THE RELATION OF AUDITOR TENURE TO AUDIT QUALITY: EMPIRICAL EVIDENCE FROM THE GERMAN AUDIT MARKET

Patrick Krauß*, Henning Zülch*

Abstract

This study investigates whether and how the length of an auditor-client relationship affects audit quality. Using a sample of 1,071 firm observations of large listed companies for the sample period of 2005 to 2011, the study is one of the first to empirically analyze this auditing issue for the German audit market. The empirical results demonstrate that neither short term nor long term audit firm tenure seems to be a significant factor with regard to audit quality in Germany. In the wake of the ongoing discussion in the European Union regarding the optimal audit tenure length for the quality of the conducted statutory audits, our findings do not support the idea of a mandatory audit firm rotation rule.

Keywords: Audit Tenure, Auditor Independence, Auditor Expertise, Audit Quality, German Audit Market

*Corresponding author. Leipzig Graduate School of Management, Jahnallee 59, D-04109 Leipzig, Germany
Tel: +49 341 9851-701
Fax: +49 341 9851-702
Email: Patrick.Krauss@hhl.de
**Leipzig Graduate School of Management, Jahnallee 59, D-04109 Leipzig, Germany

1 Introduction

This study contains empirical results on the relationship between audit engagement tenure and audit quality. Several facts motivate our research study. First, the implication and consequences of an extensive auditor-client relationship on audit quality has been discussed by law-makers and the research profession for decades. In general, a long auditor-client relationship can be viewed as either a potential threat to auditor independence or a potential benefit with regard to considerable client, respectively industry specific knowledge effects. On October 13, 2010 the European Commission considered the audit tenure debate in the published Green Paper "Audit Policy: Lessons from the Crisis" (European Commission, 2010). The aim of this regulatory proposal is to provide adequate recommendations in order to enhance the quality of statutory audits in Europe, respectively in the member states of the European Union. In this context the European Commission has identified mandatory audit firm rotation as one important instrument to curb said weaknesses in European audit practices and to enhance auditor independence, hence audit quality. The proposal outlines that a client firm has to change its statutory auditor after an ultimate audit engagement period of six consecutive years and maintain a cooling-off period of at least four years. As the proposed rules are also considered in the final proposal for the European Parliament and the European Council (European Commission, 2011), the recommendations could, when approved, considerably affect audit practices in the European Union, respectively German audit practices in the near future.

Second, the effects of auditor tenure on audit quality have been greatly explored by the research profession in the past. Nevertheless, it is important to conduct an additional empirical study with German fee data, because the published international audit studies are primarily focused on the audit market in the United States. Therefore, the investigation of audit tenure effects in the German audit market would greatly contribute to our understanding of this auditing issue over and above the studies conducted in the United States as the institutional environments in both countries differ in terms of outside investor rights, ownership concentration and equity market functions (La Porta et al., 1998). Moreover, audit market characteristics and the regulatory landscape in Germany still provides certain particularities, which could lead to different study results in comparison to prior studies (Quick and Rasmussen, 2009). For example, the civil liability in cases of auditor misbehavior is sanctioned differently in Germany and the United States. If German auditors perform a breach of duties during the audit work the liability of compensatory damages is limited by section 323

paragraph 2 of the German Commercial Code (GCC; Handelsgesetzbuch) to a maximum of 4 million €. On the contrary the legal liability for audit firms in the United States is more or less unlimited (Quick and Warming-Rasmussen, 2009; Bigus and Zimmermann, 2008).

Third, as one of the world's strongest national economies, Germany holds a leading position with respect to its total economic output. With the highest gross domestic product and the largest number of firms and inhabitants within the European Union, Germany is considered as the most important economic market in Europe (Eurostat, 2012). To be more precise, with regard to the global trading of goods and services, Germany is in third place after China and the United States (WTO, 2011). In addition public German companies account for the third largest number of cross-listed European firms on the New York Stock Exchange (NYSE, 2012). In the era of globalization and accounting harmonization these two arguments highlight the fact that the performance of German audit firms could affect global auditing practices considerably (Quick and Warming-Rasmussen, 2009). In this context the German audit market is also considered as one of the most important audit markets in continental Europe (Quick and Warming-Rasmussen, 2009). As a consequence, German audit market regulations often serve as role model for minor European audit markets. Following Quick and Warming-Rasmussen (2009) the German audit context shows similarities with audit regulation characteristics in France, Spain, Belgium, Denmark and to a smaller degree other Scandinavian countries[10]. To the best of our knowledge, the study of Quick and Wiemann (2011) is the only published empirical audit tenure study that has been conducted for the German audit market within the last decade. The results in the Quick and Wiemann (2011) study imply that audit tenure is positively associated with audit quality. The authors further conclude that a regulative restriction of audit tenure by law could lead to decreased audit quality in Germany. Using a similar study approach as Quick and Wiemann (2011), we want to provide further empirical evidence on this audit regulation issue. While the Quick and Wiemann (2011) study is limited to a sample size of 1,013 firm observations over the sample period of 2005 to 2007, we are in the position to examine 1,071 firm observations over a seven year period from 2005 to 2011. Due to the considerable extent of the sample period, we expect more detailed and robust results than the Quick and Wiemann (2011) study could provide. Moreover, the extent of the sample time frame could also lead to different results, as the German legislator implemented a mandatory audit partner rotation requirement that became effective for the fiscal years 2007 onwards. It seems possible that the regulatory effects of the mandatory audit partner rule could not only effect audit partner behavior, but also indirectly affect business and auditing practices of the entire audit firm (Gold et al., 2012).

To examine the association between audit engagement tenure and audit quality, we proceed as follows. First and in accordance with prior literature, we estimate two popular discretionary accrual estimation models. To be more precise, we estimate the performance adjusted modified Jones model (Kothari et al., 2005; Dechow et al., 1995) and the model of Ball and Shivakumar (2006), in order to calculate the magnitude of unsigned discretionary accruals. The estimated unsigned discretionary accruals are then considered as a proxy for audit quality in our research approach. Second, based on the recorded audit firm tenure, we compute two binary variables to proxy for short time and long time auditor tenure in our analysis. In this context the binary variable for short time audit tenure takes the value of 1 if the auditor is in the first, second or third year of the audit engagement, and 0 otherwise. Long time audit tenure on the contrary is defined as consecutive audit engagement tenure of seven years or more. Finally, the association between the length of an auditor-client relationship and discretionary accruals is analyzed in a separate specified estimation model.

Our empirical results show that neither short term nor long term audit tenure affects audit quality in Germany. The insignificant results imply that audit tenure plays a subordinate role on the German audit market with regard to the quality of the conducted audits. An alternative explanation for the insignificant results could be due to the fact that the opposite effects of auditor independence and client specific knowledge compensate each other over time. Despite the insignificant results, our study provides useful insights into the current regulatory debate about mandatory audit firm rotation requirements in the European Union. Moreover, we are able to provide additional empirical evidence to the comprehensible range of existing German and international audit tenure research.

Our empirical results are robust with respect to different sensitivity analyses. Despite the robust results, our empirical evidence should be interpreted cautiously with regard to the usage of discretionary accruals as a proxy for audit quality. Prior studies that are based on alternative audit quality measures (e.g., accounting restatements, issued going-concern opinions) often criticize that accrual models incorrectly separate non-discretionary and discretionary accrual items and therefore lead to a noisy proxy for earnings management, hence audit quality (e.g., Gul et al., 2009). Moreover, with regard to the latest development in European audit market regulation, our study approach is based on voluntary auditor changes. Under a voluntary regime, the decision to change an audit firm is mainly based on an

[10] Quick and Warming-Rasmussen (2009) refer in this context to the study results of Baker et al. (2008), Garcia-Benau et al. (2008), Quick and Warming-Rasmussen (2005) and Vanstraelen and Willekens (2008).

endogenous decision by the management. Under a mandatory regime the decision to change the audit firm is on the contrary exogenous. As a consequence of this endogeneity issue, our results are not unlimitedly representative for a regulative audit environment, where auditor changes are determined by law (e.g., Gosh and Moon, 2005).

The remainder of this research study is structured as follows. The next section describes the regulatory background of auditor rotation requirements in Germany. In section 3 we discuss the theoretical background, prior literature and hypotheses development of our research approach. Section 4 contains a description of our empirical research design and sample selection as well as the descriptive statistics. The following sections 5 and 6 present the results of our empirical analysis and the corresponding robustness analyses. The final section concludes our paper and mentions limitations of our research approach.

2 Regulatory Landscape

The German legislator implemented a mandatory audit partner rotation rule into the GCC by the means of the Accounting Law Reform Act of December 4, 2004 (BilReG - "Bilanzrechtsreformgesetz"). In accordance with section 319a paragraph 1 No. 4 GCC the audit partner of a listed company, respectively the lead and review audit partners, have to rotate after seven consecutive years on an audit engagement. Moreover, the audit partners in charge have to maintain a minimum cooling-off period of three years before auditing the same mandate again[11]. The new requirements became binding for certain large publicly traded companies for fiscal years beginning on and after January 1, 2007. Despite the new requirements for audit partner rotation, the GCC does not contain any regulations concerning the mandatory rotation of the entire audit firm. As a consequence, our study is based on voluntary audit firm changes within the sample period of 2005 to 2011.

