Client's business risk, public-interest entities, and audit fees: The case of German credit institutions

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This study examines a sample of 573 German credit institution-year observations covering 2009–2011, a period when not all credit institutions were designated as public-interest entities (PIEs) in Germany. The results show that a credit institution's business risk is associated with audit fees. In addition, the statistically significant findings reveal that PIE credit institutions pay approximately 27.29% higher audit fees, on average. There is also some evidence of an association between the interaction of a credit institution's business risk and PIE status and audit fees even if, on average, the business risk of credit institutions seems not to vary systematically between PIEs and non-PIEs. Ultimately, since a dummy variable for PIE versus non-PIE might not only, or even primarily, capture effects attributable to PIE status, the results should be interpreted with caution.

KEYWORDS
Audit fees, client's business risk, credit institutions, Germany, public-interest entities

1 | INTRODUCTION

The European Union's (EU) latest audit (market) reform targeted public-interest entities (PIEs), which generally include credit institutions according to the 2006 Statutory Audit Directive (European Union, 2006). However, the 2006 Statutory Audit Directive also allowed European Member States to not regard all credit institutions as PIEs. Germany exercised this option, which led to a circumstance in which only credit institutions designated as PIEs (“PIE credit institutions”) were subject to special provisions of statutory audits, whereas non-PIE credit institutions were not. For example, auditors of PIEs are subject to disciplinary oversight inspections by the Auditor Oversight Commission (AOC). Therefore, it could be asked whether auditors differentiate between audits of PIE credit institutions and non-PIE credit institutions. The German setting enables an examination of whether the PIE status of credit institutions is associated with audit fees because this status might increase the risk to the respective auditors significantly enough to influence their audit efforts or risk premiums, or both.

Using a sample of 573 German credit institution-year observations (excluding savings banks and cooperative banks) over the 2009–2011 period, this study first corroborates the findings of prior research that a credit institution's business risk is significantly associated with audit fees (e.g., Cameran & Perotti, 2014; Cullen, Gasbarro, Monroe, Shailer, & Zhang, 2017; Doogar, Rowe, & Sivadasan, 2015; Fields, Fraser, & Wilkins, 2004). In addition, it shows that PIE credit institutions tend to pay significantly higher audit fees than credit institutions not classified as PIEs. The effect also seems to be economically significant: an approximately 27.29% increase in average audit fees, ceteris paribus. Moreover, although, on average, the business risk of credit institutions seems not to vary systematically between PIEs and non-PIEs, there is some evidence of an association between the interaction of a credit institution's business risk and PIE status and audit fees. Further analyses, however, suggest that a dummy variable for PIE versus non-PIE might not only, or even primarily, capture effects attributable to PIE status.

This study extends prior research by presenting empirical evidence that PIE status is associated with audit fees of German credit institutions, which might be due to variations in audit effort and/or auditor's business risk premiums. Interestingly, the EU's new regulatory framework on statutory audits (European Union, 2014) no longer includes a Member State option to reduce the extent of the EU PIE definition, and, therefore, all credit institutions are regarded as PIEs for the purpose of specific provisions for statutory audits.
The findings suggest that this might result in a significant increase in the average audit fees of credit institutions that were not previously classified as PIEs if the additional provisions for statutory audits of PIEs (e.g., auditor oversight) are assumed to be the material driver of the PIE effect, at least in Germany. This study further argues and empirically illustrates that variations in audit fees might be explained by an interaction effect of a credit institution's business risk and PIE status, which could be interpreted to mean that PIE status conditions the business risk–audit fee relationship for credit institutions. Even though there is an enormous amount of research examining audit fee models (e.g., Hay, 2013; Hay, Knechel, & Wong, 2006), this result might also highlight that future research would benefit by increasingly analyzing effects that condition (already examined) audit fee associations.

Finally, but importantly, as further analyses show that one of the main variables of interest—i.e., the PIE dummy—might also capture other effects that we are not primarily interested in, this emphasizes the importance of acknowledging the limitations of the proxies used.2 A quite similar variable is, for example, a dummy for market listing, which in some instances is used to proxy for the client's ownership structure (e.g., Hay et al., 2006). However, a market listing dummy might also capture effects resulting from extended regulatory requirements of listed companies; interpreting the results of such a dummy solely as "ownership effects" might, therefore, be flawed.

The study is organized as follows: the next section outlines the formation of the hypotheses. Section 3 begins by explaining the research design, and an overview of the sample is then provided by discussing the sample selection and descriptive statistics. Subsequently, the regression analyses follow, and further analyses are discussed. Section 4 briefly summarizes the study's results.

2 | FORMATION OF HYPOTHESES

2.1 | Theoretical background: Client's business risk and audit fees

In simple terms, audit fees might be considered to be determined by three factors: audit effort, a risk component concerning the auditor's (residual) business risk, and a profit margin.

Audit effort is driven by audit risk, and audit risk can be defined as the "risk that the auditor expresses an inappropriate audit opinion when the financial statements are materially misstated" (International Auditing and Assurance Standards Board, 2016, p. 16). Related to the underlying logic of the Audit Risk Model (e.g., American Institute of Certified Public Accountants, 1984), audit effort (engagement hours, qualification of the audit staff deployed, etc.) is set on the basis of the auditor's detection risk. The auditor's detection risk can be calculated by dividing the desired audit risk by the client's inherent risk multiplied by the client's control risk (cf. also International Auditing and Assurance Standards Board, 2016, ISA 200 A44). The pre-specified level of audit risk is determined by the auditor's business risk, which is closely related to the client's business risk. The client's inherent and control risks—i.e., the risks of material misstatements—arise as the result of the client's business risk, industry, and macroeconomic factors, and the client's internal control system.3 Accordingly, the client's business risk is expected to influence audit effort.

However, higher audit effort due to higher client's business risk cannot entirely eliminate risks to the auditor—e.g., litigation risk or reputation risk (e.g., Gaver & Paterson, 2007; Li, 2009; Reynolds & Francis, 2000; Stice, 1991)—because auditors might still be sued even if the audit was conducted in accordance with the respective auditing regulations (DeFond & Zhang, 2014). Thus, in addition to costs related to audit effort, auditors might charge a risk premium, i.e., all "residual risks" that cannot be controlled for via higher audit effort.

In conclusion, a client's business risk is expected to be associated with audit fees. Unfortunately, empirical audit fee models typically cannot directly test the various determinants and relationships discussed above because researchers do not have access to either auditors' or clients' internal data. However, if certain observable variables might serve as reasonable proxies for a client's business risk, it might be possible to determine whether the client's business risk plays a role in pricing audits.

2.2 | Credit institution's business risk and audit fees—H1

The first industry-specific studies report mixed evidence on whether an association between audit fees and a client's business risk is empirically observable (Hill, Ramsay, & Simon, 1994; Stein, Simunic, & O'Keefe, 1994). However, recent research (Boo & Sharma, 2008; Chen, Lam, Smieliauskas, & Ye, 2010; Cullen et al., 2017; Doogar et al., 2015; Ettredge, Xu, & Yi, 2014; Kanagaretnam, Krishnan, & Lobo, 2010; Kanagaretnam, Krishnan, Lobo, & Mathieu, 2011; Mohrmann, Riepe, & Stefani, 2013) broadly supports the findings of Fields et al. (2004), which demonstrate that a client's business risk—as reflected by the bank's credit risk, market risk, operating risk, liquidity risk, and capital risk—is significantly associated with audit fees (Fields et al., 2004).4 Further analyses consider the audit pricing of European banks (e.g., Altmann, 2008; Cameran & Perotti, 2014; Sipple, 2013), and they also find empirical support for such an association. In sum, previous research highlights that a client's business risk in the banking industry might explain variations in audit fees.

In addition to the empirical evidence, with respect to German credit institutions, the relationship between a client's business risk and a credit institution's audit—and, possibly, audit fees—might be demonstrated in various ways. For example, the German Accounting Standard (GAS) 5–10 "Risk Reporting by Financial Institutions and Financial Service Institutions" (an amended version of GAS 5–10 has been part of GAS 20 "Group Management Report" since 2013) stated that in addition to information about general risks, credit institutions shall distinguish among credit risk, liquidity risk, market risk, operational risk, and other risk. This risk report section is an important part of a group management report and has to be audited by the group auditor (sections 317, 340i Commercial Code, HGB).

Therefore, it might be expected that the auditor devotes particular consideration to a credit institution's business risk when planning audit effort. Another example is the Financial Supervisory Authority's (BaFin) enactment of the Audit Report Regulation (PrüfbV). Section 3 PrüfbV (formerly section 2), "Risk Orientation and Materiality", states that auditors engaging in risk-oriented auditing shall primarily consider a credit institution's size, its scope of business, its...
complexity, and the level of risk of the business conducted by the institution. As a client’s business risk is, therefore, expected to be an essential aspect of German credit institutions’ audits, it is assumed to determine audit effort, the auditor’s business risk premium, or both, and thus, we expect a positive association between a credit institution’s business risk and audit fees, which leads to the following hypothesis (alternative form):

H1. A credit institution’s business risk is positively associated with audit fees, ceteris paribus.

2.3 Credit institutions designated as public-interest entities, credit institution’s business risk, and audit fees—H2a and H2b

According to the 2006 Statutory Audit Directive (European Union, 2006), credit institutions are PIEs, in principle; however, the use of Member State options has also meant that, until recently (June 2016), not all credit institutions necessarily had to be considered as PIEs in all EU Member States. Germany exercised this Member State option and reduced the extent of the European definition. This led to the fact that not all credit institutions were designated as PIEs in Germany—PIEs were only those issuing shares or debt securities on an EU-regulated market (i.e., listed companies, sections 264d, 319a HGB). Moreover, this resulted in a differentiation between the regulatory requirements of PIE credit institutions and those of non-PIE credit institutions. Thus far, however, there has been little discussion about whether the status of being a PIE is associated with audit fees because such status might condition the risk to auditors to a sufficient extent to influence their audit effort or their business risk premium, or both. However, certain points might suggest that average audit fees differ for PIE credit institutions relative to non-PIE credit institutions.

