
<td></td>
</tr>
</tbody>
</table>
4.2. Regression results

The Pearson Correlation Matrix for all variables is presented in Table 3. The highest pairwise correlations are .814 (LNUM and LSFEE), indicating that at the level of the individual audit engagement partner there is a strong correlation between the number of clients any single partner has and her or his market share (i.e., audit partners that have more clients in their client portfolio also have larger market shares). .741 (BIG4 and LSFEE), indicating that the market share of individual partners strongly correlates with whether the auditor is affiliated to a Big 4 firm or not (i.e., the market share of individual partners is higher when they are affiliated to a Big 4 firm than when they are affiliated to a non-Big 4 firm). There are also strong correlations between LAF, LSALES, and LTA, indicating that audit fees are strongly correlated with clients’ size (i.e., larger companies pay higher audit fees). Note also that the correlation of LAF with NAS and BIG4 is rather low (.396 and .307, respectively).

Although the variables LNUM and LSFEE were highly correlated ($r = .814$), the highest VIF score (6.7) did not exceed 10.0 so multicollinearity was not a serious problem in our regression model. One may also assume that there was no first-order autocorrelation, given that the Durbin-Watson statistic had a value of 1.931.

Table 4 present the results from our audit fee regression model where the dependent variable is the natural logarithm of the audit fees paid ($LAF$).

To save space, industry indicator variables are not reported. The coefficients for all variables except IRISK have the expected sign and are significant; the overall model is significant ($p = .000$) and has an adjusted $R^2$ of 0.68. In line with previous research, we find higher audit fees for larger clients (LSALES and LTA), for listed companies (LIST), for companies with higher non-audit fees (NAS), for companies that are audited by an auditor who is affiliated to a Big 4 firm, and for companies that are audited by an audit firm industry specialist (SPECF). Audit fees are lower for healthier companies (PROBF) and companies with smaller audit risk (LOSS).

The coefficients on all the individual auditor characteristic variables are significant. The coefficient on SEX is 0.066, indicating that female audit engagement partners median audit fees is higher by about 7 percent compared to their male counterparts. The coefficient on LANG is 0.062, indicat-
ing that median audit fees are higher by about 6 percent for audit engagement partners who have indicated a French-speaking vis-à-vis Dutch-speaking affiliation. The coefficients on $\text{LEXP}$ and $\text{LNUM}$ are both negative, indicating that audit fees are lower when the audit engagement partner is more experienced or audits a larger number of clients. The coefficient on $\text{LSFEE}$ is positive, indicating that audit engagement partners with a larger market share earn fee premiums.

### Table 4: Regression Analysis for the Impact of Individual Auditor Characteristics on Audit Fees (Dependent Variable = $\text{LAF}$)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Expected sign</th>
<th>$\beta$</th>
<th>t-statistic</th>
<th>$p$</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTANT</td>
<td></td>
<td>6.415</td>
<td>50.690</td>
<td>.000</td>
<td>[6.167; 6.663]</td>
</tr>
<tr>
<td>$\text{LSALES}$</td>
<td>+</td>
<td>.184</td>
<td>44.883</td>
<td>.000</td>
<td>[.176;.192]</td>
</tr>
<tr>
<td>$\text{LTA}$</td>
<td>+</td>
<td>.160</td>
<td>35.147</td>
<td>.000</td>
<td>[.151;.169]</td>
</tr>
<tr>
<td>$\text{IRISK}$</td>
<td>+</td>
<td>-.160</td>
<td>-4.712</td>
<td>.000</td>
<td>[-.227;-.94]</td>
</tr>
<tr>
<td>LOSS</td>
<td>+</td>
<td>.046</td>
<td>2.798</td>
<td>.005</td>
<td>[.014;.078]</td>
</tr>
<tr>
<td>$\text{PROBF}$</td>
<td>–</td>
<td>-1.225</td>
<td>-15.359</td>
<td>.000</td>
<td>[-1.462;-.988]</td>
</tr>
<tr>
<td>LIST</td>
<td>+</td>
<td>.823</td>
<td>10.604</td>
<td>.000</td>
<td>[.671;976]</td>
</tr>
<tr>
<td>NAS</td>
<td>+</td>
<td>.038</td>
<td>24.818</td>
<td>.000</td>
<td>[.035;041]</td>
</tr>
<tr>
<td>BIG4</td>
<td>+</td>
<td>.196</td>
<td>9.298</td>
<td>.000</td>
<td>[.155;237]</td>
</tr>
<tr>
<td>SPECF</td>
<td>+</td>
<td>.049</td>
<td>2.259</td>
<td>.024</td>
<td>[.012;086]</td>
</tr>
<tr>
<td>SEX</td>
<td>?</td>
<td>.066</td>
<td>3.257</td>
<td>.001</td>
<td>[.033;099]</td>
</tr>
<tr>
<td>LANG</td>
<td>?</td>
<td>.062</td>
<td>4.569</td>
<td>.000</td>
<td>[.035;088]</td>
</tr>
<tr>
<td>$\text{LEXP}$</td>
<td>?</td>
<td>-.038</td>
<td>-3.462</td>
<td>.000</td>
<td>[-.060;-.015]</td>
</tr>
<tr>
<td>$\text{LNUM}$</td>
<td>?</td>
<td>-.446</td>
<td>-32.821</td>
<td>.000</td>
<td>[-.473;-.419]</td>
</tr>
<tr>
<td>$\text{LSFEE}$</td>
<td>?</td>
<td>.406</td>
<td>33.349</td>
<td>.000</td>
<td>[.382;430]</td>
</tr>
</tbody>
</table>

F-statistic ($p$ value) $593.185$ (.000)

Adjusted $R^2$ $R^2 = .68$

All $p$-values are two-tailed. Industry indicator variables are included in all models but not tabulated. $\text{LAF}$ = natural logarithm of audit fee; $\text{LSALES}$ = natural logarithm of total sales; $\text{LTA}$ = natural logarithm of total assets; $\text{IRISK}$ = combination of inventory and receivables divided by total assets; LOSS = dummy variable: LOSS = 1, in case the company experienced losses; $\text{PROBF}$ = score of a standardized bankruptcy prediction model developed for Belgian companies; LIST = dummy variable: LIST = 1, in case the company is publicly traded; NAS = natural logarithm of non-audit fees; BIG4 = dummy variable: BIG4 = 1, in case of a Big 4 auditor; SPECF = dummy variable: SPEC = 1, in case the auditor is an industry specialist; SEX = dummy variable: SEX = 1, in case of a female auditor; LANG = dummy variable: LANG = 1, in case the auditor has indicated a French-speaking affiliation; $\text{LEXP}$ = natural logarithm of the years of experience of the auditor; $\text{LNUM}$ = natural logarithm of the total number of clients of the auditor; $\text{LSFEE}$ = natural logarithm of market share of the auditor (as percent of total audit fees).
5. Sensitivity analyses

To test if our results are robust, we conducted several sensitivity analyses. First, we tested if the allocation of individual auditors across offices influences the results of our audit fee regressions. There is evidence from recent studies that audit quality may differ across offices within an audit firm (e.g., Chen/Sun/Wu, 2010; Choi/ Jeong-Bon /Zang, 2010; Francis/Yu, 2009; Reichelt/Wang, 2010). It is apparent from the study of Choi et al. (2010) that audit fees are positively related to the size of the local engagement office. To rule out that our results are driven by non-random distribution of (certain classes of) auditors across (large) offices, we added OFSIZE to the regression model. Following Choi et al. (2010), office size (OFSIZE) was measured in two different ways: (1) as the number of audit clients within each local office or (2) as the sum of audit fees earned by each local office. In this subsample (n = 9,383)4, office size indeed appears to be an additional, engagement-specific factor that affects (perceived) audit quality, although only when measured in terms of earned audit fees \((p = .000)\). However, even after controlling for office size, the coefficients on all individual auditor characteristic variables remain significant (and qualitatively unaltered).

Second, to control for (perceived) within-group audit quality differences, auditor firm specialization (SPECF) was included in the regression model. It is, however, still unclear to which extent the deep expertise of office-based professionals can be captured and distributed within the firm through knowledge sharing practices (see Francis/Reichelt/Wang, 2005; Reichelt/Wang, 2010). An industry premium may be due to specialization at the level of the audit firm, the city-specific office, the specific engagement partner, or combinations thereof. As a second sensitivity analysis, we therefore reran our model with different controls for auditor specialization. Specifically, analogous to the audit firm specialist variable (SPECF) we determined whether an individual auditor is an industry specialist at the office level and the partner level based upon the auditor’s annual market share of audit fees within a specific industry (Ferguson/Francis/Stokes, 2003; Hogan/Jeter, 1999; Reichelt/Wang, 2010). As an alternative to the market share approach, we also considered the portfolio share approach under which auditors are considered to be industry specialists in those industries in which they generate the most revenue (Krishnan, 2003; Neal/Riley, 2004). Models were estimated that included separate main effect terms for each of the variables as well as additional cross-product interaction terms. We found evidence for the complementary effects of the market share and portfolio share approaches (Neal/Riley, 2004) as well as for the supposition that the industry premium is the joint effect of auditor specialization at different levels (Reichelt/Wang, 2010). Importantly, however, the coefficients on all other variables remained qualitatively unaltered by these different specifications.

Third, a further sensitivity analysis was conducted to address the concern in the audit literature about nonlinearities and misspecification of company size. Audit fee model parameters are sensitive to client size (e.g., Craswell/Francis/Taylor, 1995; Francis/Reichelt/Wang, 2005) and the core audit fee model has better predictive power for larger companies (see Bell/Knechel/Willingham 1994). To investigate this issue with respect to Belgian data, we divided (based on the median value of total assets) our sample into small and large companies, and re-estimated our regression model separately for the upper and lower halves of the full sample of 13,828 observations. We also estimated regression models in which either the square root or the square of the size variables (SALES and TA) was used instead of their natural logarithms. These alternative specifications do not affect the inferences. There is thus no reason to believe that model misspecification or nonlinearities with respect to company size explain our results.

Finally, we identified and eliminated possible outliers from our regression model. To eliminate extreme outliers, the audit fee measure was truncated at the 0.5th and 99.5th percentile. We also eliminated outliers with a Cook’s D greater than \(4/(n-k-1)\) (where \(n\) is sample size and \(k\) the number of independents) (Fox, 1991). In both cases, our regression model slightly gained explained variance.

4 The reduced sample size is due to the exclusion of sole practitioners and local single-office audit firms.
5 None of the cases in the sample has leverage above 0.2. Given that normality was not violated and heteroscedasticity was not a problem in estimating the baseline models, we adhered to the admonition of Draper and Smith [1998] that the automatic rejection of outliers is not always a wise procedure.
but neither of these manipulations altered the results (not tabulated).

In conclusion, the additional sensitivity tests provide the same conclusion as the tabulated results: There is evidence that audit fee premiums and discounts are associated with individual characteristics of the audit engagement partner.

6. Summary and discussion

Reputation is an auditors’ principal asset. Producer-specific reputation permits auditors to charge a premium price to their clients, which they are willing to pay for. Empirical (survey-based) studies have long indicated that the market perceives audit quality differentiation between individual auditors. Recent archival studies seem to confirm that this perceived differentiation is also being priced by the market; that is, some (classes of) individual auditors are able to charge a premium price to their clients due to greater producer-specific reputation. Inferences about the audit quality produced by a certain auditor are affected by the identity of the auditor.

In this study, we have examined the relationship between the level of the audit fee and various individual characteristics of the auditor. Based upon a sample of 13,828 Belgian companies, we found that audit engagement partners earn individual audit fee premiums (or discounts) based upon their sex, their linguistic affiliation, their experience, the size of their client portfolio, and their market share. Further tests indicate that these results cannot be explained by office-level characteristics (i.e., office size and office-level specialization) of the offices where the partners are based. Taken together, these results indicate that the audit market recognizes audit quality differentiation within audit firms (i.e., at the level of the individual audit engagement partner). Hence, the results of this paper contribute to our understanding about the effect of individual auditor attributes on audit quality—as recently noted by Francis (2011, p. 134), this is an important area of research about we still know surprisingly little.

It would be beyond the scope of the current study to provide detailed explanations about why certain individual auditor characteristics are associated with audit fee premiums whereas others are associated with audit fee discounts. Nevertheless, we wish to elaborate on some of our findings that seem to be counterintuitive and puzzling. First, the finding that the audit service market rewards more experienced audit partners with fee discounts seems puzzling at first sight. This finding is, however, consistent with the findings of Zerni (2008) and with the view that long audit experience results in higher audit efficiency and, therefore, cost savings due to economies of scale arising from servicing many clients in the past. Second, the finding that auditors earned a fee premium when they had indicated a French-speaking affiliation is contrary to the findings of Willekens and Gaeremynck (2005). One possibility is that this measure is in fact picking up economic conditions rather than individual auditor characteristics. Companies in the Walloons are riskier (e.g., have a higher likelihood of bankruptcy; see, e.g., Graydon Belgium, 2008) so the higher audit fees may simply reflect an audit fee premium for higher risk (auditors who have indicated a French-speaking affiliation are more likely to audit companies in the Walloons).

Perhaps the most interesting and challenging finding of this paper, is the observation that the audit service market rewards female auditors with fee premiums. This result is unexpected given that women are still worse off in the audit profession than men (see, e.g., Dambrin/Lambert, 2012). This result also seems to contradict the assumption that clients prefer male professionals—an assumption that is used as a discursive means to legitimize discrimination against women in audit firms (see, e.g., Anderson-Gough/Grey/Robson, 2005). Clearly, future research will need to provide an explanation for the observation of a female audit fee premium—made in this study as well as by Ittonen and Peni (2012). Given that audit fees are the joint product of audit effort (hours) and expertise, there basically seem to be two possible sets of explanations for such a fee premium (for a discussion of potential underlying causes of these explanations, see Ittonen/Peni, 2012). First, the audit fee premium could result from female audit engagement partners putting more effort into their engagements (because, for example, women are more risk-averse than men) and thus increasing audit fees. Second, the audit fee premium might be the result of greater expertise. Female audit partners are still a rarity, so those women who reach the highest ranks of the audit profession might, on average, be better qualified and of higher ability than their male colleagues. Additionally, there might be socio-politi-
cal pressures and benefits that encourage the appointment of female audit engagement partners, irrespective of audit fees. By appointing a female auditor companies could for example try to signal that they are socially responsible (much in the same way as companies can nominate women to executive positions in order to signal that the firm pays attention to women and minorities). Conversely, the existence of a female fee premium could question the role of clients, their demand and choices, in terms of individual characteristics of the audit engagement partner. Disentangling these different potential causes should be an interesting avenue for future research.

Although our results are robust to various econometric and sample selection issues, caution is needed in interpreting these findings because our theoretical explanations are largely speculative. Clearly, these exploratory findings raise many questions, which are left to be answered by future research. Future research could also address some of the specific limitations to which this study was subject. First, due to data limitations, we could only test if a number of specific individual auditor characteristics are related to audit fee premiums or discounts. It is, however, conceivable that many other individual factors (e.g., age, race, religion) are related to audit fee premiums or discounts. Furthermore, the measurement of some of the individual auditor characteristics that were tested in this study could be improved. For example, we tested the effect of experience in terms of general audit experience (as measured by the time that an auditor had been legally authorized to sign audit opinions) and industry experience (as measured by auditor specialization measures), but auditors do also possess client-specific experience. We were, however, not able to measure such client specific experience (as, for example, measured by auditor tenure) due to data limitations. Second, with respect to the generalizability of the results, the companies in the sample are not publicly listed and are generally smaller than those used in most prior (U.S.) research. Because important differences exist between publicly listed and private companies, our findings might not generalize to publicly listed companies. Third, although our results are robust across various models, variable specifications, and analysis techniques, we cannot completely rule out that our results are driven by potential underlying endogeneity (e.g., between audit fees and NAS) or omitted variables. For example, individual auditors’ interpersonal skills (e.g., negotiation skills) probably influence the level of audit fees (hence, the fee premium). Such information is, however, not available from public data sources. It would clearly be a very interesting avenue for future research to try to measure such skills in order to tease out the precise determinants of audit fee premiums and discounts (possibly by combining archival data with experimental and/or survey data).

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Valuation of takeover targets and auditor quality

This study investigates whether the market’s perception of auditor quality makes a difference to the market value of a firm using a sample of 1915 takeover offers in the USA over the period 1990 to 2005. The study finds, as hypothesised, that the takeover process makes a smaller correction to the market price of the target when it has a Big 4 auditor suggesting that less private information becomes available. We find no empirical evidence for the auditor switch effect, which is an alternative explanation for the lower CARs for Big 4 targets.

Audit quality; takeovers; valuation

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1. Introduction

This paper examines whether differential levels of market-assessed auditor\(^1\) quality have an impact on takeover bids. The aim of our investigation of takeover announcements is to provide evidence on the economic impact of the market’s perception of auditor quality. If the market perceives that a Big 4 audit lends higher credibility to the financial reporting than a non-Big 4 audit, the firms audited by the Big 4 should carry a lower cost of equity capital. Given that the information risk prior to takeover negotiations is lower for more transparent Big 4 audited target firms, the takeover process makes a smaller correction to the market price of the target with a Big 4 auditor because less private information becomes available. An alternative explanation for lower cumulative abnormal returns (CARs) is that anticipated target’s auditor switches from non-Big 4 to Big 4 auditors are perceived as good news by the market and vice versa\(^2\).

Our study is motivated by a gap in the literature on the economic value of auditor reputation. The economic value of auditor reputation has been assessed in the situation when a firm decides to offer its shares to the public in initial public offerings (IPOs) (e.g. Titman/Trueman, 1986; Simunic/Stein, 1987; Balvers et al., 1988; Beatty, 1989; Datar et al., 1991; Menon/Williams, 1991; Firth/Smith, 1992; Clarkson/Simunic, 1994) or in seasoned equity offerings (SEO)\(^3\) (Slovin et al., 1990; Zhou/Elder, 2004; Kim/Park, 2006), business takeovers provide a good setting in which to observe the systematic differences in firm values subsequent to IPO since takeovers facilitate a more powerful test of the economic value of auditor reputation than auditor switches or earnings numbers in annual reports. Auditor switches and earnings are financial quarter- or year-end information and therefore disclosed simultaneously with other annual performance and corporate governance information. However, the effect of auditor reputation on firm valuation in the takeover context has received surprisingly little research attention, whereas, for example, motives for takeovers have been a focus of prior research for many years (e.g. Jensen, 1986; Roll, 1986; Bradley et al., 1988; Dong et al., 2006; Hope/Wayne, 2008).

The main contribution of our study is two-fold. First, we are not aware of any previous studies that have examined the link between auditor quality and the valuation of takeover targets. Therefore, through its focus on the target auditor, our study contributes to the literature on the economic value of auditor reputation by providing empirical evidence that lower cumulative abnormal returns (CARs) are associated with takeover announcements of Big 4 audited target firms. This is an important finding, as it shows that the effect of auditor reputation on client firm value is not limited to the event when a privately held firm goes public. Instead, consistent with studies on SEOs (Slovin et al., 1990; Zhou/Elder, 2004; Kim/Park, 2006; Rauterkus/Song, 2005), the same reputation effect is sustained after the IPO event.

The second contribution of the study is our empirical examination, which suggests that the expected auditor switches do not have an effect on
CARs. In the majority of takeovers the target’s auditor is replaced by the acquirer’s auditor (Anderson et al., 1993; Firth, 1999). Therefore, market participants may anticipate auditor switch in the target firm at the time of the takeover announcement. Consequently, changes from non-Big 4 to Big 4 (Big 4 to non-Big 4) can be perceived as quality upgrades (downgrades). Our analysis of these expected auditor switches extends the literature on the market reactions to auditor switches. Consistent with some studies examining market reactions to auditor quality upgrades and downgrades (e.g. Nichols/Smith, 1983; Johnson/Lys, 1990), our findings suggest that the market does not react at the time of the takeover announcement to the expected future upgrades or downgrades of auditor quality.

The remainder of this paper is organized as follows. Section 2 reviews relevant prior literature and develops the hypotheses. The data used in the empirical tests, followed by the research design are explained in Section 3. Section 4 describes the empirical results, and Section 5 concludes the study.

2. Development of Hypotheses

The credibility that an audit lends to financial statements is the key element in the link between the quality of audit services and firm valuation. As audit quality is unobservable to outsiders, are all suppliers of audit quality regarded as the same (cf. Akerlof, 1970) or is it possible for some audit firms to increase their market-assessed credibility above that attached to the profession in general? When buyers cannot observe quality prior to a purchase, the reputation of the supplier provides a mechanism that signals superior quality (e.g. Shapiro, 1983; Riley, 2001).

Prior theoretical work provides two related explanations for how audit firms can acquire an above average reputation (i.e. higher level of market-assessed credibility). Both of these explanations suggest that the reputation is audit firm-specific (i.e. the same level of credibility is delivered to all clients of the firm). DeAngelo’s (1981) well-known work proposes that the auditor’s investments in client relationships (start-up costs) enable the incumbent auditor to earn client-specific quasi-rents, and that these quasi-rents represent the collateral that is lost if promises are not kept (i.e. audit failure). Thus, auditors with a larger number of clients possess greater total collateral and consequently have more to lose in audit failure. DeAngelo argues that even if professional competence is the same across the profession, variation in market-assessed quality levels will arise from the probability that the auditor will report the errors found. In other words, variation in market-assessed quality levels arises from differential levels of independence in appearance, which is mechanically related to the number of quasi-rents (clients) of the auditor (i.e. bigger is inevitably better).

Another line of argument is that in order to achieve a reputation for above average services, the supplier must first invest more than others in the quality of services. The market will eventually learn about the higher level of quality and will be willing to pay for it (Klein/Leffler, 1981; Shapiro, 1983). Because a reputation is easily destroyed, and rebuilding it is costly, reputation capital (brand name) serves as collateral that promises will be kept. Consistent with this assertion, Titman/Trueeman (1986) define auditor quality as the accuracy of the information provided, which allows investors to make a more precise estimate of the client firm’s value. A firm with more favorable information will be willing to pay a higher fee for a more accurate auditor. A firm with less favorable information has no incentive to pay a higher fee for a more accurate auditor, as the auditor’s information is likely to be unfavorable. As a result, the choice of auditor per se serves as a mechanism signaling private information about the firm’s future prospects to the market.

In line with Titman/Trueeman (1986), Big 4 firms are associated with more accurate reports and more informative signals of financial distress (Petroni/Beasley, 1996; Lennox, 1999), lower litigation activity (Palmrose, 1988), and their clients’ financial statements are associated with higher compliance with GAAP disclosure requirements (e.g. Krishnan/Schauer, 2000). The financial statements of Big 4 clients are also associated with lower abnormal accruals, which can be interpreted as an indication of higher earnings quality (Becker et al., 1998; Francis et al., 1999). Also indicative of higher earnings
quality of Big 4 clients, Teoh/Wong (1993) found that the stock market reaction to earnings surprises from Big 4 clients was greater than that of other firms. Taken together, these studies are well in line with the view that a higher auditor reputation reduces the uncertainty of future cash flows among investors and therefore reduces the cost of equity capital, and this is reflected in a higher value of the firm.5

However, Francis/Ke (2006) clearly show the significance of auditor independence in appearance. Utilizing change in the disclosure requirements of fees paid to the incumbent auditor, Francis/Ke (2006) found that the market valuation of earnings surprises was lower for firms with high levels than for those with low levels of non-audit fees, but there was no reduction in the preceding year when no disclosures were required. Therefore, their findings suggest that disclosing high levels of non-audit fees provided new information to the market related to auditor independence and earnings quality. This finding is important, as it shows that market perceived audit quality is not entirely audit firm specific. This is well in line with studies on industry specialization in auditing, which suggest that auditor reputation may vary to some extent across industries (e.g. Craswell et al., 1995).

Also, there might be specific situations when non-Big 4 firms have competitive edge over Big 4 firms. Louis (2005) who focuses on the link between acquirers’ abnormal returns and auditor quality in connection with merger transactions, argues that when targets are small and in particular are privately held companies, non-Big 4 auditors provide better advisory services to the managers of the acquirer firm because of their local knowledge and because the Big 4 tend to neglect small clients in favor of more lucrative businesses with larger clients. According to Louis, due to the superior advisory services that non-Big 4 auditors provide, acquirers audited by non-Big 4 firms outperform those audited by the Big 4 at merger announcements.6

However, even if there were some variation in perceived audit quality across audits of a given supplier, it would not dispute the theories on auditor reputation. As Francis (2004, p. 352) pointed out: » ... the arguments simply mean that audits of Big 4 firms as a group will, on average, be of higher quality than other (smaller) accounting firms.« Overall, consistent with the view that they are perceived as higher quality auditors, the Big 4 auditors are found to charge higher fees than other suppliers of audit services (Yardley et al., 1992; Walker/Johnson, 1996; Moizer, 1997; Taylor/Simon, 1999; Hay et al., 2006).

One important reason for the willingness to pay higher Big 4 fees seems to be the ability of the Big 4 to reduce the uncertainty of future cash flows of the client firm, and therefore under-pricing of its shares (Balvers et al., 1988; Beatty, 1989; Hogan, 1997; Willenborg, 1999). Following these suggestions and empirical findings, we posit that prior to the takeover announcement, non-Big 4 audited takeover targets carry more information risk than Big 4 audited takeover targets. However, in the takeover, acquirers are likely to have access to private information on the target firm not available to other outsiders, and hence acquirers potentially yield more accurate valuations than the equity market as a whole.

The empirical findings of Raman et al. (2008) are consistent with a value discount of more opaque listed takeover targets. They find, among other things, that when the target’s financial reporting quality is poor, negotiations with the target’s management generate additional information that leads to a higher premium being offered. In short, earnings quality and takeover premiums are negatively correlated, suggesting that the takeover process reveals valuable private information to the bidder, especially when earnings quality is poor. This result is stronger for private bidders than public bidders. The inverse relation of earnings quality

5 Botosan (2006) provides a literature review on the link between disclosure and the cost of capital. She concludes that »the sum total of the evidence accumulated across many studies using alternative measures, samples and research designs lends considerable support to the hypothesis that greater disclosure reduces the cost of equity capital« (Botosan 2006:39). A recent analytical study, however, describes a situation when disclosure quality may increase the cost of capital (Gao 2010). Gao’s model predicts that disclosure quality increases the cost of capital when it increases the overall risk of the firm’s cash flow, suggesting that disclosure quality does not always monotonically reduce the cost of capital.

6 However, this argument does not apply to target firms and their auditors, which is the focus of this paper. In other words, quality of advisory services provided by the target firm’s auditor cannot be assumed to affect the acquirer’s takeover decision (i.e. bid) and market value of the target firm. Nevertheless, even if the argument of superior advice by non-Big 4 auditors does not apply to target firms, the study of Louis (2005) is related to ours, as it identifies the factors that are expected to have an effect on takeover bids.
and takeover premiums documented by Raman et al. (2008) is consistent with our argument that Big 4 audits lend higher credibility to financial statements, and the surprises for more transparent Big 4 clients are therefore smaller than for more opaque non-Big 4 clients, resulting in higher abnormal returns for the non-Big 4 targets.

In summary, given that Big 4 client firms carry less information risk than non-Big 4 clients prior to the takeover process, acquirers’ access to private information during the takeover process should reduce the information risk to a lesser extent than in the case of non-Big 4 clients, ceteris paribus. The bid (takeover announcement) signals this new private information about firm value to the equity market, reflecting an increase in the market price of the target firm. For Big 4 audited, more transparent targets, less private information is available through the takeover process to be signaled in the bid, leading to lower abnormal returns on average. Accordingly, we set our hypothesis as follows:

**H1: The cumulative abnormal returns of Big 4 audited takeover targets are lower than those of non-Big 4 audited takeover targets, ceteris paribus.**

An alternative explanation for lower CARs for Big 4 targets could be the target’s future auditor switch anticipated by market participants at the time of takeover announcement. The anticipation may be warranted as in the majority of takeovers the target’s auditor is replaced by the acquirer’s auditor: Anderson et al. (1993) find a switch in 73% and Firth (1999) in 80% of the takeovers. In general, studies on factors associated with auditor switches find that a corporate takeover or a merger is one significant reason for auditor switches (Beattie/Fearnley, 1995; 1998; Woo/Koh, 2001).

Therefore, if the market’s perception of auditor quality affects the cost of capital of the client, auditor switches may be perceived as quality upgrades or downgrades. A stream of research has examined market reactions to auditor switches (e.g. Nichols/Smith, 1983; Eichener et al., 1989; Johnson/Lys, 1990). On balance, the results of these studies suggest that auditor switches are generally viewed unfavorably by the market, but switches to Big 4 auditors tend to be viewed more favorably than other auditor switches, supporting the view that a change from non-Big 4 to Big 4 can be taken as a positive signal (good news) for future growth prospects. However, these studies do not provide clear and consistent evidence of market reactions to auditor switches. For example, Johnson/Lys (1990) found that the market reacts prior to the switches, indicating that changes in a client’s operations and activities trigger the auditor switch to a more cost-efficient auditor, and the switch itself therefore has little information content. However, in the context of takeover, the auditor switch is not triggered by changes in the client firm’s operations, but can be expected to happen simply because the auditor of the target firm is likely to be replaced by the acquirer’s auditor. Therefore, the auditor switch in a takeover may cause a stronger market reaction than in other situations. To examine the effect of information risk without the switch effect, we examine H1 in a more powerful way by eliminating the potential effect of anticipated switch from the hypotheses:

**H2a: The cumulative abnormal returns of Big 4 audited takeover targets are lower than non-Big 4 audited takeover targets after the effects of the expected auditor switch are controlled for, ceteris paribus.**

The above hypothesized valuation discount associated with the fact that a firm has a non-Big 4 auditor (H1) should no longer be warranted if the target firm switches to a Big 4 auditor. Therefore, if the target is taken over by a firm with a Big 4 auditor, it could be possible that the market anticipates this quality upgrade (as acquirer’s auditor is known) and would result in larger abnormal returns to those non-Big 4 audited targets that are expected to switch from non-Big 4 to Big 4. However, the switch effect is two-way since the auditor quality of acquirers may also trigger an expected downward shift in the auditor quality of the takeover target. As an alternative explanation for the lower CAR for Big 4 targets, we examine the hypotheses H2b and H2c related to an expected auditor upgrade and downgrade switch. First, we examine the effect of an expected auditor upgrade.