The financial crisis in 2008 revealed significant weaknesses in the auditing practices within the European Union. As an answer to this weaknesses the European Commission published a Green Paper named "Audit Policy: Lessons from the Crisis" in 2010 (European Commission, 2010). The purpose of the Green Paper is to provide suggestions for the developmental progress of statutory audits in the European Union. After several internal and external discussions and consultations, the Commission published the "Proposal for a Regulation of the European Parliament and the Council on Specific Requirements Regarding Statutory Audit of Public-Interest Entities" (European Commission, 2011). With regard to the proposed requirements, the Internal Market and Service Commissioner of the European Commission Michael Barnier stated that: "Investor confidence in audit has been shaken by the crisis and I believe changes in this sector are necessary: we need to restore confidence in the financial statements of companies. Today's proposals address the current weaknesses in the EU audit market, by eliminating conflicts of interest, ensuring independence and robust supervision and by facilitating more diversity in what is an overly concentrated market, especially at the top-end" (Barnier, 2011). The proposal contains several requirements with regard to auditor independence issues. As an important requirement to strengthen auditor independence, the European Commission proposed a mandatory external audit firm rotation rule. The proposed requirement forces an auditor change after a maximum audit engagement duration of six years. The audit engagement period can be prolonged under certain circumstances (e.g., joint audits) up to an ultimate engagement tenure of twelve years. The European Commission further proposes that after a maximum audit engagement period, the audit firm has to consider a minimum cooling off period of four years before auditing the same client firm again (European Commission, 2011, p. 8). This proposal, if unchanged, may have a significant impact on future auditing practices in the European Union in general, and Germany as one of the largest audit markets in continental Europe in particular. With regard to the German audit market, prior studies often indicate that the market structures are overall non-dynamic and therefore are especially affected by audit requirement changes[12].

3 Theoretical Background and Hypotheses Development

3.1 Theoretical Formulation

The debate on how audit tenure affects audit quality has received a lot of attention from the research profession and law-makers within the last decades. Corresponding with the audit quality definition by DeAngelo (1981b), prior studies identified two major factors that determine audit quality: (1) auditor independence and (2) auditor expertise. The latter is defined as the likelihood that the statutory auditor is able to detect a significant failure in the financial reports and the accounting system, while auditor independence is defined as the likelihood that the assigned auditor actually reports that failure to third parties in the audit report (DeAngelo, 1981b; Watts and Zimmermann, 1986). With regard to our

[11] In 2009 the audit partner rotation requirements are adjusted through the "Bilanzrechtsmodernisierungsgesetz" (BilMoG - Accounting Law Modernization Act). The new regulatory requirement reduces the cooling-off period for audit partners from three to two years.

[12] For example, prior descriptive German audit market studies indicate that the auditor switching rates for major listed companies are at a relatively low level between 2 and 6 percent (e.g., Küting and Reuter, 2007; Marten and Schultze, 1998; Marten, 1994).

hypotheses development the two determinants provide the theoretical background for two competing concepts in audit tenure research, namely the independent and expertise hypothesis[13].

The independence hypothesis posits that audit quality in the initial audit engagement years is higher than in subsequent periods, due to a highly independent audit firm. In other words, audit quality is negatively associated with audit firm tenure (Gold et al., 2012; Azizkhani et al., 2006). With regard to the independence hypothesis, regulators and stakeholders have been claiming for decades that the development of a personal auditor-client relationship over time may threaten auditor independence and in the end results in a less objective auditor (Geiger and Raghunandan, 2002). In one of the first audit tenure studies, Mautz and Sharaf (1961, p. 208) state that "the greatest threat to his (the auditor`s) independence is a slow, gradual, almost casual erosion of his honest disinterestedness." In this context the Metcalf Committee further reports to the United States Senate in a later period that "long associations between a corporation and an accounting firm may lead to such close identifications of the accounting firm with the interests of its client's management that truly independent action by the accounting firm becomes difficult. One alternative is mandatory change of accountants after a given period of years…" (US-Senate, 1976, p. 21). Both studies indicate that auditor independence may be threatened or impaired as the auditor-client relationship becomes longer, and respectively closer. The Metcalf Committee moreover suggests that the latent erosion of auditor independence over time might be less significant when audit tenure is limited by law (Myers et al., 2003; Geiger and Raghunandan, 2002).

Proponents of a mandatory audit firm rotation rule often refer to the arguments of the independence hypothesis. The proponents posit that a mandatory audit firm rotation requirement would improve audit quality in two ways. First, the reduced audit engagement period would curb the opportunities for client firms to influence the decisions of the statutory auditor (Chi and Huang, 2005; Geiger and Raghunandan, 2002). Second, a periodical change of the audit firm provides a fresh and more critical perspective on companies' financial statement numbers (Li, 2010; Jenkins and Velury, 2008; Geiger and Raghunandan, 2002)[14].

On the contrary to the independence hypothesis, the expertise hypothesis posits that audit quality is positively associated with the length of an auditor-client relationship. The hypothesis assumes that the gained client, respectively industry specific knowledge, over time outweighs the benefits of short term auditor independence and critical perspective effects (Gold et al., 2012; Azizkhani et al., 2006). Therefore, client specific knowledge is considered as a crucial factor with regard to auditors' ability in order to detect erroneous accounting figures (Myers et al., 2003; Johnson et al., 2002)[15]. Prior studies have extensively documented the importance and consequences of client specific knowledge on the execution of an audit engagement. For example, Knapp (1991) states that the learning curve of a newly assigned auditor after the initial years of an audit engagement can result in a considerable improvement in audit quality, while DeAngelo (1981a; 1981b) relates client specific knowledge with significant audit start-up costs (Johnson et al., 2002). To summarize, the expertise hypothesis posits that the lack of client specific knowledge in the initial years of an audit engagement can result in lower audit quality, while long term audit engagement tenure as well as a deeper understanding of the client's business practices and the accounting system could have a positive effect on audit quality (Gold et al., 2012; Azizkhani et al., 2006).

3.2 Prior Literature

Several prior empirical studies investigate the association between audit engagement tenure and audit quality. As audit quality is not directly observable, the authors of those audit tenure studies used several audit quality proxies in their empirical analyses[16]. With regard to the majority of these studies, we decide to use discretionary accruals as a measure for earnings management, hence audit quality. In this section, we want to provide a brief overview over the published audit tenure studies that used a similar audit quality proxy as our research approach, namely abnormal accruals. Table 1 gives an overview over the recent published empirical studies within the last decade and highlights if the findings either support the independence or the expertise hypothesis as described in the previous section[17].

[13] The terms independence and expertise hypothesis are not used exclusively throughout prior audit tenure literature. Some studies (e.g., Johnson et al., 2002) just describe the two opposite effects without naming them independence and expertise hypothesis. Two studies that exclusively use these terms are Gold et al. (2012) and Azizkhani et al. (2006).

[14] Several prior studies (e.g., Libby and Libby, 1989; Burtler, 1986; Joyce and Biddle, 1981) provide evidence that the confidence in prior year audit documentation, respectively the documented previous results have a negative impact on auditor's ability to detect material misstatements in the recent fiscal year.

[15] Client specific knowledge in general comprises information about business operations, accounting system, and internal control environment (Gosh and Moon, 2005).

[16] For instance, prior studies in general use the following proxies for audit quality: (1) issued audit and going-concern opinions, (2) accounting restatements, (3) quality assessment of stakeholders, (4) association between client´s earnings and capital market reactions and (5) earnings management (Pott et al., 2009).

[17] The study of Pott et al. (2009, p. 218-220) provides a wider and more detailed overview of the recent studies in this research field and the used audit quality measures.

Table 1. Results of Empirical Studies Investigating the Effects of Audit Tenure on Audit Quality

Study (by year)	Sample Country	Sample Period	Sample Size	Supporting Theory	
				Independence	Expertise
Johnson et al. (2002)	United States	1986-1995	821	No	Yes
Myers et al. (2003)	United States	1988-2000	41,250	No	Yes
Chi and Huang (2005)	Taiwan	1998-2001	1,337	Yes	No
Jackson et al. (2008)	Australia	1995-2003	1,750	No	No[1]
Jenkins and Velury (2008)	United States	1983-2004	86,914	Yes	No
Li (2010)	United States	1983-2004	82,663	Yes[2]	No
Quick and Wiemann (2011)	Germany	2005-2007	1,013	No	Yes

[1] Positive relation between audit firm tenure and audit quality, when the latter is measured by issued going-concern reports.

[2] Long-term auditor-client relationships impose greater threats to auditor independence for smaller clients weakly monitored by auditors than for larger clients.

In one of the first German empirical studies, Quick and Wiemann (2011) analyzed listed companies over a sample period of 2005 to 2007. Using signed and unsigned discretionary accruals as a measure for audit quality, the two authors discover a positive association between the length of auditor engagement tenure and audit quality. The authors further state that the regulative limitation of auditor tenure as suggested by the European Commission would potentially have a negative impact on the quality of the conducted statutory audits in Germany.

While there is a lack of empirical research on audit engagement tenure effects in Germany, international studies provide a solid theoretical and empirical background for this research area. The majority of the empirical studies in our literature review are conducted for the audit market in the United States. As one of these studies, Johnson et al. (2002) report that short audit engagement tenure of two to three years is associated with lower financial reporting quality than medium audit engagement tenure of four to eight years. Further, the author states that the financial reporting quality for long term audit tenure of nine or more years is not significantly different when compared to medium audit engagement tenure. Using abnormal and current accruals as a measure for financial reporting quality, Myers et al. (2003) state that long term audit tenure results in auditors limiting firms' opportunities to manage earnings. Two further studies from the United States are conducted by Li (2010) and Jenkins and Velury (2008). In contrast to Johnson et al. (2002) and Myers et al. (2003) both studies find that short term audit tenure is associated with higher audit quality than long audit tenure. To be more precise, Jenkins and Velury (2008) document a positive relationship between audit engagement tenure and the conservatism in the reported earnings. Apart from the studies for the audit market in the United States, we also identified empirical audit tenure studies from Taiwan (Chi and Huang, 2005) and Australia (Jackson et al., 2008). Using abnormal working capital accruals and abnormal total accruals as a proxy for audit quality, Chi and Huang (2005) find that audit quality is higher for companies under a mandatory auditor rotation regime when compared to firm observations under a voluntary auditor change regime. Finally, Jackson et al. (2008) provide empirical evidence that audit quality measured by discretionary accruals is insignificantly associated with audit tenure. However, the authors further find that the quality of an audit increases with the length of an auditor-client relationship, when audit quality is measured by issued going-concern opinions.