First, it could be assumed that agency conflicts due to information asymmetries are higher for PIE credit institutions because PIEs are always listed on an EU-regulated market and, thus, are assumed to have higher levels of dispersed ownership.5 As a consequence, PIEs might have incentives to demand higher audit quality to counter agency costs, which is expected to be accompanied by higher audit fees (e.g., DeFond & Zhang, 2014). Moreover, research shows that listed clients face a higher risk of (shareholder) lawsuits, which might increase audit fees due to higher auditor’s business risk (e.g., Hay et al., 2006; Seetharaman, Gu, & Lynn, 2002; Stice, 1991).

PIE credit institutions’ audit fees might also vary in comparison to non-PIE credit institutions because PIEs are subject to further reporting requirements because they are listed companies. For example, the (group) management report must also include a description of the key features of the accounting-related internal control and risk management system, and this extended management report also has to be audited by the auditor (e.g., sections 317, 340i HGB).

Furthermore, the German legal environment is regularly assumed to be characterized by relatively low levels of litigiousness (e.g., La Porta, Lopez-de-Silanes, & Shleifer, 2006), which should reduce the incentive to intensify audit effort and, in turn, demand higher audit fees (DeFond & Zhang, 2014; Wingate, 1997). However, it is questionable whether this reasoning continues to apply after increases in the levels of manager liability observed over the past decade. Referring to listed companies and, thus, PIEs, members of the management board have, for instance, to sign a responsibility statement.6 A false declaration is punishable by a term of imprisonment of up to three years or by a fine (e.g., section 331 HGB). This could result in higher audit fees due to higher audit effort because the management might demand a higher level of assurance for the financial statements. In contrast, the auditor’s business risk premium might decrease as the financial reporting quality might increase. Thus, concerning this point, it is unclear whether average audit fees tend to be higher, lower, or similar for PIE credit institutions relative to non-PIE credit institutions.

Finally, probably one of the most significant differences between PIE credit institutions and non-PIE credit institutions is that the former are subject to additional public oversight elements, which can be distinguished into two—in part, interrelated—systems: the enforcement of the client’s financial reporting and the inspection of auditors.7 A PIE credit institution’s financial reporting may be examined by the Financial Reporting Enforcement Panel (FREP) because only listed companies and, thus, PIEs are subject to this enforcement. The FREP will initiate an examination: (i) in the event that concrete indications of an infringement of financial reporting requirements exist, (ii) at the request of the BaFin, or (iii) based on random sampling.8 Moreover, if an examination finds indications of a violation of professional obligations by the auditor, the Chamber of Public Accountants is notified, which presumably results in an inspection of the auditor (section 342b HGB). In addition to such inspections for cause—i.e., based on information from FREP or other sources—auditors of PIEs are also subject to random disciplinary oversight inspections (formerly sections 61a, 62b Public Accountants Act, WPO).9 It is noteworthy that there are in general no sanctions with respect to the audit firm as a legal entity and the specific inspection reports are confidential. However, it could be expected that the responsible audit engagement partner (and her team) might increase audit effort and/or price a “sanction-risk premium” into the audit fees, especially if no insurance against risks resulting from disciplinary sanctions exists (Huber, 2013). However, apart from this important aspect and although prior research shows that the German enforcement system and the auditor oversight is associated with earnings quality, stock liquidity, and the market valuation of companies (Ernstberger, Stich, & Vogler, 2012), the effect of the additional public oversight elements on audit fees is ex ante not necessarily clear. For example, there is also some evidence that supports the notion that the increased public oversight engendered by the Sarbanes–Oxley Act (SOX) improved internal controls in the US (e.g., DeFond & Zhang, 2014; Patterson & Smith, 2007). If oversight might, therefore, increase internal control quality, audit effort might decrease because the likelihood of unintentional or intentional misstatements could be expected to decrease. Such contrary effects might also exist with regard to the German public oversight system. Therefore, there are arguments for and against the additional public oversight elements being positively or negatively related to audit fees; at least for the US, there is some empirical evidence that the overall net effect of SOX led to an increase in audit fees (e.g., DeFond & Zhang, 2014; Iliev, 2010).

In summary, several points suggest that average audit fees might vary between PIE credit institutions and non-PIE credit institutions, and it is assumed that the overall net effect on audit fees is positive. The following hypothesis is stated in its alternative form:
H2a. Credit institution’s status of being a PIE is positively associated with audit fees, ceteris paribus.

In H1, it is hypothesized that a credit institution’s business risk is associated with audit fees. H2a concentrates on the question of whether a credit institution’s PIE status is associated with audit fees. However, there might also exist an association between the interaction of a credit institution’s business risk, PIE status, and audit fees, which is illustrated by two examples.

First, the auditor’s business risk defines the auditor’s willingness to permit material misstatements to exist (i.e., audit risk), which determines detection risk and, thus, audit effort. If, for example, additional public oversight elements for PIE audits decrease an auditor’s willingness to accept that the audited financial statements are materially misstated—because FREP examinations and AOC investigations could result in disciplinary sanctions, etc.—it might result in an increase in audit effort. Moreover, the auditor’s business risk and, hence, its willingness to accept possible material misstatements depends on the client’s business risk. Thus, interaction effects between considerations regarding additional public oversight elements for PIEs and a credit institution’s business risk might play a role in setting the appropriate audit effort level.

Second, non-sampling risk—whereby "the auditor reaches an erroneous conclusion for any reason not related to sampling risk [due to, for example,] use of inappropriate audit procedures, or misinterpretation of audit evidence" (International Auditing and Assurance Standards Board, 2016, p. 457, 459, ISA 530 5(d), A1)—is related to detection risk (International Auditing and Assurance Standards Board, 2016, ISA 200 A43, ISA 450 A5), which determines planned audit effort, and thus, is expected to be associated with audit fees. The effect of non-sampling risk on audit effort might increase with increases in a credit institution’s business risk, especially for PIEs. This could be the case because, on the one hand, PIE credit institutions and their auditors are additionally selected for FREP examinations and AOC inspections based on a credit institution’s business risk, and, on the other hand, it might be expected that the likelihood of possible negative findings of FREP examinations and AOC inspections is conditional on a PIE credit institution’s business risk (and complexity). Thus, there might be variations in audit fees due to an interaction effect between additional public oversight elements of PIEs and the credit institution’s business risk.

Taken together, there are arguments suggesting the following (alternative form of the hypothesis):

H2b. There is an association between the interaction of a credit institution’s business risk and the status of being a PIE and audit fees, ceteris paribus.

3 | RESEARCH DESIGN, SAMPLE, AND REGRESSION RESULTS

3.1 | Model specification

3.1.1 | Model specification—H1 and H2a

To test H1, proxies for a credit institution’s business risks must be identified. The following analysis consists of a credit institution’s business risk variables that are related to the CAMEL (Capitalization, Assets quality, Management capability, Earnings, Liquidity) approach because this approach, among other things, is assumed to be used directly or indirectly by the German supervisory authorities, rating agencies, and, thus, presumably by German auditors. This study, therefore, uses a similar underlying approach (i.e., CAMEL) to identify risk proxies as in Fields et al. (2004). However, a modified version of their empirical model is employed to consider German specifics. The credit institution’s business risk proxies are described in the following.

Capitalization is measured by a credit institution’s equity ratio (CETA). A high equity ratio might indicate lower business risk for the credit institution, and hence, is expected to be negatively associated with audit fees.

Strong total asset growth demonstrates ongoing demand for a credit institution’s products and services and the availability of and access to investment opportunities. Arguing in the opposite direction, problems of subjectivity relating to write-ups of financial assets, lax lending policies or over-investing are just a few examples of non- qualitative asset growth. Nevertheless, as the following sample considers the years just after the financial crisis—during which many credit institutions were forced to reduce their balance sheets through declining lending activities, write-offs, losses, and other activities—it is hypothesized that total asset growth (TAG) is seen positively and, thus, as reducing credit institutions’ business risk; therefore, it is hypothesized to be negatively associated with audit fees.

Another proxy referring to asset quality is a credit institution’s loan impairment charge as a percentage of average gross loans (LICAGL). Increasing impairment losses and loan loss provisions might indicate higher business risk for a credit institution, and thus, it could be hypothesized to be positively associated with audit fees.

With regard to management capability, the broad proxy NONINTEXPRATIO (non-interest expenses to average total assets) is introduced, and it illustrates a credit institution’s costs compared to assets invested. Lower figures might be indicative of operating efficiency, and high values of NONINTEXPRATIO might further suggest potential risks from expanding the business. Therefore, NONINTEXPRATIO is assumed to be positively related to audit fees since higher ratios are expected to indicate that a credit institution has higher business risk.

Return on average assets (ROAA) allows for the assessment of how efficiently a credit institution utilizes its asset base. A higher ROAA might decrease a credit institution’s business risk, and ROAA might be negatively associated with audit fees.

In highlighting this matter, note that levels of ROAA exceeding certain thresholds—such as historical average industry values—might indicate, for example, an increased risk taken or window dressing. Thus, the variation of ROAA over time might be another proxy for earnings-related risk. Moreover, a volatile ROAA might suggest greater uncertainty regarding future earnings, which might make audits more demanding, particularly when assessing a credit institution’s ability to continue as a going concern. In sum, it is hypothesized that a credit institution’s higher risk due to volatile profitability—as approximated by ROAA’s standard deviation over the last five fiscal years (SIGMAROAA)—is positively associated with audit fees.