**H2b: The cumulative abnormal returns are higher for non-Big 4 audited takeover targets that are expected to upgrade to Big 4 auditors than for those that are expected to maintain non-Big 4 auditors, ceteris paribus.**
Secondly, we examine the effect of an expected auditor downgrade:

**H2c:** The cumulative abnormal returns are higher for Big 4 audited takeover targets that are expected to maintain Big 4 auditors than for those that are expected to downgrade to non-Big 4 auditors, ceteris paribus.

### 3. Data and Research Design

Our analysis is based on a sample of firms selected from the Securities Data Corporation (SDC), Audit Analytics and Thomson One Banker, which contains financial data from the Worldscope, Compustat, I/B/E/S and Datastream databases. For the examination of H1 and H2, we retrieve a total of 1915 takeover bids (268 non-Big 4 audited and 1647 Big 4 audited) that meet the following criteria. First, the takeover target firms are listed in a US stock exchange, which provide us with information on the changes in share value. Second, for homogeneity, we only accept acquisitions where the acquirer seeks to obtain over 50% of the shares. Third, we require information on the auditor of the target and acquirer. Fourth, we do not accept firms with negative shareholders’ equity, because they are likely to be in financial distress (Bowen et al., 1995). We include both successful and unsuccessful bids in our sample.

In the examination of H1 and H2, for the computation of abnormal returns, we couple the share price data from the SDC with the MSCI US total market index obtained from Datastream. In the multivariate examination of the hypotheses, we have excluded observations if the Belsley/Kuh/Welsch (1980) diagnostic indicated that they were influential (absolute value of the studentized residual greater than 5 or Cook’s D statistic greater than 1).

The examination of H1 and H2 requires us to identify the quantity of cumulative abnormal returns. We compute the announcement-period cumulative abnormal returns (CARs) for the three-day window (one day before to one day after) around the announcement day, i.e. day 0. For the market return, we use the Morgan & Stanley U.S. return index. Following prior study by Fuller et al. (2002) and Dong et al. (2006), we employ the modified market model where \( r_i \) is the target firm-\( i \) return and \( r_m \) is the market return:

\[
\text{CAR}_i = r_i - r_m. \quad (1)
\]

We estimate the following multivariate regression model for CAR, including the auditor effect and control variables for factors known to affect CARs:

\[
\text{CAR}_i = \beta_0 + \beta'(\text{auditor characteristics}) + \gamma'(\text{target firm characteristics}) + \zeta'(\text{acquirer firm characteristics}) + \kappa'(\text{deal characteristics})_i + \varepsilon_i. \quad (2)
\]

In the above, (auditor characteristics) is a vector including auditor characteristics \( TBIG4, ABIG4 \), and interaction term \( TBIG4 \times ABIG4 \) (explained below). \( \beta' = [\beta_1, \beta_2, \beta_3] \), \( \gamma', \zeta' \) and \( \kappa' \) are the regression coefficient vectors and \( \varepsilon_i \) is the error term of the model. In the following, we describe the variables of our model in detail. First, we describe the variables related to auditor characteristics, which are the variables of main interest. We then describe the control variables that capture the relevant target firm, acquirer firm, and deal characteristics. These control variables are based on Louis (2005), who identifies the factors that are expected to have an effect on takeover bids.

#### 3.1. Auditor characteristics

Our main interest lies in the marginal effects of the dichotomous variables \( TBIG4 \) and \( ABIG4 \), and their interaction \( TBIG4 \times ABIG4 \). \( TBIG4 \) equals 1 if the target firm has a Big 4 auditor, and 0 otherwise. \( ABIG4 \) equals 1 if the acquirer firm has a Big 4 auditor, and 0 otherwise. Consequently, we will examine their regression coefficients \( \beta_i, i = 1, 2, 3 \). We include a dichotomous variable \( MIDTIER \), which distinguishes between second tier versus other target’s auditors. It equals 1 if the target has been audited by BDO or Grant Thornton, and 0 otherwise.

First, we focus on the regression coefficient \( \beta_1 \) of \( TBIG4 \) in equation (2): if the shareholders of Big 4 audited target firms obtain lower cumulative abnormal returns (CARs) than non-Big 4 audited firms, ceteris paribus, then \( \beta_1 < 0 \). H1 does not take a stance on acquirer auditor characteristics. Hence, at this point we exclude the variables \( ABIG4 \) and \( TBIG4 \times ABIG4 \), which measure the auditor quality of the acquirer, and their corresponding coefficients \( \beta_2 \) and \( \beta_3 \) from the examination of H1.
To further study the effects of auditor quality on the CAR of takeover targets, and in particular to include the effects of the expected auditor switch in the examination, we have developed a 2x2 cross table analysis (Figure 1) that shows how we can calculate the conditional effects on CAR for each of the four combinations of acquirer and target auditor quality. Figure 1 presents these combinations by displaying the non-Big 4 and Big 4 audited targets in the horizontal dimension of the cross-table, and the non-Big 4 and Big 4 audited acquirers in the vertical dimension of the cross-table. We label the quadrants clockwise from the bottom-left as follows: Low quality, Upgrade, High quality and Downgrade. H2a examines the diagonal difference between the High quality and Low quality quadrants and posits that the CAR of the Low quality quadrant is higher than that of the High quality quadrant. In the latter pair of quadrants, the target and the acquirer have the same auditor quality classification. Namely, in the quadrant Low quality, the takeover targets and the acquirers have non-Big 4 auditors and in the quadrant High quality they both have Big 4 auditors. Consequently, the acquisition bids do not trigger expectations of auditor switches. Therefore, cost of capital revisions should not be expected.

In the quadrant Low quality, the target and the acquirer have non-Big 4 auditors, and therefore the highest initial information risk and the highest CAR of the quadrants. The quadrant High quality displays a contrasting situation with high quality auditors where firms have the lowest initial information risk and, as a result of this, the lowest CAR of the quadrants. We will measure the conditional CAR of the Low quality quadrant, in which the target, acquirer, and deal characteristics are controlled for, as the regression coefficient of the intercept, $\beta_0$, of regression equation (2); this is because $TBIG4 = ABIG4 = TBIG4 \times ABIG4 = 0$ in this case. The conditional CAR of the high quality quadrant will be measured as the sum $\beta_0 + \beta_1 + \beta_2 + \beta_3$ of regression equation (2), since $TBIG4 = ABIG4 = TBIG4 \times ABIG4 = 1$ in this case. Our statistical test for H2a is thus related to the difference in the conditional effects $(\beta_0 + \beta_1 + \beta_2 + \beta_3) - \beta_0$, and can be stated as $\beta_1 + \beta_2 + \beta_3 < 0$, positing a lower CAR for the High quality quadrant compared to the Low quality quadrant.

![Fig. 1: The operationalization of the hypotheses of cumulative abnormal returns](image-url)

<table>
<thead>
<tr>
<th>Acquirer audited by Big 4</th>
<th>Target audited by Big 4</th>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
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<tr>
<td>Low quality</td>
<td>Low quality</td>
</tr>
<tr>
<td>$\beta_0$</td>
<td>$\beta_0$</td>
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<tr>
<td>H2b</td>
<td>H2a</td>
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<tr>
<td>H2c</td>
<td>H2b</td>
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<tr>
<td>0</td>
<td>0</td>
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H1: CAR (TBIG 4=1) < CAR (TBIG 4=0)
H2a: CAR (TBIG 4=1, ABIG 4=1) < CAR (TBIG 4=0, ABIG 4=0)
H2b: CAR (TBIG 4=0, ABIG 4=1) > CAR (TBIG 4=0, ABIG 4=0)
H2c: CAR (TBIG 4=1, ABIG 4=1) > CAR (TBIG 4=1, ABIG 4=0)
In Figure 1 we also present the operationalisation of H2b and H2c. H2b posits that the CAR of the quadrant Upgrade is higher than that of the quadrant Low quality. In the quadrants Upgrade and Low quality, takeover targets have non-Big 4 auditors. In the Upgrade quadrant, acquirers have a Big 4 auditor, which raises expectations of a decrease in the cost of capital. This, in turn, increases the CAR of the target, ceteris paribus. In the quadrant Low quality, no such expectations of an auditor switch exist. Therefore, the CAR of the quadrant Upgrade should be higher than that of low quality. The conditional CAR of the Upgrade quadrant is measured as the sum $\beta_0 + \beta_2$ based on regression equation (2). Consequently, our statistical test for H2b is formulated as $\beta_2 > 0$.

H2c examines the opposite auditor switch effect compared to H2b. In the quadrant Downgrade the targets have Big 4 auditors and the acquirers have non-Big 4 auditors. The difference in auditor quality between the target and the acquirer triggers expectations of a downgrade, increasing the cost of capital and decreasing the CAR of the quadrant Downgrade compared to the quadrant High quality. The conditional CAR of the Downgrade quadrant is measured as the sum of regression coefficients $\beta_0$ and $\beta_1$ of regression equation (2). Our statistical test for H2c is based on the difference between the effects of these quadrants, i.e. $\beta_0 + \beta_1 + \beta_2 + \beta_3 - (\beta_0 + \beta_1)$, and the hypothesis is $\beta_2 + \beta_3 > 0$ thus positing that downgrading should reduce the CAR. Regression equation (2) includes various control variables for the target firm, acquirer firm, and acquisition characteristics that may have an impact on target returns around a takeover bid. These will be explained next.

### 3.2. Target firm characteristics

We control for the following target firm characteristics. ACOV is analyst coverage, measured by the number of analysts forecasting the target’s annual earnings in the month immediately prior to the earnings announcement. CASH is the target’s cash divided by the total assets, a proxy for liquidity. E/P is the target’s earnings to price ratio. INHOUSE is a dichotomous variable, which equals 1 if the target firm does not use an investment banker (as identified by the SDC), and 0 otherwise. LEVERAGE is the target’s total debt divided by the total shareholders’ equity. NIB is the number of investment bankers hired by the target (as identified by the SDC). P/B is the target’s price-to-book ratio. TROE is the target’s return-on-equity ratio, which we measure from the last fiscal year that ended before the bid announcement. TSIZE is the natural logarithm of the target’s total assets. VOLATILITY is the target’s pre-bid stock volatility measured as the standard deviation of the target’s return over the period from 60 to 259 days before the merger announcement. QUALIFIED is a dichotomous variable, which equals 1 for target firms with going concern audit opinions, and 0 otherwise.

We allow for separate intercepts for firms in regulated SIC industries (REGIND) 49 (energy) or 60-69 (financial institutions), agriculture (two-digit SIC code 1-9), construction (two-digit SIC code 15-17), manufacturing (two-digit SIC code 20-39), transport (two-digit SIC code 40-48), wholesale (two-digit SIC code 50-51), retail (two-digit SIC code 52-59), and service (two-digit SIC code 70-89).

### 3.3. Acquirer characteristics

We control for the following acquirer firm characteristics: the acquirer’s size (AASSETS), industry relatedness (INDR), and relative size (RELSIZE). AASSETS is the natural logarithm of the acquirer’s total assets. INDR is a proxy for the industry relatedness of the target and the acquirer. It is equal to 1 if the target and acquirer are in the same two-digit SIC code and 0 otherwise. RELSIZE is the ratio of the target’s total assets to the acquirer’s total assets.

### 3.4. Deal characteristics

We control for the following acquisition characteristics: the attitude towards the acquisition bid (FRIENDLY), the consolidation method in the financial reports of the acquirer (POOL), potential rumors regarding the acquisition bid (RUMORED), the payment method (STOCK), and fixed year effects.

FRIENDLY equals 1 if the target’s attitude to the proposed merger is characterized as friendly by the SDC, and 0 otherwise. POOL is a dichotomous variable. It equals 1 if the acquirer will use the pool-
ing-of-interest method in the consolidated financial statements as opposed to the purchase method of consolidation, and 0 otherwise. RUMORED equals 1 if the SDC classifies the bid as rumored, and 0 otherwise. STOCK is the proportion of common stock used as payment for the target’s shares. We allow for separate intercepts for all calendar years (YEAR) except of the last calendar year of the examined period, 2005, which we leave in the intercept. After characterizing the explanatory variables, we can now state the regression model in full detail:

$$\text{CAR}_i = \beta_0 + \beta_1TBIG4_i + \beta_2ABIG4_i + \beta_3TBIG4 \times ABIG4_i + \beta_4CASH_i + \beta_5EP_i + \beta_6INHOUSE_i + \beta_7LEVERAGE_i + \beta_8NIB_i + \beta_9PB_i + \beta_{10}TROE_i + \beta_{11}TSIZE_i + \beta_{12}VOLATILITY_i + \beta_{13}QUALIFIED_i + \sum_{k=1}^{15} \gamma_k \text{INDUSTRY}_{k,i} + \epsilon_i$$

where $\epsilon_i$ refers to the error term and $i$ to firm.

3.5. Addressing potential self selection bias using two stage-modeling: auditor choice model

There is a possibility that the sub-samples audited by Big 4 and non-Big 4 auditors differ in a large number of firm characteristics, and that self-selection bias may be present. To account for possible sample selection bias in the auditor choice, we apply Heckman’s (1979) two-step procedure to examine the impact of two-stage modeling on our results as follows. We first estimate the auditor choice model using probit regression

$$\text{Prob}(TBIG4_i = 1) = \Phi(Z_i)$$

where $\Phi$ denotes the cumulative normal density function, and $Z_i = \chi_0 + \chi_1CASH_i + \chi_2EP_i + \chi_3LEVERAGE_i + \chi_4TSIZE_i + \chi_5VOLATILITY_i + \chi_6\text{REGIND},$ where $\chi_i$ is 0, 1, 2, 3, 4, 5, 6 refer to the regression coefficients of the selection model.

The model predicts the probability of the auditor choice based on the same explanatory variables that have earlier been used in the two-step auditor choice model by Louis (2005). These explanatory variables (CASH, E/P, LEVERAGE, TSIZE, VOLATILITY and REGIND) have been defined earlier in the target firm characteristics section.

Then, using the ordinary least squares method, we re-estimate regression model (3) for CAR. We include the inverse Mill’s ratio (LAMBDA) estimated from the probit model (4) in the first step and by excluding those control variables that were already included in the auditor choice model (i.e. CASH, E/P, LEVERAGE, TSIZE, VOLATILITY and REGIND).

4. Results

4.1. Descriptive statistics

In Table 1 we report the descriptive statistics of our data separately for the continuous variables (Panel A) and dichotomous variables (Panel B). The mean, median and standard deviation of the continuous variables used in regression equation (3) are presented in Panel A. The results of the t-tests comparing the non-Big 4 and Big 4 groups with respect to each continuous variable are shown there. We also report the non-parametric Mann-Whitney-Wilcoxon U-test for the equality of the medians of the two groups. The U-test is preferred in the case of skewed distributions of the underlying variables.

The dichotomous variables and their relative frequencies are presented in Panel B of Table 1. To compare the frequencies of the non-Big 4 and Big 4 groups we use Fisher’s exact test, which is more accurate than the conventional $\chi^2$-test for 2x2 tables, especially if the proportions are close to 0 or 1.

For almost all of the considered variables, the unidimensional test shows a statistically significant difference in the means of the non-Big 4 and Big 4 groups. Of the continuous variables, STOCK is the only non-significant variable in both the t-test and the U-test, indicating that the proportion of common stock used as payment does not differ between the non-Big 4 and Big 4 groups.

Interestingly, in relation to hypothesis H1, the mean CAR for the three days surrounding the takeover bid announcement is higher for the non-Big 4
Valuation of takeover targets and auditor quality

**Table 1: Descriptive statistics**

<table>
<thead>
<tr>
<th>Panel A. Continuous variables</th>
<th>Non-Big 4 auditor (n = 268)</th>
<th>Big 4 auditor (n = 1647)</th>
<th>Test of differences t-statistics and p-values</th>
<th>Mann-Whitney-Wilcoxon U-test Z-statistics and p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR</td>
<td>0.157 (0.132)</td>
<td>0.164 (0.131)</td>
<td>0.115 (0.182)</td>
<td>2.35 (0.019)**</td>
</tr>
<tr>
<td>ACOV</td>
<td>0.739 (0.000)</td>
<td>4.038 (2.000)</td>
<td>5.467 (−19.60)</td>
<td>&lt;0.001***</td>
</tr>
<tr>
<td>CASH</td>
<td>0.088 (0.051)</td>
<td>0.166 (0.070)</td>
<td>0.215 (−8.25)</td>
<td>&lt;0.001***</td>
</tr>
<tr>
<td>E/P</td>
<td>0.032 (0.044)</td>
<td>−0.915 (0.033)</td>
<td>34.575 (1.11)</td>
<td>0.266 (4.72)</td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>6.910 (7.508)</td>
<td>4.489 (3.583)</td>
<td>1.044 (5.892)</td>
<td>10.72 (0.001)**</td>
</tr>
<tr>
<td>NIB</td>
<td>1.011 (1.000)</td>
<td>0.351 (1.146)</td>
<td>1.000 (0.456)</td>
<td>−5.58 (0.001)**</td>
</tr>
<tr>
<td>P/B</td>
<td>2.190 (1.601)</td>
<td>2.708 (3.363)</td>
<td>1.863 (9.988)</td>
<td>−3.96 (0.001)**</td>
</tr>
<tr>
<td>TROE</td>
<td>0.014 (0.074)</td>
<td>−0.055 (0.071)</td>
<td>1.748 (1.42)</td>
<td>0.155 (6.02)</td>
</tr>
<tr>
<td>TSIZE</td>
<td>5.118 (5.319)</td>
<td>1.450 (5.694)</td>
<td>5.667 (1.978)</td>
<td>−5.71 (0.001)**</td>
</tr>
<tr>
<td>VOLATILITY</td>
<td>0.030 (0.026)</td>
<td>0.019 (0.036)</td>
<td>0.032 (0.019)</td>
<td>−4.22 (0.001)**</td>
</tr>
<tr>
<td>AASSETS</td>
<td>7.277 (7.297)</td>
<td>2.030 (7.545)</td>
<td>7.535 (2.109)</td>
<td>−1.94 (0.053)</td>
</tr>
<tr>
<td>RELSIZE</td>
<td>0.295 (0.134)</td>
<td>0.540 (0.587)</td>
<td>0.210 (4.860)</td>
<td>−2.35 (0.019)**</td>
</tr>
<tr>
<td>STOCK</td>
<td>0.738 (1.000)</td>
<td>0.375 (0.745)</td>
<td>1.000 (0.373)</td>
<td>−0.28 (0.780)</td>
</tr>
</tbody>
</table>

Table 1 presents descriptive statistics for the variables used in the examination of the hypotheses. Panel A presents the means, medians, and standard deviations of the continuous variables and t- and non-parametric z-statistics measuring the difference between Big 4 and non-Big 4 audited firms. A Big 4 auditor refers to Big 4, Big 5, Big 6, or Big 8, depending on the period. CAR is firm i's cumulative abnormal return in a three-day time-window (-1,1), which is centered on the announcement day. ACOV is the analyst coverage, measured by the number of analysts forecasting a target's annual earnings in the month immediately prior to the earnings announcement. CASH is the target's cash divided by total assets. E/P is the target's earnings to price ratio. LEVERAGE is the target's total debt divided by the target shareholders' equity. NIB is the number of investment bankers hired by the target (as identified by SDC). P/B is the target's price-to-book ratio. TROE is the target's return on equity ratio. TSIZE is the target's natural log of total assets. VOLATILITY is the target's pre-merger stock volatility measured by the standard deviation of the target's return over the period from 60 to 259 days before the bid announcement. AASSETS is the natural logarithm of the acquirer's total assets. Relative size (REL SIZE), is the ratio of the target's total assets to the acquirer's total assets. STOCK is the proportion of common stock used as payment for the target's shares. ***p < 0.01; **p < 0.05; *p < 0.1; two-tailed.

Audited target firms (15.7%) compared to Big 4 audited target firms (13.1%). The difference is statistically significant at the significance level p = 0.019. Analyst coverage (ACOV) is broader (p < 0.001) and liquidity (CASH) is significantly higher for Big 4 audited targets (16.6%) compared to non-Big 4 audited targets (8.8%) (p < 0.001). Non-Big 4 audited firms are riskier, as their mean LEVERAGE is 6.910 compared to 3.583 for the Big 4 audited targets (p < 0.001). We can also see that on average the non-Big 4 firms have fewer investment bankers (NIB) involved in the acquisition process than the Big 4 firms (p < 0.001). The mean of the price-to-book ratio in the subsample of non-Big 4 audited targets is lower (P/B = 2.190) than in the subsample of Big 4 audited takeover targets (P/B = 3.363) (p < 0.001).

The average profitability (measured as return on equity, TROE) of Big 4 audited targets is lower than that of non-Big 4 audited targets. Because the...
mean in the Big 4 group is negative and thus much lower than the median, the profitability distribution of the Big 4 group is extremely left-skewed, i.e. it involves some firms with very negative profitabilities. The non-Big 4 group also has a left-skewed profitability distribution, but not as severe as the Big 4 group. In addition, the standard deviation of the Big 4 group is very high, 1.748. Similar arguments that apply to the target ROE also apply to the earnings-to-price ratio ($E/P$).

The Big 4 audited targets are larger on average than the non-Big 4 audited targets ($TSIZE$), with a significance level $p < 0.001$. The VOLATILITY of the Big 4 targets is higher, being 3.6%, compared to 3.0% for non-Big 4 targets ($p < 0.001$). The mean of the acquirer’s assets ($AASSETS$) is significantly higher at the 5% level when the target is a Big 4 audited company than when it is not. The average relative size is significantly higher at the

### Panel B. Dichotomous variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-Big 4 auditor (n = 268)</th>
<th>Big 4 auditor (n = 1647)</th>
<th>Fisher's exact test p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ABIG4$</td>
<td>0.769</td>
<td>0.953</td>
<td>&lt;0.001 ***</td>
</tr>
<tr>
<td>$MIDTIER$</td>
<td>0.284</td>
<td>0.000</td>
<td>&lt;0.001 ***</td>
</tr>
<tr>
<td>$INHOUSE$</td>
<td>0.052</td>
<td>0.024</td>
<td>0.016 **</td>
</tr>
<tr>
<td>$QUALIFIED$</td>
<td>0.015</td>
<td>0.022</td>
<td>0.645</td>
</tr>
<tr>
<td>$INDR$</td>
<td>0.537</td>
<td>0.635</td>
<td>0.003 ***</td>
</tr>
<tr>
<td>$FRIENDLY$</td>
<td>0.993</td>
<td>0.987</td>
<td>0.761</td>
</tr>
<tr>
<td>$POOL$</td>
<td>0.295</td>
<td>0.354</td>
<td>0.062 *</td>
</tr>
<tr>
<td>$RUMORED$</td>
<td>0.000</td>
<td>0.013</td>
<td>0.061 *</td>
</tr>
<tr>
<td>$REGIND$</td>
<td>0.731</td>
<td>0.378</td>
<td>&lt;0.001 ***</td>
</tr>
<tr>
<td>$AGRICULTURE$</td>
<td>0.004</td>
<td>0.002</td>
<td>0.453</td>
</tr>
<tr>
<td>$CONSTRUCTION$</td>
<td>0.000</td>
<td>0.007</td>
<td>0.393</td>
</tr>
<tr>
<td>$TRANSPORT$</td>
<td>0.007</td>
<td>0.049</td>
<td>&lt;0.001 ***</td>
</tr>
<tr>
<td>$WHOLESALE$</td>
<td>0.022</td>
<td>0.024</td>
<td>1.000</td>
</tr>
<tr>
<td>$RETAIL$</td>
<td>0.011</td>
<td>0.038</td>
<td>0.027 **</td>
</tr>
<tr>
<td>$MANUFACTURING$</td>
<td>0.116</td>
<td>0.249</td>
<td>&lt;0.001 ***</td>
</tr>
<tr>
<td>$SERVICE$</td>
<td>0.090</td>
<td>0.210</td>
<td>&lt;0.001 ***</td>
</tr>
</tbody>
</table>

Panel B of Table 1 presents the dichotomous variables and their relative frequencies. To compare the frequencies of the non-Big 4 and Big 4 groups of takeover targets, we use Fisher’s exact test for 2x2 tables. $ABIG4$ is a dichotomous variable, which equals 1 if the acquirer firm is audited by a Big 4 auditor, 0 otherwise. $MIDTIER$ is a dichotomous variable, which equals 1 if the target firm is audited by BDO or Grant Thornton, 0 otherwise. $INHOUSE$ is a dichotomous variable, which equals 1 if the target firm does not have an investment banker hired by the target (as identified by SDC), 0 otherwise. $QUALIFIED$ is a dichotomous variable, which equals 1 for target firms with going concern audit opinions, and 0 otherwise. $INDR$ is a proxy for the industry relatedness of the target and the acquirer. It is equal to 1 if the target and acquirer are in the same two-digit SIC code, and 0 otherwise. $FRIENDLY$ equals 1 if the target’s attitude to the proposed merger is characterized as friendly by SDC, and 0 otherwise. $POOL$ is a dichotomous variable. It equals 1 if the acquirer will use the pooling-of-interest method in the consolidated financial statements as opposed to the purchase method of consolidation, and 0 otherwise. $RUMORED$ equals 1 if SDC classifies the bid as rumored, and 0 otherwise. $REGIND$ equals 1 if the target firm belongs to regulated SIC industries 49 (energy) or 60-69 (financial institutions), and 0 otherwise. $AGRICULTURE$ equals 1 if the target firm belongs to two-digit SIC industries 1-9, and is 0 otherwise. $CONSTRUCTION$ equals 1 if the target firm belongs to two-digit SIC industries 15–17, and is 0 otherwise. $TRANSPORT$ equals 1 if the target firm belongs to two-digit SIC industries 40-48, and is 0 otherwise. $WHOLESALE$ equals 1 if the target firm belongs to two-digit SIC industries 50-51, and is 0 otherwise. $RETAIL$ equals 1 if the target firm belongs to two-digit SIC industries 52-59, and is 0 otherwise. $SERVICE$ equals 1 if the target firm belongs to two-digit SIC industries 70-89, and is 0 otherwise. We allow separate intercepts for each year. ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$; two-tailed.
5% level when the target is Big 4 audited compared to non-Big audited targets. Between non-Big 4 and Big 4 audited targets, there is a statistically significant difference in how often the acquirer is Big 4 audited \( p < 0.001 \), the target and the acquirer are related by industry \( p = 0.003 \), whether an INHOUSE advisor is used \( p = 0.016 \). There are 76 mid-tier auditors (28.36%) in the subgroup non-Big 4 auditors, and by definition none in the subgroup of Big 4 auditors. We can also see that there are differences in how often the bids have appeared in different years and in different industries. The manufacturing and service sectors are the two largest groups in our sample, but both of them are less represented in the sample of non-Big 4 audited firms (11.6% and 9.0%, respectively) compared to the sample of Big 4 audited firms (24.9% and 21.0%, respectively). There is no statistically significant difference in how often the merger is considered FRIENDLY.

### 4.2. The auditor choice model

We can see from Table 2 that the auditor choice model is significant at level \( p < 0.001 \). It’s ability to classify the observations correctly is 82.1%. Nagelkerke’s (1991) coefficient of determination Pseudo-\( R^2 \) is 27.2%. \( CASH, E/P, LEVERAGE, TSIZE \) and \( REGIND \) are all significant at 0.1% level. Our

#### Table 2: Probit regression: auditor choice model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>Wald ( \chi^2 )</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>-0.434</td>
<td>0.197</td>
<td>4.86</td>
<td>0.028**</td>
</tr>
<tr>
<td>CASH</td>
<td>1.176</td>
<td>0.310</td>
<td>14.41</td>
<td>&lt;0.001***</td>
</tr>
<tr>
<td>E/P</td>
<td>-0.958</td>
<td>0.279</td>
<td>11.82</td>
<td>&lt;0.001***</td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>-0.032</td>
<td>0.008</td>
<td>15.17</td>
<td>&lt;0.001***</td>
</tr>
<tr>
<td>TSIZE</td>
<td>0.363</td>
<td>0.031</td>
<td>139.91</td>
<td>&lt;0.001***</td>
</tr>
<tr>
<td>VOLATILITY</td>
<td>4.354</td>
<td>2.779</td>
<td>2.45</td>
<td>0.117</td>
</tr>
<tr>
<td>REGIND</td>
<td>-1.022</td>
<td>0.112</td>
<td>82.55</td>
<td>&lt;0.001***</td>
</tr>
</tbody>
</table>

\( \chi^2 \) p-value

- Likelihood ratio test: 313.89 <0.001***
- Score test: 265.89 <0.001***
- Wald test: 222.76 <0.001***
- Percent concordant (disconcordant): 82.1 (17.7)
- Nagelkerke’s pseudo \( R^2 \): 0.272
- n: 1915

\( CASH \) is target’s cash divided by total assets. \( E/P \) is the target's earnings to price ratio. \( LEVERAGE \) is target’s total debt divided by total shareholders’ equity. \( TSIZE \) is natural log of the target’s total assets. \( VOLATILITY \) is the target’s pre-merger stock volatility, which is measured by standard deviation of the target’s return over the period from 60 to 259 days before the merger announcement. \( REGIND \) equals 1 if the target firm belongs to regulated SIC industries 49 or 60-69, and 0 otherwise. In the regression equation firms are denoted by \( i \).