Overall, the results from the literature review shows inconsistent results with regard to audit tenure effects on audit quality. On the one hand some studies (e.g., Myers et al., 2003; Johnson et al., 2002) provide evidence that the effects of the expertise hypothesis outweigh the effects of the independence hypothesis leading to a positive association between audit engagement tenure and audit quality. On the other hand some study results imply a negative audit tenure effect on audit quality (e.g., Li, 2010; Jenkins and Velury, 2008) or provide insignificant results at all (e.g., Jackson et al., 2008).

3.3 Hypotheses Formulation

To summarize, prior empirical research on audit tenure effects in the German audit market are quantitatively and qualitatively limited. Moreover, the shortage of studies analyzing German data indicates a need for further analyses in this research field. In addition, prior international audit studies also provide mixed empirical results with regard to the effects of audit tenure on the magnitude of reported discretionary accruals. As there is neither s solid theoretical background for the independence nor the expertise hypothesis in the German audit market, we posit the following two non-directional hypotheses for our study approach in null form:

Hypothesis (1): Short audit firm tenure is not associated with audit quality.

Hypothesis (2): Long audit firm tenure is not associated with audit quality.

4 Research Design, Sample Selection and Description

4.1 Earnings Management Estimation Model

In accordance with prior audit quality literature (e.g., Choi et al., 2010; Davis et al., 2009; Myers et al., 2003; Johnson et al., 2002), we use discretionary accruals in our research approach as a measure for the magnitude of earnings management, hence audit quality. The basic idea behind the usage of discretionary accruals as audit quality proxy is the assumption that high-quality audits should be able to curb or prevent more extreme earnings management reporting (Myers et al., 2003). Moreover, prior empirical results suggest that high levels of unexpected accruals are for instance positively related with audit reporting failures (Geiger and Raghunandan, 2002) or issued qualified audit, respectively going-concern opinions (Bartov et al., 2003). In this context discretionary accruals are expected to capture earnings management in a more general manner than alternative audit quality measures (e.g., qualified audit opinions, accounting restatements and accounting fraud) that are related to unusual or specific audit situations (Choi et al., 2010; Myers et al., 2003).

In this study, we decide to use two popular discretionary accrual models: (1) the performance-adjusted modified Jones model (Kothari et al., 2005; Dechow et al., 1995), and the model of Ball and Shivakumar (2006). Both models are illustrated in the following two equations: 1 – Performance-Adjusted Modified Jones Earnings Management Estimation Model, 2 – Earnings Management Estimation Model by Ball and Shivakumar.

$$TACC_{it}/TA_{it-1} = \beta_0 + \beta_1(1/TA_{it-1}) + \beta_2([\Delta REV_{it} - \Delta REC_{it}]/TA_{it-1}) + \beta_3(PPE_{it}/TA_{it-1}) + \beta_4(ROA_{it}/TA_{it-1}) + \varepsilon_i \quad (1)$$

$$TACC_{it}/TA_{it-1} = \beta_1(1/TA_{it-1}) + \beta_2([\Delta REV_{it} - \Delta REC_{it}]/TA_{it-1}) + \beta_3(PPE_{it}/TA_{it-1}) + \beta_4(CFO/TA_{it-1}) + \beta_5(DCFO_{it}) + \beta_6([CFO_{it}/TA_{it-1}] * DCFO_{it}) + \varepsilon_i \quad (2)$$

where, for fiscal year t and firm i; εi = discretionary accrual. As shown, all variables, except the binary variable DCFO, are scaled by lagged total assets. The variables used in Equation (1) and (2) are defined in the Appendix. For convenience, we denote the discretionary accruals from Equation (1) as DA1, respectively as DA2 for Equation (2).

The final accrual measures for our analysis are computed as follows. We first estimate both equations for each SIC code industry as classified by Behn et al. (1999)[18]. We are unable to estimate the two models by a more detailed industry classification (e.g., two-digit SIC) due to sample size restrictions. From the estimated DA1 and DA2 we then calculate |DA1|, respectively |DA2|, by taking the absolute value of both discretionary accrual measures. |DA1| and |DA2| are then added as dependent variable in the following Equation (3).

4.2 Measuring the Association between Audit Tenure and Earnings Management

To examine the association between audit engagement tenure and audit quality, we developed the following empirical estimation model in Equation (3). The model links the degree of unsigned discretionary accruals with our variables of interest, namely the indicator audit tenure variables SHORT and LONG, as well as other independent control variables. Using a pooled sample of 1,071 firm observations[19], we first want to capture the effects of short time audit tenure by the binary variable SHORT, which takes the value of 1 if the auditor is assigned to the audit for one to three consecutive years, and 0 otherwise. In addition, we want to control for long term audit tenure effects with the indicator variable LONG, which takes the value of 1 if the auditor is assigned to the audit engagement for seven or more consecutive years, and 0 otherwise. Our research design follows the research approach of Quick and Wiemann (2011), respectively Johnson et al. (2002). The variables used in Equation "Model for the Association between Audit Tenure and Discretionary Accruals" (3) are defined in the Appendix.

Consistent with previous empirical studies (e.g., Jenkins and Velury, 2008; Myers et al., 2003; Johnson et al., 2002), we add a number of independent control variables to Equation (3) in order to improve the explanatory power of the estimation model. To be more precise, the independent variables are LNTA, AGE, BTM, ISSUE, CHGREV, ROE, CFO, LOSS, LEVE, CYCLE, CGK, BIG4 and IFRS. As first control variable LNTA is added to the estimation model in order to capture firm size effects on |DA1| and |DA2|. Prior studies state that large listed

[18] The industry classification follows Behn et al. (1999) and is based on the one-digit SIC code as follows: Mining and construction (1000-1999), manufacturing – food, textiles, lumber and chemicals (2000-2999), manufacturing – rubber, metal, machinery, equipment (3000-3999), transportation, communication and utilities (4000-4999), wholesale and retail (5000-5999), and services (7000-9999).

[19] We use a cross-sectional estimation approach, because a pooled estimation model generally increases the statistical power in comparison to firm-fixed effect computations. Moreover, we want to provide comparable empirical evidence to the prior German audit tenure study of Quick and Wiemann (2011), who also use a cross-sectional approach.

companies are in the public focus, leading to a restriction in extensive earnings management behavior (Myers et al., 2003; Johnson et al., 2002). Following Johnson et al. (2002), we also include the continuous variable AGE in our estimation model. Firms with a certain company history are assumed to have developed more mature business practices and stable financial reporting systems. As a consequence of this development, long time existing companies are expected to report lower levels of discretionary accruals than inexperienced and developing short time existing firms (Myers et al., 2003; Anthony and Ramesh, 1992). Moreover, we include BTM, ISSUE, CHGREV and ROE to isolate potential revenue growth and profitability effects from the audit tenure effects on earnings management (Choi et al., 2010; Carey and Simnett, 2006; Ashbaugh et al., 2003; Chung and Kallapur, 2003; Frankel et al., 2002; Becker et al., 1998). Further, we select CFO as an additional profitability control variable (Kothari et al., 2005; Meyers et al., 2003; Frankel et al., 2002; Becker et al., 1998). In addition to the variables controlling for firm growth and profitability, we also insert the indicator variable LOSS in order to control for different discretionary accrual levels between firms that reported a negative net income and firms that reported a positive net income (Choi et al., 2010; Dechow and Dichev, 2002). In particular, when firms report a negative net income in the previous fiscal year, the companies are more likely to be engaged in managing earnings in order to improve the reported income in the current fiscal year. Finally, with regard to companies' net assets, financial position and results of operations we add the variables LEVE and CYCLE to Equation (3). Prior research indicates that firms with high debt ratios and a long operating cycle tend to have more incentives to increase reported earnings (Quick and Wiemann, 2011; Frankel et al., 2002; Johnson et al., 2002; Becker et al., 1998; DeFond and Jiambalvo, 1994) than other companies.

$$\begin{aligned}|DA1| \text{ or } |DA2| = {} & \beta_0 + \beta_1(SHORT) + \beta_2(LONG) + \beta_3(LNTA) + \beta_4(AGE) + \beta_5(BTM) + \beta_6(ISSUE) \\ & + \beta_7(CHGREV) + \beta_8(ROE) + \beta_9(CFO) + \beta_{10}(LOSS) + \beta_{11}(LEVE) + \beta_{12}(CYCLE) \\ & + \beta_{13}(CGK) + \beta_{14}(BIG4) + \beta_{15}(IFRS) + \text{year dummies} + \varepsilon_i\end{aligned} \quad (3)$$

Besides financial control variables, the corporate governance structure of a company is also identified as a significant determinant with regard to firm's financial reporting quality (Larcker and Richardson, 2004). To control for potential corporate governance effects on audit quality, we include the variable CGK in Equation (3). The continuous variable is based on the number of non-complied recommendations of the German Corporate Governance Codex (Quick and Sattler, 2011). As another proxy for (external) corporate governance, we include BIG4 to proxy for audit firm size effects (Francis et al., 1999; Becker et al., 1998)[20]. In addition to BIG4, the binary variable IFRS is included in the estimation model to capture potential first time IFRS adoption effects on earnings quality in Germany. Finally, we also include several industry indicator variables as determined by Behn et al. (1999) and year indicator variables to control for different industry and year effects.