The last industry-specific proxies are measures of market liquidity or funding liquidity risk, which indicate liquidity in a broader sense. First, the core measure is the liquid asset ratio (liquid assets to total assets; LIQTA), which describes overall liquidity (e.g., International
Monetary Fund; Poghosyan & Cihák, 2009). A high ratio implies lower liquidity risk. Moreover, liquid assets might be easier to audit than illiquid assets (e.g., Chen et al., 2010; Ettredge et al., 2014). Thus, it could be expected that LIQTA is negatively associated with audit fees. Second, the ratio of interbank assets to interbank liabilities (INTERBANKRATIO) is an essential funding liquidity risk indicator. Normally, a higher ratio means higher liquidity for the credit institution. The consequences might be lower audit fees because of lower client business risk. On the downside, a substantially liquid position in the interbank market also suggests greater counterparty risk. It might be assumed that this aspect has gained particular importance in the aftermath of the financial crisis. A number of facts support this point, including, in particular, high interbank interest rate spreads, a sharp increase in banks’ usage of the Eurosystem’s deposit facility or even a dried-up interbank market—which persists during some parts during the sample period—hint at the increased importance of counterparty risk (e.g., Brunnermeier, 2009; European Central Bank, 2013). A positive association between INTERBANKRATIO with audit fees is expected.

In addition to those variables referring to a credit institution’s business risk (H1), the dummy PIE—which equals one if a credit institution is classified as a public-interest entity in the German legal meaning (section 319a HGB) and zero otherwise—is introduced to empirically test H2a, i.e., whether PIE credit institutions tend to pay higher audit fees on average than non-PIE credit institutions.

In sum, the empirical model to test H1 and H2a can be specified as follows:

\[
\text{LNAF}_{it} = \alpha_0 + \alpha_1 \text{CETA}_{it} + \alpha_2 \text{TAG}_{it} + \alpha_3 \text{LICAGL}_{it} + \alpha_4 \text{NONINTEXPRATIO}_{it} + \alpha_5 \text{ROAA}_{it} + \alpha_6 \text{SIGMAROAA}_{it} + \alpha_7 \text{LIQTA}_{it} + \alpha_8 \text{INTERBANKRATIO}_{it} + \alpha_9 \text{PIE}_{it} + \sum_{j=1}^{8} \alpha_{9+j} \text{CONTROL}_{jit} + \sum_{l=1}^{2} \alpha_{17+l} \text{YR}_{lit} + \epsilon_{it},
\]

where CONTROL is a set of control variables that are employed to control for further credit institution and auditor characteristics, and YR represents two year dummies. First, in contrast to all previous

| TABLE 1 | Variables and definitions |
|---------|---------------------------|
| **Variable** | **Definition** |
| Dependent variable | LNAF | Natural logarithm of a credit institution’s audit fees paid. |
| Variables of interest | | |
| Capitalization | CETA | A credit institution’s common equity to total assets. |
| | TAG | A credit institution’s growth of total assets. |
| | LICAGL | A credit institution’s loan impairment charge divided by average gross loans. |
| Assets quality | | |
| | | |
| Earnings | ROAA | A credit institution’s return on average assets. |
| | SIGMAROAA | A credit institution’s return on average assets’ standard deviation over the last five fiscal years. |
| Liquidity | LIQTA | A credit institution’s liquid assets to total assets. |
| | INTERBANKRATIO | A credit institution’s interbank assets to interbank liabilities. |
| Management capability | NONINTEXPRATIO | A credit institution’s non-interest expenses to average assets. |
| Public-interest entity | PIE | A dummy variable that equals one if a credit institution is classified as a public-interest entity according to the German Commercial Code (section 319a HGB) and zero otherwise. |
| Control variables—CONTROL | LNTBV | Natural logarithm of a credit institution’s total business volume. |
| | CFS | A dummy variable that equals one if the financial statement consists of consolidated accounts and zero otherwise. |
| | SAMECITY | A dummy variable that equals one if a credit institution’s office and the auditor’s office are in the same city and zero otherwise. |
| | FFMM | A dummy variable that equals one if the auditor’s office is located in Frankfurt am Main and zero otherwise. |
| | BIG2 | A dummy variable that equals one if a credit institution is audited by either KPMG or PWC and zero otherwise. |
| | AUDITORCHANGE | A dummy variable that equals one if the credit institution’s auditor (audit firm) changed and zero otherwise. |
| | EPCHANGE | A dummy variable that equals one if one or both engagement partners have changed and zero otherwise. |
| | AFS | A dummy variable that equals one if the credit institution’s financial statements are amended or corrected after the first publication in the German Company Register and zero otherwise. |
| Fixed-effects variable—YR | YR | A set of two year dummies. |
analyses, this study does not use total assets as the size proxy. Contemporary German audits are individualized and risk-oriented (e.g., Ellifsen, Knechel, & Wallage, 2001; IDW Auditing Standards 261 revised version), which implies that auditors must adequately consider clients' specialties, such as off-balance-sheet items in the case of financial institutions (e.g., IDW Auditing Practice Statements 9.302.1).17 Thus, the credit institution’s total business volume (LNTBV)—i.e., total assets plus off-balance-sheet items—is used as the size proxy.18 Second, the dummy CFS is employed because it might be assumed that auditing consolidated financial statements requires greater audit effort because the auditor not only must audit the annual financial statement of the parent company but also must “obtain sufficient appropriate audit evidence regarding the financial information of the components and the consolidation process” (International Auditing and Assurance Standards Board, 2016, p. 625, ISA 600 8). Third, if the auditor’s and client’s locations do not differ (SAMECITY), Francis, Stokes, and Anderson (1999) conclude that minimizing information asymmetries leads to reduced (contracting) costs, and audit firms may pass on lower costs to their clients (assuming a competitive audit market). Fourth, it might also be of interest whether a unique city, namely, Frankfurt am Main (FFM), is associated with audit fees (e.g., Basioudis & Francis, 2007). Frankfurt am Main is a European financial center, where a large proportion of German credit institutions and the industry’s leading audit firms—i.e., KPMG and PWC—have their registered offices. On the one hand, aspects of audit quality related to either larger local offices or high geographical density of employees qualified specifically to work in the financial industry might suggest higher audit (contracting) costs, and audit firms may pass on lower costs to their clients (assuming a competitive audit market). On the other hand, local business centers enable the operation of scale economies/learning curve effects through regional knowledge-sharing and more intense monitoring of competitors and networking which might result in lower audit fees (e.g., Breschi & Lissoni, 2003; Danos, Eichenseher, & Holt, 1989; Malmberg & Maskell, 2006; Vera-Muñoz, Ho, & Chow, 2006). Fifth, the regression includes a control variable for a Big 2 premium (BIG2), i.e., KPMG and PWC, as these two audit firms are the most significant suppliers of audits of German credit institutions (e.g., Hay & Knechel, 2017; Leidner & Lenz, 2013).19 Sixth, we control for changes in the auditing firm (AUDITORCHANGE). Seventh, the analysis also controls for audit partner change (EPCHANGE). Research on audit partner tenure delivers non-uniform results (e.g., Bedard & Johnstone, 2010; Manry, Mock, & Turner, 2008); thus, audit partner rotation might be negatively or positively associated with audit fees. Eighth, an amendment or correction of the disclosed annual (consolidated) financial statements (AFS) might be an indication of audit problems, which might be expected to be positively associated with audit fees (e.g., Mande & Son, 2013; Stice, 1991). Table 1 presents definitions of the variables.

3.1.2 Model specification—H2b

The empirical model to examine H2b is based on Equation 1; however, it includes additional two-way interactions because they reveal whether there exists an association between the interaction of a credit institution’s business risk and the PIE status and audit fees. The regression to analyze H2b is:

\[ \text{LNAF}_t = \beta_0 + \beta_1 \text{CETA}_t + \beta_2 \text{TAGA}_t + \beta_3 \text{LCAGL}_t + \beta_4 \text{NONINTEXPRATIO}_t + \beta_5 \text{ROAA}_t + \beta_6 \text{SIGMAROOAA}_t + \beta_7 \text{LQTA}_t + \beta_8 \text{INTERBANKRATIO}_t + \beta_9 \text{PIE}_t + \beta_{10} \text{CETA}_t \times \text{PIE}_t + \beta_{11} \text{TAGA}_t \times \text{PIE}_t + \beta_{12} \text{LCAGL}_t \times \text{PIE}_t + \beta_{13} \text{NONINTEXPRATIO}_t \times \text{PIE}_t + \beta_{14} \text{ROAA}_t \times \text{PIE}_t + \beta_{15} \text{SIGMAROOAA}_t \times \text{PIE}_t + \beta_{16} \text{LQTA}_t \times \text{PIE}_t + \beta_{17} \text{INTERBANKRATIO}_t \times \text{PIE}_t + \beta_{18} \text{SIGMAROOAA}_t + \beta_{19} \text{LQTA}_t + \beta_{20} \text{INTERBANKRATIO}_t + \beta_{21} \text{LQTA}_t + \beta_{22} \text{INTERBANKRATIO}_t + \beta_{23} \text{LQTA}_t + \beta_{24} \text{INTERBANKRATIO}_t + \beta_{25} \text{YR}_t + \sum_{j=1}^8 \beta_{26} \text{CONTROL}_j + \varepsilon_t. \]

where the set of additional variables—i.e., CONTROL and YR—is identical to that of Equation 1.