***\( p < 0.01 \); **\( p < 0.05 \); two-tailed.
model fit is almost identical to a similar model developed by Louis (2005) for the acquirers.

4.3. The cumulative abnormal returns of Big 4 audited and non-Big 4 audited takeover targets (H1)

Panel A of Table 1 provides univariate results that support H1 since the mean of the CAR for non-Big 4 audited takeover targets is higher than that of Big 4 audited takeover targets ($p = 0.019$). Then, using the ordinary least squares method, we estimate a regression model (equation 3) for $CAR$, including the auditor effect and control variables as explanatory variables. In testing the significance of regression coefficients, we use White’s heteroskedasticity corrected estimates for standard errors (White, 1980). The results of the regression model and the expected signs for those control variables that can be justified based on prior studies are provided in Table 3. We present three models: the first model tests for H1 and the second and third model (Heckman) test for H2.

In model 1, consistent with hypothesis H1, the regression coefficient of the Big 4 dummy ($b_1$) is negative (coefficient of -0.0277) and statistically significant ($p = 0.018$), suggesting that non-Big 4 audited takeover targets obtain 2.77% higher cumulative abnormal returns compared to Big 4 audited takeover targets.

In Model 2 of Table 3 auditor characteristics $ABIG4$, $MIDTIER$ and interaction $TBIG4 \times ABIG4$ are added. The regression coefficient $MIDTIER$ is negative (-0.0717) and significant ($p = <0.001$) suggesting that this group of mid-tier audit firms receives lower CAR than non-Big4 audited firms. The regression coefficient $ACOV$ has the predicted negative coefficient (-0.0028) and is significant ($p = 0.005$) suggesting that targets’ have lower CAR when there is less information asymmetry. The coefficient of $E/P$ is negative, as predicted (-0.0001), and significant ($p = 0.002$) consistent with CAR decreasing with increasing $E/P$ or decreasing growth expectations. Similarly to Dong et al. (2006, S. 747), we find that target valuation ($P/B$) is negatively associated with cumulative abnormal returns (CAR). The coefficient of $P/B$ is -0.0008, and significant ($p = 0.004$). The coefficient of $TROE$ is positive (0.0046), as predicted (Ismail and Davidson 2007), and significant ($p = 0.037$).

The regression coefficient of $AASSETS$ is positive (0.0113), and is statistically significant ($p < 0.001$). The coefficient of $POOL$ is positive (0.0428), and significant ($p < 0.001$) consistent with price advantage of pooling firms (Vincent, 1997). The coefficient of $RUMORED$ is negative, as predicted (-0.0514), and significant ($p = 0.019$) suggesting that prior information leaks diminish the CAR measured in an event window. Following Bhagat et al. (2005) the regression coefficient of stock payment ($STOCK$) is negative (-0.0432), and is significant ($p = 0.001$). Other variables in model 2 are not significant.

4.4. The effects of an expected auditor switch on cumulative abnormal returns of Big 4 audited and non-Big 4 audited takeover targets (H2)

In Table 4 we present the statistical results regarding hypotheses H2 related to the possible alternative explanation that expected auditor switch effects CAR. These effects originate from Model 3 (Heckman) of Table 3. Our empirical results are in accordance with our hypothesis H2a. We can see from the Panel A of Table 4 that the largest CAR (12.68%) of all quadrants appears in the quadrant Low quality. The conditional CAR of the quadrant High quality is 6.08%, which is 6.60% points lower (two-tailed $p = 0.002$) than that of the Low quality quadrant. Hence, we find empirical evidence suggesting that the takeover process makes a smaller correction to the market price of the target with a Big 4 auditor even in the absence of expected auditor switches.

In the examination of H2b, we find that there is no statistically significant difference (two-tailed $p = 0.299$) between the conditional CAR of the Upgrade quadrant (CAR = 10.36%) and the Low quality quadrant (CAR = 12.68%). Hence, we do not find empirical evidence supporting the auditor upgrade hypothesis.

In the examination of H2c, we find that the conditional effect in CAR of Downgrade (CAR = 3.47%) is not statistically significantly different (two-tailed $p = 0.119$) from the conditional effect in CAR of High quality (CAR = 6.08%). Hence, we do not find empirical evidence supporting the auditor downgrade hypothesis.
### Dependent variable: Cumulative abnormal returns (CAR)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pred. sign</th>
<th>Coefficient</th>
<th>t-statistics</th>
<th>p-values</th>
<th>Pred. sign</th>
<th>Coefficient</th>
<th>t-statistics</th>
<th>p-values</th>
<th>Pred. sign</th>
<th>Coefficient</th>
<th>t-statistics</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT ($\beta_0$)</td>
<td>?</td>
<td>0.1176</td>
<td>2.050</td>
<td>0.041**</td>
<td>?</td>
<td>0.1563</td>
<td>2.680</td>
<td>0.001***</td>
<td>0.1268</td>
<td>2.280</td>
<td>0.023**</td>
<td></td>
</tr>
<tr>
<td><strong>Auditor characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TBIG4 (b1)</td>
<td>–</td>
<td>-0.0277</td>
<td>-2.360</td>
<td>0.018**</td>
<td>?</td>
<td>-0.0914</td>
<td>-3.460</td>
<td>0.001***</td>
<td>-0.0921</td>
<td>-3.470</td>
<td>0.001***</td>
<td></td>
</tr>
<tr>
<td>ABIG4 (b2)</td>
<td>?</td>
<td>-0.0228</td>
<td>-1.030</td>
<td>0.304</td>
<td>?</td>
<td>-0.0228</td>
<td>-1.030</td>
<td>0.304</td>
<td>-0.0232</td>
<td>-1.040</td>
<td>0.299</td>
<td></td>
</tr>
<tr>
<td>TBIG4×ABIG4 (b3)</td>
<td>?</td>
<td>0.0487</td>
<td>1.750</td>
<td>0.081*</td>
<td>0.0487</td>
<td>1.750</td>
<td>0.081*</td>
<td>0.0493</td>
<td>1.770</td>
<td>0.077*</td>
<td>0.077*</td>
<td></td>
</tr>
<tr>
<td>MIDTIER</td>
<td>–</td>
<td>-0.0717</td>
<td>-3.670</td>
<td>&lt;0.001***</td>
<td>-0.0691</td>
<td>-3.550</td>
<td>&lt;0.001***</td>
<td>0.0493</td>
<td>1.770</td>
<td>0.077*</td>
<td>0.077*</td>
<td></td>
</tr>
<tr>
<td><strong>Target characteristics</strong></td>
<td></td>
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<td>+</td>
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<td>0.0046</td>
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<td>?</td>
<td>-0.0662</td>
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<td>0.025**</td>
<td>-0.0637</td>
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### Dependent variable: Cumulative abnormal returns (CAR)

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<th>Coefficient</th>
<th>t-statistics</th>
<th>p-values</th>
<th>Pred. sign</th>
<th>Coefficient</th>
<th>t-statistics</th>
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<td>0.0113</td>
<td>4.100</td>
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<td>4.410</td>
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<td>?</td>
<td>–0.0003</td>
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<td>FRIENDLY</td>
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<td>+</td>
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<td>0.020**</td>
<td>–</td>
<td>–0.0514</td>
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<td>0.019**</td>
<td>–0.0519</td>
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<td>Adj. $R^2$</td>
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</table>

The variables used are defined in Table 1. LAMBDA is the inverse Mill’s ratio estimated from the probit model (see Table 2). ***p < 0.01; **p < 0.05; *p < 0.10; two-tailed.

Table 3: Regression results of cumulative abnormal returns (CAR) models
4.5. Robustness tests

We perform several robustness tests, which are described below.

Size effect. Given that the TBIG4 variable and TSIZE are highly correlated (untabulated), a potential concern arises that the results reported could be driven by a client firm size effect (cf. Lawrence et al., 2007). To address this concern, we restrict the sample by removing firms bigger than the largest non-Big 4 client and firms smaller than the smallest Big 4 client. This does not change the main results of the study.

S&P 500 index in measuring cumulative abnormal returns. To compute abnormal returns, we use the S&P 500 return index as an alternative to Morgan & Stanley U.S. return index. The results of these alternative analyses are inferentially similar to the original analysis.

Time period studied. The perceptions of auditor quality might change over time. Enron scandal took place in 2001 leading to the collapse of Arthur Andersen and to the Sarbanes-Oxley Act (SOX) that impacted the structure of the audit market and the quality of audit services. To study this effect, we split our data and run two separate regressions for sub-periods 1990-2000 and 2001-2005. The regression coefficients and p-values of main interest are very similar when comparing the two time periods.

Different time windows in measuring cumulative abnormal returns. We have used a narrow event window to reduce noise relating to other market or firm information than what the acquisi-
tion offer. As a sensitivity test, we widen the event window from [-1, 1] to [-5, 5]. This does not change the main conclusions of the study.

Non-audit service fees. Disclosing high levels of non-audit fees may impair the perception of audit quality and auditor independence (Francis/Ke, 2006). The reporting of audit fees became obligatory for SEC registrants in 2001 and therefore we were only able to study the subsample for the time period 2001-2005. We measure the level of non-audit fees as the ratio of non-audit fees to total audit fees. When controlling for this effect our main results remain qualitatively unchanged.

The effect of rumored deals. Rumors of imminent mergers and acquisitions are notorious for leaking early into share prices. We analyze and find that the evidence is robust to dropping deals that the SDC codes as rumored.

Targeted over 10% ownership. Because an effective control may be secured without acquiring over 50% of the outstanding shares, we examine whether the results are sensitive to imposing less demanding criteria. A resampling with targeted acquisitions exceeding 10% of the shares show that the main results of our study are robust to including targeted 10%-50% ownership to the sample.

Successful and unsuccessful deals. It is possible that the distinction between successful and unsuccessful deals will affect the results. We address this possibility by deleting unsuccessful deals from the sample. Our results are robust to this sample selection choice.

In all of the above alternative tests, our results regarding the variables of interest remain qualitatively the same.

5. Conclusions

The aim of this study is to investigate whether the market’s perception of auditor quality makes a difference to the market value of a firm using a sample of 1,915 takeover offers in the USA involving listed acquirers and targets over the period 1990 to 2005. If the market perceives that a Big 4 audit lends higher credibility to the financial reporting than a non-Big 4 audit, the firms audited by the Big 4 should carry, ceteris paribus, a lower cost of equity capital. Consistent with this, the prior literature supports the view that a privately-held firm going public can reduce the level of uncertainty of future prospects, and consequently the level of under-pricing of its shares, through auditor choice (e.g. Titman/Trueman 1986; Beatty 1989). However, the impact of auditor choice on firm value is not limited to the event when a firm goes public (Zhou/Elder, 2004; Kim/Park, 2006; Toeh/Wong, 1993; Haw et al., 2008).

Similar to SEOs (Zhou/Elder, 2004; Kim/Park, 2006), business takeovers provide a good setting in which to observe the systematic differences in firm values subsequent to IPO since takeovers facilitate a more powerful test of the economic value of auditor reputation than auditor switches or earnings numbers (as used in previous studies). Unlike auditor switches and earnings that are financial quarter- or year-end information disclosed simultaneously with other annual performance and corporate governance information, business takeovers can be thought as random events with less other information disclosed around takeover announcements.

The main contribution of our study is two-fold. The first contribution of this study is that through its focus on the target auditor it provides empirical evidence that lower CARs are associated with takeover announcements of Big 4 audited target firms. This suggests that the takeover process makes a bigger correction to the market price of the target when it has a non-Big 4 audit because more private information becomes available. That additional information is signaled to the stock market via the acquirer’s bid. Average bids are lower for Big 4 audited targets and produce lower CARs for takeover announcements of such firms. To illustrate the economic significance of our main result, the difference in the value between Big 4 and non-Big 4 audit for an average target firm in our sample (USD 1.2 billion) is approximately USD 33 million (2.77%). Our results suggest that the effect of auditor reputation on client firm value is not limited to an IPO, but can also be observed after going public.

An alternative explanation for lower CARs is that anticipated auditor switches from non-Big 4 to Big 4 auditors are perceived as good news by the market and vice versa. A stream of research has examined market reactions to auditor switches (e.g. Nichols/Smith, 1983; Eichenseher et al., 1989; Johnson/Lys, 1990). These studies do not provide clear and consistent evidence of market reactions to auditor switches. On balance, however, the results of these studies suggest that auditor switches
are generally viewed unfavorably by the market, but switches to Big 4 auditors tend to be viewed more favorably than other auditor switches, supporting the view that a change from non-Big 4 to Big 4 might be taken as a positive signal (good news) for future growth prospects. However, we do not find statistically significant effects of auditor switches and therefore no support for their economic significance in takeovers. Even, after controlling for the expected auditor switches, we still find that the takeover announcements of Big 4 audited targets are associated with lower CARs. Moreover, when we develop a 2x2 cross table analysis and calculate the conditional effects on CAR for each of the four combinations of acquirer and target auditor quality, we find no empirical evidence of the effects of expected switches on CARs. It may be that markets do not react to possible future auditor switches at the time of take over announcement as there is still some uncertainty involved. Even if in most cases the auditor of target firm is replaced by acquirer’s auditor, sometimes the incumbent auditor is allowed to continue (Anderson et al., 1993; Firth, 1999). These results, by showing that a differential market reaction to takeover announcements between Big 4 and non-Big 4 clients is attributable to incumbent auditor, not expected future auditor adds to the studies on market reactions to auditor switches, represent a second contribution of the study.

Even if we control for the factors affecting CARs including client characteristics identified in prior studies (e.g. Louis, 2005), employ Heckman modeling to address potential self-selection bias, and conduct series of robustness tests reported in the paper, it is still possible that our findings are driven by client characteristics rather than auditor quality. Employing matching models such as propensity-scoring, Lawrence et al. 2012 do not find significant differences in audit quality between B4 and non-B4 auditors, but that observed differences are mainly attributable to differences in client size. We do not use matching models as the relatively small number of non-Big 4 takeover targets would reduce our sample size significantly. Instead, as an additional control for the client size effect, we restrict the sample by removing firms bigger than the largest non-Big 4 client and firms smaller than the smallest Big 4 client. This does not change the main results of the study. Nevertheless, we acknowledge the possibility of insufficient controls for client characteristics as a limitation of our study.

Our findings should be of interest to those involved in the merger and acquisitions market. This paper focuses on US takeover bids and there may be characteristics in other markets that are not captured by this study. However, in today’s global markets, it seems likely that such effects would be relatively small. The fact that the evidence is drawn from the largest capital market, adds to generalisability of the results but there is still scope for further studies in other jurisdictions.

References


Valuation of takeover targets and auditor quality

Determinants of audit delay in a mandatory IFRS setting

Bestimmungsfaktoren der Prüfungsdauer von verpflichtend aufzustellenden IFRS-Abschlüssen

Schlüsselbegriffe
Enforcement; IFRS; Prüfungsdauer; Prüfungsqualität

Zusammenfassung


Abstract

This paper investigates the determinants of audit delay, the time span between the reporting date and the date of the auditor’s opinion, in the post-IFRS adoption period. For a sample of firms listed on the Frankfurt stock exchange, we investigate the role of accounting-related determinants, enforcement-related determinants, firm characteristics, and market-based determinants. Using regression analyses, we find a negative association of audit delay in particular with market factors indicative of commitment to transparency (voluntary adoption of an international accounting standard before 2005, foreign listing) and of market demand for timely information (firm size, dividend yield). With respect to enforcement-related determinants, we find that presence of a Big4 auditor also reduces the audit delay. In contrast, the duration of the audit increases materially (nine days on average) in instances where the firm has been censured by the DPR/BaFin mechanism for publishing erroneous financial reports. Our results are important as they shed light on the interaction between firm characteristics and market forces in setting the time span for auditors to conduct their mandatory activities in an era of potentially increasing regulation of the auditing market.

Keywords
Audit delay; audit quality; enforcement; IFRS

We acknowledge helpful comments from two anonymous reviewers, from Cédric Lesage and from session participants at the 2012 EAA annual congress in Ljubljana.
1. Introduction

This paper investigates the determinants of audit delay for German listed firms in the post-IFRS adoption period. Audit delay is defined as the time span between the reporting date (fiscal year end) and the date of the auditor’s opinion (e.g., Ashton et al., 1987) and can be regarded as an (admittedly noisy) indicator of time and resources spent on the auditing process. Prior literature mainly from the U.S., from emerging markets settings and from pre-IFRS settings in EU-countries shows that audit delay is determined by a number of firm-specific factors such as company size (e.g., Leventis et al., 2005), existence of extraordinary items or a loss before extraordinary items (e.g., Bamber et al., 1993), a stock exchange listing (e.g., Ruhnke/Au, 1998), audit-related factors such as a structured audit approach (e.g., Schwarz/Soo, 1996) or industry specialization of auditors (Habib/Bhuiyan, 2011).1

Our paper investigates the determinants of audit delay for a sample of large German corporations. We augment prior literature in several ways. First, this is to our knowledge the first paper to address audit delay in a setting of pure mandatory IFRS application.2 Since German domestic GAAP differ substantially from IFRS both in terms of accounting principles and with respect to the magnitude of reported information, the implications of this new set of accounting standards for the scope and length of the auditing process are an open question. Second, in addition to prior work for the German market, we include into our analyses additional enforcement-related and capital market determinants. The establishment of institutionalized enforcement mechanisms concurrent with the mandatory adoption of IFRS for consolidated accounts of listed firms was explicitly mandated by the IAS regulation and led to the establishment of the two-tier DPR/BaFin enforcement mechanism in Germany. Recent evidence by Hitz et al. (2012) suggests that the activities of the DPR/BaFin mechanism are deemed value relevant by investors, which suggests that the framework for auditing listed firms has changed. Also, as the importance of the capital markets has increased substantially in recent years, so has the pressure on the auditing and auditing process to deliver accounting information on a timely basis. This increasing pressure is witnessed by the growing importance of the so-called ‘fast close’. Our study therefore incorporates the effect of enforcement action and the various dimensions of the influence that markets and market intermediaries exert on firms and auditors.

For a sample of 269 German firms listed in the Prime Standard in 2009, the bluechip market segment of the FWB (Frankfurter Wertpapierbörse), we calculate audit delay and collect data on accounting determinants, enforcement-related determinants, firm level determinants, and market determinants. Using multivariate regression analyses, we find that market determinants in particular (voluntary adoption of an international accounting standard before 2005, a foreign listing, dividend yield, firm size) show a significant negative association with audit delay. With respect to enforcement-related determinants, we find that auditor size, proxied by the presence of a big four auditing firm, significantly reduces the audit delay, while the auditing period is on average increased by nine days for firms that have been censured by the DPR/BaFin mechanism for producing defective accounts.

Our results are important as they shed light on the interaction between firm characteristics and market forces in setting the time span for auditors to conduct their mandatory activities. Also, we illicit the interaction of audit delay and the newly introduced DPR/BaFin enforcement mechanism, thus providing initial evidence on externalities of this new institutional feature. Knowledge of these forces and interactions is a key input to the discussion on audit quality, which has recently been reinforced by the EU’s Green Book and the proposed regulation that aims to introduce additional regulation in the audit market. Also, our findings shed light on market-related reporting incentives which pressure companies to release their accounting information on a timely basis.

The remainder of this paper is organized as follows. Section 2 discusses prior literature and devel-

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1 Determinants of audit delay which were found to be significant in previous studies can be divided into firm specific and audit-related factors (Owuusu-Ansah, 2000). Moreover, audit-related factors can be split up into the categories audit process and auditor characteristics (Leventis et al., 2005).

2 Bonsón-Ponte et al. (2008) examine audit delay for Spanish companies in a setting of transition to IFRS (2002–2005). Habib and Bhuiyan (2011) examine audit delay for a setting of companies listed in New Zealand (in New Zealand IFRS were made compulsory for listed companies in January 2007) within the years 2004 to 2008.
ops our hypotheses. In section 3 the methodology is outlined. Section 4 presents and discusses our empirical findings. Our final section five concludes and points out avenues for future research.

2. Prior literature and hypotheses development

Audit delay is defined as the time span between the reporting date (fiscal year end) and the date of the auditor’s opinion (e.g., Ashton et al., 1987). It represents a quantitative measure of time and resources spent on the auditing process. However, the indicative quality of audit delay to this end is limited. First, the measurement of audit delay implies a relatively invariant audit effort per day (Ruhnke/Au, 1998).

Also, the concept assumes that the principal auditing procedures do not commence before the end of the reporting period, e.g., December 31. Therefore, audit delay, as defined here, does not capture whether substantial parts of the auditing process have already been concluded before the reporting date. The performance of substantial auditing tasks prior to fiscal year end is an integral part of so-called ‘fast close’ and ‘hard close’ concepts. A ‘fast close’ procedure is aimed at accelerating preparation and auditing of financial statements and can include antedated auditing processes. The so-called ‘hard close’ represents a special form of the ‘fast close’ approach. It involves the earlier preparation of the financial statements by pre-dating the closing date, in most cases to one month prior to the official reporting date. This enables auditors to perform auditing tasks well before the official fiscal year end (Ruhnke/Au, 1998; Küting et al., 2004; Ruhnke, 2009).

When applied by a company, these approaches should have an inverse impact on audit delay. For instance, Knechel and Payne (2001), using data obtained from an internal survey conducted at an international accounting firm, are able to include audit tasks performed before fiscal year end into their study, and demonstrate a significant negative association with audit delay. Ruhnke (2009) documents that 47 out of 255 German-based sample clients of a big audit firm conducted a ‘hard close’ in 2007, which underscores the potentially noisy nature of audit delay as an indicator of time and resources spent on the audit process for the German environment. These limitations and caveats in mind, we investigate audit delay, since it represents an externally observable variable that is widely used as a measure for audit efficiency in the literature (Bamber et al., 1993).

A substantial number of prior studies investigate the determinants of audit delay. Leventis et al. (2005) divide the explanatory variables which were found to be significant in prior studies into the categories client (firm) characteristics, audit process and auditor characteristics. Firm characteristics found to be relevant include, for instance, company size (e.g., Ashton et al., 1989; Leventis et al., 2005), existence of extraordinary items or a loss before extraordinary items (e.g., Ashton et al., 1989; Bamber et al., 1993), a stock exchange listing (e.g., Ruhnke/Au, 1998), probability of bankruptcy (e.g., Henderson/Kaplan, 2000; Krishnan/Yang, 2009), and geographic dispersion of operations (e.g., Knechel/Payne, 2001; Tanyi et al., 2010). Only few studies address audit-related factors. Variables found to be significantly related to audit delay include, among others, internal control quality of companies (Ashton et al., 1987; Ettredge et al., 2006), a qualified audit opinion (e.g., Bamber et al., 1993) and provision of non-audit services (e.g., Knechel/Payne, 2001; Lee et al., 2009). With respect to characteristics of auditors, literature provides, for instance, evidence of a significant role for the use of a structured audit technology (e.g., Schwartz/Soo, 1996) and for industry specialization of auditors (Habib/Bhuiyan, 2011). Other studies examine the impact of regulatory changes on audit delay, e.g. accelerated filing requirements (Krishnan/Yang, 2009), and voluntary compared to forced auditor changes (Tanyi et al., 2010). While the majority of audit delay studies concentrate on information retrievable from publicly available sources, a small number of papers also use internal auditing firm information obtained from surveys (Ashton et al., 1987; Knechel/Payne, 2001; Behn et al., 2006).

In their majority, extant studies examine U.S. settings or are set in emerging capital markets (e.g., Ng/Tai, 1994; Hossain/Taylor, 1998; Al-Ajmi, 2008; Lee/Jahng, 2008). Studies conducted in European settings investigate Greek (Leventis et al., 2005), Spanish (Bonsón-Ponte et al., 2008) and French (Soltani, 2002) companies. Because the German setting differs substantially from the U.S. in terms of the institutional setup, governance
mechanisms, litigation environment, and financial reporting requirements, findings from prior studies do not naturally translate to Germany. The only study so far, Ruhnke and Au (1998), which is set in a pre-IFRS setting, investigates the determinants of audit delay for a sample of 100 German public companies. The authors document an average audit delay of 91 days, which is significantly related to complexity- and risk-related factors (industry, number of employees, cashflow, ratio of cashflow to debt, cash ratio, complexity of the corporation, ratio of financial assets to total assets, debt ratio), to the incidence of ›busy auditors‹ (fiscal year ends on 31 December), and to determinants such as return on equity and a stock exchange listing.

Expanding on Ruhnke and Au (1998), ours is to our knowledge the first paper to investigate determinants of audit delay in a pure mandatory IFRS setting for a broad sample of listed firms, in an era of increasing enforcement, governance and market regulation in Germany, and strong capital market forces. We conjecture that audit delay is determined by four kinds of factors: Accounting complexity, enforcement-related determinants, firm characteristics, and market determinants. For each of these categories, we develop hypotheses:

**Accounting complexity**

IFRS 3 (Business Combinations) and IAS 36 (Impairment of Assets) set out complex rules for purchase price allocation and goodwill impairment (e.g., Ernst, 2012). Therefore, we expect the relative proportion of goodwill to be positively associated with audit delay, because auditing procedures become more complex and time-consuming with an increasingly material proportion of goodwill, as IAS 36 mandates annual impairment testing, which is typically based on exhaustive present value calculations. As a second accounting-related determinant, we expect the duration of the audit to be longer for firms that conducted a M&A transaction during the reporting year, given the complex and resource-intensive regulations IFRS 3 sets out in terms of purchase price allocation, including the identification of hitherto unrecognized intangible assets and contingent liabilities, and the computation of fair values for all acquired assets and liabilities. Therefore, we state our first hypothesis as follows:

**H1: Audit delay is positively associated with accounting complexity**

(proportion of goodwill/M&A transactions)

**Enforcement-related determinants**

We conjecture that audit delay is related to enforcement activities, as performed by auditors and enforcement institutions. With respect to the former, large auditing firms on average command more detailed expertise and human resources than smaller ones (Ashton et al., 1989; Bonsón-Ponte et al., 2008; Lee/Jahng, 2008). This is particularly relevant for IFRS accounting, which requires substantial expert knowledge in specialized areas such as, pension accounting, deferred taxes, or impairment testing. This results in the second hypothesis:

**H2: Audit delay is negatively associated with auditor size.**

Concurrent with the introduction of IFRS as of 2005, EU member states have been required to install enforcement institutions that conduct reviews of (audited) financial statements of listed firms. To that end, the German legislator in 2004 adopted the ›Bilanzkontrollgesetz‹ (BilKoG), which established the legal foundations for a two-tier enforcement mechanism that went into operation mid-2005 and includes a private body, the German Enforcement Panel DPR, and the securities authority BaFin. Firms found to have published materially erroneous financial statements are penalized by mandatory publication of these infringements via error releases (›name and shame‹). Recent evidence suggests that market participants impose market value discounts on censured firms (Hitz et al., 2012). Also, prior evidence from U.S. enforcement actions conducted by the Securities and Exchange Commission suggests a comparatively higher likelihood of auditor change and increased risk of litigation after a firm has been censured for accounting malfeasance (e.g., Beneish, 1999). Taken together, this suggests that publication of a DPR/BaFin error announcement represents a ›critical event‹ that likely increases the auditor’s risk assessment and also leads to more intensive efforts in documenting the auditing process, to illustrate the quality of the audit. Also, given the threat of litigation and negative market impact, firms may feel inclined to document increased emphasis on accounting and auditing quality. Because these ef-
ffects are all likely to substantially increase the scope and duration of the audit process, we state our third hypothesis as follows:

**H3: Audit delay is incrementally larger for firms that were censured by the DPR/BaFin mechanism for publishing materially erroneous financial statements.**

**Firm characteristics**

As pointed out above, previous research provides evidence that audit delay is linked to various firm characteristics. Following up on that literature, profitability is expected to be negatively linked to audit delay, because higher levels of return on equity indicate good financial condition of a company (Ruhnke/Au, 1998):

**H4: Audit delay is negatively associated with return on equity.**

In contrast, we expect a positive link between leverage and audit delay. Because leverage is a measure of financial risk, it is indicative of the financial condition of a company and any ensuing incentives for managers, e.g. to manage earnings. Therefore, given this indication of intrinsic risk, we expect auditors to intensify their efforts with increased leverage, thus prolonging the audit delay (Carslaw/Kaplan, 1991; Bamber et al., 1993):

**H5: Audit delay is positively associated with leverage.**

**Market determinants**

Firm managers can be expected to have an interest in informing investors about good company news on a timely basis (Ruhnke/Au, 1998). Thus, we conjecture measures of good news (price earnings ratio, dividend yield and an increased dividend) to be inversely related to the audit delay:

**H6: Audit delay is negatively associated with firm performance (P/E ratio, dividend yield, dividend increase).**

Also, we expect pressure from capital market participants to further reduce audit delay. Thus, market capitalization, as a measure for company size, is predicted to be negatively linked to audit delay, because larger companies are on average subject to higher scrutiny from capital market participants than smaller ones, also reflected in general public attention (Dyer/McHugh, 1975).