4.3 Sample Selection

Our analysis consists of German listed companies belonging to the DAX, MDAX, SDAX and TecDAX indices of the Frankfurt Stock Exchange. The indices include the largest and most important traded German listed companies which are closely monitored by regulators, financial analysts and commentators. In order to avoid a potential survivorship bias issue in our sample selection, we consider all firms that have been listed for at least one calendar year within one of the four indices during the sample period. In addition, the firm observations have to provide adequate accounting data for our estimation models for at least two consecutive fiscal years within the sample period.

We chose our sample period from the mandatory adoption of IFRS in Germany in 2005 to allow for comparable financial and accounting data over a seven year period until 2011. In this context, audit firm tenure is defined as the number of consecutive years a client firm has engaged a particular auditor for the annual financial statement audit. The calculation of audit tenure starts in the fiscal year 1999. Based on the recorded audit firm tenure, we compute our two binary variables SHORT and LONG to proxy for short term and long term auditor tenure. The binary variable SHORT takes the value of 1 if the auditor is in the first, second or third year of the audit engagement, and 0 otherwise. On the contrary the binary variable LONG is defined as consecutive audit engagement tenure of minimum seven years or longer. With regard to our multivariate analysis, audit tenure of four to six engagement years is considered as medium audit tenure and therefore serves as a benchmark for SHORT and LONG. Finally, the data for the remaining independent variables of our multivariate analysis are collected from the Hoppenstedt Database and the annual financial statement reports.

Our original investigation sample consists of 1,625 firm observations. The majority of the audit data is hand-collected from the annual financial reports of the respective sample firms. Consistent with prior studies, we exclude 252 firm observations of financial service companies (e.g., banks and insurance companies). Further, we exclude 157 firm

[20] For convenience, throughout this paper, BIG4 auditor always refers to Deloitte, Ernst & Young, KPMG and PricewaterhouseCoopers.

observations from our sample as appropriate IFRS accounting data, respectively other necessary financial data for our multivariate analysis, are not publicly available. The financial data of foreign issuers (140 firm observations) are also not considered in our estimation models, as our study is aimed to focus on the German audit market. Moreover, we exclude several accounting figures (16 firm observations) of cross-listed German companies in the United States. These companies used a mandatory regulative option to publish an US-GAAP financial statement until 2007 instead of providing an IFRS annual report. Finally, we are also unable to consider the annual financial statements of firm observations with an alternative fiscal year 2011 (16 firm observations). Table 2 gives a brief overview over the sample composition.

Table 2. Sample Composition

Original Sample	**1,652**
./. Banks, Insurances and other Financial Service Companies	**252**
./. Missing Financial Data	**157**
./. Foreign Issuer	**140**
./. US-GAAP Financial Statement	**16**
./. Alternative Fiscal Year 2011	**16**
Total	**1,071**

4.4 Sample Description

Table 3 contains the descriptive statistics of the variables used in Equation (3). With regard to the distribution of the variables it is important to mention the following facts. First, the degrees of unsigned discretionary accruals (i.e., |DA1| and |DA2|) are on average 7 percent, respectively 6 percent of lagged total assets. Second, the median audit tenure in our sample composition amounts to 6 years. Third, after delogging the respective variables the median sample firm report total assets of 1,053,365,000 € and a firm history of 37 years. Fourth, with regard to the financial data, the descriptive statistics in Table 3 show that the median sample firm has a book-to-market ratio of 54 percent, revenue growth rate of 8 percent and a return of equity ratio of 11 percent. Finally, as can be learned from Table 3 the median and mean values of most continuous control variables are not significantly different from each other. However, we find a considerable difference between the mean and median values of AGE, BTM and CHGREV. This suggests that our sample contains a small number of long time existing firms with high sales growth rates and book-to-market ratio figures.

In addition, our sample shows plausible frequencies of our binary variables SHORT, LONG, ISSUE, LOSS, LEVE, BIG4 and IFRS. On average, the sample contains 28 percent short term and 45 percent long term audit engagements. Further, 17 percent of the firm observations report a negative net income in the sample period, while 80 percent of the companies engaged a BIG4 audit firm as the statutory auditor. Finally, only 6 percent of the firms in our analysis adopted IFRS accounting standards for the first time within our sample period. This suggests that the majority of large listed companies in Germany already applied IFRS voluntarily before 2005.

Table 4 presents the Spearman correlation matrix for the dependent variables, variables of interest and all other independent variables that show considerable high correlations ($p > 0.30$) with other independent control variables included in Equation (3). The correlation table shows that our two measures of unsigned discretionary accruals (i.e., |DA1| and |DA2|) are significantly correlated with each other ($p= 0.812$, p-value < 0.01). Besides the dependent variables, our variables of interest (i.e., SHORT and LONG) are also highly correlated with each other ($p= -0.561$, p-value < 0.01). Further, |DA1| is highly correlated at p-value < 0.01 with our variables of interest SHORT ($p= 0.075$) and LONG ($p= -0.096$), while |DA2| is only significantly associated with long time audit tenure ($p= -0.084$, p-value <0.01). In addition, most of the control variables used in Equation (3) are statistically significantly associated with both accrual measures. Therefore, it makes sense to control for their potential effects by using a multivariate analysis.

With regard to the correlations among our independent control variables in Equation (3), it is worth mentioning the following two facts. First, LNTA is significantly positively correlated at p-value < 0.01 with AGE ($p= 0.347$) and BIG4 ($p= 0.328$). This indicates that long time operating firms report greater values of total assets than short time operating companies and are more likely to assign a BIG4 audit firm for the annual financial statement audit. Second, LNTA is on the contrary highly negatively correlated with CGK ($p= -0.432$, p-value < 0.01). This correlation suggests that large firms are more anxious to comply with the recommendations of the German Corporate Governance Codex when compared with small or medium-sized companies. We assume that the correlation is due to the increased scrutiny of large listed firms by regulators and commentators.

Table 3. Descriptive Statistics

Cont. Variables	Mean	Median	Std. Dev.	Min	Max
|DA1|	0.07	0.04	0.10	0.08	1.29
DA1	0.00	0.00	0.12	-0.74	1.29
|DA2|	0.06	0.03	0.09	0.00	1.32
DA2	0.00	0.00	0.11	-0.56	1.32
TENURE	6.07	6.00	3.36	1	13
LNTA	14.04	13.87	1.89	9.16	19.39
AGE	62.03	37.00	56.99	1	264
BTM	0.68	0.54	0.60	-4.29	4.17
CHGREV	0.11	0.08	0.30	-0.99	2.41
ROE	0.04	0.11	0.65	-13.47	4.38
CFO	0.09	0.09	0.12	-0.59	1.15
CYCLE	59.13	53.05	42.63	0.03	734.31
CGK	0.07	0.07	0.05	0.00	0.35
Binary Variables	**Mean**	**0**	**1**	**Std. Dev.**	
SHORT	0.28	776	295	0.45	
LONG	0.45	586	485	0.50	
ISSUE	0.15	909	162	0.36	
LOSS	0.17	885	186	0.38	
LEVE	0.03	1,043	28	0.16	
BIG4	0.80	217	854	0.40	
IFRS	0.06	1,004	67	0.24	

Table 4. Correlation Matrix

Spearman Correlations among Regression Variables

	|DA1|	|DA2|	SHORT	LONG	LNTA	AGE	CGK	BIG4
|DA2|	0.812	**1.0**						
	(0.00)							
SHORT	0.075	0.039	**1.0**					
	(0.01)	(0.20)						
LONG	-0.096	-0.084	-0.561	**1.0**				
	(0.00)	(0.01)	(0.00)					
LNTA	-0.193	-0.237	-0.140	0.257	**1.0**			
	(0.00)	(0.00)	(0.00)	(0.00)				
AGE	-0.178	-0.178	-0.050	0.118	0.347	**1.0**		
	(0.00)	(0.00)	(0.10)	(0.00)	(0.00)			
CGK	0.155	0.091	0.085	-0.131	-0.432	-0.144	**1.0**	
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)		
BIG4	-0.056	-0.047	0.056	-0.027	0.328	0.125	-0.201	**1.0**
	(0.07)	(0.12)	(0.07)	(0.38)	(0.00)	(0.00)	(0.00)	
IFRS	0.015	0.022	0.117	-0.119	-0.049	-0.057	0.097	0.006
	(0.63)	(0.48)	(0.00)	(0.00)	(0.11)	(0.06)	(0.00)	(0.86)

Two-tailed p-values are presented in parentheses. See the Appendix for the definitions of variables.

Overall, the correlation matrix as reported in Table 4 implies that our estimation models are unlikely to suffer from material multicollinearity issues.