3.2 Sample and descriptive statistics

The pooled sample comprises credit institutions located in Germany covering fiscal years 2009–2011 (it excludes savings banks and cooperative banks because of their different regulatory requirements). The initial sample from Bankscope includes 933 firm-years. The sample period begins in 2009 because German credit institutions since that year—irrespective of their legal form or capital market orientation—have been legally responsible for publishing audit fees. This applies to all German credit institutions, apart from the exemption for subsidiaries, which do not have to disclose this information as long as their parent companies include all subsidiary-related audit fees in their consolidated financial statement disclosure (section 285 HGB). Therefore, the sample decreases by 237 firm-years.20 The variables on audit fees (LNAF), auditor location (SAMECITY, FFM), Big 2 premium (BIG2), auditor change (AUDITORCHANGE, EPCHANGE), and AFS have been hand-collected.21

To identify which German credit institutions are PIEs, published annual transparency reports from 2010 to 2014 were examined.22 After merging the data from all sources, the final sample consists of 573 credit institution-years. Table 2 briefly outlines the sample selection procedure.

Summary statistics of the pooled sample are presented in Table 3, and several points are notable. The mean of LNAF is 12.48, and the standard deviation equals 1.43; only a few credit institutions pay very

**TABLE 2 Sample selection**

| Credit institution-years | Initial sample of German credit institution-year observations (excluding savings banks and cooperative banks) with data on total assets in fiscal 2009, 2010, or 2011 in Bankscope. |
|-------------------------|----------------------------------------------------------------------------------------------------------|
|                         | 933                                                                                                      |
| Less:                   | German credit institution-year observations with no information on audit fees in fiscal 2009, 2010, or 2011; hand-collected data from financial statements disclosed at the German Company Register. |
|                         | (237)                                                                                                     |
|                         | German credit institution-year observations with no information on all independent variables in fiscal 2009, 2010, or 2011; data from Bankscope, or hand-collected from financial statements disclosed at the German Company Register. |
|                         | (123)                                                                                                     |
| Final sample            | 573                                                                                                      |


TABLE 3  Summary statistics

|                  | Mean All | Mean only PIE | Mean only non-PIE | p-value of test of differences | Std. dev. | 25% | 50% | 75% | Min. | Max. |
|------------------|----------|---------------|------------------|-------------------------------|-----------|-----|-----|-----|------|------|
| LNTBV            | 21.648   | 24.333        | 20.730           | 0.000                         | 2.523     | 19.748| 21.319| 23.372| 16.601| 27.347|
| CFS              | 0.328    | 0.692         | 0.204            | 0.000                         | 0.470     | 0.000| 0.000| 1.000| 0.000| 1.000|
| SAMECITY         | 0.515    | 0.733         | 0.440            | 0.000                         | 0.500     | 0.000| 1.000| 1.000| 0.000| 1.000|
| FFM              | 0.311    | 0.281         | 0.321            | 0.368                         | 0.463     | 0.000| 1.000| 1.000| 0.000| 1.000|
| BIG2             | 0.504    | 0.671         | 0.447            | 0.000                         | 0.500     | 0.000| 1.000| 1.000| 0.000| 1.000|
| AUDITORCHANGE    | 0.084    | 0.082         | 0.084            | 0.937                         | 0.277     | 0.000| 0.000| 0.000| 1.000| 1.000|
| EPCHANGE         | 0.298    | 0.349         | 0.281            | 0.120                         | 0.458     | 0.000| 0.000| 1.000| 1.000| 1.000|
| AFS              | 0.042    | 0.048         | 0.040            | 0.673                         | 0.201     | 0.000| 0.000| 1.000| 0.000| 1.000|
| n                | 573      | 146           | 427              |                               | 573       | 573 | 573 | 573 | 573  | 573  |

Note: This table presents summary statistics of pooled data based on samples of banks in Germany from 2009 to 2011. All continuous regression variables are winsorized (1st and 99th percentiles) to mitigate the potential influence of outliers on the results. The p-value of the test of differences equals the p-value of a two-group mean-comparison test. Variable definitions are listed in Table 1.

high fees. The mean of LNTBV is 21.65 (standard deviation of 2.52). CETA ranges from −0.003 to 0.860, indicating that the pooled sample contains credit institutions nearly on the verge of balance-sheet over-indebtedness and institutions predominantly financed by equity. The majority of all credit institutions are characterized by positive total asset growth during the 2009–2011 period, during which the standard deviation of TAG amounts to 0.19. The risk ratios on asset quality (LICAGL), profitability (ROAA, SIGMAROAA) and AFS display the highest skewness and/or kurtosis. Approximately 51.48% of all the auditors in the pooled sample have their offices in the same city as the client, and 31.06% of the auditors have their registered offices in Frankfurt am Main. Furthermore, the mean of BIG2 equals 0.50. Changes in one of the engagement partners occur more frequently than changes in the audit firm; 29.84% versus 8.38%. Amendments or corrections to financial statements are seldom found (24 out of 573). This attests to either the high reporting and audit quality of German credit institutions or weak controls, e.g., through shareholders or the enforcement system. Finally, of the credit institutions in the pooled sample, 50 out of 184, 47 out of 197, and 49 out 192 are classified as PIEs in 2009, 2010, and 2011, respectively. Moreover, a two-group mean-comparison test for PIE versus non-PIE credit institutions reveals that PIEs are on average larger and disclose higher audit fees. The riskiness of PIEs seems not to be higher in general—it depends on the specific variable of interest because, for example, PIEs have on average a significantly higher leverage (indicated by lower levels of CETA) and, simultaneously, appear to be more efficient as measured by NONINTEXPRATIO.23

First indications of possible collinearity problems, i.e., Pearson product-moment correlation coefficients between independent variables as presented in Table 4, can be observed for only a few variables. Moreover, 14 of 17 independent variables demonstrate a statistically significant linear relationship with LNTBV at the 0.10 level.

3.3 Regression results

3.3.1 Results—H1 and H2a

The results of the sample in Table 5 are based on a pooled ordinary least squares (OLS) estimation of Equation 1; standard errors are clustered by credit institution.24

Focusing first on H1, five out of eight credit institution business risk variables (TAG, NONINTEXPRATIO, SIGMAROAA, LIQTA, and INTERBANKRATIO) are significantly associated with audit fees (p-value <0.05, one-tailed test).25 In addition to the statistical significance of those variables, they are also economically relevant. For example, an increase of 0.19 (one standard deviation in the sample) in TAG lowers, ceteris paribus, the average audit fee by approximately 12.15%. Comparable results are revealed for the other variables (a one standard deviation increase in each respective variable, ceteris paribus): NONINTEXPRATIO 15.01%, SIGMAROAA 14.61%, LIQTA −7.84%, and INTERBANKRATIO 9.06%. For CETA, LICAGL, and ROAA, the null hypotheses could not be rejected at a 0.10 significance level, and whether these credit institution business risk variables are associated with audit fees could, thus, not be observed.26 Overall, there is empirical support for H1, suggesting that a credit institution’s business risk is associated with audit fees, which is in line with prior research (e.g., Cameran & Perotti, 2014; Doogar et al., 2015; Fields et al., 2004).

H2a hypothesizes that the PIE status of a credit institution is positively associated with audit fees. The PIE variable is significant (p-value = 0.016, one-tailed test), and its economic significance is...
|   | 1     | 2     | 3     | 4     | 5     | 6     | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   |
|---|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | 1.000 |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |
| 2 | -0.384| 1.000 |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |
| 3 | -0.221| -0.014| 1.000 |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |
| 4 | -0.180| 0.150 | -0.023|       | 1.000 |       |      |      |      |      |      |      |      |      |      |      |      |      |
| 5 | -0.166| 0.556 | -0.013| -0.008|       | 1.000 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 6 | -0.083| 0.151 | 0.096 | 0.070 | 0.097 | -1.080|      |      |      |      |      |      |      |      |      |      |      |      |      |
| 7 | -0.135| 0.493 | 0.053 | -0.031| 0.525 | -0.108|      |      |      |      |      |      |      |      |      |      |      |      |      |
| 8 | -0.065| 0.052 | 0.084 | -0.121| -0.003| -0.041|      |      |      |      |      |      |      |      |      |      |      |      |      |
| 9 | -0.040| 0.068 | 0.050 | -0.090| 0.055 | 0.043 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 10| 0.632 | -0.238| -0.160| -0.103| -0.159| -0.108|      |      |      |      |      |      |      |      |      |      |      |      |      |
| 11| 0.848 | -0.543| -0.116| -0.123| -0.419| -0.042|      |      |      |      |      |      |      |      |      |      |      |      |      |
| 12| 0.696 | -0.215| -0.138| -0.123| 0.023 | 0.045 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 13| 0.214 | 0.033 | -0.148| 0.011 | -0.100| -0.057|      |      |      |      |      |      |      |      |      |      |      |      |      |
| 14| 0.070 | -0.026| 0.013 | -0.059| 0.059 | -0.037|      |      |      |      |      |      |      |      |      |      |      |      |      |
| 15| 0.287 | -0.095| -0.156| -0.004| -0.118| -0.112|      |      |      |      |      |      |      |      |      |      |      |      |      |
| 16| -0.097| 0.663 | 0.026 | 0.050 | 0.018 | 0.050 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 17| 0.119 | 0.023 | -0.081| 0.005 | -0.009| -0.061|      |      |      |      |      |      |      |      |      |      |      |      |      |
| 18| 0.020 | -0.056| 0.031 | -0.036| -0.006| -0.001|      |      |      |      |      |      |      |      |      |      |      |      |      |