**H7: Audit delay is negatively associated with firm size.**

We expect market attention to be particularly high for firms with a strong capital market orientation, as reflected in a listing at a foreign stock exchange. Such a cross-listing creates additional visibility and thus attention from media and financial analysts (Baker et al., 2002; Lang et al., 2003), which in turn is expected to create incentives for timely reporting and therefore for reducing audit delay:

**H8: Audit delay is incrementally shorter for cross-listed firms.**

We further conjecture that firm-specific reporting incentives, or a general attitude to transparency, create incentives to provide a fast close, and to reduce audit delay respectively. IFRS adoption policy is one factor indicative of the firm-specific reporting attitude. Since 2005, the IFRS regulation requires firms listed at a stock market in a EU member country to prepare their consolidated accounts in accordance with IFRS. In contrast to IFRS, German GAAP are considered to be less informative for investors since they are traditionally aimed at measuring income distributable to owners and taxable profit (e.g., Leuz/Wüstemann, 2004). Prior research establishes that voluntary adopters of IFRS or comparable standards like US-GAAP are more forthcoming with information, i.e. have particularly high incentives to provide high quality reporting (e.g., Christensen et al., 2008). Because timely reporting represents one dimension of reporting quality, we expect a negative relation between audit delay and high quality reporting incentives, as indicated by the self selection of firms that voluntarily adopted IFRS (Soderstrom/Sun, 2007):

**H9: Audit delay is incrementally shorter for firms that voluntarily adopted an international accounting standard prior to 2005.**

Finally, we expect auditors to increase their efforts if they have indications of earnings management. This is in line with a risk-based approach to audit-
ing. The literature on earnings management provides a vast array of measures for earnings management. Given the capital market context of our study, we focus on one indicator that prior literature has consistently demonstrated to create high incentives for upward earnings management, loss avoidance. The rationale here is that markets have very different perceptions of small losses as opposed to small profits (Burgstahler/Dichev, 1997; Degeorge et al., 1999; Leuz et al., 2003).

Therefore, firms have incentives to turn small losses into small profits by managing earnings, thus avoiding losses. We expect auditors to recognize the presence of incentives to manage earnings and therefore state our final hypothesis as follows:

**H10:** Audit delay is incrementally larger for firms that reported a small profit.

### 3. Methodology

To test our hypotheses, we estimate different versions of the following model using OLS-regression:

\[
AD_i = \beta_0 + \beta_1 MA_i + \beta_2 GOODWILL_i + \beta_3 BIG4_i + \beta_4 DPR_i + \beta_5 ROE_i + \beta_6 LEV_i + \beta_7 SIZE_i + \beta_8 PER_i + \beta_9 DIVYIELD_i + \beta_{10} DIVCHANGE_i + \beta_{11} FOREIGNLIST_i + \beta_{12} VOLADOPT_i + \beta_{13} LOSSAVOID_i + \epsilon_i
\]

Audit delay (AD) is measured as the time span (days) between the reporting date (fiscal year end) and the date of the auditor’s opinion. MA is an indicator variable, which takes the value of one if an acquiring company completed an M&A transaction (only public target companies are included) in fiscal year 2009, and zero otherwise. GOODWILL is calculated as the ratio of goodwill to total assets. We follow prior literature and proxy for auditor size by a binary variable that takes the value of one when the audit firm belongs to one of the four global networks of auditing firms, the so-called “big four.” Accordingly, our test variable BIG4 takes the value of one if a company was audited by either PricewaterhouseCoopers, KPMG, Ernst & Young or Deloitte & Touche, and zero otherwise. However it needs to be cautioned that the extant evidence is not comprehensively supportive of the notion that big four firms provide high quality audits. For instance, Francis and Wang (2008) provide evidence that earnings quality of firms audited by a big four auditor is higher only in countries with strict investor protection. Consistent with this, Verriest (2011) shows that analyst forecasts for firms audited by a big four auditor are more accurate only in strong investor protection countries. Also, the results of Krishnan (2003) and Lim and Tan (2008) show that the quality of audits fluctuates also among big audit firms due to industry specialization.

DPR equals one if a DPR/BaFin error announcement was published by the respective firm between July 2005 (when the DPR/BaFin enforcement mechanism was established) and December 2009, and zero otherwise. ROE is the return on equity, calculated as the percentage ratio of net income to total equity. LEV is the debt to equity ratio, measured as the percentage ratio of reported liabilities to book value of equity. SIZE is the natural log of market capitalization. PER, the price earnings ratio, is measured by dividing the market price per share through earnings per share. DIVYIELD is the dividend yield, which is calculated as the percentage ratio of the most recent full-year dividend and the current share price. DIVCHANGE takes the value of one if the full-year dividend per share of 2009 is higher compared to the full-year dividend per share in 2008, and zero otherwise. FOREIGNLIST is an indicator variable which equals one if either the company’s shares are listed on at least one foreign stock exchange in addition to the domestic listing at the Frankfurt Stock Exchange (FWB) or the company’s stocks are traded as American depositary shares (ADSSs), and zero otherwise. The indicator variable VOLADOPT equals one if an international accounting standard was voluntarily adopted by a company before 2005, and zero otherwise. LOSSAVOID takes the value of one when a zero profit or a small profit (a value smaller than 0.01 for the ratio of earnings to total assets) occurred, and zero otherwise (Leuz et al., 2003).

### 4. Empirical findings

#### 4.1. Sample selection and data collection

We examine annual consolidated IFRS financial statements of companies listed in the Prime Standard in 2009. Accordingly, we investigate the fourth fiscal year after mandatory adoption of IFRS, rul-
ing out first-time adoption effects. As of 31 December 2009, 376 companies were listed in this segment. 22 companies had to be excluded from our sample, since either only their preferred shares were listed on the FWB, or they were listed with both ordinary shares and preferred shares or different types of ordinary shares. In the latter two cases a company was included only once in the sample with its ordinary shares. Further 10 companies were excluded since they either prepared their consolidated accounts in accordance with US-GAAP, or did not prepare consolidated accounts at all. 24 companies were excluded because they were audited by either a foreign auditor or jointly by two auditors. In 10 cases, the annual report was not available. Two companies were excluded because their reporting period was shorter than 12 months. Finally, 39 companies had to be excluded due to missing data. Thus, our final sample includes 269 firm observations.

To calculate audit delay, the dates of the auditor’s opinion were collected from the annual reports. The names of auditing firms were taken from the annual reports. DPR/BaFin error announcements were collected from the German federal registry (elektronischer Bundesanzeiger). Details concerning the composition of the Prime Standard were taken from the FWB website. All other data was obtained from Datastream, I/B/E/S, SDC Platinum and Worldscope. The dependent and all continuous explanatory variables except GOODWILL, which has a natural lower and upper bound, are winsorized at the 2nd and 98th percentiles.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD</td>
<td>71.758</td>
<td>19.695</td>
<td>33</td>
<td>135</td>
</tr>
<tr>
<td>GOODWILL</td>
<td>0.115</td>
<td>0.131</td>
<td>0</td>
<td>0.615</td>
</tr>
<tr>
<td>ROE</td>
<td>−1.034</td>
<td>27.892</td>
<td>−105.16</td>
<td>51.76</td>
</tr>
<tr>
<td>LEV</td>
<td>97.719</td>
<td>175.669</td>
<td>0</td>
<td>1019.22</td>
</tr>
<tr>
<td>SIZE</td>
<td>5.475</td>
<td>2.033</td>
<td>2.524</td>
<td>10.484</td>
</tr>
<tr>
<td>PER</td>
<td>15.427</td>
<td>31.872</td>
<td>−36.91</td>
<td>158.5</td>
</tr>
<tr>
<td>DIVYIELD</td>
<td>1.779</td>
<td>2.077</td>
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<td>7.06</td>
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<table>
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</tr>
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<tr>
<td>DPR</td>
<td>23</td>
<td>246</td>
</tr>
<tr>
<td>BIG4</td>
<td>189</td>
<td>80</td>
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<tr>
<td>DIVCHANGE</td>
<td>83</td>
<td>186</td>
</tr>
<tr>
<td>FOREIGNLIST</td>
<td>47</td>
<td>222</td>
</tr>
<tr>
<td>VOLADOPTER</td>
<td>229</td>
<td>40</td>
</tr>
<tr>
<td>LOSSAVOID</td>
<td>28</td>
<td>241</td>
</tr>
</tbody>
</table>

Table 1: Descriptive statistics. This table presents descriptive statistics for the test variables used in our main analyses. Definitions of variables used are given in section 3.
4.2. Descriptive statistics

Table 1 presents the descriptive statistics for the continuous and categorical variables. Figure 1 complements this data and plots the distribution of audit delay for our sample firms. While the shortest audit delay in our sample was 33 days, and the longest 135 days, the mean audit delay in our sample is 71.76 days, which is 19.24 days shorter than the mean audit delay of 91 days reported by Ruhnke and Au (1998). In comparison, Leventis et al. (2005) find a mean audit delay of 98 days in their sample of 171 Greek companies, and Bonsón-Ponte et al. (2008), who examine a sample of 105 Spanish companies, find a mean audit delay of 81.50 days. Prior studies from the U.S. report shorter mean audit delays, e.g. Bamber et al. (1993) document 40 days, and Ashton et al. (1989) report 55 days. Taken together, these comparative findings are in line with our general conjecture that (increasing) capital market forces and reporting demands have reduced audit delay over time.

Table 2 reports Pearson correlations of our continuous test variables. All values are well below the threshold of |0.8|, which suggests that multicollinearity is not a serious issue.

4.3. Multivariate results

Table 3 presents the results of our regression analysis. We estimate five different models, one model for each category of determinants, and a full model. As the main findings are robust across the different model specifications, we confine our discussion to the results of the full model (model 5).

While all explanatory variables which were found to be statistically significant in our regression have their predicted signs, we find no evidence that accounting-related factors are associated with the duration of the audit. Both our variables $MA$ and $GOODWILL$ show no significant relation with audit delay, which suggests that neither recently concluded firm transactions nor the
proportion of recognized goodwill appear to prolong the auditing process. H1 is therefore rejected. One explanation for this finding is that both accounting issues, in principle, can be resolved prior to fiscal year end, and auditors may correspondingly review these processes on a timely basis. For instance, purchase price allocation refers to the acquisition date during the fiscal year. Also, while impairment tests are to be conducted on an annual basis, they are not required to coincide with the fiscal year end.

With respect to enforcement-related factors, we corroborate our hypothesis H2 that the presence of a big auditing firm (variable: \textit{BIG4}) significantly (at the 10\% level) reduces the audit delay. Consistent with prior findings, our analyses therefore confirm the negative association between auditor size and audit delay. In contrast, and in line with our third hypothesis (H3), enforcement actions appear to have a material prolonging effect on the audit delay. Our binary variable \textit{DPR}, which indicates that a firm has been censured for erroneous accounting by the DPR/BaFin mechanism at least once, displays a significant positive relation (at the 10\% level) with audit delay. The size of the variable is economically meaningful and suggests that firms which have been subject to adverse disclosure under the German enforcement mechanism experience an audit delay that is on average nine days longer than for uncensored firms. This finding confirms prior findings that ›enforcement matters‹, indicating that publication of a DPR/BaFin error finding markedly changes the accounting and auditing processes and environment for the respective firms.

Findings are mixed with respect to our third set of variables that capture firm characteristics. While there is no significant association between profitability (variable: \textit{ROE}) and the duration of the audit, which leads us to reject H4, leverage (variable: \textit{LEV}) shows the predicted positive association, which is significant at the 10\% level. We therefore accept our fifth hypothesis (H5). One casual interpretation of these findings is that good financial health, as indicated by high profitability, does not reduce auditors’ efforts, because auditors are still required to conduct a certain amount of tests and checks to ascertain the required level of reliability of their findings. In contrast, high leverage appears to serve as a red flag which indicates higher intrinsic risk and therefore requires auditors to expand their activities. Also, leverage is likely correlated with other unobservable factors that indicate agency problems of financial distress, and likewise trigger higher auditor vigilance.

With respect to market determinants, we find no consistent evidence in support of H6 that better firm performance reduces the audit delay, as only dividend yield shows the predicted sign and is significant (at the 1\% level). Also, we find no evidence in support of H10 that audit delay increases for firms with small or zero profits. While this suggests that this particular earnings management incentive does not materially impact the auditing process, we caution that this result does not translate to earnings management incentives in general, which have not been thoroughly investigated in this study.

On the other hand, our test variable that captures firm size (\textit{SIZE}) is negative and significant at
Regression results (dependent variable: audit delay)

<table>
<thead>
<tr>
<th></th>
<th>Expected sign</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
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<tbody>
<tr>
<td>Intercept</td>
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<td>77.184 (0.000)</td>
<td>70.935 (0.000)</td>
<td>105.381 (0.000)</td>
<td>101.426 (0.000)</td>
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<td>Accounting complexity</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA (+)</td>
<td></td>
<td>-7.436 (0.326)</td>
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<td></td>
<td></td>
<td>3.094 (0.564)</td>
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<tr>
<td>GOODWILL (+)</td>
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<td>-7.527 (0.414)</td>
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<td>3.249 (0.727)</td>
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<td>Enforcement-related determinants</td>
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<td></td>
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<tr>
<td>BIG4 (-)</td>
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<td>-9.150 (0.000)</td>
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<td>-4.303 (0.081)</td>
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<td>DPR (+)</td>
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<td>11.726 (0.071)</td>
<td></td>
<td>9.048 (0.091)</td>
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<td>Firm characteristics</td>
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<tr>
<td>ROE (-)</td>
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<td>-0.215 (0.001)</td>
<td></td>
<td>-0.104 (0.121)</td>
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<td>LEV (+)</td>
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<td>0.006 (0.392)</td>
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<tr>
<td>SIZE (-)</td>
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<td></td>
<td>-3.529 (0.000)</td>
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<tr>
<td>PER (-)</td>
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<td>FOREIGNLIST (-)</td>
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<td>-6.825 (0.008)</td>
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<td>VOLADOPT (-)</td>
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<td>LOSSAVOID (+)</td>
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<td>6.793 (0.094)</td>
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<td>F</td>
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</table>

Table 3: Regression results (dependent variable: audit delay) This table presents results from OLS-regressions of our dependent variable, audit delay (AD), on explanatory variables consistent with our hypotheses H1-H10. Definitions of variables used are given in section 3. Models 2-5 use heteroskedasticity-robust (HC3) standard errors (MacKinnon/White, 1985). Reported values are coefficients, and p-values in parentheses.
the 1% level, corroborating H7. The same applies to high transparency firms, as witnessed by early adoption of an international reporting standard (VOLADOPT). This finding supports H9 that firms committed to high-quality financial reporting are particularly eager to publish their financial results in a timely manner, and provide a general level of accounting quality that facilitates the auditing process. An additional, non-exclusive interpretation is that these firms have more years of experience in preparing IFRS accounts. In turn, their auditors are more experienced in auditing these IFRS financial statements, which suggests learning effects that potentially reduce duration of the audit. Correspondingly, and in line with H8, another indicator of commitment to transparency, the presence of a cross-listing (FOREIGNLIST), is also significant (at the 5% level). Taken together, these findings suggest that pressure from market participants and managerial incentives to inform investors about good news on a timely basis play an important role in shaping the length of audit delay.

The adjusted R² is 34.13% for the full model, suggesting that our model has sufficient explanatory power and does a satisfactory job at explaining audit delay. In particular, potentially owing to our inclusion of additional variables that have not been investigated in prior studies, goodness-of-fit is higher compared to the prior study by Ruhnke and Au (1998), who report an adjusted R² of 31.09% for their whole sample regression. Other European studies provide markedly lower explanatory power, e.g., Leventis et al. (2005) report an adjusted R² of 24.30%, Bonsón-Ponte et al. (2008) an adjusted R² of 19.03%.

4.4. Additional analyses

We conduct further analyses to address the robustness of our main findings. First, the German auditing market is specific because a fifth auditing firm, BDO, is conventionally regarded as large in the sense of providing high-quality audits (e.g., Gassen/Skaife, 2009). Therefore, we re-run our regression using a Big5 indicator variable instead of the Big4 variable. Essentially, this modification leaves our main results unaltered.

Second, we include three additional variables into our analyses to glean additional insights. A fiscal year end in December, which is quite common among firms in our sample (only 35 out of 269 firms have fiscal year ends other than 31 December), indicates a high demand for audit services during this period of time and thus may have a prolonging effect on audit delay (e.g., Ruhnke/Au, 1998; Krishnan/Yang, 2009). However, our analyses fail to demonstrate a significant impact of this “busy season” indicator variable. Also, an auditor change (e.g., Leventis et al., 2005) that occurred during the reporting period (22 observations) does not have a significant impact on audit delay. Finally, “bad news”, measured as smaller actual earnings per share (EPS) relative to the latest mean consensus analyst EPS forecast published before the earnings announcement date (120 out of 250 available observations), also has no significant prolonging effect on audit delay (Lee et al., 2008).

5. Conclusion

We investigate the determinants of audit delay, the time span between the reporting date and the date of the auditor’s opinion, in the post-IFRS adoption period, a period of tightened standards on reporting, enforcement, and governance, and increased informational demands by capital market participants. While we cannot demonstrate that presumably complex accounting issues related to business combinations and goodwill impairment impact audit delay, we confirm prior evidence that large audit firms reduce the duration of the audit. In addition, we provide novel evidence that the activities of the German two-tier enforcement system also impact the auditing process, as firms that have been censured by the DPR/BaFin mechanism for producing erroneous financial statements experience significantly longer audits (nine days on average) compared to uncensored firms. This finding augments prior literature and demonstrates how the introduction of an enforcement mechanism has altered the reporting and auditing environment in Germany. Again in line with prior literature, we find that financial risk, proxied by leverage, increases audit delay. More importantly, we find rich evidence that market-related factors appear to shape the duration of the audit. Variables that proxy for firms’ commitment to transparent reporting (voluntary adoption of international standards, foreign listing) and variables that capture firm visibility and market attention (dividend yield, market...
capitalization) all turn out to reduce audit delay on average.

Our findings are important as they provide insights into factors that influence audit delay in the era of mandatory IFRS application and tightened regulation of enforcement. In particular, we show how enforcement-related factors and market demand for a fast close act together in shaping audit delay. These analyses therefore help to understand the factors behind the ever-decreasing time span between fiscal year end and publication of financial statements. At the same time, they help to identify market factors that may be critical for audit quality in the sense that they pressurize managers, and auditors in turn, to provide timely reporting, at the peril of further reducing the window for in-depth auditing procedures, potentially jeopardizing the reliability of auditors’ findings.

Our findings are subject to several limitations. First, audit delay per se is but a crude measure of auditor effort and is therefore a noisy indicator at best, e.g. of audit quality. In particular, owing to data restrictions, we cannot control for firms that adopt a fast close/hard close concept, thereby reducing observed audit delay. Second, while we do not find accounting effects to play a role for audit delay, these findings are confined to our focus on business combinations. We cannot rule out that other complex accounting issues, e.g. in the sphere of financial instruments, do indeed impact the auditing process. More generally, our findings are restricted by the quality of our empirical constructs. For instance, the Big4-proxy as a measure of audit quality needs to be treated with some caution, given its interaction with the general strength of enforcement and investor protection on the country level. At the same time, these limitations point at avenues for future research. Due to increased regulatory concern with audit quality, we believe more research is warranted into the economic effects of audit quality. To that end, we suggest to investigate the impact of enforcement- and market-related determinants on other quality aspects of the auditing process, in particular alternative measures of actual auditor effort, e.g. staff hours spent on the audit, or audit fees, to further illicit our understanding of the forces that shape audit quality.

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Are clarified ISAs readable?

Sind Clarified ISAs lesbar?

Schlüsselbegriffe

Abschlussprüfung; Clarity Project; IFAC; ISAs; Lesbarkeit; Regulatoren

Keywords

Auditing; clarity project; IFAC; ISAs; readability; regulators

Zusammenfassung

Zielsetzung dieses Artikels ist es, die Frage, weshalb die IFAC Prüfungsstandards aus der weltweiten (und insbesondere der europäischen) Perspektive immer wichtiger werden, in einen Kontext zu setzen sowie die Analyse der Auswirkungen des »Clarity Projects« in Bezug auf die Lesbarkeit. Der Abschluss des »IFAC Clarity Projects« hinsichtlich der internationalen Prüfungsstandards (ISA) brachte weitere Dynamik in den Konvergenzprozess der Rechnungslegung, da die Funktion der Abschlussprüfung eine elementare Säule der Infrastruktur ist und folglich eine hohe Qualität aufweisen muss. Anschließend an die Analyse der regulatorischen Rahmenbedingungen wurden fünf ISAs, die verschiedene Aspekte des Prüfungsprozesses abdecken, ausgewählt. Für diese wird die Lesbarkeit vor und nach den durch das Clarity Projekt initiierten Modifikationen untersucht. Die Ergebnisse zeigen eine sehr geringe Lesbarkeit der ISAs. Die vorliegende Studie untersucht erstmals die Lesbarkeit der Prüfungsstandards und eröffnet dadurch neue Forschungsbereiche im Kontext hoher regulatorischer Aktivität.

Abstract

The objective of this paper is to contextualize why IFAC auditing standards are increasingly important from a worldwide perspective, as well as to analyse the impact of the Clarity Project as regards readability. Completion of the IFAC's Clarity Project on International Standards on Auditing brought further momentum to the convergence process of accounting, as the audit function is a key pillar of the infrastructure it needs to be considered of high quality. Having analyzed the regulatory framework of this study, we chose five ISAs covering different aspects of the audit process. We studied readability before and after the modifications introduced by the Clarity Project. Our results show very low readability of ISAs. This paper is pioneer in the study of readability of auditing standards so it opens up new avenues of research in a context of high regulatory activity.

Autoren

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1. Introduction

The quest for plain language in legal writing goes back a long way, especially in Anglo-Saxon countries. In recent years, all US federal agencies have been ordered to draft notices and regulations in plain English (Leche, 2002). In this context, and partly as a consequence of the Enron failure, the SEC now requires prospectuses and periodic reporting by public companies to be written in plain English. Obviously, these documents should be understandable and therefore, they should obtain a certain score in the Reading Ease Readability Formula (Cox, 2008, Raiborn et al. 2008). The final aim of this initiative is to improve information flow to investors.

Yet is it reasonable to expect »readable« reports from companies if regulators pass »not-so-readable« regulations? Should accounting/auditing standard-setting bodies make an effort in that direction and lead the way in the plain English movement as regards accounting information?

As Zeff (2007, p. 296) highlights, there is a trend towards global convergence in accounting, in the sense of »increasing compatibility« of national standards »at a high level of quality«. Hence, the fact that the quality of accounting systems relies on a complex financial infrastructure should not be overlooked. The audit function is a key pillar of that infrastructure and, as Ball (2006) notes, uniform standards can protect auditors against »opinion shopping« from managers. Completion of the Clarity Project on International Standards on Auditing (ISAs) in 2009 brought further momentum to the convergence process, as an important effort was made to clarify standards as well as to make them more »readable« (IAASB, 2007).

Therefore, the objective of this paper is to analyse whether the Clarity Project undertaken by the International Auditing and Assurance Standards Board (IAASB) has achieved one of its objectives, i.e. to result in »readable« ISA. So, we will test empirically readability of ISAs, before and after the Clarity Project. Hopefully, the results of this paper may influence IFAC to write ISAs using a more readable style.

2. Use of ISAs in the European Union and the »Endorsement Mechanism«

The International Standards on Auditing issued by the International Auditing and Assurance Standards Board, a standard setting board of the International Federation of Accountants (IFAC) are especially important in the European Union. In fact, the Eighth Directive (EU, 2006) states that Member States shall require their enforcement as ISAs are adopted by the Commission »in accordance with the regulatory procedure with scrutiny referred to in Article 48(2a)« (as ammended by EU, 2008). In order to adopt ISAs, the Commission should consider whether they »(a) have been developed with proper due process, public oversight and transparency, and are generally accepted internationally; (b) contribute a high level of credibility and quality to the annual or consolidated accounts in conformity with the principles set out in Article 2(3) of Directive 78/660/EEC and in Article 16(3) of Directive 83/349/EEC; and (c) are conducive to the European public good«.

Under the Eighth Directive, the EU Commission shall adopt implementing measures, using the »comitology« procedure (Schockaert/Houyoux, 2008), with the assistance of the Audit Regulatory Committee (AuRC)-composed of Member State representatives.

In 2005, the EU Commission set up a »European Group of Auditors’ Oversight Bodies« (EGAOB) to ensure effective coordination of new public oversight systems of statutory auditors and audit firms within the European Union. These national bodies...
María A. García-Benau/Ana Zorio/Josefina Novejarque

are meant to oversee: a) the approval and registration of statutory auditors and audit firms, b) the adoption of standards on ethics, internal quality control of audit firms and auditing, and c) continuous education, quality assurance and investigative and disciplinary systems.

The EGAOB provides the Commission with technical support for preparing measures to implement the Eighth Directive. To do so, and with the agreement of AuRC, the EGAOB created an ISA subgroup in 2006 (EGAOB, 2008). The main objective of this subgroup is to provide proactive input for the IAASB’s standard setting process. Indeed, the ISA subgroup has assisted the EU Commission in sending comment letters on most draft ISAs2 (see figure 1). It has also monitored the IAASB work program and provided advice to the Commission on the IAASB 2009–11 strategic plan.

According to the Proposal for a Directive amending Directive 2006/43/EC (EU, 2011c), »Member States shall ensure that statutory auditors and audit firms comply with international auditing standards when carrying out statutory audits as long as those standards are in conformity with the requirements of this Directive« (art. 26). As Schockaert and Houyoux (2008) point out, this could hinder harmonisation among EU countries. Moreover, it could lead to «spurious harmonisation and lowest common denominator standards», according to ICAEW (2006).

Nonetheless, it is important to bear in mind that differences in culture, accounting tradition and the whole financial reporting systems cannot be ignored in this process (Zeff, 2007). However, it has been demonstrated that the cost-benefit analysis to adopt them in the EU is very positive (Kohler, 2009) and that the user community supports them (IOSCO, 2009; Fraser, 2010; EU 2010).

Following the issuance of a Green Paper »Audit Policy: Lessons from the crisis« (Humphrey et al. 2011), the European Commission has announced two important proposals aimed at reforming and strengthening the auditing system in the EU. The Commission plans to introduce a Directive to amend the Statutory Audit Directive (Directive 2006/43/EC); and a new Regulation dealing with specific requirements regarding statutory audit of public-interest entities (such as banks, insurance companies and listed companies) (EU, 2011a; EU 2011b).

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2 These comment letters can be downloaded at http://ec.europa.eu/internal_market/auditing/isa/index_en.htm
The main objectives of these two proposals are to clarify the role of the auditor; to reinforce auditor’s independence and professional scepticism; to dynamise the audit market; to improve the supervision of auditors; to facilitate cross-border provision of statutory audit services; and, last but not least, to assist SMEs by reducing burdens on them.

Among other key changes in the proposal for a Regulation, we should highlight the following:

- Mandatory rotation of the audit firm after 6 years (9 years if two audit firms used). A cooling off period of 4 years would be applicable;
- Mandatory tendering for audit mandates, and stricter rules on the appointment of auditors with an increased role for the audit committee.
- Auditors will be prohibited from providing non-audit services to audit clients.
- Big audit firms will be required to separate their audit activities into pure audit firms.
- EU-level cooperation by the European Securities and Markets Authority. The mandate, powers and independence requirements for audit supervisors would be established at EU level, but supervision would be carried out nationally.
- European certification by ESMA of audit firms’ aptitude to perform high quality audits of listed companies.
- Mutual recognition of statutory auditors approved in Member States to ensure cross-border mobility of auditors (European Passport for auditors);
- Expanded content of the audit report to provide more information to all stakeholders; as well as an additional more detailed audit report itself for the audit committee and management of the audited entity, which upon request, should be made available to the competent authority;
- New requirements on the internal organization and governance of audit firms.
- Compliance with the ISA by all statutory auditors and audit firms.

As can be derived from the above, it looks as if the EGAOB is going to have less power in this process, because the ESMA might play a more important role as regards auditing in the EU.

This final point is especially relevant for our study. In fact, article 20 in the proposal for a Regulation of firms auditing PIEs states that “The statutory auditor(s) or the audit firm(s) shall comply with the international auditing standards referred to in Article 26 of Directive 2006/43/EC when carrying out the statutory audit of public-interest entities as long as those standards are in conformity with the requirements of this Regulation” and article 26 in the proposal of Directive, states that “in order to enhance the quality of statutory audits performed in the Union, Member States are required to ensure that statutory auditors and audit firms carry out audits in accordance with the international auditing standards.” This fact, i.e. compliance with ISAs has also to be clearly stated in the audit report (article 22).

The proposal for a Directive indicates that Member States could impose additional national audit procedures or requirements only if they are needed because of specific national legal requirements not covered by the adopted ISAs, and only if they add to the credibility and quality of annual financial statements and consolidated financial statements and are conducive to the Union public good.