5 Empirical Results

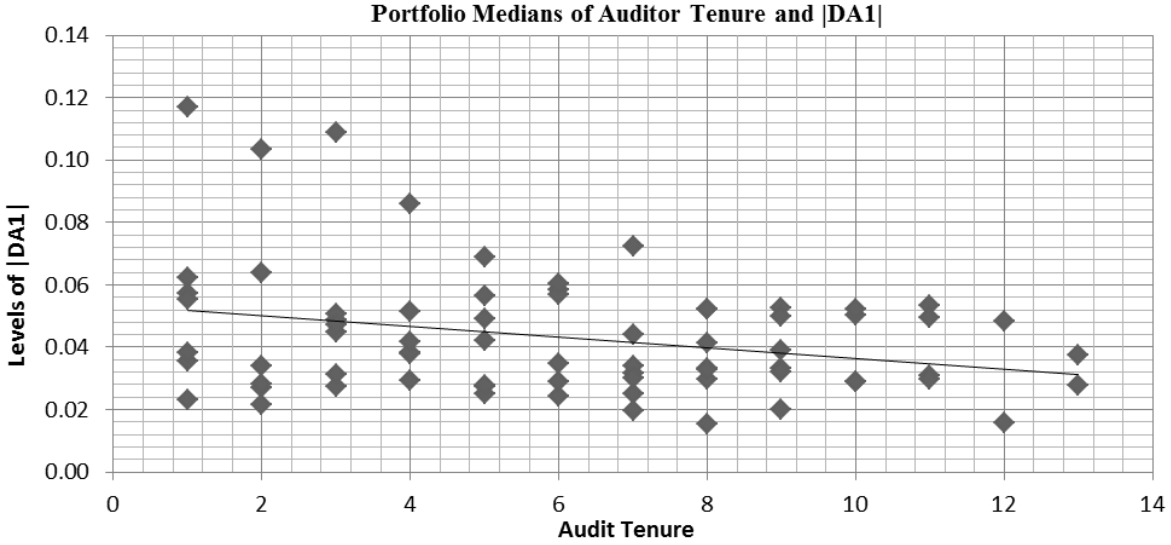
5.1 Univariate Analyses

As shown in the correlation analysis (Table 4), short time and long time audit tenure is conditionally significantly associated with our measures of unsigned discretionary accruals (i.e., |DA1| and |DA2|). In order to get a more accurate understanding about the relationship between the degree of discretionary accruals and audit engagement tenure, we first conduct an univariate analysis of the two variables. As the results in the correlation matrix imply that |DA1| is significantly associated with both SHORT and LONG audit tenure, while |DA2| only shows a significant correlation with the indicator variable LONG, we decide to perform two separate univariate analyses for both dependent variables.

To conduct the univariate analysis, we first compute 15 item portfolios based on the value of the continuous audit tenure variable. Then we calculate for each of the 71 portfolios the median values of audit tenure and corresponding |DA1|. A plot of the

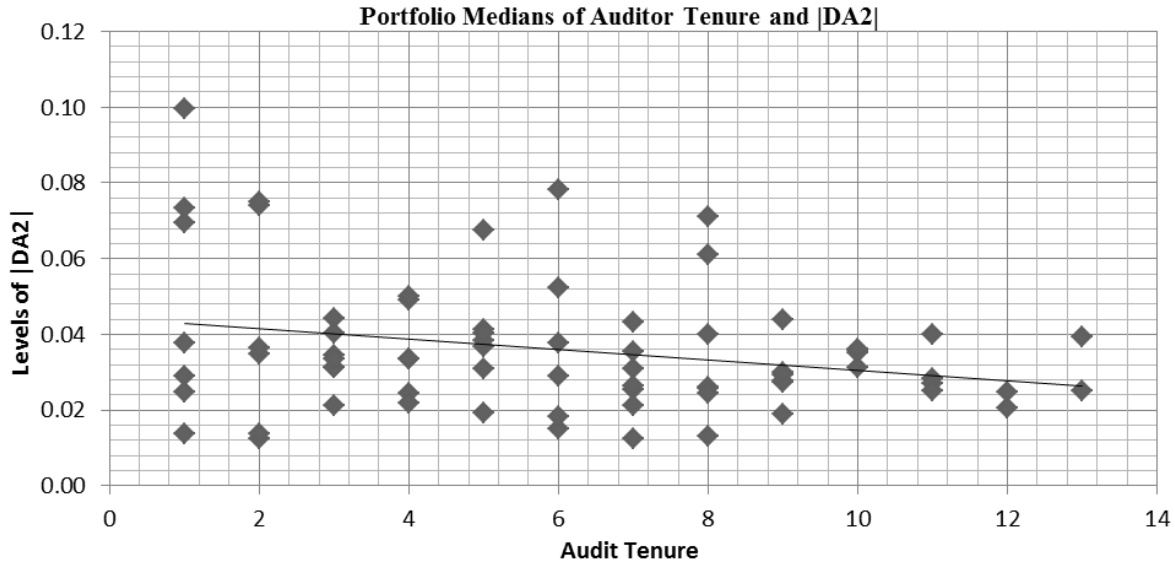
portfolio medians of auditor tenure and |DA1| is presented in Figure 1. As can be seen there, the level of |DA1| is negatively moving together with the level of audit tenure. In other words, the higher the portfolio medians of audit tenure, the lower the degree of earnings management. As can be learned from the trend lines in Figure 1, the association between both variables seems to follow a linear relationship. Moreover, it is worth mentioning that the results for the univariate analysis also hold for audit tenure portfolios consisting of 30, 10 or 5 items (not tabulated). In addition, the results are also robust for portfolio mean values (not tabulated).

Figure 1. Univariate Analysis of Audit Tenure and Discretionary Accruals (1)



In addition to the univariate analysis with |DA1|, we perform an additional analysis using the alternative discretionary accrual measure |DA2|. The analysis approach is similar than the one described above for the univariate analysis with |DA1|. Figure 2 presents the results for the univariate analysis between the 71 portfolio median values of audit tenure and |DA2|. As can be seen there the results are qualitative identical when compared with Figure 1. Please note that the results for the univariate analysis also hold for audit tenure portfolios consisting of 30, 10 or 5 items and portfolio mean values (not tabulated).

Figure 2. Univariate Analysis of Audit Tenure and Discretionary Accruals (2)



To summarize, the results of our univariate analyses indicate that an increase in audit firm tenure has more positive consequences for audit quality than negative ones. Moreover, the univariate analyses provide qualitative similar results with regard to |DA1| and |DA2|.

5.2 Multivariate Analyses

Table 5 presents the estimation results of testing the association between audit tenure (i.e., SHORT and LONG) and earnings management, where |DA1| and |DA2| are used as the dependent variables. The empirical evidence for both dependent variables show qualitatively similar results for short and long term audit tenure. For both dependent variables, the coefficients of SHORT and LONG are statistically insignificant at minimum p-value < 0.10. With regard to our hypotheses development, the results suggest that the effects of auditor independence and client specific knowledge negate each other over the entire audit engagement period. An alternative explanation for the insignificant results could be the fact that audit firm tenure is generally a subordinate factor with respect to the quality of the conducted audits in the German audit market. Moreover, we assume that the empirical results are influenced by the fact that the majority of the audit engagements in our sample are conducted by BIG4 audit firms, which use identical risk-based auditing approaches and have similar external, respectively internal quality standards[21]. Overall, the empirical results in Table 5 do not support the rejection of our non-directional Hypotheses (1) and (2).

Our empirical evidence is conditionally in line with the study results of Quick and Wiemann (2011). Consistent with the empirical findings of the two authors, the level of unsigned discretionary accruals is not significantly different between medium and long audit engagement tenure. However, Quick and Wiemann (2011) are able to detect lower audit quality in the initial audit engagement years, while our results for the indicator variable SHORT are insignificant. We assume that the deviating results of the two studies are primarily based on the different sample periods and sample compositions as well as the calculation, respectively definition of the audit tenure variables. Moreover, the implementation of a mandatory audit partner rotation by the German legislator for the fiscal years 2007 onwards affects our analyses in a more general manner (sample period 2005-2011), than the study results of Quick and Wiemann (2011; sample period 2005-2007). Besides the Quick and Wiemann (2011) study, our results are supported by the empirical findings of Ruiz-Barbadillo et al. (2009) for the Spanish audit market and Jackson et al. (2008) for the Australian audit market[22].

Besides our variables of interest, Table 5 also shows that some of our independent variables are significantly associated with both unsigned discretionary accrual measures. Since the results for |DA1| and |DA2| are more or less qualitatively similar, let us discuss the significant control variable for |DA1| as an example. As expected and consistent with prior studies, unsigned discretionary accruals are significantly negatively associated with LNTA (p= -0.005, p-value < 0.05) and AGE (p= -0.001, p-value < 0.05). In addition, the independent variables ISSUE (p= 0.028, p-value < 0.01), CHGREV (p= 0.019, p-value < 0.10) and LEVE (p= 0.135, p-value < 0.01) are significantly positively associated with the magnitude of |DA1|. This suggests that fast growing firms with a great financing demand report high levels of discretionary accruals. Finally, the results in Table 5 show that |DA1| is significantly positively associated with CGK (p= 0.156, p-value < 0.05), indicating that firms with weak corporate governance structures are more engaged in earnings management activities than companies with an adequate corporate governance structure. Finally, the remaining control variables seem to have an insignificantly statistically effect on the level of unsigned discretionary accruals.

6 Robustness Analyses

We perform a variety of sensitivity analyses to examine the robustness of our empirical findings. First, we want to test if our empirical results are robust to alternative audit tenure definitions. In order to separate initial and short term audit engagement effects from each other, we re-estimate Equation (3) by using the indicator variables INITIAL, SHORT and LONG. The binary variable INITIAL is included in the model to capture first-year audit engagement effects on audit quality, while the variable SHORT controls for different discretionary accrual levels in the second and third audit engagement year. The variable LONG remains unchanged with regard to our original variable definition in Equation (3). Table 6 displays the results of this robustness test. As can be seen there, our variables of interest, namely INITIAL, SHORT and LONG, are all statistically insignificant with regard to |DA1| and |DA2|. On the one hand the results imply that auditor changes in the German audit market have an insignificant impact on audit quality, while on the other hand this results support the robustness of our results with regard to the original multivariate analysis.