Note: This table presents Pearson product-moment correlation coefficients of pooled data based on samples of credit institutions in Germany from 2009 to 2011. The numbers in parentheses represent the correlation coefficient's p-values (two-tailed test). All continuous regression variables are winsorized (1st and 99th percentiles) to mitigate the potential influence of outliers on the results. Variable definitions: (1) LNAF denotes the natural logarithm of a credit institution's audit fees paid. (2) CETAll labels a credit institution's common equity to total assets. (3) TAG represents a credit institution's growth of total assets. (4) UCAGL corresponds to a credit institution's loan impairment charge divided by average gross loans. (5) NONINTERPRATIO denotes a credit institution's non-interest expenses to average assets. (6) ROA stands for a credit institution's return on average assets. (7) SIGMAROAA equals a credit institution's return on its average assets' standard deviation over the last five fiscal years. (8) LIQA stands for a credit institution's liquid assets to total assets. (9) INTERBANKRATIO corresponds to a credit institution's interbank assets to interbank liabilities. (10) PIE is a dummy variable that equals one if a credit institution is classified as a public-interest entity according to the German Commercial Code and zero otherwise. (11) LNTBV is a dummy variable that equals one if the credit institution's total business volume. (12) CFS is a dummy variable that equals one if the financial statement consists of consolidated accounts and zero otherwise. (13) SAMECITY is a dummy variable that equals one if a credit institution's office and the auditor's office are in the same city and zero otherwise. (14) FFM is a dummy variable that equals one if the auditor's office is located in Frankfurt am Main and zero otherwise. (15) BIG2 is a dummy variable that equals one if a credit institution is audited by either KPMG or PWC and zero otherwise. (16) AUDITORCHANGE is a dummy variable that equals one if the credit institution's auditor (audit firm) changed and zero otherwise. (17) EPCHANGE is a dummy variable that equals one if one or both engagement partners have changed and zero otherwise. (18) AFS is a dummy variable that equals one if the credit institution's financial statements are amended or corrected after the first publication in the German Company Register and zero otherwise.
The influence of outliers on the results. The following regression model is estimated on samples of credit institutions in Germany from 2009 to 2011. Standard errors and t-statistics are adjusted, clustered by credit institution. p-values are based on one-sided tests when the coefficient's sign is predicted; otherwise, two-tailed tests are used. The regression includes a set of year dummies (YR), which are omitted from the table. All continuous regression variables are winsorized (1st and 99th percentiles) to mitigate the potential influence of outliers on the results. The following regression model is tested: LnAFit = α0 + α1*TAGit + α2*LICAGLit + α3*NONINTEXPRATIOit + α4*ROAAit + α5*SIGMAROAAit + α6*LNTBVit + α7*CETSit + α8*INTERBANKRATIOit + α9*PIEit + α10*SAMECITYit + α11*FFMit + α12*BIG2it + α13*AUDITORCHANGEit + α14*EPCHANGEit + α15*AFS + α16*INTERCEPTit.

Table 5: Audit fee pooled OLS regression—H1 and H2a

| Variable                | Expected sign | Coefficient | Robust standard error | p-value |
|-------------------------|---------------|-------------|-----------------------|---------|
| CETA                    | -             | -0.2099     | 0.2629                | 0.213   |
| TAG                     | -             | -0.6479     | 0.1284                | 0.000   |
| LICAGL                  | +             | -0.0213     | 0.0093                | 0.988   |
| NONINTEXPRATIO          | +             | 1.1584      | 0.3815                | 0.001   |
| ROAA                    | -             | -0.6986     | 1.8053                | 0.350   |
| SIGMAROAA               | +             | 9.7970      | 3.0817                | 0.001   |
| LIQTA                   | -             | -0.3323     | 0.1744                | 0.029   |
| INTERBANKRATIO          | +             | 0.0520      | 0.0172                | 0.001   |
| PIE                     | +             | 0.2729      | 0.1257                | 0.016   |
| LNTBV                   | +             | 0.4046      | 0.0276                | 0.000   |
| CFS                     | +             | 0.6643      | 0.1119                | 0.000   |
| SAMECITY                | -             | 0.0199      | 0.0876                | 0.590   |
| FFM                     | +/-           | 0.0514      | 0.0952                | 0.590   |
| BIG2                    | +             | 0.1736      | 0.0796                | 0.015   |
| AUDITORCHANGE           | -             | -0.2829     | 0.0939                | 0.001   |
| EPCHANGE                | +/-           | 0.0623      | 0.0600                | 0.300   |
| AFS                     | +             | 0.0904      | 0.1146                | 0.216   |
| INTERCEPT               | +/-           | 3.2885      | 0.5728                | 0.000   |

Year dummies: Clustered by: Credit institution, Yes
n = 573, Adj.R² = 0.838, Prob > F = 0.0000

Note: This table presents the results of a pooled OLS regression based on samples of credit institutions in Germany from 2009 to 2011. Standard errors and t-statistics are adjusted, clustered by credit institution. p-values are based on one-sided tests when the coefficient’s sign is predicted; otherwise, two-tailed tests are used. The regression includes a set of year dummies (YR), which are omitted from the table. All continuous regression variables are winsorized (1st and 99th percentiles) to mitigate the potential influence of outliers on the results. The following regression model is tested: LnAFit = α0 + α1*TAGit + α2*LICAGLit + α3*NONINTEXPRATIOit + α4*ROAAit + α5*SIGMAROAAit + α6*LNTBVit + α7*CETSit + α8*INTERBANKRATIOit + α9*PIEit + α10*SAMECITYit + α11*FFMit + α12*BIG2it + α13*AUDITORCHANGEit + α14*EPCHANGEit + α15*AFS + α16*INTERCEPTit, where LnAF represents the natural logarithm of a credit institution’s audit fees paid. CETA denotes a credit institution’s common equity to total assets. Tag represents a credit institution’s growth of total assets. LICAGL stands for a credit institution’s return on average assets’ accounts and all audit fees related to audits of subsidiaries that were performed by the parent company’s auditor (section 285 HGB). Thus, the 66.43% increase in average audit fees might be explained at least in part by the German audit fee disclosure requirements. A fee premium of approximately 17.36% (ceteris paribus) is reported for the Big 2, i.e., KPMG and PWC, and fee-cutting can be observed on initial audit engagements.27 Changing engagement partners is not associated with audit fees. Neither the remaining controls on auditor location (SAMECITY, FFM) nor the broad proxy for possible audit problems (AFS) are associated with audit fees at the 0.10 significance level.28

3.3.2 | Results—H2b

H2b addresses the question of whether an association between an interaction of a credit institution’s business risk and the PIE status and audit fees is empirically observable.29 The interactions with PIE present the empirical findings for this hypothesis, and the interactions of capitalization (CETA × PIE), asset quality (LICAGL × PIE), management capabilities (NONINTEXPRATIO × PIE), and volatile profitability (SIGMAROAA × PIE) are significantly associated with audit fees. This does not apply to the interactions with TAG, ROAA, LIQTA, and INTERBANKRATIO. The results moderately support H2b: Although, on average, risk seems not to vary systematically between PIE and non-PIE credit institutions (Table 3), there is some empirical support for the notion of an association between the interaction of a credit institution’s business risk and the PIE status and audit fees—PIE status conditions the relationship between a credit institution’s business risk and audit fees.30 This might be of interest for future research because it shows that associations between variables of interest and audit fees might be conditional on other variables (of interest). For example, Ettredge et al. (2014) highlights that assets that are more difficult to assess (Level 3 versus Level 1 or 2, fair value hierarchy) are associated with
higher audit fees. However, it might be assumed that a client’s business risk interacts with the association between the proportions of total assets that are fair-valued and audit fees because it might be assumed that the estimation uncertainty of fair values is conditional on the complexity and the level of risk of the business conducted, i.e., the client’s business risk.

### Further analyses

#### Aggregate measure of a credit institution’s business risk

One might interpret the results in Tables 5 and 6 as supporting evidence for H1 and H2b if many but not all credit institutions' audit fees were lower if a credit institution's business risk interacts with the association between the proportions of total assets that are fair-valued and audit fees. Because it might be assumed that the estimation uncertainty of fair values is conditional on the complexity and the level of risk of the business conducted, i.e., the client’s business risk.

### Table 6

| Variable          | Expected sign | Coefficient | Robust standard error | p-value |
|-------------------|---------------|-------------|-----------------------|---------|
| CETA              | -             | -0.1382     | 0.2506                | 0.291   |
| TAG               | -             | -0.5383     | 0.1320                | 0.000   |
| LICAGL            | +             | -0.0218     | 0.0095                | 0.988   |
| NONINTEXPRATIO    | +             | 1.2238      | 0.3927                | 0.001   |
| ROAA              | -             | -0.5417     | 1.8265                | 0.384   |
| SIGMAROOA         | +             | 8.4911      | 3.1513                | 0.004   |
| LIQTA             | -             | -0.3184     | 0.1784                | 0.038   |
| INTERBANKRATIO    | +             | 0.0515      | 0.0178                | 0.002   |
| PIE               | +             | 0.4759      | 0.2101                | 0.012   |
| CETA×PIE          | +/-           | -6.7835     | 3.3006                | 0.041   |
| TAG×PIE           | +/-           | -0.5854     | 0.4352                | 0.180   |
| LICAGL×PIE        | +/-           | -1.4733     | 0.5648                | 0.010   |
| NONINTEXPRATIO×PIE| +/-           | 5.4793      | 3.1654                | 0.085   |
| ROAA×PIE          | +/-           | 6.0610      | 4.4959                | 0.179   |
| SIGMAROOA×PIE     | +/-           | 22.6639     | 8.4914                | 0.008   |
| LIQTA×PIE         | +/-           | -0.3852     | 0.4421                | 0.385   |
| INTERBANKRATIO×PIE| +/-           | 0.0507      | 0.0737                | 0.492   |
| LNTBV             | +             | 0.4057      | 0.0280                | 0.000   |
| CFS               | +             | 0.6305      | 0.1162                | 0.000   |
| SAMECITY          | -             | 0.0187      | 0.0860                | 0.586   |
| FFMI              | +/-           | 0.0677      | 0.0961                | 0.482   |
| BIG2              | +             | 0.1857      | 0.0798                | 0.010   |
| AUDITORCHANGE     | -             | -0.2857     | 0.0927                | 0.001   |
| EPCHANGE          | +/-           | 0.0617      | 0.0587                | 0.294   |
| AF               | +             | 0.1179      | 0.1130                | 0.149   |
| INTERCEPT         | +/-           | 3.2518      | 0.5783                | 0.000   |