3. ISAs and the IAASB Clarity Project

Established back in 1977, IFAC is a private global organization dedicated to serving the public interest by strengthening the accountancy profession and developing standards in the areas of auditing, education, ethics, and public sector financial reporting. It aims to ensure the competence and integrity of accountants around the world and to support them in serving society as providers of high quality services.

The IAASB is an independent standard-setting board within IFAC (see figure 2). It aims to serve the public interest by setting high-quality auditing and assurance standards. It works for the convergence of international and national standards, improving the quality and uniformity of audit practice worldwide.

In 2005, the Public Interest Oversight Board (PIOB) for accountancy was established as a result of the 2003 IFAC’s structural reorganisation. Its ten members were nominated by the International Organization of Securities Commissions (IOSCO), the Basel Committee on Banking Supervision, the International Association of Insurance Supervisors, the World Bank and the European Commission. As an independent body, the PIOB oversees the standard setting process within IFAC to ensure that the
standards developed by IFAC’s boards respond to public interest. As a result, the PIOB oversees IAASB activities, and establishes IAASB due process and working procedure.

Audit firms have an intrinsic interest within IFAC. This was recognised through the creation in 2001 of the Forum of Firms (FoF) as well as the FoF’s representative body within IFAC’s organisational structure.

IFAC Constitution was revised in 2011. The organisation supports four independent standard-setting boards:
- International Audit and Assurance Standards Board (IAASB)
- International Accounting Education Standards Board (IAESB)
- International Ethics Standards Board for Accountants (IESBA)
- International Public Sector Accounting Standards Board (IPSASB)

In addition it has three constituency-focused committees (see IFAC, 2011), which are as follows:
- Professional Accountancy Organization (PAO) Development Committee
- Professional Accountants in Business (PAIB) Committee
- Small and Medium Practices (SMP) Committee

As many countries as are adopting (or in the process of adopting) ISAs, the IAASB undertook a mission to «clarify» all of its standards. This is the so-called «Clarity Project», begun in 2003 with a view to ensuring that IAASB standards are «principles-based» (Dennis, 2008), understandable, clear and capable of consistent application throughout the world. According to IAASB (2007), the aim of the Clarity project is to improve the clarity of IAASB standards, so as to make them more readable and to avoid any possible ambiguity as to what they require and what is guidance, thereby improving the consistency with which they are implemented by

Fig. 2: IFAC governance structure (Source: http://www.ifac.org/publicationsresources/ifac-2011-annual-report)

3 Mainly in the European Union as a consequence of the Eighth Directive as well as many non-English speaking countries.
auditors. As a result, increased clarity should lead to enhanced uniformity and quality of audit services. The project’s most important points are as follows:

- All ISAs are to have the same structure, consisting of the following main sections: Scope, Effective date, Objective to be achieved, Definitions, Requirements, Application Material, and Appendices and examples, where applicable. The new structure implies that the bold /grey-lettering code to differentiate compulsory or non-compulsory paragraphs is no longer needed. More precisely, ISA 200 sets out how the objectives, requirements, and guidance in all ISAs are to be understood.
- Setting an overall objective in each ISA and establishing the auditor’s obligation as regards that objective.
- Clarifying auditor obligations in ISAs through the language used (e.g. using »shall« in the requirements section and present tense in the other sections of the ISA)
- Using shorter sentences, removing obvious ambiguity and repetitions.

As a first step, in 2006, these conventions to be used by the IAASB in redrafting existing or drafting future ISAs were approved as amendments to the Preface to the International Standards on Quality Control, Auditing, Review, Other Assurance and Related Services.

The following table shows the final set of clarified standards, which includes 36 ISAs (16 standards of which contain new and revised requirements (referred to as »revised and redrafted ISAs»); and 20 standards that have been simply redrafted and a completely new standard, International Standard on Quality Control 1.

All clarified ISAs4 are effective for audits of financial statements for periods beginning on or after December 15, 2009. As a response to stakeholders’ requests for some stability in the set of standards, the IAASB has committed itself not to issue new standards effective in the next two years.

The PIOB, CAG and several national regulators have expressed increasing confidence in standards clarified by the IAASB. As Loft et al. (2006) highlight when looking into IFAC’s governance, IAASB members are chosen because of their well-known expertise and work in the public interest. Even though some of them are from the Big4, they have to acknowledge independence from their firm in an ad hoc form, as regards their involvement in IAASB activities.

Politics, however, can be rarely kept out from the standard-setting debate, as several voices point out in the literature. Indeed, it is rather easy to imagine an individual IAASB member finding it difficult to adopt a balanced position if under pressure from representatives of the large accounting firms or national authorities (Simnet, 2007). Delaportas et al. (2008) goes a step further in stating that, in his view, the IAASB’s structure is clearly dominated by the Big4 from mostly the UK, USA and a few other Anglo-Saxon countries. Nonetheless, Glover et al. (2009) argue that the USA has lost its leadership role with respect to auditing standards, in favour of the IAASB, because it now uses ISAs as a foundation.

4. Readability and the Clarity Project

Readability is that quality in writing which results in quick and easy communication.Readable writing communicates precisely and with a single reading (Lesikar and Lyons, 1986, p. 21). The study of Readability is based on analysis of the characteristics of a text (Schroeder/Gibson, 1990; Smith/Taffler, 1992); that is, readability has to do with the ways in which a text can be read (Gilliland, 1972; Barnett/Loeffler, 1979).

There is an important debate on text readability and understandability in the literature. The two concepts are obviously related but different. In order to gain better understanding of our research presented here, it is important to clarify these concepts. Readability measures how difficult it is to read a text whereas understandability measures how difficult it is to understand a text. Jones (1997) provides a good discussion of the differences between readability and understandability. While readability per se is constant for all readers, their ability to understand material depends on their personal characteristics such as background, knowledge, interest, and general reading ability. Therefore, readability provides an impartial, objec-

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4 These clarified standards should be used as a basis for translation in different languages and can be downloaded free of charge from www.ifac.org, together with the Basis for Conclusions for each project.
ative measure. It does not focus on reader interest and requires no input from readers. In this paper we would like to concentrate on the analysis of readability of ISAs.

Prior research has shown that the readability index can be used to assist in predicting the readability of legal documents (Tan/Tower, 1992). In October 1998, the SEC issued new plain English disclosure guidelines that encouraged the use of plain English in the drafting and formatting of all prospectuses in domestic and foreign public offerings. More recently, the SEC has taken several steps to make the disclosure of mutual funds more readable (See Li, 2008).

Table 1: Results of the Clarity Project: List of Clarified Standards (Source: www.ifac.org)

| ISA 200, Overall Objectives of the Independent Auditor and the Conduct of an Audit in Accordance with International Standards on Auditing |
| ISA 210, Agreeing the Terms of Audit Engagements |
| ISA 220, Quality Control for an Audit of Financial Statements |
| ISA 230, Audit Documentation |
| ISA 240, The Auditor’s Responsibilities Relating to Fraud in an Audit of Financial Statements |
| ISA 250, Consideration of Laws and Regulations in an Audit of Financial Statements |
| ISA 260, Communication with Those Charged with Governance |
| ISA 265, Communicating Deficiencies in Internal Control to Those Charged with Governance and Management |
| ISA 300, Planning an Audit of Financial Statements |
| ISA 315, Identifying and Assessing the Risks of Material Misstatement through Understanding the Entity and Its Environment |
| ISA 320, Materiality in Planning and Performing an Audit |
| ISA 330, The Auditor’s Responses to Assessed Risks |
| ISA 402, Audit Considerations Relating to an Entity Using a Service Organization |
| ISA 450, Evaluation of Misstatements Identified during the Audit |
| ISA 500, Audit Evidence |
| ISA 501, Audit Evidence-Specific Considerations for Selected Items |
| ISA 505, External Confirmations |
| ISA 510, Initial Audit Engagements-Opening Balances |
| ISA 520, Analytical Procedures |
| ISA 530, Audit Sampling |
| ISA 540, Auditing Accounting Estimates, Including Fair Value Accounting Estimates, and Related Disclosures |
| ISA 550, Related Parties |
| ISA 560, Subsequent Events |
| ISA 570, Going Concern |
| ISA 580, Written Representations |
| ISA 600, Special Considerations-Audits of Group Financial Statements (Including the Work of Component Auditors) |
| ISA 610, Using the Work of Internal Auditors |
| ISA 620, Using the Work of an Auditor’s Expert |
| ISA 700, Forming an Opinion and Reporting on Financial Statements |
| ISA 705, Modifications to the Opinion in the Independent Auditor’s Report |
| ISA 706, Emphasis of Matter Paragraphs and Other Matter Paragraphs in the Independent Auditor’s Report |
| ISA 710, Comparative Information-Corresponding Figures and Comparative Financial Statements |
| ISA 720, The Auditor’s Responsibilities Relating to Other Information in Documents Containing Audited Financial Statements |
| ISA 800, Special Considerations-Audits of Financial Statements Prepared in Accordance with Special Purpose Frameworks |
| ISA 805, Special Considerations-Audits of Single Financial Statements and Specific Elements, Accounts or Items of a Financial Statement |
| ISA 810, Engagements to Report on Summary Financial Statements |
| International Standard on Quality Control (ISQC) 1, Quality Controls for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements |

5 The US Internal Revenue Service has used the Flesch index.
Are clarified ISAs readable?

Adelberg (1979), Courtis (1986 and 1998), Stevens et al. (1992) and Jones and Shoemaker (1994) agree that readability formulas really capture the difficulty of reading narrative information. According to Davison and Kantor (1982), readability is a combination of factors measured by formulas, i.e. word and sentence length and other undefined factors which they call «Black Box». In short, these formulas are a fast, objective, reliable method for studying readability. This is the reason why we use readability indices for our research purposes.

Sydserff and Weetman (1999) studied readability formulas, showing that the factors that make a text difficult to read are complex and multidimensional.

Our research uses readability formulas supported by numerous previous studies demonstrating their validity for capturing whether accounting information is transmitted in a readable way (Li, 2008; Fialho et al., 2002; Casasola, 2007). In particular, we would like to draw the attention to the fact that readability of standards should be borne in mind by the regulator, specially now that ISAs have been revised within IAASB’s Clarity Project and they are in the process of being translated to many other languages. As explained in section two, these standards are to be widely introduced in Europe. Therefore a good level of readability would be desirable, not only in English but also in all the official languages of the European Union.

Several methods have been proposed to measure readability. They are based on specific formulas involving word length and sentence length (Smith/Taffler, 1992). These readability formulas are mathematical models that assign a score to a selected passage. According to Lilley et al. (2005) essentially, readability formulas measures sentence difficulty by counting the number of words per sentence and word difficulty by number of letters or syllables per word.

Table 2 below shows the most common measures of readability proposed in the international literature. All of them evaluate, some or all of the following items: average number of syllables per word, average number of words per sentence and the average number of sentences per paragraph.

The use of readability formula is the most common method in contemporary research for assessing readability. As Table 2 shows, the number of different readability formulas suggests there are different measures of readability. However, the Flesch index is the most widely used by prior research (Courtis, 1998). Some research shows high correlations between the Flesch formula and other readability indices (Gilliland, 1972). In this paper we use the Flesch index.

Flesch (1948) was the frontrunner in creating a formula for evaluating readability («Reading Ease») in a given text. The Reading Ease formula is based on the following equation:

\[
RE \text{ (Reading Ease)} = 206.835 - 0.846 \times \text{wl} - 1.015 \times \text{sl}
\]

where:
wl = number of syllables per 100 words of writing style
sl = average sentence length in words

According to Flesch, there are three aspects of writing known to affect readability: passive voice, sentence complexity and vocabulary complexity (Lilley et al., 2005).

Flesch established the following steps for measuring text readability (Flesch, 1948; see Table 3).

<table>
<thead>
<tr>
<th>Some relevant Index proposals</th>
<th>General basis of the readability index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flesch (1948)</td>
<td>The index considers the average number of syllables per word and the average number of words per sentence</td>
</tr>
<tr>
<td>Fog index (Gunning, 1952)</td>
<td>This index is based on the total number of words, words with three or more syllables and number of sentences in a paragraph.</td>
</tr>
<tr>
<td>McLaughlin (1969)</td>
<td>The index considers the number of words containing three or more syllables.</td>
</tr>
</tbody>
</table>

Table 2: Readability index considerations
Table 3: Steps defined by Flesch (1948)

Table 4: Interpretation of the results of Flesch’s Reading Ease formula (Source: Flesch, 1948, p. 230)

Flesch index gives written documents a Reading Ease score from 0 (most difficult to read) to 100 (easiest to read). The longer the sentences and the more syllables there are in each 100 words, the harder the text will be to read. One could think that a score around 40 could be acceptable for auditing standards, since previous research on legislation finds a RE-index around this score (Smith/Richardson, 1999; Sawyer, 2010).

5. Analysis of the Readability of selected ISAs

5.1. Sample and methodology

We applied the RE index to ISAs published before and after the Clarity Project. We took ISAs published in IFAC’s January 2006 Handbook of International Auditing, Assurance and Ethics Pronouncements (hereinafter referred to as «Old ISAs») and ISAs published by IFAC after the modifications...
introduced by the Clarity Project effective for audits of financial statements for periods beginning on or after December 15, 2009 and which we shall call «New ISAs». This procedure enabled us to analyse ISA readability before and after the Clarity Project and monitor the evolution.

We took a sample of five ISAs chosen to cover different aspects of auditing and we analysed the readability of each ISA following the steps proposed by Flesch.

The ISAs analysed in this paper are: ISA 402, ISA 505, ISA 540, ISA 620 and ISA 700. Their names have been slightly modified after the Clarity Project and are as follows:

- ISAs included in IFAC’s 2006 Handbook of International Auditing, Assurance and Ethics Pronouncement
  - ISA 402: Audit considerations relating to entities using service organizations
  - ISA 505: External confirmations
  - ISA 540: Audit of accounting estimates
  - ISA 620: Using the work of an expert
  - ISA 700: The auditor’s report on financial statements

- ISAs published as a result of the Clarity Project, 2009:
  - ISA 402: Audit considerations relating to entities using a service organization
  - ISA 505: External confirmations
  - ISA 540: Auditing accounting estimates, including fair value accounting estimates, and related disclosures
  - ISA 620: Using the work an auditor’s expert
  - ISA 700: Forming an opinion and reporting on financial statements

As can be seen, we have chosen ISAs that cover different aspects of auditing, ranging from internal and procedural aspects to the auditor’s report. For instance, ISA 402 belongs to the «Risk assessment and response to assessed risk» ISA group, ISA 505 and 540 to «Audit Evidence» ISA group, ISA 620 to «Using work of others» ISA group and ISA 700 belongs to the group «Audit conclusions and reporting».

As our selection comprises texts of different lengths, the number of samples taken varies according to text length. Thus, ISA 402, the shortest text has the smallest number of samples; whereas ISA 540 and 700 have the most samples as they are the longest texts in the analysis.

As this work analyses auditing standards, the readability formula study was carried out considering a series of basic, ad hoc hypotheses to ensure the same criteria were used for all the documents. The criteria were as follows:

- The old ISAs were subdivided into the parts which appear in each ISAs contents, because they lacked a standard structure. As the new ISAs do have an identical format, they were subdivided into the parts established by the contents, taking into account the fact that the section Application and other explanatory material is subdivided in turn according to the subject being dealt with in each ISA.

- As the Objectives and Definitions sections in the new ISAs have only one paragraph each which is under the 100 words required for the samples, we decided to combine the content, considering the two parts as a single section.

- All the standards analysed are characterised by a contents index divided into paragraphs rather than pages as normally happens in contents indices. Therefore we respected the pre-established numeration and we took odd-numbered paragraphs as the sample. In the word count, however, for paragraphs with less than 100 words, we continued counting into the next paragraph to reach the 100 word total, provided this was possible within each subsection of the text.

- In the sentence count, the sentence was considered after full stop, same paragraph; full stop, new paragraph; semicolon and/or colon provided there was a verb in the sentence.

- The word count did not include numbers or abbreviations. Given the eminently normative nature of our texts, we decided not to include abbreviations in the word count as results could be distorted.

- Where a paragraph contained a number representing a footnote, the content of the footnote was not included in the word count for the paragraph because normally the notes referred to paragraphs in other ISAs and contained the number and title of the ISA being referred to.

- Negative readability indices are outside the ranges which Flesch established for measuring text readability. In our study, negative readabil-

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6 New ISAs were downloaded from http://web.ifac.org/clarity-center/the-clarified-standards
ity indices correspond to samples containing a number of sentences below four in the sentence count for a sample of 100 words or a number closest to 100.

- The RE indexes in the tables below are calculated as the mean RE of all the samples taken for each ISA section or for the whole ISA.

The RE indexes were obtained through http://www.addedbytes.com/code/readability-score/. Some of the calculations were contrasted manually.

5.2. Analysis of the results

We present the results of our readability study at different levels. First, we offer the overall results for the ISAs and then analyse the evolution of readability, taking into account the differences observed in each section. Finally, we consider ISA readability after the Clarity Project.

Table 5 shows the overall results for the five ISAs analysed before and after the revision process they underwent in the Clarity Project.

Table 5 shows that readability of all the ISAs is very low. The old ISAs are very difficult to read except for old ISA 620 “Using the work of an expert” whose difficulties are comparable to academic-type publications. Furthermore, although ISA 505 “External confirmations” is the most difficult to read (6.23), its readability improves with the Clarity Project doubling its value to an RE index of 13.04, a 109.30% improvement in the index. Thus for this particular standard, the Clarity Project revision shows a positive evolution as regards readability.

However, it is interesting to emphasise that after the Clarity Project modification of the ISAs, readability can be seen to reach values which show how difficult they are to read as for all of them, reading difficulty is assimilated to scientific type publications. Even more striking is the fact that there has been no improvement in readability in any of the standards analysed except for ISA 505 “External Confirmations”. Generally speaking, the worsening of RE index in the ISAs varies between 30.23% in ISA 402 “Audit considerations relating to entities using a service organisation” and 10.19% for ISA 540 “Auditing accounting estimates, including fair value accounting estimates and related disclosures”. In view of the above, and based on the five standards analysed, the clarity which the Clarity Project sought to introduce has not improved readability according to the index used, as it does not take into account the existence of a coherent text structure (as it does). Therefore, the Clarity Project efforts to give a homogenous and coherent structure for all ISAs have not had a direct positive impact on the readability index.

Below are the results for each of the ISAs analysed, with more in-depth analysis presenting readability for each of the sections in each ISA.

The results of calculating standard readability using the mean readability for each part into which the ISAs were segmented are different from the results for overall readability. This is due to the fact that each part of the standard differs in length and the number of samples taken depends upon length. Readability is therefore calculated in relation to the samples.

Table 6 shows the readability indices obtained for ISA 402, “Audit considerations relating to entities using service organisations”, before and after the Clarity Project. The structure of the standard is different in both cases, with greater detail being

<table>
<thead>
<tr>
<th>ISAs</th>
<th>RE Before Clarity Project (1)</th>
<th>After Clarity Project (2)</th>
<th>Evolution of RE (3)</th>
<th>% Evolution RE (3) / (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>402</td>
<td>10.32</td>
<td>7.20</td>
<td>-3.12</td>
<td>-30.23%</td>
</tr>
<tr>
<td>505</td>
<td>6.23</td>
<td>13.04</td>
<td>6.81</td>
<td>109.30%</td>
</tr>
<tr>
<td>540</td>
<td>16.97</td>
<td>15.24</td>
<td>-1.73</td>
<td>-10.19%</td>
</tr>
<tr>
<td>620</td>
<td>32.76</td>
<td>24.41</td>
<td>-8.35</td>
<td>-25.48%</td>
</tr>
<tr>
<td>700</td>
<td>21.57</td>
<td>15.05</td>
<td>-6.51</td>
<td>-30.18%</td>
</tr>
</tbody>
</table>

Table 5: Overall results for ISAs before and after the Clarity Project
Are clarified ISAs readable?

Table 6: ISA 402

<table>
<thead>
<tr>
<th>Old ISA 402 Audit considerations relating to entities using service organizations</th>
<th>RE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>7.69</td>
</tr>
<tr>
<td>Consideration of the Auditor</td>
<td>–3.18</td>
</tr>
<tr>
<td>Service Organization Auditor’s Report</td>
<td>25.90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New ISA 402 Audit considerations relating to entities using service organizations</th>
<th>RE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>–0.64</td>
</tr>
<tr>
<td>Objectives y Definitions</td>
<td>6.79</td>
</tr>
<tr>
<td>Requirements</td>
<td>9.05</td>
</tr>
<tr>
<td>Application and Other Explanatory Material</td>
<td>7.38</td>
</tr>
<tr>
<td>Obtaining an Understanding of the Services Provided by a Service Organization, Including Internal Control</td>
<td>10.45</td>
</tr>
<tr>
<td>Responding to the Assessed Risks of Material Misstatement</td>
<td>5.24</td>
</tr>
<tr>
<td>Type 1 and Type 2 Reports that Exclude the Services of a Subservice Organization</td>
<td>1.94</td>
</tr>
<tr>
<td>Fraud, Non-Compliance with Laws and Regulations and Uncorrected Misstatements in Relation to Activities at the Service Organization</td>
<td>–19.55</td>
</tr>
<tr>
<td>Reporting by the User Auditor</td>
<td>6.09</td>
</tr>
</tbody>
</table>

provided after the modifications introduced by the Clarity Project. Before the Clarity project the part of the ISA which was easier to read was the part which developed aspects concerning »Service organisation auditor’s report« with an RE value of 25.90. Table 6 shows even lower values after the Clarity Project modifications, with the part on »Obtaining an Understanding of the Services Provided by a Service Organization, Including Internal Control« offering the highest readability with a score of 10.45 which shows very high reading difficulty. Furthermore, and leaving negative values to one side, the part which offers a worse readability value is »Type 1 and Type 2 Reports that Exclude the Services of a Subservice Organization« with an RE of 1.94.

In Table 7, the old ISA 505 »External confirmations« show very low readability indices which characterise the ISA as having a very difficult to read style. RE scores range from between 1.30 (Misstatement Assertions Addressed by External Confirmations) and 15.98 (External Confirmations Prior to the Year-end Effective Date), excluding the two parts which show negative values.

The new ISA has two parts with negative values, i.e. outside the range according to Flesch. The other parts have values between 0 to 30. The part with the worst index and therefore the worst readability is the part on »Requirements« with a value of 8.62, with the most readable part being »External confirmation procedures« and »Management’s Refusal to Allow the Auditor to Send a Confirmation Request« with values between 16 and 17. However, despite the low readability of this ISA, we would like to emphasise that the Clarity Project has led to a considerable improvement in readability of the different parts of this regulation although the results continue to show a reading style corresponding to a scientific type publication.

Table 8 shows the results for ISA 540 »Audit of accounting estimates/Auditing accounting estimates, including fair value accounting estimate, and related disclosures«. The old ISA has been divided into seven parts and are more detailed in the new ISA. All the ISA values before and after the Clarity Project are within the 0 to 30 range, which indicates that it is very difficult to read.

In the old ISA, the part with the best result is »Reviewing and testing the process used by management« with a score of 20.64; and the part with the lowest index is »The nature of accounting estimates« with 7.95. In the new ISA, the part with the highest values and therefore the most readable is »Indicators of Possible Management Bias« (23.09) and the part with the worst values is »Introduction« with a score of 4.90. However, the new clarified ISA is less readable.

Table 9 shows the results of the analysis of ISA 620 »Using the work of an expert«. The values for this ISA before and after the Clarity Project show that of all the ISAs we have analysed, this one offers the greatest readability. However, the values are far from showing suitable readability.
Old ISA 505 External confirmations

Introduction.
Relationship of External Confirmation Procedures to the Auditor’s Assessments of the Risk of Material Misstatement Addressed by External Confirmations
Misstatement Assertions Addressed by External Confirmations
Design of the External Confirmation Request
Use of Positive and Negative Confirmations
Management Requests
Characteristics of Respondents
The External Confirmation Process
Evaluating the Results of the Confirmation Process
External Confirmations Prior to the Year-end. Effective Date

New ISA 505 External confirmations

Introduction
Objectives and Definitions
Requirements
Application and Other Explanatory Material
External Confirmation Procedures
Management’s Refusal to Allow the Auditor to Send a Confirmation Request
Results of the External Confirmation Procedures
Negative Confirmations
Evaluating the Evidence Obtained

Table 7: ISA 505

Old ISA 540 Audit of accounting estimates

Introduction.
The Nature of Accounting Estimates
Audit Procedures Responsive to the Risk of Material Misstatement of the Entity’s Accounting Estimates
Reviewing and Testing the Process Used by Management
Use of an Independent Estimate
Review of Subsequent Events
Evaluation of Results of Audit Procedures.

New ISA 540 Auditing accounting estimates, including fair value accounting estimates, and related disclosures

Introduction
Objective Definitions
Requirements
Application and Other Explanatory Material
Nature of Accounting Estimates
Risk Assessment Procedures and Related Activities
Identifying and Assessing the Risks of Material Misstatement
Responses to the Assessed Risks of Material Misstatement
Further Substantive Procedures to Respond to Significant Risks
Evaluating the Reasonableness of the Accounting Estimates, and Determining Misstatements
Disclosures Related to Accounting Estimates
Indicators of Possible Management Bias
Written Representations
Documentation
Appendix: Fair Value Measurements and Disclosures

Table 8: ISA 540
The old ISA 620 has been subdivided into the six sections shown in Table 9. The results report a value for four of the six parties between 30 to 50, and the other parts have values between 0 to 30. The most readable part is »Scope of the Expert’s Work« with a score of 44.24 and the least readable part is »Reference to an Expert in the Auditor’s Report« with a score of 18.35.

All the segments of the new ISA 620 show values between 0 and 30. In general, there is a loss of readability. In this new ISA, the part with the best readability is »Obtaining an Understanding of the Field of Expertise of the Auditor’s Expert«. The least readable part is the introduction.

Table 10 shows the results for ISA 700 »The auditor’s report on the financial statement«. The old ISA shows values between 0 to 30 and scores for the new ISA vary between 0 and 40. However, despite the fact that the ranges achieved increased slightly, the analysis shows that in general terms there is a loss in readability and the standard continues to be classified as similar to scientific or academic writing (table 3). In particular, the part with the highest index in the old ISA is »Introduction«, whereas »The Auditor’s Report« and »Modified Reports« shows the lowest values and therefore the least readability.

The new ISA 700 is subdivided into a total of 10 parts. We only found readability within the 30 to 50 range in one of them. In the other parts, readability value was within the 0 to 30 range. The most readable part is »Introduction« whereas the part with the worst result is »Supplementary Information Presented with the Financial Statements«.

We finish our analysis of the results with the readability of the ISAs after the Clarity Project. As mentioned above, one of the issues of concern in this project, in addition to content, are the formal aspects. All the ISAs have a similar structure and therefore it may be helpful to know which parts have the greatest readability problems and which do not (Table 11).

All the new ISAs have the same format. They are divided into four identical parts »Introduction, Objective and Definition, Requirements« and »Application and other explanatory material«. The new uniform structure of the standards allows us to calculate the readability index for each part and compare readability by parts, thereby enabling observation of any trends in the different parts of the standards.

As can be seen from the previous table, the

Table 9: ISA 620

<table>
<thead>
<tr>
<th>Old ISA 620 Using the work of an Expert</th>
<th>RE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>33.00</td>
</tr>
<tr>
<td>Determining the Need to Use the Work of an Expert</td>
<td>28.77</td>
</tr>
<tr>
<td>Competence and Objectivity of the Expert</td>
<td>33.00</td>
</tr>
<tr>
<td>Scope of the Expert’s Work</td>
<td>44.24</td>
</tr>
<tr>
<td>Evaluating the Work of the Expert</td>
<td>34.27</td>
</tr>
<tr>
<td>Reference to an Expert in the Auditor’s Report</td>
<td>18.35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New ISA 620 Using the work of an auditor’s expert</th>
<th>RE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>10.97</td>
</tr>
<tr>
<td>Objectives and Definitions</td>
<td>14.21</td>
</tr>
<tr>
<td>Requirements</td>
<td>28.05</td>
</tr>
<tr>
<td>Application and Other Explanatory Material</td>
<td>24.50</td>
</tr>
<tr>
<td>Definition of an Auditor’s Expert</td>
<td>20.21</td>
</tr>
<tr>
<td>Determining the Need for an Auditor’s Expert</td>
<td>27.65</td>
</tr>
<tr>
<td>Nature, Timing and Extent of Audit Procedures</td>
<td>27.61</td>
</tr>
<tr>
<td>The Competence, Capabilities and Objectivity of the Auditor’s Expert</td>
<td>14.53</td>
</tr>
<tr>
<td>Obtaining an Understanding of the Field of Expertise of the Auditor’s Expert</td>
<td>29.59</td>
</tr>
<tr>
<td>Agreement with the Auditor’s Expert</td>
<td>24.63</td>
</tr>
<tr>
<td>Evaluating the Adequacy of the Auditor’s Expert’s Work</td>
<td>27.60</td>
</tr>
<tr>
<td>Reference to the Auditor’s Expert in the Auditor’s Report</td>
<td>22.89</td>
</tr>
<tr>
<td>Appendix: Considerations for Agreement between the Auditor and an Auditor’s External Expert</td>
<td>25.05</td>
</tr>
</tbody>
</table>

Table 10: ISA 700
overall results are within the 0 to 30 range, which represents a very difficult style. Observation of each part individually shows results which differ from those for the overall index, with sections with more or less readability than the overall readability and there is no consistency between them. A priori, the new ISAs may have insisted on seeking clarity through readable objectives and definition and therefore hypothetically we should find similar readability indices for these sections. That is not the case, however. The RE values found for the different sections of each ISA show no apparent similarity. For example, in the objectives and definition part, values range from 6.79 to 39.79, with the standard on audit reports showing the best readability values. Similar aspects were found in other ISA parts. ISA 700 for example, has a higher readability index than the overall index for the introduction, objectives and definitions, whereas for the other two parts of the standard the RE index is similar or even below the overall results. Something similar has been found with ISA 620 but the other way round, the first two parts show lower readability than the overall readability and the other parts shows similar or even higher readability than the overall results.