[21] For example, Kida (1980) find in a survey study with auditors from different audit firms, that all participants in general are able to identify distressed companies with a going-concern issue as accurately as a mathematical forecast model. With regard to external audit quality standards the International Federation of Accountants (IFAC) provides high quality standards with respect to auditing, review, other assurance, quality control and other related audit service issues.

[22] Ruiz-Barbadillo et al. (2009) find no evidence of an association of mandatory auditor rotation with the likelihood of issuing a modified going-concern opinion for a sample of distressed Spanish companies.

Table 5. Results on the Association between Discretionary Accruals and Audit Tenure

	|DA1|			|DA2|		
Independent variables	Coefficient	t-value	p-value	Coefficient	t-value	p-value
Constant	0.119	3.74	0.000	0.194	6.87	0.000
SHORT	0.004	0.55	0.583	-0.002	-0.27	0.790
LONG	-0.006	-0.86	0.390	-0.006	-0.86	0.389
LNTA	-0.005	-2.32	0.021	-0.009	-4.84	0.000
AGE	-0.001	-2.28	0.023	-0.001	-1.85	0.064
BTM	-0.002	-0.38	0.706	-0.002	-0.45	0.656
ISSUE	0.028	3.30	0.001	0.022	2.83	0.005
CHGREV	0.019	1.75	0.081	-0.015	-1.52	0.128
ROE	0.001	0.12	0.908	-0.005	-1.11	0.266
CFO	0.001	0.03	0.973	-0.051	-2.17	0.030
LOSS	0.013	1.54	0.125	0.023	2.97	0.003
LEVE	0.135	7.20	0.000	0.130	7.79	0.000
CYCLE	0.000	0.31	0.759	0.000	-0.75	0.455
CGK	0.156	2.49	0.013	-0.035	-0.62	0.533
BIG4	-0.003	-0.34	0.733	-0.002	-0.30	0.766
IFRS	-0.016	-1.13	0.259	-0.002	-0.17	0.862
Year and industry dummies	Included			Included		
Adjusted R^2	13%			15%		
N	1,071			1,071		

Table 6. Results Robustness Analysis on the Association between Discretionary Accruals and an Alternative Audit Tenure Definition (1)

	|DA1|			|DA2|		
Independent variables	Coefficient	t-value	p-value	Coefficient	t-value	p-value
Constant	0.118	3.73	0.000	0.194	6.86	0.000
INITIAL	0.013	1.12	0.262	0.002	0.25	0.804
SHORT	0.000	0.02	0.984	-0.004	-0.52	0.600
LONG	-0.006	-0.87	0.384	-0.006	-0.87	0.385
LNTA	-0.005	-2.30	0.021	-0.009	-4.83	0.000
AGE	-0.001	-2.30	0.022	-0.001	-1.87	0.062
BTM	-0.002	-0.36	0.718	-0.002	-0.44	0.663
ISSUE	0.028	3.30	0.001	0.022	2.82	0.005
CHGREV	0.019	1.76	0.078	-0.015	-1.51	0.131
ROE	0.001	0.17	0.868	-0.005	-1.08	0.280
CFO	0.000	-0.01	0.993	-0.051	-2.19	0.029
LOSS	0.013	1.53	0.125	0.023	2.97	0.003
LEVE	0.136	7.21	0.000	0.130	7.79	0.000
CYCLE	0.000	0.28	0.779	0.000	-0.76	0.446
CGK	0.155	2.46	0.014	-0.036	-0.64	0.524
BIG4	-0.003	-0.32	0.746	-0.002	-0.29	0.775
IFRS	-0.018	-1.25	0.210	-0.003	-0.25	0.800
Year and industry dummies	Included			Included		
Adjusted R^2	13%			15%		
N	1,071			1,071		

Second, to test if our empirical results are not only robust with regard to short term audit engagement tenure, but also for the entire audit engagement period, we re-estimate our original multivariate analysis by replacing the binary audit tenure variables (i.e., SHORT and LONG) through the continuous audit TENURE variable in Equation (3). Table 7 presents the empirical results of this additional analysis. In accordance with our previous analyses, we are again unable to find statistically significant results for the association between TENURE and |DA1|, and respectively |DA2|. This suggests that our original results are not only robust with regard to initial audit engagement years but also for later audit periods. With regard to the first robustness analysis presented above, we are able to summarize the results of the first two robustness checks indicate that our empirical findings seem to be robust with respect to alternative audit tenure definitions.

Table 7. Results Robustness Analysis on the Association between Discretionary Accruals and an Alternative Audit Tenure Definition (2)

	|DA1|			|DA2|		
Independent variables	Coefficient	t-value	p-value	Coefficient	t-value	p-value
Constant	0.126	3.97	0.000	0.196	6.96	0.000
TENURE	-0.001	-1.32	0.187	-0.001	-0.76	0.448
LNTA	-0.005	-2.31	0.021	-0.009	-4.84	0.000
AGE	-0.001	-2.29	0.022	-0.001	-1.88	0.061
BTM	-0.002	-0.37	0.711	-0.002	-0.47	0.641
ISSUE	0.028	3.29	0.001	0.021	2.77	0.006
CHGREV	0.019	1.80	0.073	-0.015	-1.56	0.119
ROE	0.001	0.16	0.876	-0.005	-1.09	0.278
CFO	0.000	-0.01	0.991	-0.051	-2.21	0.027
LOSS	0.013	1.55	0.122	0.022	2.96	0.003
LEVE	0.135	7.19	0.000	0.130	7.80	0.000
CYCLE	0.000	0.31	0.756	0.000	-0.75	0.456
CGK	0.154	2.45	0.014	-0.037	-0.65	0.514
BIG4	-0.003	-0.34	0.732	-0.002	-0.33	0.745
IFRS	-0.015	-1.10	0.271	-0.002	-0.19	0.845
Year and industry dummies	Included			Included		
Adjusted R^2	13%			16%		
N	1,071			1,071		

Third, our original analysis is based on a pooled sample of 1,071 firm observations controlling for specific year and industry fixed effects by respective indicator variables. Despite the included industry binary variables in Equation (3), our results could still suffer from unobserved company fixed effects. By controlling for firm-fixed effects in an additional fixed effects estimation model, we want to test the robustness of our empirical results with regard to hidden differences between auditor switching and non-auditor switching companies. Table 8 shows the results for the firm-fixed effects earnings management estimation model. As can be seen there, the results for our variables of interest, namely SHORT and LONG, are in accordance with the empirical findings presented in Table 5. This suggests that our empirical results are not influenced by potential unobserved firm-fixed effects.

Table 8. Results Robustness Analysis of Firm-Fixed Effects on the Association between Discretionary Accruals and Audit Tenure

	|DA1|			|DA2|		
Independent variables	Coefficient	t-value	p-value	Coefficient	t-value	p-value
Constant	-0.324	-0.77	0.442	-0.810	-2.11	0.036
SHORT	0.010	1.14	0.256	0.002	0.20	0.840
LONG	-0.009	-0.95	0.340	-0.008	-0.96	0.335
LNTA	0.039	3.85	0.000	0.036	3.84	0.000
AGE	-0.003	-0.56	0.577	0.005	1.00	0.318
BTM	-0.007	-0.98	0.329	0.003	0.53	0.599
ISSUE	0.020	2.35	0.019	0.016	2.05	0.041
CHGREV	-0.009	-0.79	0.432	-0.034	-3.20	0.001
ROE	0.000	-0.08	0.937	-0.007	-1.53	0.126
CFO	0.035	1.03	0.304	-0.019	-0.59	0.553
LOSS	-0.002	-0.21	0.834	0.010	1.19	0.234
LEVE	0.090	4.75	0.000	0.091	5.21	0.000
CYCLE	0.000	0.13	0.897	0.000	-0.73	0.466
CGK	0.120	1.06	0.289	-0.016	-0.16	0.875
BIG4	0.020	1.07	0.283	0.018	1.07	0.284
IFRS	-0.006	-0.42	0.675	0.011	0.85	0.395
Year dummies	Included			Included		
Adjusted R^2	29%			28%		
N	1,071			1,071		

Fourth, our sample period contains several time specific events (e.g., regulative changes, mandatory IFRS accounting standard adoption, financial crisis) that could affect our empirical results. In order to control for time specific effects, we re-estimate Equation (3) for each sample year separately (without year indicator variables). The empirical results of these empirical analyses are qualitatively equal to the

results reported in Table 5, indicating that our empirical findings are not significantly affected by time-specific effects (not tabulated).

7 Conclusion and Limitations

In our study we predict that audit quality differs systematically between two situations, namely when audit engagement tenure is short term, respectively when audit engagement tenure is long term. If auditors are assigned to a new audit engagement, they appear to be more independent for outsiders as they have not developed a personal relationship with their client, while at the same time the audit team generally lacks of client-specific knowledge, hence auditor expertise. For long term audit engagements, the opposite effect for auditor independence and auditor expertise is expected.

Using a sample of 1,071 firm observations for the sample period of 2005 to 2011, our empirical results demonstrate that neither short term nor long term audit tenure affect audit quality in Germany. In accordance with our hypotheses development, there are two possible explanations for these results. On the one hand it can be assumed that the opposite effects of auditor independence and client specific knowledge compensate each other over the entire audit engagement period. On the other hand, it is also possible that audit tenure is generally considered as a subordinate factor with regard to the quality of the conducted audits in Germany.