Year dummies: Clustered by: Credit Institution

n = 573
Adj. R² = 0.841
Prob > F = 0.0000

Note: This table presents the results of a pooled OLS regression based on samples of credit institutions in Germany from 2009 to 2011. Standard errors and t-statistics are adjusted, clustered by credit institution. p-values are based on one-sided tests when the coefficient’s sign is predicted; otherwise, two-tailed tests were used. The regression includes a set of year dummies (YR), which are omitted from the table. The variables with “×” are interaction terms. All continuous regression variables are winsorized (1st and 99th percentiles) to mitigate the potential influence of outliers on the results. The following regression model is tested: LNAFIT[n] = β0 + β1CETAn + β2TAGn + β3LICAGLn + β4NONINTEXPRATION + β5ROAAAn + β6SIGMAROOAn + β7LIQTan + β8INTERBANKRATO + β9PIEn + β10CETAn×PIE + β11TAGn×PIE + β12LICAGLn×PIE + β13NONINTEXPRATIO×PIE + β14ROAAAn×PIE + β15SIGMAROOAn×PIE + β16LIQtan×PIE + β17INTERBANKRATIO×PIEn + β18CETAn×LNBTVn + β19CFSn + β20SAMECITYn + β21FFMn + β22BIgn + β23AUDITORCHANGEn + β24EPCHANGEn + β25AFSn + Σ(YRn−1) β26+25YRn + εn, where LNAFIT denotes the natural logarithm of a credit institution’s audit fees paid. CETA denotes a credit institution’s common equity to total assets. TAG corresponds to a credit institution’s loan impairment charge divided by average gross loans. NONINTEXPRATIO denotes a credit institution’s non-interest expenses to average assets. ROAA stands for a credit institution’s return on average assets. SIGMAROOA equals a credit institution’s return on average assets’ standard deviation over the last five fiscal years. LIQTA refers to a credit institution’s liquid assets to total assets. INTERBANKRATIO corresponds to a credit institution’s interbank assets to interbank liabilities. PIE is a dummy variable that equals one if a credit institution is classified as a public-interest entity according to the German Commercial Code and zero otherwise. LNTBV equals the natural logarithm of a credit institution’s total business volume. CFS is a dummy variable that equals one if the financial statement consists of consolidated accounts and zero otherwise. SAMECITY is a dummy variable that equals one if a credit institution’s office and the auditor’s office are in the same city and zero otherwise. FFMI is a dummy variable that equals one if the auditor’s office is located in Frankfurt am Main and zero otherwise. BIG2 is a dummy variable that equals one if a credit institution is audited by either KPMG or PWC and zero otherwise. AUDITORCHANGE is a dummy variable that equals one if the credit institution’s auditor (audit firm) changed and zero otherwise. EPCHANGE is a dummy variable that equals one if one or both engagement partners have changed and zero otherwise. AF is a dummy variable that equals one if the credit institution’s financial statements are amended or corrected after the first publication in the German Company Register and zero otherwise.
business risk proxies are significantly associated with audit fees. However, and in a similar vein to, for example, Fukukawa, Mock, and Wright (2011), we believe that auditors assess a client’s overall engagement risk or, at most, broad risk categories to determine their audit effort and risk premiums demanded instead of “a linear aggregation of individual risk variable assessments” (Fukukawa et al., 2011, p. 92). Thus, an aggregate measure of a credit institution’s business risk (RISK) is additionally introduced. Each credit institution is ranked on each credit institution business risk proxy on a yearly basis, and a higher rank suggests higher risk. Subsequently, the aggregate measure is computed, and it equals the median ranking on all eight assigned individual risk proxy rankings. If the aggregate measure of a credit institution’s business risk (RISK) is computed, and it equals the median ranking on all eight assigned individual risk proxy rankings. If the aggregate measure of a credit institution’s business risk (RISK) is computed, and it equals the median ranking on all eight assigned individual risk proxy rankings.

### TABLE 7
Audit fee pooled OLS regressions and aggregate measure of credit institution’s business risk—H1, H2a, and H2b

| Variable          | (1) H1 and H2a | (2) H2b |
|-------------------|----------------|---------|
| RISK              | +              | +       | +      |
| PIE               | +/−            | +/−     | +/−    |
| RISK × PIE        | +/−            | +/−     | +/−    |
| LNTBV             | +              | +       | +      |
| CFS               | +              | +       | +      |
| SAMECITY          | −              | −       | −      |
| FFM               | +/−            | +/−     | +/−    |
| BIG2              | +              | +       | +      |
| AUDITORCHANGE     | −              | −       | −      |
| EPCHANGE          | +/−            | +/−     | +/−    |
| AFS               | +              | +       | +      |
| INTERCEPT         | +/−            | +/−     | +/−    |

| Coefficient       | Robust standard error | p-value | Coefficient       | Robust standard error | p-value |
|-------------------|-----------------------|---------|-------------------|-----------------------|---------|
| RISK              | 0.0066                | 0.0111  | 0.000             | 0.0053                | 0.0111  | 0.000 |
| PIE               | 0.3541                | 0.1244  | 0.002             | −0.2574               | 0.2636  | 0.835 |
| RISK × PIE        | 0.0063                | 0.0024  | 0.000             | 0.0356                | 0.0231  | 0.000 |
| LNTBV             | 0.3541                | 0.0235  | 0.000             | 0.3506                | 0.0231  | 0.000 |
| CFS               | 0.8014                | 0.1022  | 0.000             | 0.8128                | 0.1019  | 0.000 |
| SAMECITY          | 0.0302                | 0.0838  | 0.641             | 0.0252                | 0.0822  | 0.620 |
| FFM               | 0.0736                | 0.0918  | 0.424             | 0.0938                | 0.0908  | 0.303 |
| BIG2              | 0.1599                | 0.0817  | 0.026             | 0.1603                | 0.0810  | 0.025 |
| AUDITORCHANGE     | −0.3424               | 0.0934  | 0.000             | −0.3270               | 0.0948  | 0.000 |
| EPCHANGE          | 0.0679                | 0.0619  | 0.273             | 0.0650                | 0.0615  | 0.292 |
| AFS               | 0.1101                | 0.1043  | 0.146             | 0.1198                | 0.1001  | 0.117 |
| INTERCEPT         | 3.7502                | 0.5227  | 0.000             | 3.9377                | 0.5136  | 0.000 |

| Year dummies:     | Yes                      | Yes             |
| Clustered by:     | Credit institution       | Credit institution |
| n                 | 573                      | 573             |
| Adj.R²            | 0.824                    | 0.827           |
| Prob > F          | 0.0000                   | 0.0000          |

Note: This table presents the results of two pooled OLS regression based on samples of credit institutions in Germany from 2009 to 2011. Standard errors and t-statistics are adjusted, clustered by credit institution. p-values are based on one-sided tests when the coefficient’s sign is predicted; otherwise, two-tailed tests are used. The regressions include a set of year dummies (YR), which are omitted from the table. The variable with “+” is an interaction term. All continuous regression variables are winsorized (1st and 99th percentiles) to mitigate the potential influence of outliers on the results (this does not apply to RISK). For H1 and H2a, the following regression model is tested: column (1) LNAFit = α0 + α1RISKit + α2PIEit + α3LNTBVit + α4CFSit + α5SAMECITYit + α6FFMit + α7BIG2it + α8AUDITORCHANGEit + α9EPCHANGEit + α10AFSit + Σl=1−10YRlit + εit, and for H2b, the following regression model is tested: column (2) LNAFit = β0 + β1RISKit + β2PIEit + β3LNTBVit + β4CFSit + β5SAMECITYit + β6FFMit + β7BIG2it + β8AUDITORCHANGEit + β9EPCHANGEit + β10AFSit + Σl=1−10YRlit + εit, where LN denotes the natural logarithm of a credit institution’s audit fees paid. RISK represents an aggregate measure of credit institution’s business risk and is computed as follows: Each credit institution is ranked for each credit institution’s business risk variable on a yearly basis, and a higher rank suggests higher risk. Subsequently, RISK is computed, and it equals the median rank of all eight assigned individual risk proxy ranks. PIE is a dummy variable that equals one if a credit institution is classified as a public-interest entity according to the German Commercial Code and zero otherwise. LNTBV equals the natural logarithm of a credit institution’s total business volume. CFS is a dummy variable that equals one if the financial statement consists of consolidated accounts and zero otherwise. SAMECITY is a dummy variable that equals one if a credit institution’s office is located in Frankfurt am Main and zero otherwise. BIG2 is a dummy variable that equals one if a credit institution is audited by either KPMG or PWC and zero otherwise. AUDITORCHANGE is a dummy variable that equals one if the credit institution’s auditor (audit firm) changed and zero otherwise. EPCHANGE is a dummy variable that equals one if one or both engagement partners have changed and zero otherwise. AFS is a dummy variable that equals one if the credit institution’s financial statements are amended or corrected after the first publication in the German Company Register and zero otherwise.