Comparison of readability by segments reveals a curious feature. The index follows no clear trend in any of the parts. Thus the readability index for the first part, «Introduction», varies from 0 to 28.84.

<table>
<thead>
<tr>
<th>Old ISA 700 The auditor’s report on financial statement</th>
<th>RE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>25.63</td>
</tr>
<tr>
<td>Basic Elements of the Auditor’s Report</td>
<td>24.95</td>
</tr>
<tr>
<td>The Auditor’s Report</td>
<td>14.49</td>
</tr>
<tr>
<td>Modified Reports</td>
<td>14.87</td>
</tr>
<tr>
<td>Circumstances that may Result in Other than an Unqualified Opinion</td>
<td>24.17</td>
</tr>
<tr>
<td>Effective Date</td>
<td>18.68</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New ISA 700 Forming an opinion and reporting on financial statements</th>
<th>RE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>28.84</td>
</tr>
<tr>
<td>Objectives and Definitions</td>
<td>39.79</td>
</tr>
<tr>
<td>Requirements</td>
<td>15.24</td>
</tr>
<tr>
<td>Application and Other Explanatory Material</td>
<td>11.00</td>
</tr>
<tr>
<td>Qualitative Aspects of the Entity’s Accounting Practices</td>
<td>21.43</td>
</tr>
<tr>
<td>Disclosure of the Effect of Material Transactions and Events on the Financial Statements</td>
<td>2.08</td>
</tr>
<tr>
<td>Information Conveyed in the Financial Statements</td>
<td>17.46</td>
</tr>
<tr>
<td>Description of the Applicable Financial Reporting Framework</td>
<td>22.41</td>
</tr>
<tr>
<td>Form of Opinion Auditor’s Report</td>
<td>11.54</td>
</tr>
<tr>
<td>Supplementary Information Presented with the Financial Statements</td>
<td>0.10</td>
</tr>
<tr>
<td>Appendix: Illustrations of Auditors’ Reports on Financial Statements</td>
<td>6.12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New ISAs’</th>
<th>ISA 402</th>
<th>ISA 505</th>
<th>ISA 540</th>
<th>ISA 620</th>
<th>ISA 700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>-0.64</td>
<td>14.46</td>
<td>4.90</td>
<td>10.97</td>
<td>28.84</td>
</tr>
<tr>
<td>Objective+ definition</td>
<td>6.79</td>
<td>8.62</td>
<td>18.55</td>
<td>14.21</td>
<td>39.79</td>
</tr>
<tr>
<td>Requirements</td>
<td>9.05</td>
<td>10.72</td>
<td>14.49</td>
<td>28.05</td>
<td>15.24</td>
</tr>
<tr>
<td>Application and other explanatory material</td>
<td>7.38</td>
<td>13.55</td>
<td>15.41</td>
<td>24.50</td>
<td>11.00</td>
</tr>
<tr>
<td>RE GLOBAL</td>
<td>7.20</td>
<td>13.04</td>
<td>15.24</td>
<td>24.41</td>
<td>15.05</td>
</tr>
</tbody>
</table>

Table 10: ISA 700

Table 11: ISAs in the Clarity Project
The same happens for the other sections, »Objective and Definition« varies between 6.79 and 39.79. For »Requirements«, values are between 9.05 and 28.05. Finally, in »Application and other expansion material« values are between 7.38 and 24.50. All readability values are in the 0 to 30 range, except for ISA 700 with a readability value in »Objective and Definition« of 39.79, which corresponds to the 30 to 50 range, difficult style and academic-type text. The other values are in the 0 to 30 range.

The ISA with the lowest values for the overall index and by parts is 402. The ISA with the best results for both global and part index is 620. ISAs 700 and 540 have a curious feature in their overall index and by parts. ISA 700 has individual indices which are higher than the global index in all the parts, except for the last part, »Applications and other explanatory material«, which is below the overall index and therefore lowers the overall index of this ISA because it is the longest part. Similar results have also been found for ISA 540, the readability of all its segments is greater than the overall value, except for »Introduction« which has a readability value below that of the overall index.

6. Conclusions

The early 21st century has been marked by dramatic upheavals in the economic situation. Financial scandals, Stock Market crashes and the international financial crisis have led to a flurry of regulations. Audits play a major role in this situation and so in recent years, in-depth reforms have been introduced to reinforce the audit’s role in maintaining the credibility of business financial information. In this context, and bearing in mind the globalised world in which we live, this article reflects on the reforms which certain institutions have been bringing to the regulations and standards on auditing.

In the last decade, we have experienced structural changes in European accounting models. Obviously the harmonisation process of financial reporting according to international trends is unfinished and EU countries are currently considering how to implement EU initiatives as regards the use of IAASB auditing standards (Richardson, 2008 and 2009 on the Canadian case). Attention should be paid to the decisions which are being taken, especially if we bear in mind a global convergence of auditing standards (Boolaky, 2012 for adoption of ISAs in the world and bear in mind that only five areas of differences have been identified between ISAs and PCAOB standards (Vanstraelen et al. 2009). In fact, the proposal for a new Regulation of auditing of PIEs sets several key measures to overcome some deficiencies (as for instance the ones detected by Quick and Warming-Rasmussen (2009) regarding auditor independence or by Bantleon et al. (2011) as regards audit committees and internal audit) and requires compliance with ISAs. There are many concerns with the EU’s strategy regarding audit but also the nature of the profession’s response and the overall quality of auditing – as discussed in Humphrey et al. (2011) or Francis (2011).

IFAC has established a modified organizational structure to ensure that its standards can be accepted for generalized use. Changes in IFAC’s structure have been introduced to achieve the objective of setting higher quality standards. The Clarity Project, 2003–2009, was aimed to ensuring that ISAs are understandable, clear, capable of consistent application and »readable«. We consider that in accordance with those aims, it is essential that new ISAs are readable and that the text is made as easy to read as possible. In our opinion, ensuring readability of the standards will facilitate compliance. Nonetheless, note that the ISA readership is rather restricted so they should be primarily readable for auditors, regulators and maybe institutional investors.

In our study we chose five ISAs covering different aspects of the audit process. We studied readability before and after the modifications introduced by the Clarity Project. Our results are worrying because the standards show very low readability. Please note that there is a difference between the idea of a) having more readable standards, b) having more useful standards and c) having standards better placed to deliver high quality audits. Our paper focus in the first idea, but there is certainly a connection with the other two (as for instance some countries require specific levels of RE indexes, e.g. the USA for insurance policies and informed medical consents). We would like this study to be a reminder to regulators and professional organizations that extra effort must be made to ensure good readability when publishing standards. This paper provides a challenge to the IAASB to reflect on its clarity methodology and to explain exactly why the clarified ISAs were generally less readable.

Our study may suggest some intriguing questions regarding the process by which ISAs were
adjusted/revised during the Clarity Project. In clarifying ISAs, IFAC may have worked from a very normative but complex linguistic position or set of assumptions which has served to increase the complexity of the readability of ISAs. Most probably, the changes in readability have been effectively being driven (implicitly or explicitly) by a desire to satisfy the demands of regulators, governmental bodies or any other user or preparer group involved in the Clarity Project.

In light of the findings of this study, new avenues for research can be explored. One of them could be to analyse understandability of standards by their own prime users, i.e. auditors and regulators indeed. Auditing standards are intrinsically complex and very technical and in an international regulatory forum with political implications, as for instance IAASB, language differences and translations nuances can hinder both readability and understandability.

In conclusion, we simply note that we cannot ignore the fact that auditing has been heavily criticised by society, especially as a result of the financial scandals which have called into question the accounting and auditing mechanisms. In International Journal of Corporate Governance, Vol. 2 (2011), No. 2, pp. 140–155.


References


An audit is an audit?
Evidence from the German private firm sector

This study investigates the audit quality differential between Big 4, mid-tier and smaller (independent) audit firms employing a large sample of private German firms. The results contribute to literature for a multitude of reasons. Most studies focus on audit quality employing public firm samples. The market for public firm audits is dominated by Big 4 audit firms, whereas the market for private firm audits is far more competitive. Moreover, unlike most studies, this paper employs three proxy metrics for earnings quality. Discretionary accruals, income smoothing as well as the cross-sectionally unexplained portion of conservatism are facets of accounting earnings quality. Big 4 audit firms provide higher audit quality than mid-tier auditors, which in turn provide higher audit quality than smaller (independent) auditors. Hence, this study contributes to the ongoing discussion about audit market concentration.
1. Introduction

*An audit is an audit* (IAASB, 2011, p. 2). This notion of the International Auditing and Assurance Standards Board (IAASB) expresses that audit quality should be homogeneous, no matter which auditor is employed. Nor should the auditee’s size be a factor influencing audit quality. But what is audit quality? As of now, there is no final definition (e.g., Bedard et al., 2010). One of the most popular and widely cited in literature claims that the quality of audit services is defined to be the market-assessed joint probability that a given auditor will both (a) discover a breach in the client’s accounting system, and (b) report the breach. (DeAngelo, 1981, p. 186). This quote shows that audit quality is not readily measurable from the outside as it will always be a joint test of the auditor’s ability to find and his willingness (i.e., independence) to report such breaches. For this reason, my study employs a range of earnings quality proxies to assess and compare earnings properties across clients of various auditor types.

While most other studies limit themselves to one proxy, I employ three proxies, which cannot be separated easily in the context of accounting earnings quality. Abnormal (i.e., discretionary) accruals, income smoothing and accounting conservatism can simultaneously influence the quality of reported earnings (e.g., Wagenhofer/Dücker, 2007). Managers use abnormal accruals to either increase or decrease reported earnings to achieve certain earnings goals (e.g., Jones, 1991). Smoothing, on the other hand, is the deliberate reduction of variability of earnings to create the impression of a less risky business model (Leuz et al., 2003). Last but not least, I employ cross-sectionally unexpected conservatism based on Ball and Shivakumar. While conditional conservatism (i.e., timely loss recognition) is viewed rather positively from a contracting perspective (e.g., Basu, 1997), unconditional conservatism reduces contracting efficiency by introducing randomness in decisions based on financial information (Ball and Shivakumar, 2005, pp. 90f.). Nonetheless, literature has not yet developed a clear-cut empirical distinction between the two facets of conservatism on a firm-year level (e.g., Fülbier et al., 2008).

Earnings quality can never be a function of a single metric but a combination of multiple proxies. On the one hand, discretionary accruals can be employed to achieve a smoother income stream (e.g., Gu et al., 2005; Hunt et al., 2000; Tucker/Zarowin, 2006). On the other hand, income smoothing and accounting conservatism are not easily separated from an empirical standpoint (Gassen et al. 2006). Subsequently, the three accounting earnings quality proxies are aggregated into two combined accounting earnings quality measures, combining discretionary accruals (cross-sectionally unexpected conservatism) with income smoothing, by transforming all firm-year observations into percentile ranks and averaging the single disaggregated ranks.

Earnings quality itself is a highly debated issue (e.g., Dechow et al., 2010). Given the context of private German firms, I follow Lo (2008) and define conservative earnings as high quality. Net income is distributable amongst the firm’s owners, hence stakeholders, facing a concave payoff function inherent in their implicit and explicit claims, prefer negatively biased earnings knowing that from an information perspective these earnings are not as value-relevant.

Stakeholders, who are not privy with the firm’s internal processes and inherent risk profile, have to trust the plausibility of the audited financial report to assess the value of their (implicit) claims in the firm. Using large sample evidence of private German companies enables me to test the influence of different auditors in a more competitive environment than the market for large publicly listed firm audits. This market is dominated by Big 4 audit firms in most countries, including Germany. All publicly listed firms have to seek statutory audits regardless of their size. Private firms are mandated to receive an audit if they meet certain size criteria (e.g., Gassen/Skaife, 2009). Nevertheless, in my private firm sample Big 4 firms also have a substantial market share of approximately 41%, but there is vibrant competition in the form of mid-tier audit firms (approx. 12%) and independent (smaller) auditors (approx. 47%), as well.

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1. In the European Union the propensity of Big 4 auditors for firms listed in the main stock exchange indices is even between 83% and 100% (European Commission (2008), p. 13). Big 4 audit firms consist of Deloitte, Ernst & Young (E&Y), KPMG and PricewaterhouseCoopers (PWC).

2. Market share is measured in terms of firm-year observations. The present sample is thus qualitatively similar to the ones employed by Cano-Rodriguez (2010) and van Tendeloo and Vanstraelen (2008), where about 28% or 27.69% of the observations received a Big 4 audit, respectively.
The results partly confirm literature on Big 4 audit firms providing higher audit and, as a result, higher earnings quality (e.g., Becker et al., 1998; Francis et al., 1999; van Tendeloo/Vanstraelen, 2008). This paper also extends the evidence for mid-tier audit firms which rank between the name brand Big 4 auditors and smaller (independent) auditors in terms of their clients’ earnings quality. This holds true for the aggregate accounting earnings quality measures as well as the three single accounting earnings quality proxy measures. Larger auditors increase aggregate accounting earnings quality, decrease discretionary accruals, income smoothing and unexpected conservatism. The results for mid-tier audit firms resemble those for Big 4 firms, although the associations are less pronounced. On the one hand, these inferences confirm that audit quality in fact does seem to be a function of auditor size (DeAngelo, 1981). Although agency conflicts generally are a minor problem concerning privately held firms, as their ownership is far less dispersed and more aligned with management (e.g., Vander Bauwhede/Willekens, 2004), this apparently does not lead to a lack of differentiation in terms of audit quality. On the other hand, it, in a sense, also makes the case for more cooperation among smaller auditors to create additional competition to the existing Big 4 audit firms.

The remainder of this paper is structured as follows: Section (2) provides a review of relevant previous literature and develops research questions. The following Section (3) describes the formation of the data sample and the empirical methods. Section (4) presents descriptive statistics, empirical results as well as additional robustness analyses. Section (5) concludes.

2. Literature review and development of research questions

The detection of errors, discretionary misstatements and management of earnings is directly mitigated and influenced by the auditor, or reported, in case of lack of cooperation on the auditee’s part (DeAngelo, 1981). Auditors’ detection ability is a direct outcome of audit effectiveness and effort. As these determinants are unobservable to stakeholders (e.g., Dechow et al., 2010), proxies like hours spent auditing (Caramanis/Lennox, 2008) or observable financial statement figures can be employed, depending upon availability.

There is numerous empirical evidence of the «Monitoring effect of auditor size hypothesis» (Vander Bauwhede et al., 2003, p. 6). On average Big 4 audit firms seem to provide higher quality audits (e.g., Becker et al., 1998; Behn et al., 2008; Francis et al., 1999; Francis/Wang, 2008; Krishnan, 2003a; Kim et al., 2003). Theoretical explanations for this dichotomy range from increased independence of larger auditors, because no single mandate is of special importance (DeAngelo, 1981), over fears of costly losses of their brand name reputation (Francis/Wilson, 1988), a higher propensity of industry expert auditors employed by larger audit firms (e.g., Balsam et al., 2003; Krishnan, 2003b), to economies of scale resulting in positive spillover effects of experience and audit technology. There also is evidence of increased audit effort by larger auditors. Caramanis and Lennox (2008) provide evidence that a larger amount of audit hours leads to less earnings management, as proxied by discretionary accruals. Not only do Big 4 auditors, on average, seem to spend more hours on their audit engagements, but an additional hour of auditing also has a larger marginal effect on Big 4-compared with Non-Big 4 auditees.

Conversely, empirical evidence for private and publicly listed European firms casts the auditor size hypothesis in doubt and thus follows the »An audit is an audit«-hypothesis. Financial statements of private firms are not subject to scrutiny by financial analysts, stock exchange supervision or a large number of (outside) investors (Vander Bauwhede/Willekens, 2004). As such, Maijoor and Vanstraelen (2006) find a Big 4-effect only for the U.K., but not

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3 For an extensive review of further audit effort proxy measures refer to Bedard et al. (2010).
4 Big 5, Big 6, or Big 8 audit firms depending on the investigated time period.
5 Niemi (2004) extends these findings and provides evidence that larger independent auditors provide higher audit quality than their smaller competitors.
6 The quasi-rent of an ongoing audit engagement poses an incentive to not report an accounting failure. If this behavior is uncovered, the firm puts the quasi-rents of other client relationships in danger. Hence, a large number of clients works as an incentive for the auditor to maintain her independence.
7 Boone et al. (2010) and Carson (2009) argue that at least larger mid-tier audit firms have themselves created significant global brand name reputation.
for France or Germany. For publicly listed and privately held Belgian firms, Vander Bauwhede et al., (2003) do not provide clear inferences. They find that Big 6-auditors restrict income-decreasing, but not income-increasing abnormal accruals. Cumulatively, it is an empirical question whether overall accounting earnings quality, as proxied by discretionary accruals, unexpected conservatism, and income smoothing, is positively associated with audit firm size.

Research Question 1:
Is earnings quality positively associated with auditor size in a private firm framework?

Attributable to less severe agency problems (Francis, 2004; Knechel et al., 2008; Vander Bauwhede et al., 2003) and less close monitoring by outside parties (e.g., Barton, 2005), such as the press and financial analysts, associated with private firms, there might just not be demand for higher quality audits. One hallmark of private firms is the close alignment between ownership and management. Although litigation in connection with audit failures is quite low for publicly listed companies to begin with (e.g., Francis, 2004), there is anecdotal evidence that the rate of litigation is even much lower for privately held companies (e.g., Knechel et al., 2008; Vander Bauwhede/Willekens, 2004). Yet, Gassen and Skaife (2009) show that auditor-related litigation in Germany increased, especially in recent years. In the absence of agency conflicts, tax authorities might be a constraining factor for private firms’ earnings management behavior. Contrariwise, there is empirical evidence that Big 4 auditors do not increase earnings quality with private firms, even when book-tax alignment is high (e.g., Vander Bauwhede/Willekens, 2004).

Even if there, arguably, are little agency conflicts between inside (i.e., majority) and outside (i.e., minority) shareholders, there most likely remain agency conflicts associated with lenders. Thus, a factor determining earnings quality in a private firm setting is debt contracting. Banks are, by far, the most important providers of debt capital to private firms in Germany (e.g., Elsas/Krahnen, 2004). Relationship banks collect private information on their clients (e.g., Boot, 2000) and, thus, arguably rely less on financial reports aiding in their lending decisions and subsequent monitoring processes. On the one hand, as the number of bank relationships, and hence information asymmetries, increases, so does the need for earnings quality (e.g., Beatty et al., 2010). On the other hand, the lack of private information will make it more difficult to effectively monitor managerial behavior, possibly increasing managements’ incentives to manage earnings. Implicit employee claims are a further source of agency conflicts, which potentially determine earnings quality (e.g., Vander Bauwhede/Willekens, 2004).

In a similar vein, a line of research developed around employee influence on financial reporting policies, and earnings quality (e.g., Bowen et al., 1995). Another agency conflict exists between top and middle management. Subsidiary firm management in a corporate structure might have different, even contrarian, incentives to manage earnings (e.g., Fudenberg/Tirole, 1995). For instance, while the corporate parent might want earnings to increase, subsidiary management might be inclined to create cookie jar reserves for future periods, or vice versa. Resultingly, it is an empirical question whether, controlling for aforementioned agency conflicts, earnings quality is incrementally positively associated with audit firm size.

Research Question 2:
Controlling for agency conflicts, is earnings quality positively associated with auditor size in a private firm framework?

3. Method

3.1. Sample selection

Financial reporting and auditor data have been derived from the BvD DAFNE database. The sample includes non-consolidated single accounts of German companies from 2001 to 2009. This approach ensures that each firm (i.e., account) is audited by exactly one audit firm. Especially if foreign subsidiaries have been consolidated into the accounts this is at least unlikely. The dataset only contains firms for which figures for total assets and net income for a minimum of years 2005 through 2008...
are available (Table 1). Financial services and public sector firms are excluded. They are subject to much more extensive regulation and government intervention to be comparable to the remaining observations. I also drop insolvent and distressed firm-years as distress creates additional incentives to manage earnings (Francis/Wang, 2008; García Lara et al., 2009). Moreover, firms with no obligation to get audited, and firms with no published auditor information for any of the years in the sample are also truncated, to control for potential sample selection bias. As a measure of control for data errors and outliers, I truncate observations at the .25th and 99.75th percentile for continuous variables revenue, total assets, debt, CFO, net income. To compute the earnings quality proxy measures, firms for which at least one auditor observation is present remain in the sample. But for subsequent analyses firm-years with no auditor observations are dropped. The final sample, attributable to the cross-sectional estimation by industry and year of two key variables (i.e., discretionary accruals and unexpected conservatism), consists of 36,863 firm-year observations ranging from 2002 to 2009 (Table 2). There is an apparent over-representation of the years 2006 through 2008, attributable to aforementioned data availability requirements and sam-

Table 1: Formation of the data sample

<table>
<thead>
<tr>
<th>Year</th>
<th>Observations</th>
<th>Percent</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>182,270</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>-4,822</td>
<td>8</td>
<td>.02</td>
</tr>
<tr>
<td>2004</td>
<td>-44,460</td>
<td>34</td>
<td>.09</td>
</tr>
<tr>
<td>2005</td>
<td>-1,384</td>
<td>325</td>
<td>.88</td>
</tr>
<tr>
<td>2006</td>
<td>-1,098</td>
<td>2,806</td>
<td>24.76</td>
</tr>
<tr>
<td>2007</td>
<td>-17,020</td>
<td>9,129</td>
<td>27.17</td>
</tr>
<tr>
<td>2008</td>
<td>-2,019</td>
<td>10,015</td>
<td>27.35</td>
</tr>
<tr>
<td>2009</td>
<td>-2,019</td>
<td>10,081</td>
<td>27.35</td>
</tr>
<tr>
<td>Total</td>
<td>36,863</td>
<td>4,465</td>
<td>12.11</td>
</tr>
</tbody>
</table>

Table 2: Annual distribution of firm-year observations

9 The upper time limit is set to the last fiscal year before the possible voluntary early adoption of the financial reporting modernization act (BilMoG) which imposed numerous changes to financial reporting choices in German GAAP. The lower time limit is set to ensure that there is a significant number of consecutive observations per firm but not reduce sample size too much by extending the minimum time frame beyond four years.

10 WZ2008 codes K64 »Financial service activities, except insurance and pension funding«, K65 »Insurance, reinsurance and pension funding, except compulsory social security« and O84 »Public administration and defense; compulsory social security«. WZ2008 is the official industry grouping by the German Federal Statistical Bureau (Destatis).

11 Distressed firms have more debt than total assets but are legally not yet insolvent.

12 Small limited liability companies are not required to seek statutory audits. According to §67 HGB a small limited company has less than EUR 4,840,000 in total assets, less than EUR 9,680,000 in revenues and less than 50 employees (values as of 2010). Unlimited liability companies are only required to publish their financial statements and seek statutory audits if they fulfill at least two out of the three size criteria of §1 PublG: (1) Total assets ≥ EUR 65,000,000 or (2) revenues (sales) ≥ EUR 130,000,000 or (3) average annual number of employees ≥ 5,000.
Audit is an audit?

ple construction. Big 4 audit firms provide statutory audits to about 40.83% of the final sample (Table 3). PricewaterhouseCoopers (PWC) is the market leader with a proportion of 14.55%, followed by two competitors of relatively similar size (KPMG and Ernst & Young (E&Y)). Mid-tier audit firms provide their services to about 11.75% of the sample. I define mid-tier audit firms as auditors which are included in the Lünendonk lists »Führende Wirtschaftsprüfungsgesellschaften in Deutschland« of the 25 largest German audit firms, but not part of the Big 4. Almost 48% of firm-years in the final sample receive an audit by an independent (smaller) auditor.

<table>
<thead>
<tr>
<th>Auditor</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWC</td>
<td>5,364</td>
<td>14.55</td>
</tr>
<tr>
<td>KPMG</td>
<td>3,799</td>
<td>10.30</td>
</tr>
<tr>
<td>E&amp;Y</td>
<td>3,624</td>
<td>9.83</td>
</tr>
<tr>
<td>DELOITTE</td>
<td>2,269</td>
<td>6.15</td>
</tr>
<tr>
<td>BIG4</td>
<td>15,053</td>
<td>40.83</td>
</tr>
<tr>
<td>MIDTIER</td>
<td>4,332</td>
<td>11.75</td>
</tr>
<tr>
<td>INDEPAUD</td>
<td>17,478</td>
<td>47.42</td>
</tr>
<tr>
<td>Total</td>
<td>36,863</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Sample breakdown of audit relationships

3.2. Statistical tests

3.2.1. Abnormal accruals

Abnormal (i.e., discretionary) accruals can be employed to either increase or decrease reported earnings. They are a commonly used proxy for earnings management in audit quality literature with the general result that larger auditors mitigate abnormal accruals more effectively (e.g., Becker et al., 1998; Francis et al., 1999; Vander Bauwhede et al., 2003). The residual of net income (NI) and cash flow from operations (CFO) are total accruals (TACC). Total accruals can be further split up into a discretionary (DA) and a non-discretionary part. I estimate discretionary accruals cross-sectionally by industry and year (Model 1), with a minimum of 15 observations per cross-section. This controls for unobserved heterogeneity between the different industries in the sample. Robust White-adjusted standard errors (White, 1980) are employed to cope with any remaining heteroscedasticity, as is scaling determinants by total assets (TA).

\[
\frac{TACC_{i,t}}{TA_{i,t}} = \alpha_0 + \alpha_1 \cdot \frac{1}{TA_{i,t}} + \alpha_2 \cdot \frac{CFO_{i,t}}{TA_{i,t}} + \alpha_3 \cdot \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{TA_{i,t}} + \alpha_4 \cdot \frac{PPE_{i,t}}{TA_{i,t}} + \epsilon_{i,t}
\]

where for firm i (in year t):
- \(TACC_{i,t}\) are total accruals
- \(TA_{i,t}\) are total assets
- \(CFO_{i,t}\) is cash flow from operations
- \(\Delta REV_{i,t}\) is change in sales revenue
- \(\Delta REC_{i,t}\) is change in accounts receivable
- \(PPE_{i,t}\) is property, plant and equipment

The expected sign of CFO\(_{i,t}\) is negative (Kasznik, 1999; Dechow, 1994). According to German GAAP the publication of CFO is not mandatory for single accounts of non-publicly listed firms, which means it has to be derived from the profit and loss statement in combination with the balance sheet. The expected sign of \(\Delta REV_{i,t}\) is positive while the sign of \(\Delta REC_{i,t}\) is a priori unclear, changing revenues.
may also lead to increases in accounts payable (Jones, 1991). There is numerous empirical evidence that the sign on the residual of both components is positive (e.g., Dechow et al., 1995). Gross property, plant and equipment \( PPE_{i,t} \) results in significant depreciation expenses, which are a large part of total accruals, and thus has a negative expected sign (Jones, 1991).

There is the possibility of adverse litigation if auditors fail to uncover misleading income-increasing (i.e., aggressive) accounting choices (e.g., Francis/Wang, 2008; Kim et al., 2003). Albeit the actual number of court cases brought forward against auditors is small (Francis, 2004a), there is evidence for Germany that auditor related litigation increased in recent years (Gassen/Skaife, 2009). In line with previous findings (e.g., DeFond/Jiambalvo, 1993; Kim et al., 2003; Lys/Watts, 1994), I predict that larger auditors are more conservative than smaller audit firms. They will not only constrain aggressive earnings management but even foster income-decreasing accounting choices to reduce their risk of adverse litigation and other reputational effects. Hence, following Francis and Wang (2008), I employ signed abnormal accruals in the subsequent analyses.¹⁷

### 3.2.2. Income smoothing

Firm-specific income smoothing, as proxied by the standard deviation of scaled \( NI \) divided by the standard deviation of scaled \( CFO \), is the second earnings quality measure. Cash flows from operations are one of the standard proxies for true underlying performance in the income smoothing literature (e.g., Leuz et al., 2003).¹⁸

\[
\text{IS}_i = \frac{\sigma\left(\frac{NI_{i,t}}{TA_{i,t}}\right)}{\sigma\left(\frac{CFO_{i,t}}{TA_{i,t}}\right)} \cdot (-1) \tag{2}
\]

where for firm \( i \) (in year \( t \)):

- \( NI_{i,t} \) is net income
- \( TA_{i,t} \) are total assets
- \( CFO_{i,t} \) is cash flow from operations

The income smoothing proxy is multiplied by -1 to ensure that higher values imply more income smoothing. Smooth earnings may not only be attributed to managerial discretion. Natural smoothing is a result of accrual reversals (e.g., Dechow, 1994; Gassen et al., 2006) or a diversified business model (e.g., Eckel, 1981). From an information perspective it is unclear whether discretionary income smoothing is beneficial as it conveys private information about sustainable earnings, or disadvantageous as it can be used to intentionally mislead stakeholders about true firm risk (e.g., Gordon, 1964; Leuz et al., 2003). Equity investors in private firms can reasonably be expected to collect private information on sustainable earnings and the firm’s risk profile. As such, stakeholders benefit from an unbiased representation of firm risk to assess the inherent value of their claims in the firm. Hence, I expect larger auditors to possess sufficient independence to protect stakeholders’ interest in credible and decision-useful financial statements and are associated with auditees exhibiting less smooth income streams.