Our study provides additional empirical evidence to the inconsistent and comprehensible range of existing audit tenure literature. Further, we are able to complement the latest empirical study about the effects of audit tenure length on audit quality in Germany by Quick and Wiemann (2011). On the contrary to our study, the authors are able to find a statistically negative impact of short term audit firm tenure on unsigned and positive signed discretionary accruals, hence audit quality. However, our results for long term audit tenure are in line with the findings of Quick and Wiemann (2011). With regard to the divergent results of the two studies, we assume that the differences in the empirical results are mainly based on the divergent sample periods and sample composition as well as the divergent calculation of the audit tenure variables. Moreover, it is possible that our analysis is more substantially affected by the implementation of a mandatory audit partner rotation requirement in Germany in the fiscal year 2007 than the Quick and Wiemann (2011) study approach. However, our empirical findings are especially supported by the reported study results from Ruiz-Barbadillo et al. (2009) and Jackson et al. (2008) about the audit tenure effects on the Spanish, respectively Australian audit market.

From a regulatory point of view, our study provides useful insights into the recent debate regarding the optimal audit tenure length for statutory audits in the European Union. Our findings indicate that mandatory external audit firm rotation requirements are neither an efficient instrument to strengthen auditor independence nor to improve audit quality in Germany. Moreover, our findings suggest that the recent regulatory requirements on the German audit market, especially the forced rotation of the key audit partners, are adequate to assure a consistent audit quality over a certain audit engagement length.

As for many other empirical studies in this research field, our results should be interpreted cautiously as the empirical findings are subject to some limitations. First, our study approach assumes that discretionary accruals and the related estimation models measure earnings management, hence audit quality, reliably. Overall, estimated discretionary accruals are considered to be noisy proxies for earnings management[23]. In this context, we cannot rule out the fact that the insignificant results of our multivariate analysis might be based on the chosen audit quality proxy. Therefore, future research studies should also use alternative audit quality measures (e.g., qualified audit opinions, qualified going-concern opinions, accounting restatements or audit fraud) in order to provide a comprehensive understanding about audit tenure effects on audit quality in Germany.

Second, our multivariate analysis is based on voluntary audit firm changes for the sample period of 2005 to 2011. Under a voluntary regime, the observed relationship between audit tenure and audit quality can be endogenous, because the decision to change an audit firm is mainly based on an internal, respectively endogenous decision by the client firm. However, consistent with the majority of almost all other empirical audit tenure studies, we are unable to tackle this endogeneity issue in our research approach. Therefore, we have to highlight the fact that our empirical analyses are conducted under a voluntary auditor change regime in Germany and as a consequence our results cannot be adopted one by one for a mandatory audit firm rotation regime (Gosh and Moon, 2005; Johnson et al., 2002).

Finally, our audit tenure variable is calculated using published auditor opinions since the fiscal year 1999 onwards. Therefore, the maximum audit engagement length in our sample is limited to 13 years. In this context prior studies used a more extensive timeframe for their empirical analyses (e.g., Quick and Wiemann, 2011; Chen et al., 2008; Myers et al., 2003). We rejected a more extensive audit tenure calculation, due to missing prior audit opinion data. As a consequence of this limitation, we cannot exclude the possibility that our empirical findings are affected by the relatively short audit engagement timeframe. However, this limitation is only relevant for the calculation and definition of long term audit engagement tenure, while the binary short and medium term audit tenure variables are not affected.

[23] Gul et al. (2009) refer to studies of Ball and Shivakumar (2008) and Dopuch et al. (2005) with regard to misspecified discretionary accrual estimation models.

References

1. Anthony, J.H. and Ramesh, K. (1992), "Association between accounting performance measures and stock prices: A test of the life cycle hypothesis", *Journal of Accounting and Economics*, Vol. 15 No. 2-3, pp. 203-227.
2. Ashbaugh, H./ LaFond, R. and Mayhew, B. (2003), "Do nonaudit services compromise auditor independence? Further evidence", *The Accounting Review*, Vol. 78 No. 3, pp. 611-639.
3. Azizkhani, M./ Monroe, G. S. and Shailer, G. (2006), "Auditor tenure and perceived credibility of financial reporting", *Working paper*, Australian National University.
4. Baker, C.R./Beard, J. and Prat dit Hauret, C. (2008), "The regulatory response in France to accounting scandals", *Auditing, Trust and Governance: Developing Regulation in Europe*, London, Routledge, pp. 98-111.
5. Ball, R. and Shivakumar, L. (2006), "The role of accruals in asymmetrically timely gain and loss recognition", *Journal of Accounting Research*, Vol. 44 No. 2, pp. 207–241.
6. Ball, R. and Shivakumar, L. (2008), "Earnings quality at initial public offerings", *Journal of Accounting and Economics*, Vol. 45 No. 2-3, pp. 324-349.
7. Barnier, M. (2011), "Restoring confidence in financial statements: the European Commission aims at a higher quality, dynamic and open audit market", European Commission – Press Release from 30. November 2011, Brussels. Available from: http://ec.europa.eu/internal_market/auditing/reform/index_en.htm
8. Bartov, E./ Gul, F.A. and Tsui J.S.L. (2003), "Discretionary-accruals models and audit qualifications", *Journal of Accounting and Economics*, Vol. 30 No. 3, pp. 421-452.
9. Becker, C./ DeFond, M./ Jiambalvo, J. and Subramanyam, K. (1998), "The effect of audit quality on earnings management", *Contemporary Accounting Research*, Vol. 15 No. 1, pp. 1-24.
10. Behn, K.B./ Carcello, J.V./ Hermanson, D.R. and Hermanson, R.H. (1999), "Client satisfaction and Big 6 audit fees", *Contemporary Accounting Research*, Vol. 16 No. 4, pp. 587-608.
11. Bigus, J. and Zimmermann, R-C. (2008), "Non-audit fees, market leaders and concentration in the German audit market: A descriptive analysis", *International Journal of Auditing*, Vol. 12 No. 3, pp. 159-179.
12. Burtler, S.A. (1986), "Anchoring in the judgmental evaluation of audit samples", *The Accounting Review*, Vol. 61 No. 1, pp. 101–111.
13. Carey, P. and Simnett, R. (2006), "Audit partner tenure and audit quality", *The Accounting Review*, Vol. 81 No. 3, pp. 653-676.
14. Chen, C-Y./ Lin, C-J. and Lin, Y-C. (2008), "Audit partner tenure, audit firm tenure, and discretionary accruals: Does long auditor tenure impair earnings quality?", *Contemporary Accounting Research*, Vol. 25 No. 2, pp. 415-445.
15. Chi, W. and Huang, H. (2005), "Discretionary accruals, audit-firm tenure and audit-partner tenure: Empirical evidence from Taiwan", *Journal of Contemporary Accounting and Economics*, Vol. 1 No. 1, pp. 65-92.
16. Choi, J-H./ Kim, J-B. and Zang, Y. (2010), Do abnormally high audit fees impair audit quality? *Auditing: A Journal of Practice & Theory*, Vol. 29 No. 2, pp. 73-97.
17. Chung, H. and Kallapur, S. (2003), "Client importance, nonaudit services, and abnormal accruals", The Accounting Review, Vol. 78 No. 4, pp. 931-955.
18. Davis, L.R./ Soo, B.S. and Trompeter, G.M. (2009), "Auditor tenure and the ability to meet or beat earnings forecasts", *Contemporary Accounting Research*, Vol. 26 No. 2, pp. 517-548.
19. DeAngelo, L.E. (1981a), ''low balling'' and disclosure regulation", *Journal of Accounting and Economics*, Vol. 3 No. 2, pp. 113–127.
20. DeAngelo, L.E. (1981b), "Auditor size and audit quality", *Journal of Accounting and Economics*, Vol. 3 No. 3, pp. 183-199.
21. Dechow, P. and Dichev, I. (2002), "The quality of accruals and earnings", *The Accounting Review*, Vol. 77 Supplement, pp. 35-59.
22. Dechow, P./ Sloan, R. and Sweeney, A. (1995), "Detecting earnings management", *The Accounting Review*, Vol. 70 No. 2, pp. 193-225.
23. DeFond, M. (2010), "Earnings quality research: Advances, challenges and future research", *Journal of Accounting and Economics*, Vol. 50 No. 2-3, pp. 402-409.
24. DeFond, M. and Jiambalvo, J. (1994), "Debt covenant effects and the manipulation of accruals", *Journal of Accounting and Economics*, Vol. 17 No. 1-2, pp.145-76.
25. Dopuch, N./ Mashruwala, R./ Seethamraju, C. and Zach, T. (2005), "Accrual determinants, sales changes and their impact on empirical accrual models", *Working Paper*, Washington University in St. Louis.
26. European Commission (2010), "Green paper. Audit policy: Lessons from the crisis", Brussels, Available from: http://ec.europa.eu/internal_market/auditing/reform/index_en.htm
27. European Commission (2011), "Proposal for a regulation of the European Parliament and the Council on specific requirements regarding statutory audit of public-interest entities", Brussels, Available from: http://ec.europa.eu/internal_market/auditing/reform/index_en.htm
28. Eurostat (2012), "Key figures on Europe 2012", Luxembourg, Available from: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-EI-12-001/EN/KS-EI-12-001-EN.PDF
29. Ferguson, M.J./ Seow, G.S. and Young, D. (2004), "Nonaudit services and earnings management: UK evidence", *Contemporary Accounting Research*, Vol. 21 No. 4, pp. 813-841.
30. Francis, J.R./ Maydew, E.L. and Sparks, H.C. (1999), "The role of Big 6 auditors in the credible reporting of accruals", *Auditing: A Journal of Practice & Theory*, Vol. 18 No. 2, pp. 17-34.
31. Frankel, R./ Johnson, M. and Nelson, K. (2002), "The relation between auditors' fees for non-audit services and earnings quality", *The Accounting Review*, Vol. 77 Supplement, pp. 71-105.
32. Garcia-Benau, M.A./ De Fuentes Barberà, C. and Martinez, A.V. (2008), "The development of the