3.4.2 | Public-interest entity dummy and international financial reporting standards

The PIE dummy might also reflect other effects than those discussed in the hypothesis development section if they are closely linked with the...
status of being a PIE. One reason might be the use of International Financial Reporting Standards (IFRS) instead of German Generally Accepted Accounting Principles (GAAP), which might increase audit fees due to higher audit effort and/or decrease the auditor's business risk premium due to higher financial reporting quality and, therefore, lower expected liability costs (Cameran & Perotti, 2014). A total of 101 out of 146 PIE-year observations publish IFRS reports instead of reports based on German GAAP. As a consequence, one should control for whether financial statements are prepared under IFRS. However, the above-presented regressions control indirectly for a possible IFRS effect for PIE credit institutions because every PIE credit institution that publishes an IFRS report also publishes consolidated financial statements. Thus, for the sub-sample of PIE credit institutions, an IFRS dummy would equal CFS. Nevertheless, in an effort to address this point, all regressions are re-estimated by (1) including an IFRS dummy, (2) by including an IFRS dummy and simultaneously excluding CFS, and (3) by analyzing the sub-sample of credit institution observations that publish German GAAP reports. In the first two cases, the results exhibit no empirical support for H2a and the significance levels regarding H2b decrease. In the third case, i.e., for the sub-sample of non-IFRS credit institution observations, the coefficient on PIE and the significance levels decrease but still support H2a; there is, however, no empirical support for H2b. This mixed evidence might be interpreted to mean that the PIE variable does not only, or even primarily, capture the effect of PIE status. Thus, the prior interpretations concerning the PIE dummy should be viewed with a degree of caution.

4 | CONCLUSION

Germany’s decision not to classify all credit institutions as PIEs—and, thus, to exercise the Member State option to reduce the extent of the European definition—resulted in a differentiation between the regulatory requirements of PIE credit institutions and those of non-PIE credit institutions. This regulatory setting makes it possible to examine whether PIE status is associated with audit fees because the audit of a PIE client—in contrast to non-PIE clients—might increase the risk to an auditor to an extent sufficient to influence audit effort, an auditor’s business risk premium, or both.

Employing a sample of 573 German credit institution observations covering the 2009–2011 period, this study first presents supporting evidence that a credit institution’s business risk is associated with audit fees, which accords with the results of previous research (e.g., Cameran & Perotti, 2014; Cullen et al., 2017; Fields et al., 2004). Second, this study demonstrates not only that PIE credit institutions tend to have statistically significantly higher audit fees but also that this effect is economically significant (a 27.29% increase in average audit fees, ceteris paribus). This result might be of interest in light of the recent amendment of the 2006 Statutory Audit Directive (European Union, 2014) because the new EU regulation no longer includes the Member State option to reduce the extent of the EU PIE definition, and, therefore, all credit institutions are regarded as PIEs. This study's results might suggest that—if the specific provisions for statutory audits of PIEs (e.g., auditor oversight) are assumed to be the material driver of the PIE effect—audit fees of credit institutions that previously (before June 2016) were not classified as PIEs could be expected to increase, at least in Germany. A follow-up study could examine this expected effect of this change and attempt to analyze why these expectations are observable or not. Third, there are some indications of an association between the interaction of a credit institution’s business risk and PIE status and audit fees even if, on average, the business risk of credit institutions seems not to vary systematically between PIEs and non-PIEs; PIE status conditions the relationship between a credit institution's business risk and audit fees. Fourth, the additional analyses are not always robust and might, moreover, suggest that a dummy variable for PIE versus non-PIE does not only, or even primarily, capture effects attributable to PIE status. Thus, this study provides only initial evidence that PIE status is associated with audit fees. Therefore, future research could attempt to disentangle the effects captured by a PIE versus non-PIE dummy. For example: Do (random) inspections of PIE auditors increase audit quality, on average, and, thus, are they associated with audit fees (see also Hay, Knechel, & Willekens, 2014)? Do self-selection effects of PIE clients regarding audit quality explain the observed PIE effect? To what extent do the litigation and reputation rationales explain this study's findings?

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ENDNOTES

1 For an overview of the reform, see http://ec.europa.eu/finance/auditing/reform/index_en.htm, accessed on June 1, 2017.

2 Recall that many studies in auditing—including the present study—are far from being able to draw causal inferences (see also Gow, Larcker, & Reiss, 2016).

3 In general, (the client's or auditor's) business risk might be understood as the "risk resulting from significant conditions, events, circumstances, actions or inactions that could adversely affect an entity's ability to achieve its objectives and execute its strategies, or from setting of inappropriate objectives and strategies” (International Auditing and Assurance Standards Board, 2016, p. 17).

4 These studies also report other interesting findings, such as that corporate governance characteristics are not significantly associated with audit fees (Boo & Sharma, 2008), that higher audit effort due to complex recognition and matters involving fair asset valuations might result in significantly increased audit fees (e.g., Chen et al., 2010; Ettredge et al., 2014), and that not only changes in the client’s business risk environment (Doogar et al., 2015) but also regulatory changes are associated with audit fees (Cullen et al., 2017).
This reasoning applies predominantly to credit institutions that issue shares (i.e., equity) on an EU-regulated market. However, if a credit institution issues (only) debt securities on an EU-regulated market, it is also designated as a PIE.

For example, the responsibility statement by the management board of Deutsche Bank AG in 2011 is worded as follows: “To the best of our knowledge, and in accordance with the applicable reporting principles, the consolidated financial statements give a true and fair view of the assets, liabilities, financial position and profit or loss of the Group, and the Group management report includes a fair review of the development and performance of the business and the position of the Group, together with a description of the principal opportunities and risks associated with the expected development of the Group.” See https://annualreport.deutsche-bank.com/2011/ar/supplementaryinformation/statementbythemanagementboard.html, accessed on June 1, 2017.

Note that the enforcement of financial reporting—as well as the other above-mentioned points—are legal requirements for listed companies (section 264d HGB). The inspection of auditors is a legal requirement for PIEs (section 319a HGB). Until very recently (June 2016), this differentiation has not been of interest in Germany since the PIE definition (section 319a HGB) has covered only listed companies. However, since the amendment of the 2006 Statutory Audit Directive (European Union, 2014) extends the German PIE definition—because it includes, among others, all credit institutions—an expected increase in average audit fees of non-PIE credit institutions (see section 3.3.1) might be due to an increase in specific provisions for statutory audits—e.g., inspections of the auditor—and not due to legal requirements of listed companies (e.g., enforcement of financial reporting). It also has to be noted that the number of regulatory differences between PIEs and non-PIEs discussed in this section is not conclusive.

For details, see http://www.frep.info/index_en.php, accessed on June 1, 2017.

For details, see http://www.apak-aoc.de/index.php/en/, accessed on June 1, 2017.

Measuring a client’s business risk is somewhat complicated. Fields et al. (2004) state that risk and complexity are interrelated. A separation of the two into individual variables is nearly impossible.

The German Supervisory Review and Evaluation Process uses, among other things, ratings to classify credit institutions (Deutsche Bundesbank & BaFin, 2009). Even if specific rating methods are not disclosed by either the BaFin or the Deutsche Bundesbank, it could be expected that the basic procedure is closely related to the recognized international rating system CAMEL. In addition, auditors are assumed to be an integral part of the German Supervisory Review and Evaluation Process because their reports must be evaluated (sections 7, 26 Banking Act), and these reports might act as the starting point for the (quantitative) credit institution rating procedure. Therefore, it would seem consistent for auditors to examine measures similar to those employed by the supervisory authority. Independent of this and due to the valuable insights into the rating process provided by one of the Big 3 rating agencies (i.e., Standard & Poor’s, Moody’s and the Fitch Group), it might be concluded that rating agencies also use modified versions of the CAMEL concept, and based on this information, the credit institution’s business risk proxies were identified.

The study of Fields et al. (2004) uses, for example, the standard deviation of daily returns as an independent variable, which is, however, only available for PIE credit institutions. Another example is a dummy controlling for savings banks; however, this study excludes German savings banks due to their different regulatory requirements.

Doogar et al. (2015) posit a positive association with audit fees; however, they refer to risk-weighted equity ratios. Moreover, CETA might be even more important than the risk-weighted figure (e.g., Admati, DeMarzo, Hellwig, & Pfleiderer, 2013; International Monetary Fund, 2009).

It might also be assumed that auditors notice both types of relationships. To capture the effect of extreme total asset growth, a variable referred to as squared total asset growth has to be included in the empirical model. Re-estimating the regressions—including squared total asset growth—suggests that the results are qualitatively unchanged.

The loan impairment charge is defined as amortization and write-downs on loans and advances to customers and certain securities, as well as additions to loan loss provisions (see Form 3, Position 13 of the Ordinance Regulating the Accounting Requirements for Financial Institutions and Financial Service Providers).

If a credit institution obtains its (short-term) funding mainly from the interbank market, periods of a dried-up interbank market might also be a (significant) determinant of a credit institution’s liquidity risk. This reasoning is, in our opinion, of lesser importance. It might be shown that the European Central Bank effectively replaced the interbank market’s function by changing its tender procedure and standing facilities corridor on October 8, 2008.

According to the HGB, in their notes, companies must disclose the nature and purpose of risks and benefits of off-balance-sheet transactions and their total amount (e.g., sections 285, 340a HGB). The notes are part of the annual audit (section 316 HGB). This consideration is justified by the fact that off-balance-sheet activities may significantly affect earnings while not affecting total asset balances. Moreover, note that items not reported as on-balance-sheet items tend to require more audit effort because of the more challenging recognizable risks and complex contract terms (Cullen et al., 2017).

Studies examining credit institutions’ market structure and the concentration of German credit institutions’ auditors also adopt total business volume as the size proxy (e.g., Leidner & Lenz, 2013; Monopolkommission, 1977). The Bankscope database defines total business volume as follows: Total assets plus managed securitized assets reported off-balance-sheet plus other off-balance-sheet exposure to securitization plus guarantees plus acceptances and documentary credits reported off-balance-sheet plus committed credit lines plus other contingent liabilities.