### 3.2.3. Unexpected conservatism

Conservatism is an integral part of accounting according to German GAAP. Conservatism is made up of two components. On the one hand, there is unconditional conservatism. The ›Vorsichtsprinzip‹ (i.e., prudence principle; §252 HGB) leads to the tendency to overstate liabilities and underestimate assets. This tendency is not conditional upon an actual economic outcome (e.g., Ball et al., 2008). The extent of the bias is unknown attributable to a less well developed information environment surrounding private firms. Following the ›Vorsichtsprinzip‹

\[
CFO = \text{net income} \pm/\text{write-downs (write-ups) on non-current assets} \pm/\text{increase (decrease) of inventories} \pm/\text{increase (decrease) of trade receivables} \pm/\text{increase (decrease) of trade payables} \pm/\text{profit (loss) on disposals of property, plant and equipment. This approach is an analogous application of German Accounting Standard (GAS) 2.27.}
\]

¹⁷ A second reason for employing signed instead of absolute discretionary accruals is brought forward by Hribar and Nichols (2007). They raise the concern that the mean of absolute discretionary accruals varies with the standard deviation of signed discretionary accruals. Thus, tests based on absolute discretionary accruals are exposed to a class of correlated omitted variables that is generally not a concern in research using signed discretionary accruals (p. 1049, italics in original).

¹⁸ On the downside, this implicitly assumes that cash flows themselves are not managed. This rather stringent assumption is discussed in Section (4.3.1).
and introducing more unconditional conservatism into the financial statement nevertheless can be beneficial to firms to potentially reduce litigation risk, as well as to stakeholders who can prudently assess their claims in the firm which inevitably are subject to the future’s uncertainty. Additionally, there are tax reasons for increasing unconditional conservatism reducing the present value of tax expenditures (Cano-Rodriguez, 2010). On the other hand, there is conditional conservatism. It is based on timely recognition of losses. As debt covenants are most likely based on accounting information, timely loss recognition serves as a contracting device which potentially transfers power from debtors to creditors (e.g., Watts, 2003a; Ball/Shivakumar, 2005). Literature provides, to my knowledge, no theoretically conclusive empirical proxy to distinguish between the two components of conservatism on a firm-level without reliance on an arbitrary scoring mechanism or capital market data such as equity returns.19

As a result, to proxy for the unexpected portion of conservatism, I cross-sectionally employ an estimation technique by Ball and Shivakumar (2005) with a minimum of 15 firm-years per industry. Thus, the resulting residual UC measure resembles a cross-sectional discretionary accruals model. The model incorporates two functions of accruals. On the one hand, accruals are used to reduce cash flow noise (e.g., Dechow, 1994). On the other hand, they incorporate the asymmetric recognition of unrealized gains and losses (e.g., Basu, 1997).

\[
\frac{TACC_{it}}{TA_{it}} = \beta_0 + \beta_1 \cdot DCFO_{it} + \beta_2 \cdot \frac{CFO_{it}}{TA_{it}} + \beta_3 \cdot DCFO_{it} \cdot \frac{CFO_{it}}{TA_{it}} + \epsilon_{it}
\]

where for firm i (in year t):
- \(TACC_{it}\) are total accruals
- \(TA_{it}\) are total assets
- \(CFO_{it}\) is cash flow from operations
- \(\Delta CFO_{it}\) is a dummy variable equal to 1 if \(CFO_{it}\) is negative and 0, otherwise

The effect of reducing cash flow noise on earnings is captured in \(\beta_2\), whereas \(\beta_3\) measures conditional conservatism through the differential reaction of accruals on the occurrence of good (i.e., positive cash flows) and bad news (i.e., negative cash flows). Cross-sectionally, unconditional conservatism is proxied by the part of total accruals which is independent of cash flows (i.e., \(\beta_0\) and \(\beta_1\); Cano-Rodriguez, 2010). As a result, \(UC\) proxies for the firm-specific, unexpected portion of (conditional and unconditional) conservatism. Negative values suggest a more conservative reporting of earnings compared with the cross-sectional mean, and vice versa.

As argued above, conditional conservatism is seen rather positive as a contracting device and unconditional conservatism as a nuisance from an informational perspective. Focusing on single accounts according to German GAAP, with payments to shareholders being restricted to net income, conservatism generally seems to reduce agency cost (e.g., Fülbier et al., 2008) and the likelihood of auditor-related litigation (Watts, 2003a). While aforementioned earnings quality proxies unani-
mously originate from an Anglo-Saxon back-
ground, they seem appropriate in this case, as well. Already Schmalenbach (1925) exhibits a preference for conservative earnings from a stakeholder perspective. Contrariwise, from the viewpoint of the average stock market investor, the informa-
tion-content of earnings perspective (e.g., Beaver, 1997) would refuse conservative reporting of earnings as it introduces a downward bias. Consistent with Schmalenbach’s view, Lo (2008) posits that »high-quality earnings are conservative, while low-quality earnings are upwardly managed earnings« (p. 351). Equity investors in private firms, on average, are aligned with management and well-informed. Hence, I predict that larger auditors are more independent and inclined to protect stake-
holder claims in the firm and thus are associated with comparatively more conservative reporting.

3.2.4. Aggregate accounting earnings quality proxies and subsequent analyses

Replicating the methodology in van Tendeloo and Vanstraalen (2008), the single accounting earnings quality measures (i.e., discretionary accruals (DA), income smoothing (IS) and unexpected conserva-
tism (UC) are transformed into percentage ranks. IS is multiplied by -1, it thus points in the same direction as DA and UC. Subsequently, these percentage ranks are aggregated into one average rank for each firm-year observation. Higher ranks resemble lower accounting earnings quality. An aggregate measure in this setting is called for, for a multitude of reasons. First, it recognizes that accrual earnings management and income smoothing, as well as conservatism and income smoothing constitute earnings properties which are not easily and readily separable from an empirical standpoint (Chen et al., 2007; Gassen et al., 2006; García Lara et al., 2012; Gu et al., 2005; Hunt et al., 2000; Watts, 2003b). Nonetheless, aggregating all three earnings properties into one aggregate measure seems inappropriate due to a high and significant correlation between discretionary accruals and unexpected conservatism (Table 5). Second, it avoids basing inferences on a single proxy which might itself have already attracted considerable criticism in the literature (van Tendeloo/Vanstraelen, 2008). Third, ranking proxy measures also reduces potential measurement error (Cano-Rodríguez, 2010; van Tendeloo/Vanstraelen, 2008). Nevertheless, to mitigate potential concerns that the results are attributable to ranking the observations or the aggregation process, tests employing the unaggregated proxies are conducted, as well.

The aggregate accounting earnings quality proxies (AEQ_{DA} and AEQ_{UC}) and the single measures are employed in univariate and multivariate analyses. On a univariate basis the aggregated, as well as the single earnings quality proxies, are analyzed with a two-sample t-test (with unequal variances). The multivariate analyses are based on regression model (4). Standard errors are robust to heteroscedasticity (White, 1980) and clustered at the firm-level. Industry- (IND) and year- (YEAR) fixed effects are amended to control for a potential omitted correlated variable bias.

\[
AEQ_{it} = \alpha_0 + \alpha_1 \cdot ROA_{it} + \alpha_2 \cdot LOSS_{it} + \alpha_3 \cdot SIZE_{it} + \\
+ \alpha_4 \cdot LEV_{it} + \alpha_5 \cdot CAPINT_{it} + \\
+ \alpha_6 \cdot INVREC_{it} + \alpha_7 \cdot LNAGE_{it} + \\
+ \alpha_8 \cdot CORPSTRUC_{it} + \alpha_9 \cdot SHAREHOLD_{it} + \alpha_{10} \cdot NUMBANK_{it} + \alpha_{11} \cdot EMP_{it} + \\
+ \alpha_{12} \cdot BIG4_{it} + \alpha_{13} \cdot MIDTIER_{it} + \epsilon_{it} 
\]

AEQ_{it} is the aggregated accounting earnings quality rank
ROA_{it} is return on assets (net income scaled by total assets)
LOSS_{it} is a binary variable indicating whether there was a loss
SIZE_{it} is the natural logarithm of total assets
LEV_{it} is leverage (total debt to total assets)
CAPINT_{it} is capital intensity (long-term assets to total assets)
INVREC_{it} are inventories and receivables (scaled by total assets)
LNAGE_{it} is the natural logarithm of firm age
CORPSTRUC_{it} is a binary variable indicating whether the firm is part of a corporate structure
SHAREHOLD_{it} is the natural logarithm of the number of shareholders
NUMBANK_{it} is the natural logarithm of the number of bank relationships
EMP_{it} is a binary variable indicating whether the firm has more than 100 employees
BIG4_{it} is a binary variable indicating whether the firm’s auditor is a Big 4 audit firm
MIDTIER_{it} is a binary variable indicating whether the firm’s auditor is a mid-tier audit firm

The model includes independent variables controlling for differences in firm characteristics. ROA and LOSS are proxies for firm profitability. On the one hand, firms which are more profitable might have a larger incentive for higher earnings quality (i.e., lower levels of AEQ) (e.g., Burgstahler et al., 2006). On the other hand, stakeholders interested in the firm possibly do not worry as much about AEQ if profits are acceptably high and the firm is going-concern (e.g., Gassen/Skaife, 2009). Methodologically, ROA is necessary to control for firm-specific profitability not captured by the earnings quality proxies (Lawrence et al., 2011). As a result, it is an empirical question which motivation dominates and thus I do not predict a sign on ROA. Additionally, LOSS firms are expected to voluntarily increase earnings quality (e.g., Francis/Wang, 2008), or even have less opportunities to manage earnings (e.g., DeAngelo et al., 1994). Hence, I pre-
dict a negative association between $AEQ$ and $LOSS$. A priori, the relation between $SIZE$ and $AEQ$ is not clear. Smaller firms might have more incentive to increase earnings quality as financial statements are one of the few pieces of information available on these firms (e.g., Ball/Shivakumar, 2005). Larger firms simply might have more discretion over financial reporting attributable to more accounting flexibility, both in magnitude and number of balance sheet items. But, on the other hand, they are under additional scrutiny by various stakeholders. Watts and Zimmerman (1986) refer to this as the political cost of company size-effect. Predicting a sign for $LEV$ is equally problematic. On the one hand, higher leverage suggests more monitoring by creditors (e.g., Becker et al., 1998), on the other hand, the debt-equity hypothesis (Watts/Zimmerman, 1986) stipulates that managers have an incentive to increase earnings and, in the process, decrease earnings quality. More capital intensive firms ($CAPINT$) need to maintain good relations with their lenders, increasing the incentive for higher earnings quality (e.g., Francis et al., 1999). Yet, fixed assets regularly serve as collateral for debt (Cano-Rodriguez/Sanchez Alegria, 2011), implicitly reducing the debt contracting need for higher quality earnings. Therefore, I control for capital intensity, but do not predict a sign. $INVREC$ is a proxy for asset and transactional complexity (Knechel et al., 2008), managerial information advantage over stakeholders (Hutton et al., 2012) and idiosyncratic risk (Hilary, 2006). It is a major source of weaknesses in the internal control system (Ge/McVay, 2005), and subject to considerable managerial discretion. With respect to firm age, there are various explanations. On the one hand, younger firms face financial distress and bankruptcy more often than older firms (e.g., Boone et al., 2010). On the other hand, younger firms’ earnings quality might be lower, attributable to less mature accounting and internal control systems. Cumulatively, I expect a negative relation between $AEQ$ and $LNAGE$. If a firm is part of a corporate structure ($CORPSTRUC$) as either the corporate parent or a subsidiary, its accounting is not completely independent. There even is some evidence of earnings management on the profit center level of larger corporations (e.g., Fudenberg/Tirole, 1995). Yet, I explicitly do not predict a sign as the dependence in terms of financial reporting can go both ways (i.e., increase or decrease earnings quality) or the behavior of some profit center managers may as well be averaged out by contrarian attempts of others. $SHAREHOLD$ and $NUMBANK$ are variables proxying for two aspects of agency problems (Jensen/Meckling, 1976). First, a larger number of shareholders and the resulting increasing divergence between ownership and management might induce agency problems between (minority) shareholders and management. Second, a larger number of bank relationships (i.e., the arguable lack of a relationship bank which collects and processes private information (e.g., Boot, 2000)), makes it more costly for a bank to monitor managerial behavior. On the other hand, this should in turn increase the need for earnings quality (e.g., Beatty et al., 2010). Hence, I predict a positive sign for $SHAREHOLD$ and $NUMBANK$. $EMP$ proxies for implicit employee claims (Vander Bauwede/Willekens, 2004). There is conflicting evidence whether employee claims decrease (e.g., Bowen et al., 1995) or increase (e.g., Bermig/Frick, 2010) earnings quality, hence I explicitly do not predict a sign. Following the discussion in the previous sections, I expect a positive relation (and, therefore, a negative sign) between $BIG4$ as well as $MIDTIER$ and $AEQ$. The coefficient on $BIG4$ should nevertheless be considerably larger than the one on $MIDTIER$. Smaller (independent) audit firms serve as the category of reference.

4. Descriptive statistics and empirical results

4.1. Descriptive statistics and univariate results

Table 4 provides summary statistics for the main variables for the full sample of 36,863 firm-years. The mean aggregate accounting earnings quality proxies $AEQ_{DA}$ ($AEQ_{UC}$) are .4999 (.4999) with higher values symbolizing lower earnings quality. Mean profitability ($ROA$) is 5.40% and 17.05% of the firm-years in the sample report losses ($LOSS$). Mean leverage ($LEV$) is 49.51% with a quite large variance. Also capital intensity ($CAPINT$) and the portion of total assets allocated to inventories and accounts receivable ($INVREC$) vary to a large extent. Variables controlling for governance factors are $CORPSTRUC$, which shows that about 58.07% of the firm-years are disseminated among firms in a corporate structure as either the corporate parent
Table 4: Summary statistics of main variables

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<th>P25</th>
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AEQDA is the aggregate accounting earnings quality percentile rank based on DA and IS
AEQUC is the aggregate accounting earnings quality percentile rank based on UC and IS
DA are discretionary accruals based on Kasznik (1999) (scaled by total assets)
IS is the income smoothing ratio according to Leuz et al. (2003)
UC is the proxy measure for unexpected conservatism based on Ball and Shivakumar (2005)
ROA is return on assets (net income scaled by total assets)
LOSS is a binary variable indicating whether there was a loss in the given firm-year
CFO is cash flow from operations (scaled by total assets)
TACC are total accruals (scaled by total assets)
SIZE is the natural logarithm of total assets
LEV is leverage (total debt to total assets)
CAPINT is capital intensity (long-term assets to total assets)
INVREC is inventories and receivables (scaled by total assets)
LNAGE is the natural logarithm of firm age
CORPSTRUC is a binary variable indicating whether the firm is part of a corporate structure
SHAREHOLD is the natural logarithm of the number of shareholders
NUMBANK is the natural logarithm of the number of bank relationships
EMP is a binary variable indicating whether the firm has above 100 employees
BIG4 is a binary variable indicating whether the firm’s auditor is a Big 4 audit firm
MIDTIER is a binary variable indicating whether the firm’s auditor is a mid-tier audit firm

Source: BvD DAFNE. For binary variables only means are reported.
or a first- or second-tier subsidiary. SHAREHOLD and NUMBANK. Theory tells us that less close relationships, a wider dispersion of ownership, as well as the divergence of ownership and management lead to agency problems. EMP controls for implicit employee claims (Vander Bauwede/Willekens, 2004). About 66% of total firms have more than 100 employees in a given year.

The Pearson correlation matrix in Table 5 indicates no problems of multicollinearity. The aggregate accounting earnings quality proxies (AEQDA and AEQUC) are correlated with the single earnings quality proxies to quite an extent. As these proxies are dependent variables in different regressions, this does not lead to any problems. As mentioned before, attributable to a high correlation between discretionary accruals and unexpected conservatism, I refrain from aggregating both measures into discretionary accruals (DA), also which can be explained well. Discretionary accruals are employed to either reduce taxable income or reach earnings target by inflating earnings. Variance Inflation Factors (VIFs) are unanimously below standard textbook levels, indicating no signs of multicollinearity between independent variables.

Corporate governance proxy variables are correlated according to theory. A larger number of, presumably, less tight bank-firm relationships is associated with lower earnings quality, as is a wider dispersion of ownership with a resulting divergence of ownership and management. Conversely, there seems to be better monitoring if the firm is in a corporate structure (CORPSTRUC), audited by a Big 4 audit firm (BIG4), or, to a lesser degree, a mid-tier audit firm (MIDTIER). Both audit firm indicator variables are correlated with DA and UC at a 99th percentile level, while MIDTIER is insignificantly correlated with income smoothing.

Mean values for the accounting earnings quality proxies also reveal the predicted pattern. Table 6 presents t-tests (for unequal variances) comparing BIG4 with MIDTIER (INDEPAUD), as well as MIDTIER and INDEPAUD clients. Firms audited by a Big 4 audit firm exhibit higher accounting earnings quality (lower mean values of AEQ) than their non-Big 4 audited counterparts. The differences based on AEQDA of .0419 between BIG4 and MIDTIER, as well as .0834 (.0415) between BIG4 (MIDTIER) and INDEPAUD are highly significant at a 99th percentile level. Univariate results based on AEQUC are similar. Big 4 clients on average have more conservative (i.e., income-decreasing) discretionary accruals (DA) than mid-tier and independent audit firms’ auditees, although only the latter difference is significant. A possible explanation for this phenomenon is that auditors arguably care less about discretionarily decreasing earnings, or might even encourage such behavior, compared with income deflation. This is in line with my expectations, prior literature and anecdotal evidence (e.g., Bigus et al., 2010; Nobes/Parker, 2012). Big 4 firms’ auditees also smooth income (IS) significantly less, and exhibit more negative unexpected conservatism (UC).

In summary, the univariate analyses show that Big 4 audit firms seem to provide higher audit quality than mid-tier audit firms, which in turn supersede smaller (independent) auditors.

4.2. Multivariate results

Table 7 presents the multivariate results of model (4). The results generally follow the predictions. The indicator variable BIG4 exhibits a stronger as-

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20 I define second-tier subsidiaries as firms which do not have subsidiaries of their own. First-tier subsidiaries have a corporate parent as well as own subsidiaries. Corporate structures are approximated if there are contractual obligations to transfer profits or losses to other firms.

21 Employing a single aggregated earnings quality proxy measure yields qualitatively similar results [untabulated].

22 As correlations are unanimously below the critical value of .80 (Gujarati/Porter, 2009, p. 338), there is no apparent sign of collinearity, either.

23 As aggregate accounting earnings quality (AEQ) and earnings quality are inversely related, a positive relationship between variables NUMBANK and AEQ, and SHAREHOLD and AEQ, respectively, leads to the mentioned negative relation.

24 IS is inversely related to income smoothing (i.e., higher values, closer to zero, imply more income smoothing). Results are insensitive to employing other smoothing measures with, for instance, revenues as underlying performance (Eckel, 1981) [untabulated].

25 A step-wise extension of the model, starting only with audit firm indicators as explanatory variables, than adding firm-characteristics which potentially are associated with the choice of a certain type of audit firm (e.g., Lawrence et al., 2011), and finally adding controls for agency conflicts, reveals qualitatively similar results [untabulated]. This ensures that inferences are not attributable to correlated effects generated by control variables.
<table>
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<th>Variables</th>
<th>AEQ,DA</th>
<th>AEQ,UC</th>
<th>DA</th>
<th>IS</th>
<th>UC</th>
<th>ROA</th>
<th>LOSS</th>
<th>SIZE</th>
<th>LEV</th>
<th>CAPINT</th>
<th>INVREC</th>
<th>LNAGE</th>
<th>CORP-STRUCT</th>
<th>SHAREHOLD</th>
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<th>EMP</th>
<th>BIG4</th>
<th>MID-TIER</th>
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</tr>
</tbody>
</table>

P-values (two-tailed) are presented in brackets. $AEQ_{DA}$ ($AEQ_{UC}$) is the aggregated accounting earnings quality percentile rank based on $DA$ ($UC$), and $IS$ are signed discretionary accruals scaled by total assets according to Kasznik (1999). $IS$ is the income smoothing ratio defined by Leuz et al. (2003), which is the standard deviation of net income divided by the standard deviation of cash flow from operations. $US$ are signed discretionary accruals scaled by total assets. $IS$ are signed discretionary accruals scaled by total assets. $LC$ is the natural logarithm of total assets. $LOSS$ is a dummy variable indicating whether there was a loss in the given firm-year. $SIZE$ is the natural logarithm of total assets. $LEV$ is total debt to total assets. $CAPINT$ is long-term assets to total assets. $INVREC$ is the portion of total assets assigned to inventories and receivables. $LNAGE$ is the natural logarithm of firm age. $CORP-STRUC$ is a dummy variable indicating whether the firm is part of a corporate structure as either the parent or a subsidiary company. $SHAREHOLD$ is the number of shareholders. $NUMBANK$ is the number of bank relationships the firm is engaged in. $EMP$ is a binary variable indicating whether the firm has above 100 employees. $BIG4$ is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a Big 4 audit firm. $MIDTIER$ is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a mid-tier audit firm.

Table 5: Pairwise Pearson correlations
<table>
<thead>
<tr>
<th>Measure</th>
<th>BIG4 (N)</th>
<th>MIDTIER (N)</th>
<th>INDEPAUD (N)</th>
<th>Difference (t-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEQDA</td>
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<td>.4974 (4,332)</td>
<td>.5389 (17,478)</td>
<td>.0419*** (11.9501)</td>
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<tr>
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<td>.4974 (4,332)</td>
<td>.5389 (17,478)</td>
<td>.0415*** (12.3371)</td>
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<td>.4987 (4,332)</td>
<td>.5386 (17,478)</td>
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<td>.0041 (17,478)</td>
<td>.0003 (0.2507)</td>
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<td>-.0050 (4,332)</td>
<td>.0041 (17,478)</td>
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<td>-.0053 (15,053)</td>
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<td>.0094*** (11.5120)</td>
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<tr>
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<td>-.5054 (4,332)</td>
<td>-.3971 (17,478)</td>
<td>.1217*** (6.7008)</td>
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<tr>
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<td>-.5054 (4,332)</td>
<td>-.3971 (17,478)</td>
<td>.1083*** (9.0248)</td>
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<td>-.5054 (4,332)</td>
<td>-.3971 (17,478)</td>
<td>.2300*** (15.6044)</td>
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<td>-.0085 (4,332)</td>
<td>.0004 (17,478)</td>
<td>.0012 (0.9162)</td>
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<td>-.0085 (4,332)</td>
<td>.0004 (17,478)</td>
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<td>-.0085 (4,332)</td>
<td>.0004 (17,478)</td>
<td>.0101*** (11.9845)</td>
</tr>
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</table>

All variables are rounded to the fourth decimal. ***/**/* indicates significance at the 99th/95th/90th percentile level using a two-tailed t-test. BIG4 is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a Big 4 audit firm. MIDTIER is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a mid-tier audit firm. INDEPAUD is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a legally independent audit firm.

Table 6: Mean accounting earnings quality for firms audited by a BIG4, MIDTIER or INDEPAUD audit firm.
The results of the auditor binary variables number of shareholders decrease earnings quality, average less tight, bank relationships and a larger suggested by agency theory. More, but therefore on average, firms in corporate structures also exhibit increased levels of earnings quality. On the one hand, as CORPSTRUC is significantly positively related with SIZE this does not seem to be particularly surprising. On the other hand, firm size seems to follow the political cost hypothesis (Watts/Zimmerman (1986). An increased general visibility of firms seems to serve as an incentive to increase earnings quality. Higher leverage (LEV), higher capital intensity (CAPINT) and increased asset complexity (INVREC), on average, are associated with reduced managerial accounting flexibility and, hence, increased earnings quality. Confirming the hypothesis that younger firms are potentially more often in distress, or simply have less well developed accounting and internal control systems, increasing firm age is associated with higher earnings quality. The corporate governance control variables SHAREHOLD and NUMBANK exhibit a behavior suggested by agency theory. More, but therefore on average less tight, bank relationships and a larger number of shareholders decrease earnings quality. The results of the auditor binary variables BIG4 and MIDTIER shed light on the posited research questions. Big 4 auditors, and likewise, but to a lesser extent, mid-tier audit firms, increase accounting earnings quality. Smaller audit firms (INDEPAUD) serve as the category of reference.

Table 7 also exhibits the association of the audit indicator variables with the single (accounting) earnings quality measures. As discussed before, larger auditors decrease discretionary accruals (DA). They even foster the creation of conservative (i.e., income-decreasing) discretionary accruals, attributable to auditors acting more strictly against inflation of earnings (e.g., Francis/Wang, 2008). Moreover, they are also associated with less income smoothing (IS) and more negative cross-sectionally unexpected conservatism (UC). On average, larger auditors thus are significantly associated with more conservative reporting of earnings compared with their smaller counterparts, thus confirming my prior expectations.26

4.3. Additional analyses

4.3.1. Potential trade-off between real and accrual earnings management

There is an extensive line of literature evolving around overall earnings quality which is a function of accounting earnings quality and real earnings management (e.g., Wagenhofer/Dücker, 2007). Real earnings management is the part of a firm’s discretion over earnings creation and reporting which is not subject to statutory audits. Amongst other business strategies, like overproduction and the reduction of discretionary expenditures, there is ample evidence of discounts and increased credit sales to achieve certain earnings goals (Roychowdhury, 2006). Thus, real earnings management is more problematic than accounting earnings management. It is associated with substantial (long-term) economic cost to the firm (Cohen/Zarowin, 2010) and does not necessarily have to reverse in future periods (Ernstberger et al., 2011). Therefore, managers wanting to reach specific earnings goals should primarily resort to accounting earnings management as it results in little direct cost.

Chi et al., 2011 conclude that accrual and real earnings management are substitutes. When costs of accrual earnings management are higher, ceteris paribus, firms are more likely to engage in real earnings management* (p. 318, italics in original). Given managers have incentives to manage earnings, and high quality auditors increase their cost of accounting earnings management, one can expect them to resort to real earnings management (Chi et al., 2011; Ewert/Wagenhofer, 2005; García Lara et al., 2012). As such, I predict that larger auditors, being superior in constraining accounting-based earnings management, are thus associated with increased levels of real earnings management by their clients.

26 Admittedly, survivorship bias potentially increases the positive association of LNAGE with earnings quality.

27 As IS is firm-specific, I re-estimate the regression presented in Table 7 with firm-specific averages of control variables, and without firms changing auditor types. The results remain robust [untabulated].
### Table 7: OLS-regression results of model (4)

<table>
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<tr>
<th>Dependent Variable:</th>
<th>AEQ_{DA}</th>
<th>AEQ_{UC}</th>
<th>DA</th>
<th>IS</th>
<th>UC</th>
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<tr>
<td>Variable</td>
<td>Coefficient (Robust Std. err.)</td>
<td>Coefficient (Robust Std. err.)</td>
<td>Coefficient (Robust Std. err.)</td>
<td>Coefficient (Robust Std. err.)</td>
<td>Coefficient (Robust Std. err.)</td>
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<td>-0.0112</td>
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<tr>
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<td>Yes</td>
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<tr>
<td>YEAR</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</table>

All coefficients are rounded to the fourth decimal. Standard errors are clustered at the firm-level. ***/**/* denotes significance at the 99%/95%/90%-percentile using a two-tailed test. AEQ_{DA} (AEQ_{UC}) is the aggregated accounting earnings quality percentile rank based on DA (UC) and IS. DA are signed discretionary accruals scaled by total assets according to Kasznik (1999). IS is the income smoothing ratio defined by Leuz et al. (2003), which is the standard deviation of net income divided by the standard deviation of cash flow from operations. UC is the proxy for unexpected conservatism based on Ball and Shivakumar (2005). BIG4 is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a Big 4 audit firm. MIDTIER is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a mid-tier audit firm. Independent audit firms (INDEPENDENT) are the category of reference. ROA is net income scaled by total assets. LOSS is a dummy variable indicating whether there was a loss in the given firm-year. SZE is the natural logarithm of total assets. LEV is long-term assets to total assets. CAPINT is the portion of total assets assigned to inventories and receivables. LNAGE is the natural logarithm of firm age. CORPSTRUC is a dummy variable indicating whether the firm is part of a corporate structure as either the parent or a subsidiary company. SHAREHOLD is the natural logarithm of the number of shareholders in the firm. NUMBANK is the natural logarithm of the number of bank relationships the firm is engaged in. EMP is a binary variable indicating whether the firm has above 100 employees. IND and YEAR are variables controlling for year- and industry-fixed effects.
Following Dechow et al., (1998) and Roychowdhyr (2006), I estimate the following regression cross-sectionally for every industry and year with a minimum of 15 firm-year observations per industry to determine the «normal» level of CFO. Hence, $ACFO$ is the residual of reported $CFO$ and its corresponding «normal» level.

$$\frac{CFO_{i,t}}{TA_{i,t}} = \alpha_0 + \alpha_1 \cdot \frac{1}{TA_{i,t}} + \alpha_2 \cdot \frac{REV_{i,t}}{TA_{i,t}} + \alpha_3 \cdot \frac{\Delta REV_{i,t}}{TA_{i,t}} + \epsilon_{i,t}$$

(5)

where for firm $i$ (in year $t$):

$CFO_{i,t}$ is cash flow from operations

$TA_{i,t}$ are total assets

$REV_{i,t}$ is sales revenue

$\Delta REV_{i,t}$ is the change in sales revenue

Roychowdhyr (2006) also computes overproduction and abnormal discretionary expenses (i.e., research & development, and advertising expenses, etc.). Due to a lack of necessary data, I have to limit my additional analyses to $ACFO$. Yet, to get a full picture of real earnings management one would have to consider a combination of all three proxy measures (e.g., Ernstberger et al., 2011).