auditing profession in Spain: Fast evolution in a highly regulated environment", *Auditing, Trust and Governance: Developing Regulation in Europe*, London, Routledge, pp. 186-205.
33. Geiger, M.A. and Raghunandan, K. (2002), "Auditor tenure and audit reporting failures", *Auditing: A Journal of Practice & Theory*, Vol. 21 No. 1, pp. 67-80.
34. Gold, A./ Lindscheid, F./ Pott, C. and Watrin, C. (2012), "The effect of engagement and review partner tenure and rotation on audit quality: Evidence from Germany", *Working Paper*, University of Amsterdam and Muenster.
35. Gosh, A. and Moon D. (2005), "Auditor tenure and perceptions of audit quality", *The Accounting Review*, Vol. 80 No. 2, pp. 585-612.
36. Gul, F.A./ Jaggi, B.L. and Krishnan, G.V. (2009), "Auditor independence: Evidence on the joint effects of auditor tenure and nonaudit fees", Auditing: A Journal of Practice & Theory, Vol. 26 No. 2, pp. 117-142.
37. Jackson, A.B./ Moldrich, M. and Roebuck, P. (2008), "Mandatory audit firm rotation and audit quality", *Managerial Audition Journal*, Vol. 23 No. 5, pp. 420-437.
38. Jenkins, D.S. and Velury, U. (2008), "Does auditor tenure influence the reporting of conservative earnings?", *Journal of Accounting and Public Policy*, Vol. 27 No. 2, pp. 115-132.
39. Johnson, V.E./ Khurana, I.K. and Reynolds, J.K. (2002), "Audit-firm tenure and the quality of financial reports", *Contemporary Accounting Research*, Vol. 19 No. 4, pp. 636-660.
40. Joyce, E.J. and Biddle, G.C. (1981), "Anchoring and adjustment in probabilistic inferences in auditing", *Journal of Accounting Research*, Vol. 19 No. 1, pp. 120-145.
41. Kida, T. (1980), "An Investigation into auditor's continuity and related qualification judgements", *Journal of Accounting Research*, Vol. 18 No. 2, pp. 506-523.
42. Knapp, M. (1991), "Factors that audit committees use as surrogates for audit quality", *Auditing: A Journal of Practice & Theory*, Vol. 10 No. 1, pp. 35-52.
43. Kothari, S.P./ Leone, A.J. and Wasley, C.E. (2005), "Performance matched discretionary accrual measures", *Journal of Accounting and Economics*, Vol. 39 No. 1, pp. 163-197.
44. Küting, K. and Reuter, M. (2007), "Prüferwechsel in Deutschland – Empirische Untersuchung der (Konzern-) Abschlussprüfer von in Deutschland börsennotierten Unternehmen", *Die Wirtschaftsprüfung (WpG)*, Vol. 60 No. 22, pp. 953–962.
45. La Porta, R./ Lopez-de-Silanes, F./ Schleifer, A. and Vishny, R. (1998), "Law and finance", *Journal of Political Economy*, Vol. 106 No. 6, pp. 1113-1155.
46. Larcker, D.F. and Richardson, S.A. (2004), "Fees paid to audit firms, accrual choices, and corporate governance", *Journal of Accounting Research*, Vol. 42 No. 3, pp. 625-658.
47. Li, D. (2010), "Does auditor tenure affect accounting conservatism? Further evidence", *Journal of Accounting and Public Policy*, Vol. 29 No. 3, pp. 225-241.
48. Libby, R. and Libby, P.A. (1989), "Expert measurement and mechanical combination in control reliance decisions", *The Accounting Review*, Vol. 64 No. 4, pp. 729-747.
49. Marten, K.-U. (1994), „Der Wechsel des Abschlussprüfers – Ergebnisse einer empirischen Untersuchung des Prüfungsmarktes in Kontext der Agency-Theorie", IDW, Düsseldorf.
50. Marten, K.-U. and Schultze, W. (1998), "Konzentrationsentwicklung auf dem deutschen und europäischen Prüfungsmarkt", *Zeitschrift für betriebswirtschaftliche Forschung (zfbf)*, Vol. 50, No. 4, pp. 360–386.
51. Mautz, R.K. and Sharaf, H.A. (1961), "The philosophy of auditing", American Accounting Association, Sarasota, FL.
52. Myers J.N./ Myers L.A. and Omer C.T. (2003), "Exploring the term of the auditor-client relationship and the quality of earnings: A case for mandatory auditor rotation?", *The Accounting Review*, Vol. 78 No. 3, pp. 779-799.
53. New York Stock Exchange (NYSE) (2012), Listed company directory, New York, Available from: http://www.nyse.com/about/listed/lc_all_overview.html
54. Pott, C./ Mock, T.J. and Watrin, C. (2009), "Review of empirical research on rotation and non-audit services: auditor independence in fact vs. appearance", *Journal für Betriebswirtschaft*, Vol. 58 No. 4, pp. 209-239.
55. Quick, R. and Warming-Rasmussen, B.W. (2005), "The impact of MAS on perceived auditor independence – some evidence from Denmark", *Accounting Forum*, Vol. 29 No. 2, pp. 137-168.
56. Quick, R. and Warming-Rasmussen, B.W. (2009), "Auditor independence and the provision of non-audit services: Perceptions by German investors", *International Journal of Auditing*, Vol. 13 No. 2, pp. 141-162.
57. Quick, R. and Wiemann, D. (2011), "Zum Einfluss der Mandatsdauer des Abschlussprüfers auf die Prüfungsqualität", *Journal of Business Economics (ZfB-Zeitschrift für Betriebswirtschaft),* Vol. 81 No. 9, pp. 915-943.
58. Ruiz-Barbadillo, E./ Gómez-Aguilar, N. and Carrera, N. (2009), "Does mandatory audit firm rotation enhance auditor independence? Evidence from Spain", *Auditing: A Journal of Practice & Theory*, Vol. 28 No. 1, pp. 113-135.
59. United States Senate (US-Senate) (1976), "The accounting establishment: A staff study prepared by the subcommittee on reports, accounting, and management of the committee on government operations", Washington, DC, United States Government Printing Office.
60. Vanstraelen, A. and Willekens, M. (2008), "Audit regulation in Belgium: Overregulation in a limited capital market oriented country?", *Auditing, Trust and Governance: Developing Regulation in Europe*, London, Routledge, pp. 19-42.
61. Watts , R.L. and Zimmermann, J.L. (1986), "Positive accounting theory", Prentice, Hall, Engelwood Cliffs, New Jersey.
62. World Trade Organization (WTO) (2011), "International Trade Statistics 2011", Geneva, Available from: http://www.wto.org/english/res_e/statis_e/its2011_e/its2011_e.pdf

Appendix

Table A.1. Definition of Variables

Variable	Definition	Type
AGE	age of the company measured in years.	Continuous
BIG4	binary variable equal to 1 if auditor is a Big 4 audit firm (Deloitte, PWC, Ernst & Young, KPMG), and 0 otherwise.	Binary
BTM	total equity divded by market capitalization, book-to-market ratio.	Continuous
CFO	cash flow from operations scaled by lagged total assets.	Continuous
CGK	number of non-complied recommendations of the German Corporate Governance Codex divided by the total number of recommendations.	Continuous
CHGREV	revenue change in percent from the prior year to current year.	Continuous
CYCLE	360/(total revenues/total receivables), operating cycle.	Continuous
|DA1|	unsigned discretionary accruals estimated in Equation (1).	Continuous
|DA2|	unsigned discretionary accruals estimated in Equation (2).	Continuous
DCFO	binary variable equal to 1 if cash flow form operations is negative, and 0 otherwise.	Binary
IFRS	binary variable equal to 1 for first time IFRS application, and 0 otherwise.	Binary
ISSUE	binary variable equal to 1 if equity titels issued during the current year exceed ten percent of prior year subscribed capital, and 0 otherwise.	Binary
LEVE	binary variable equal to 1 if leverage ratio (total liabilities divided by total assets) change from the prior year to current year exceeds twenty percent, and 0 otherwise.	Binary
LNTA	natural log of total assets.	Continuous
LONG	binary variable equal to 1 if seventh or later audit engagement year, and 0 otherwise.	Binary
LOSS	binary variable equal to 1 if net income is negative in the prior fiscal year, and 0 otherwise.	Binary
PPE	total net value of property, plant, and equipment.	Continuous
REC	total receivables.	Continuous
REV	total revenue.	Continuous
ROA	net income divided by total assets, return on assets.	Continuous
ROE	net income divided by total equity, return on equity.	Continuous
SHORT	binary variable equal to 1 if first, second, or third year of audit engagement, and 0 otherwise.	Binary
TA	total assets.	Continuous
TACC	total accruals scaled by lagged total assets.	Continuous
TENURE	auditor tenure measured in consecutive years since the last auditor change.	Continuous