Nevertheless, in line with theory and empirical evidence, a first analysis provides evidence that better monitoring of financial reporting quality by Big 4 audit firms seems to incentivize their clients to resort to increased levels of real earnings management. Compared with smaller auditors, Big 4 clients exhibit significantly higher mean values of $ACFO$ [untabulated]. Table 8 exhibits that real earnings management, in the form of abnormal cash flows ($ACFO$), exhibits a positive association with larger auditors, with the effect of Big 4 being significant at the 90th percentile. As a result, I am able to provide, to my knowledge, first indication of an apparently unintended consequence of increased audit quality in a private firm-framework. This interesting finding warrants additional future research which undoubtedly has to further encompass the other facets of real earnings management, namely overproduction and discretionary expenditures.

### 4.3.2. Additional robustness checks

There is evidence of self-selection and endogeneity issues surrounding auditor choice and the decision to manage earnings (Lawrence et al., 2011). Table 9 exhibits the differences between clients of Big 4 and mid-tier audit firms. BIG4-clients are significantly more profitable, larger, more leveraged, carry comparatively more inventory and accounts receivable, and are more likely to be part of a larger corporate structure. At the same time, they are comparatively less capital intensive, have less shareholders and bank relationships.

Following up on these significant differences between both groups in terms of client firm-characteristics, I control for the endogeneity of audit firm choice. Thus, I create two propensity score matched samples of Big 4 vs. Non-Big 4 clients. The first sample is based on model (4). For the second sample, I add a vector of binary variables indicating whether the bank relationship is with a distinct banking group. This controls for banks specifically demanding an audit by a Big 4 audit firm, commonly referred to as Big4 only-clauses. In both cases, I match the observations without replacement and with a caliper of 1%. The results for $AEQ_{0,0}$ as well as $AEQ_{0,0}$ are robust with a slightly smaller factor load on the newly created, matched BIG4 variable, indicating that only a minor fraction of the inferences might in fact be based on the endogeneity of hiring a Big 4 auditor and the decision to manage earnings.

Results for audit quality comparisons are potentially driven by office size. Francis and Yu (2009) find that larger Big 4 offices provide increased levels of audit quality. To control for this effect, I drop observations with an independent or mid-tier auditor. Big 4 audit clients are then divided into two groups based on the number of observations audited by a particular Big 4 office. I consider offices to be large if they audit more than 400 of the

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28 A total of eleven banks (banking groups) are considered. These are Deutsche Bank (DB), Commerzbank (COBA), cooperative banks (COOP), co-operative central banks (COOP-CENT), savings banks (SAV), HypoVereinsbank (HVB), Postbank (POBA), federal state banks (LAND), foreign banks (FOREIGN), German subsidiaries of foreign banks (SUBSIDIARY) and other commercial banks (OTHER).

29 The propensity of Big 4 only-clauses is controversial and widely discussed in Germany (e.g., Barthel, 2011; Otte, 2011), and internationally (e.g., European Commission, 2010; Eichenseher/Shields, 1985).
### Table 8: OLS- and quantile (median-)regression results of model (4)

<table>
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<tr>
<th>Dependent Variable: ACFO</th>
<th>Variable</th>
<th>Exp. Sign</th>
<th>OLS</th>
<th>Median</th>
</tr>
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<tr>
<td></td>
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<td></td>
<td>Coefficient (Robust std.err.)</td>
<td>Coefficient (Std. err.)</td>
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<td></td>
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<tr>
<td>BIG4</td>
<td>+</td>
<td>.0100 (.0053)</td>
<td>* .0041 (.0013)</td>
<td>***</td>
</tr>
<tr>
<td>MIDTIER</td>
<td>+</td>
<td>.0250 (.0219)</td>
<td>.0003 (.0019)</td>
<td>***</td>
</tr>
<tr>
<td>ROA</td>
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<td>1.808 (.0434)</td>
<td>*** .1307 (.0063)</td>
<td>***</td>
</tr>
<tr>
<td>LOSS</td>
<td>+</td>
<td>.0365 (.0072)</td>
<td>*** .0275 (.0018)</td>
<td>***</td>
</tr>
<tr>
<td>SIZE</td>
<td>?</td>
<td>- .0113 (.0035)</td>
<td>*** - .0041 (.0006)</td>
<td>***</td>
</tr>
<tr>
<td>LEV</td>
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<td>.0230 (.0113)</td>
<td>** .0158 (.0026)</td>
<td>***</td>
</tr>
<tr>
<td>CAPINT</td>
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<td>- .1646 (.0488)</td>
<td>*** - .0648 (.043)</td>
<td>***</td>
</tr>
<tr>
<td>INVREC</td>
<td>?</td>
<td>- .0525 (.0362)</td>
<td>- .024 (.0043)</td>
<td>***</td>
</tr>
<tr>
<td>LNAGE</td>
<td>-</td>
<td>- .0083 (.0036)</td>
<td>** - .0031 (.0008)</td>
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</tr>
<tr>
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<td>*** - .0077 (.0012)</td>
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</tr>
<tr>
<td>SHAREHOLD</td>
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<td>.0038 (.0011)</td>
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</tr>
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<td>EMP</td>
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<td>- .0046 (.0013)</td>
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<td>IND</td>
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<td>Yes</td>
<td>**</td>
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<td>R²</td>
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<td>Prob &gt; F</td>
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<tr>
<td>Pseudo R²</td>
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<td>0.0871</td>
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All coefficients are rounded to the fourth decimal. Standard errors are clustered at the firm-level. ***/***/* denotes significance at the 99%/95%/90th percentile using a two-tailed test. ACFO is abnormal cash flow from operations according to Roychowdhury (2006). BIG4 is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a Big 4 audit firm. MIDTIER is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a mid-tier audit firm. Independent audit firms (INDEPAUD) are the category of reference. ROA is net income scaled by total assets. LOSS is a dummy variable indicating whether there was a loss in the given firm-year. SIZE is the natural logarithm of total assets. LEV is total debt to total assets. CAPINT is long-term assets to total assets. INVREC is the portion of total assets assigned to inventories and receivables. LNAGE is the natural logarithm of firm age. CORPSTRUC is a dummy variable indicating whether the firm is part of a corporate structure as either the parent or a subsidiary company. SHAREHOLD is the natural logarithm of the number of shareholders in the firm. NUMBANK is the natural logarithm of the number of bank relationships the firm is engaged in. EMP is a binary variable indicating whether the firm has above 100 employees. IND and YEAR are variables controlling for year- and industry-fixed effects.
An audit is an audit?

The coefficient on LARGE-BIG4 in a re-estimation of model (4) is slightly negative (-.0008) but highly insignificant (with a t-value of -.21).

In an additional analysis, I examine the probability of upwards earnings management around the zero earnings threshold (Burgstahler/Dichev, 1997). The robust probit regression uses cash flow from operations scaled by total assets, SIZE, LEV, CAPINT and year-fixed effects as control variables. Additional models include an indicator variable for positive discretionary accruals (DAPOS) and interaction terms of DAPOS with BIG4 and MIDTIER.

The interval width of [0:.005] is in accordance with the rationale by Freedman and Diaconis (1981), such that the interval is positively associated with data variability and negatively with the number of observations. Upward earnings management is, thus, expected if firm-years fall into the smallest profit interval, while there, arguably, is no earnings management if scaled net income is in the smallest loss interval.

Table 10 exhibits the results of the small loss avoidance analysis. Big 4 audit firms significantly reduce the probability of upward earnings management compared to smaller auditors, at least at the 95th percentile, whereas the negative coefficient on MIDTIER is (1) smaller in magnitude, and (2), mostly, less significant. Smaller (independent) au-

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std. err.</th>
<th>N</th>
<th>Mean</th>
<th>Std. err.</th>
<th>Difference</th>
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<td>.0011</td>
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<td>.0408</td>
<td>.0016</td>
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<td>.0033</td>
<td>4,332</td>
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</tr>
<tr>
<td>LEV</td>
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<td>.0021</td>
<td>4,332</td>
<td>.4503</td>
<td>.0039</td>
<td>.0106***</td>
</tr>
<tr>
<td>CAPINT</td>
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<td>.4408</td>
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<td>INVREC</td>
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<td>.0024</td>
<td>3,987</td>
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<td>.0044</td>
<td>.1090***</td>
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<td>2.8473</td>
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<td>CORPSTRUC</td>
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<td>.0040</td>
<td>4,332</td>
<td>.5644</td>
<td>.0075</td>
<td>.0470***</td>
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<td>SHAREHOLD</td>
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<td>.0110</td>
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<td>.0088</td>
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<td>4,332</td>
<td>.7181</td>
<td>.0058</td>
<td>-.0263***</td>
</tr>
</tbody>
</table>

All coefficients are rounded to the fourth decimal. ***/**/* denotes significance at the 99%/95%/90th percentile using a two-tailed test. BIG4 is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a Big 4 audit firm. MIDTIER is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a mid-tier audit firm. ROA is net income scaled by total assets. LOSS is a dummy variable indicating whether there was a loss in the given firm-year. SIZE is the natural logarithm of total assets. LEV is total debt to total assets. CAPINT is long-term assets to total assets. INVREC is the portion of total assets assigned to inventories and receivables. LNAGE is the natural logarithm of firm age. CORPSTRUC is a dummy variable indicating whether the firm is part of a corporate structure as either the parent or a subsidiary company. SHAREHOLD is the natural logarithm of the number of shareholders in the firm. NUMBANK is the natural logarithm of the number of bank relationships the firm is engaged in. EMP is a binary variable indicating whether the firm has above 100 employees.

Table 9: Differences in client firm-characteristics

sample’s firm-years. The coefficient on LARGE-BIG4 in a re-estimation of model (4) is slightly negative (-.0008) but highly insignificant (with a t-value of -.21).

In an additional analysis, I examine the probability of upwards earnings management around the zero earnings threshold (Burgstahler/Dichev, 1997). The robust probit regression uses cash flow from operations scaled by total assets, SIZE, LEV, CAPINT and year-fixed effects as control variables. Additional models include an indicator variable for positive discretionary accruals (DAPOS) and interaction terms of DAPOS with BIG4 and MIDTIER.

30 If one lowers the bar to 250 firm-years qualitatively similar results are achieved.
### Table 10: Probit-regression results

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>EM</th>
<th>EM</th>
<th>EM</th>
<th>EM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Exp.</td>
<td>Sign</td>
<td>Coefficient (Robust Std.err.)</td>
<td>Coefficient (Robust Std.err.)</td>
</tr>
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<td>Constant</td>
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<td>.8463 (0.0258) ***</td>
<td>.6071 (0.1769) ***</td>
<td>.7822 (0.1856) ***</td>
</tr>
<tr>
<td>BIG4</td>
<td>-</td>
<td>-.2166 (0.0448) ***</td>
<td>-.2339 (0.0485) ***</td>
<td>-.2421 (0.0488) ***</td>
</tr>
<tr>
<td>MIDTIER</td>
<td>-</td>
<td>-.1195 (0.0586) ***</td>
<td>-.1006 (0.0608) *</td>
<td>-.1078 (0.0609) *</td>
</tr>
<tr>
<td>CFO</td>
<td>?</td>
<td>.2509 (0.1284) *</td>
<td>.1646 (0.1298)</td>
<td>.1472 (0.1300)</td>
</tr>
<tr>
<td>SIZE</td>
<td>?</td>
<td>.0288 (0.0165) *</td>
<td>.0188 (0.0168)</td>
<td>.0208 (0.0168)</td>
</tr>
<tr>
<td>LEV</td>
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<td>.1085 (0.0783)</td>
<td>.1060 (0.0704)</td>
<td>.1039 (0.0781)</td>
</tr>
<tr>
<td>CAPINT</td>
<td>?</td>
<td>-.2505 (0.0705) ***</td>
<td>-.2415 (0.0705) ***</td>
<td>-.2326 (0.0707) ***</td>
</tr>
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<td>DAPOS</td>
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<td>-.0821 (0.0550)</td>
<td>-.0821 (0.0550)</td>
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<tr>
<td>DAPOS*BIG4</td>
<td>?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DAPOS*MIDTIER</td>
<td>?</td>
<td></td>
<td></td>
<td></td>
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<td>Yes</td>
<td>Yes</td>
</tr>
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<td>Pseudo $R^2$</td>
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<td>0.0104</td>
<td>0.0121</td>
<td>0.0128</td>
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</table>

All coefficients are rounded to the fourth decimal. ***/**/* denotes significance at the 99th/95th/90th percentile using a two-tailed test. Standard-errors are robust according to White (1980). EM is an indicator variable whether scaled net income is in the smallest profit interval [0;0.005] or in the smallest loss interval [-0.005;0]. BIG4 is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a Big 4 audit firm. MIDTIER is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a mid-tier audit firm. Independent audit firms (INDEPAUD) are the category of reference. CFO is cash flow from operations scaled by total assets. SIZE is the natural logarithm of total assets. LEV is total debt to total assets. CAPINT is long-term assets to total assets. DAPOS is an indicator variable whether discretionary accruals are positive. YEAR are variables controlling for year-fixed effects.
An audit is an audit?

...ditors are, once more, the category of reference. It seems that the existence of positive (i.e., income-increasing) discretionary accruals mitigates small loss avoidance, suggesting that these firms resort comparatively more to real earnings management activities as discussed in the previous section. This effect is mostly driven by BIG4-auditees. Cumulatively, this suggests that BIG4 auditors exert even more pressure on auditees which likely have had increased incentives to manage earnings attributable to their ex-ante closeness to the zero earnings benchmark.31 On the downside, the explanatory power of all presented probit models is relatively small. This is in line with research on earnings management around thresholds but, nevertheless, suggests that there are other factors associated with the decision to (not) avoid reporting small losses.

Another question that comes to mind is whether all Big 4 auditors provide audits of similar quality. While Francis and Wang (2008) find significant cross-country (i.e., international) differences based on the countries’ legal frameworks, Fuerman (2006) claims that (only) Arthur Andersen provided systematically lower audit quality than its Big 5 peers. I repeat the regression of model (4) on AEQDA and replace BIG4 with separate binary variables for each of the Big 4 firms. The R² of this new model is slightly higher (0.2769) but the coefficients (and t-values) of the separate Big 4 variables are comparable, suggesting that there are virtually no differences in Big 4-audit quality in my setting.32 Inferences are qualitatively similar for AEQUC.

Table 11 repeats analyses shown in Table 7 employing an outlier robust estimation technique (i.e., quantile (median) regression (Koenker/Bassett, 1978; Koenker/Hallock, 2001). Moreover, it does not assume a specific distribution of the response variable. Hence, it is not biased by potential non-normality of dependent variables. The results remain qualitatively unchanged. The same is the case for the single (accounting) earnings quality measures [untabulated].

Table 12 exhibits the results of year specific OLS-regressions for years 2006 through 2008 as they constitute the majority of the sample. The inferences are stable, indicating that the year-fixed effects and controls for firm-specific profit levels capture most of the inter-temporal differences. Year-specific regressions with AEQUC, DA, IS and UC as dependent variables reveal qualitatively similar patterns [untabulated].

A final robustness analysis is concerned with the association of audit firm groups and their clients’ use of discretionary accruals. Therefore, I split the full sample analysis presented in Table 7 into its conservative (income-decreasing) and aggressive (income-increasing) sub-samples. The results presented in Table 13 exhibit a negative, yet insignificant, association of both BIG4 and MIDTIER audit firms with aggressive discretionary accruals. The association with their conservative counterparts is highly significant and negative. This, in fact, shows that larger auditors seem to foster income-decreasing accruals but do not necessarily, at least not significantly, impair their income-increasing use.

5. Summary and discussion

This study analyzes the effect of auditor size on earnings management and earnings quality by German private firms. This paper contributes to literature for a multitude of reasons. First, other papers mainly focus on listed firms (e.g., Becker et al., 1998; Francis et al., 1999). While agency issues might be a more pronounced problem for listed firms, as ownership is more widely dispersed (e.g., Jensen/Meckling, 1976), their financial statements are under far more scrutiny by financial analysts, investors and the like. Sometimes financial statements are the only piece of information available on private firms, which makes high quality audits particularly valuable for private firms (Cano-Rodriguez/Sanchez Alegria, 2011). Another reason for choosing a private firm setting is the lower (higher) market share of Big 4 (mid-tier and independent) audit firms. While Big 4 auditors are employed by over 80% of the major stock corporations, their market share in my sample is only about 41%.

Second, other papers generally focus on single33 proxy metrics of audit and earnings quality, like

31 Inferences of a probit model resembling Model (4) employing a sample of 4,195 observations are qualitatively similar with the negative coefficient on BIG4 (MIDTIER) being significant at the 90th percentile (insignificant). The explanatory power of this ‘full’ model is slightly higher (Pseudo R² = 0.0285).
32 The coefficient (t-value) on PWC is -0.0645 (-12.68). For KPMG it is -0.0549 (-9.57). DELOITTE and E&Y have values of -0.0563 (-7.55) and -0.0505 (-8.47), respectively.
33 With notable exceptions like e.g., Boone et al. (2010) and van Tendeloo and Vanstraelen (2008).
<table>
<thead>
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<th>Variable</th>
<th>Exp.</th>
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<th>Coefficient (Robust Std.err.)</th>
<th>Coefficient (Robust Std.err.)</th>
<th>Coefficient (Robust Std.err.)</th>
<th>Coefficient (Robust Std.err.)</th>
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<td>** -.6115 (.1156)</td>
<td>*** -.0321 (.0144)</td>
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<td>-.0576 (.0028)</td>
<td>*** -.0563 (.0030)</td>
<td>*** -.0054 (.0066)</td>
<td>*** -.0728 (.0052)</td>
<td>*** -.0056 (.0006)</td>
</tr>
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<td>MIDTIER</td>
<td>-</td>
<td>-.0139 (.0040)</td>
<td>*** -.0124 (.0041)</td>
<td>*** -.0023 (.0009)</td>
<td>*** -.0151 (.0073)</td>
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<td>*** 5544 (.0031)</td>
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<td>*** -.1810 (.0040)</td>
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<td>*** -.2658 (.0071)</td>
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<td>* .0020 (.0003)</td>
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<td>*** -.0673 (.0168)</td>
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<td>.1705 (.0168)</td>
<td>*** .0089 (.0021)</td>
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<td>*** .0356 (.0041)</td>
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<td>*** -.0218 (.0030)</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
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<td>Yes</td>
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</tbody>
</table>

All coefficients are rounded to the fourth decimal. Standard errors are clustered at the firm-level. ***/**/* denotes significance at the 99%/95%/90% percentile using a two-tailed test. AEQDA (AEQUC) is the aggregated accounting earnings quality percentile rank based on DA (UC) and IS. DA are signed discretionary accruals scaled by total assets according to Kasznik (1999). IS is the income smoothing ratio defined by Leuz et al. (2003), which is the standard deviation of net income divided by the standard deviation of cash flow from operations. UC is the proxy for unexpected conservatism based on Ball and Shivakumar (2005). BIG4 is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a Big 4 audit firm. MIDTIER is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a mid-tier audit firm. Independent audit firms (INDEPAUD) are the category of reference. ROA is net income scaled by total assets. LOSS is a dummy variable indicating whether there was a loss in the given firm-year. SIZE is the natural logarithm of total assets. LEV is total debt to total assets. CAPINT is long-term assets to total assets. INVREC is the portion of total assets assigned to inventories and receivables. LNAGE is the natural logarithm of firm age. CORPSTRUC is a dummy variable indicating whether the firm is part of a corporate structure as either the parent or a subsidiary company. SHAREHOLD is the natural logarithm of the number of shareholders in the firm. NUMBANK is the natural logarithm of the number of bank relationships the firm is engaged in. EMP is a binary variable indicating whether the firm has above 100 employees. IND and YEAR are variables controlling for year- and industry-fixed effects.

Table 11: Quantile (median)-regression results of model (4)
### Table 12: Annual OLS-regression results of model (4)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Exp. Sign</th>
<th>AEQDA 2006 Coefficient (Robust Std.err.)</th>
<th>AEQDA 2007 Coefficient (Robust Std.err.)</th>
<th>AEQDA 2008 Coefficient (Robust Std.err.)</th>
</tr>
</thead>
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<tr>
<td>Constant</td>
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<td>0.7061 (0.1400)</td>
<td>0.5047 (0.0714)</td>
<td>0.4535 (0.0870)</td>
</tr>
<tr>
<td>BIG4</td>
<td>-</td>
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<td>-0.0616 (0.0046)</td>
<td>-0.0585 (0.0045)</td>
</tr>
<tr>
<td>MIDTIER</td>
<td>-</td>
<td>-0.0176 (0.0064)</td>
<td>-0.0195 (0.0061)</td>
<td>-0.0235 (0.0061)</td>
</tr>
<tr>
<td>ROA</td>
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<td>0.1591 (0.0270)</td>
<td>0.1706 (0.0249)</td>
</tr>
<tr>
<td>LOSS</td>
<td>-</td>
<td>-0.1573 (0.0069)</td>
<td>-0.1828 (0.0064)</td>
<td>-0.1967 (0.0062)</td>
</tr>
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<td>SIZE</td>
<td>?</td>
<td>0.026 (0.021)</td>
<td>0.043 (0.020)</td>
<td>0.0043 (0.020)</td>
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<tr>
<td>LEV</td>
<td>?</td>
<td>-0.0374 (0.0093)</td>
<td>-0.0267 (0.0091)</td>
<td>-0.0396 (0.0088)</td>
</tr>
<tr>
<td>CAPINT</td>
<td>?</td>
<td>-0.0249 (0.0154)</td>
<td>-0.0102 (0.0149)</td>
<td>-0.0205 (0.0149)</td>
</tr>
<tr>
<td>INVREC</td>
<td>?</td>
<td>0.0690 (0.0156)</td>
<td>0.0855 (0.0150)</td>
<td>0.0559 (0.0151)</td>
</tr>
<tr>
<td>LNAGE</td>
<td>-</td>
<td>0.0015 (0.0028)</td>
<td>0.0040 (0.0027)</td>
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<td>CORPSTRUC</td>
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<td>-0.0550 (0.0041)</td>
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<td>SHAREHOLD</td>
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<td>NUMBANK</td>
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<td>-0.0222 (0.0046)</td>
<td>-0.0228 (0.0046)</td>
<td>-0.0204 (0.0046)</td>
</tr>
<tr>
<td>IND</td>
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<td>Yes</td>
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<tr>
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<td>No</td>
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<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
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</tr>
</tbody>
</table>

All coefficients are rounded to the fourth decimal. ***/** denotes significance at the 99%/95%/90% percentile using a two-tailed test. AEQDA is the aggregate accounting earnings quality rank based on DA and IS. BIG4 is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a Big 4 audit firm. MIDTIER is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a mid-tier audit firm. Independent audit firms (INDEPAUD) are the category of reference. ROA is net income scaled by total assets. LOSS is a dummy variable indicating whether there was a loss in the given firm-year. SIZE is the natural logarithm of total assets. LEV is total debt to total assets. CAPINT is long-term assets to total assets. INVREC is the portion of total assets assigned to inventories and receivables. LNAGE is the natural logarithm of firm age. CORPSTRUC is a dummy variable indicating whether the firm is part of a corporate structure as either the parent or a subsidiary company. SHAREHOLD is the natural logarithm of the number of shareholders in the firm. NUMBANK is the natural logarithm of the number of bank relationships the firm is engaged in. EMP is a binary variable indicating whether the firm has above 100 employees. IND and YEAR are variables controlling for year- and industry-fixed effects.

AEQDA is the aggregate accounting earnings quality rank based on DA and IS.
Dependent Variable: income-decreasing DA  income-increasing DA

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<th>Variable</th>
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<th>Median Coefficient</th>
<th>OLS Coefficient</th>
<th>Median Coefficient</th>
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<td>(Std. err.)</td>
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<td>(Std. err.)</td>
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<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>YEAR</td>
<td>?</td>
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<td>Yes</td>
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<td>R²</td>
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<td>0.3328</td>
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</tr>
</tbody>
</table>

All coefficients are rounded to the fourth decimal. Standard errors are clustered at the firm-level. ***/**/* denotes significance at the 99%/95%/90th percentile using a two-tailed test. DA are signed discretionary accruals scaled by total assets according to Kasznik (1999). BIG4 is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a Big 4 audit firm. MIDTIER is a dummy variable indicating whether the firm’s statutory auditor in the corresponding year is a mid-tier audit firm. Independent audit firms (INDEPAUD) are the category of reference. ROA is net income scaled by total assets. LOSS is a dummy variable indicating whether there was a loss in the given firm-year. SIZE is the natural logarithm of total assets. LEV is total debt to total assets. CAPINT is long-term assets to total assets. INVREC is the portion of total assets assigned to inventories and receivables. LNAGE is the natural logarithm of firm age. CORPSTRUC is a dummy variable indicating whether the firm is part of a corporate structure as either the parent or a subsidiary company. SHAREHOLD is the natural logarithm of the number of shareholders in the firm. NUMBANK is the natural logarithm of the number of bank relationships the firm is engaged in. EMP is a binary variable indicating whether the firm has above 100 employees. IND and YEAR are variables controlling for year- and industry-fixed effects.

Table 13: OLS- and median regression results of model (4) with income-increasing and income-decreasing DA as the dependent variable
abnormal accruals (e.g., Francis et al., 1999). I employ a methodology by Tendeloo and Vanstraelen (2008) and rank all observations on a percentage scale for each accounting earnings quality proxy measure. The three accounting earnings quality measures being discretionary accruals (Kasznik, 1999), income smoothing (Leuz et al., 2003) and unexpected conservatism based on Ball and Shivakumar (2005). For each observation its single proxy ranks are aggregated into two overall accounting earnings quality measures combining discretionary accruals (unexpected conservatism) with income smoothing to incorporate the inherent connection of both earnings properties with income smoothing (e.g., Gassen et al., 2006; Tucker/Zarowin, 2006, and many others). The earnings quality proxies employed here originate from the Anglo-Saxon strand of earnings management and earnings quality research. As such, it is debatable whether they are appropriate in the German private firm-context. Interpreting conservative earnings as high-quality earnings, which is at the core of a stakeholder-oriented accounting system such as German GAAP (e.g., Schmalenbach, 1925), they seem well-suited. It accepts the notion that earnings are not as informative for investors, who, in the case of private firms, regularly are well informed to begin with.

Third, the results extend the literature on the audit quality differences between Big 4, mid-tier and smaller (i.e., independent) audit firms. They show that larger auditors seem to be more effective in ensuring higher accounting earnings quality than smaller auditors. Big 4 audit firms are associated with higher accounting earnings quality than mid-tier auditors, which in turn supersede smaller audit firms. As a result, this paper contributes to the ongoing debate about audit market concentration for non-listed private firms. In an additional analysis, consistent with theory and empirical evidence (Ewert/Wagenhofer, 2005; Chi et al., 2011), I show one potential adverse effect of higher audit and accounting earnings quality. The tightening of accounting choices by larger auditors seems to incentivize at least some firms to apply more real earnings management. As real earnings management choices are associated with considerable economic cost, this provides initial evidence on the ‘dark side’ of increased audit quality. These findings warrant additional future research on the trade-off between real and accounting earnings management in a private firm setting.

One limitation of the study is that it only considers auditors, besides the Big 4 auditors, which are part of the Lünendonk list of Germany’s 25 largest audit firms as mid-tier auditors. There is no doubt that smaller auditors, which might not be part of the list on their own, could be considered as mid-tier auditors if one also takes networks of independent audit firms into account. These audit networks share expertise and provide joint training for employees. Nevertheless, while this might discriminate against auditors which are part of larger networks of legally independent audit firms, it would act, in my opinion, against finding differences between Big 4/mid-tier audit firms and smaller (legally independent) auditors. A second limitation lies in the formation of the sample itself. Like all commercially available databases, BvD DAFNE depends on publicly available financial reports. Compliance with the obligation to publish financial reports has traditionally been low in Germany (e.g., Noack, 2002). Only for very recent years, the number of published financial reports has been rising attributable to increased enforcement effort. This might lead to potential self-selection issues and the sample being generally of higher earnings quality than the population. In my opinion, this would again, if anything, lead to not finding an audit/earnings quality differential. For data availability reasons, this study does not differentiate between different types of private firms. There likely are different reporting incentives for owner-managed (or family-firms) compared to firms with additional external shareholders. Especially tax reduction might be a more prevalent determinant of reporting choices for the former than for the latter group. Considering real earnings management, it likely is less pronounced for owner-managed firms than for multi-shareholder firms. An owner-manager, being aware of the economic cost, would need strong incentives directed at external stakeholders to actually engage in real earnings management. Additional future research elaborating on these these ownership issues and potentially resulting differences in reporting incentives is warranted, as well.
References


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Datum, Unterschrift

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