Note that Big2 assumes that quality is equal across auditors, an assumption that is not economically justifiable (Simunic, 1984), and even if KPMG and PWC dummies were included in the regression, the dummies would still assume identical and constant audit quality across different engagements.

The case in which subsidiaries do not disclose audit fee information if their parent companies include all subsidiary-related audit fees in their consolidated financial statement disclosure might also be regarded as a selection bias problem. However, as those subsidiary-related audit fees are still included in our sample if the parent company is a German credit institution, we do not believe that the following conclusions would significantly change. Apart from that, this sample reduction also includes cases in which Bankscope provides data only on non-consolidated financial statements even if the consolidated financial statements and, therefore, audit fees of a parent company are published in the German Company Register.

Due to problems with the interpretation of German clauses and to ensure a high degree of comparability of audit fees across different institutions, the reported audit fees are partly adjusted. The audit fees included in the regression do not include the fees of (international) networks of audit firms (if related disclosures allowed for such a correction). If necessary, fees are reduced to account for the value added tax.

German auditors must publish an annual transparency report (section 55c WPO, old version) if they audit a PIE, as defined in section 319a HGB. See http://www.wpk.de/eng/public/transparency-reports/, accessed on June 1, 2017.

In a later subsection, an aggregate measure of a credit institution’s business risk is introduced. For this measure, there is no statistically significant difference in the means for PIE credit institutions versus non-PIE credit institutions, which could also be interpreted to mean that the riskiness of PIE credit institutions is not higher in general.

Equations 1 (H1 and H2a) and 2 (H2b) were also re-estimated using a random effects regression, a fixed effects (FE) regression (e.g., Wooldridge, 2016), and the Hausman-Taylor estimator (HT; Hausman & Taylor, 1981). The regressions present mixed evidence and, thus, call into question this study’s following conclusions. However, that no effects are found in the FE and the HT regressions might be because of their “inefficiency in estimating the effect of variables that have very
little within variance" (Plümper & Troeger, 2007, p. 125)—as is the case for the variable PIE (within-variation: standard deviation of 0.076; between-variation: standard deviation of 0.420).

Several client size and business risk proxy variables were replaced to examine the sensitivity of the results. First, size is also proxied by the natural logarithm of total assets. Second, capitalization is measured separately by total equity as a percentage of total assets and total equity relative to total liabilities. Third, TAG is replaced by a comparable variable on gross loan growth. Fourth, management capability is proxied by the cost-to-income ratio. Fifth, ROAA is replaced by return on average equity. Sixth, LIQTA is replaced by liquid assets as a percentage of customer and short-term funds. Seventh, INTERBANKRATIO is replaced by the ratio of gross loans to customer deposits (both less reverse repurchase agreements). The results remain qualitatively unchanged, apart from three cases—growth of gross loans (H1 and H2b) is not associated with audit fees, H2b is not supported in the regression that includes the cost-to-income ratio, and H2b is supported by both liquidity measures when liquid assets as a percentage of customer and short-term funds are employed. Moreover, note that due to data availability considerations, the number of credit institution-years included differs slightly (with n ranging between 536 and 573), which might not ensure full comparability of the results.

However, an examination of the two-tailed p-values reveals that LICAGL is significantly negatively (p-value = 0.023) associated with audit fees. It was hypothesized that higher LICAGL values might indicate a higher potential business risk for credit institutions. However, it might also be assumed that higher LICAGL actually represents a client’s accounting conservatism. German shareholders are accustomed to the prudence principle—protecting creditors and maintaining capital (e.g., section 252 HGB)—whereby provisions or write-offs are not necessarily viewed negatively. Moreover, recent research demonstrates that auditors demand lower fees if a client’s accounting is more conservative (DeFond, Lim, & Zang, 2016). Although LICAGL is generally a risk indicator, when related to German credit institutions, its function as a conservative accounting proxy might be of greater importance, and a negative association with audit fees would, thus, be explained.

To be accurate, it cannot definitely be stated whether the significant coefficient of AUDITORCHANGE reflects fee-cutting and/or a “reduction in [audit fees] stickiness at the time of the switch” (de Villiers, Hay, & Zhang, 2014, p. 22). Moreover, to precisely test fee-cutting, the initial audit fees should be compared to: (1) the predecessor auditor’s fees, (2) the second-year fee, or (3) a continuing audit fee for a comparable audit” (Francis, 1984, p. 138).

If geographic proximity leads to higher audit quality (Choi et al., 2012), a positive relationship with audit fees might also be expected, and thus, it might explain the non-significance of SAMECITY (i.e., countervailing effects).

The results are qualitatively similar if, for all variables, interactions with PIE are included in the regression.

Note that it could also interpreted to mean that the credit institution’s business risk conditions the PIE–audit fee relationship.

The minimum rank—defining the lowest risk rank—always equals one. The maximum rank—defining the highest risk rank—equals 184 in 2009, 197 in 2010, and 192 in 2011, which correspond to the number of credit institutions in the sample in each year. For example, the individual ranks of Deutsche Bank AG’s proxies CETA, TAG, LICAGL, NONINTEREPRATIO, ROA, SIGMAROAA, LIQTA, and INTERBANKRATIO equal 150, 178, 122, 65, 84, 88, 56, and 155 in 2009, 169, 21, 100, 69, 130, 86, 59, and 169 in 2010, and 171, 37, 110, 74, 108, 81, 55, and 164 in 2011, respectively. Deutsche Bank AG’s median rankings equal 105 in 2009, 93 in 2010, and 94.5 in 2011, which are Deutsche Bank AG’s yearly values of the variable RISK. The results remain qualitatively unchanged if the aggregate measure is computed based on the mean ranking of all eight individual risk proxy rankings.

The coefficient on PIE in Table 7, column 2, is negative and not significant; this does not alter the empirical support for H2a. In this regression, the coefficient of PIE is the (predicted) difference in average audit fees between a PIE and a non-PIE credit institution that both have a business risk of zero; i.e., RISK equals zero. Since no credit institution with zero risk exists, this is not of further interest.

For the sake of brevity, all results in this section are untabulated.

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REFERENCES
Admati, A. R., DeMarzo, P. M., Hellwig, M. F., & Pfleiderer, P. C. (2013). Fallacies, irrelevant facts, and myths in the discussion of capital regulation: Why bank equity is not expensive. Stanford Graduate School of Business Research Paper 2065.
Altmann, J. (2008). Revisionshonorable bei Schweizer Banken: Eine empirische Untersuchung. Göttingen: Cuvillier Verlag.
American Institute of Certified Public Accountants (1984). Statement on Auditing Standards No. 47—Audit risk and materiality in conducting an audit. The Journal of Accountancy, 157, 143–146.
Basioudis, I. G., & Francis, J. R. (2007). Big 4 audit fee premiums for national and office-level industry leadership in the United Kingdom. Auditing: A Journal of Practice & Theory, 26, 143–166.
Bedard, J. C., & Johnstone, K. M. (2010). Audit partner tenure and audit planning and pricing. Auditing: A Journal of Practice & Theory, 29, 45–70.
Boc, E., & Sharma, D. (2008). The association between corporate governance and audit fees of bank holding companies. Corporate Governance, 8, 28–45.
Breschi, S., & Lissoni, F. (2003). Mobility and social networks: Localised knowledge spillovers revisited. CESPRI working paper 142.
Brunnermeier, M. K. (2009). Deciphering the liquidity and credit crunch 2007–2008. Journal of Economic Perspectives, 23, 77–100.
Cameran, M., & Perotti, P. (2014). Audit fees and IAS/IFRS adoption: Evidence from the banking industry. International Journal of Auditing, 18, 155–169.
Chen, F., Lam, K., Smielauskas, W., & Ye, M. (2010). Fair value measurements and auditor versus management conservatism: Evidence from the banking industry. Working Paper, University of Toronto.
Choi, J.-H., Kim, J.-B., Qiu, A. A., & Zang, Y. (2012). Geographic proximity between auditor and client: How does it impact audit quality? Auditing: A Journal of Practice & Theory, 31, 43–72.
Cullen, G., Gasbarro, D., Monroe, G. S., Shailer, G., & Zhang, Y. Y. (2017). Bank audit fees and asset securitization. Auditing: A Journal of Practice & Theory, https://doi.org/10.2308/ajpt-51751.
Danos, P., Eichenseher, J. W., & Holt, D. L. (1989). Specialized knowledge and its communication in auditing. Contemporary Accounting Research, 6, 91–109.
de Villiers, C., Hay, D. C., & Zhang, Z. J. (2014). Audit fee stickiness. Managerial Auditing Journal, 29, 2–26.
DeFond, M. L., Lim, C. Y., & Zang, Y. (2016). Client conservatism and auditor-client contracting. The Accounting Review, 91, 69–98.
DeFond, M. L., & Zhang, J. (2014). A review of archival auditing research. Journal of Accounting and Economics, 58, 275–326.
Deutsche Bundesbank, & BaFin. (2009). Risk-oriented supervision following implementation of Pillar 2 of Basel II: Publication pursuant to the CEBS Guidelines on Supervisory Disclosure.
Doogar, R., Rowe, S. P., & Sivadasan, P. (2015). Asleep at the wheel (again)? Bank audits during the lead-up to the financial crisis. Contemporary Accounting Research, 32, 358–391.
Ellifsen, A., Knechel, W. R., & Wallage, P. (2001). Application of the business risk audit model: A field study. Accounting Horizons, 15, 193–207.
Ernstberger, J., Stich, M., & Vogler, O. (2012). Economic consequences of accounting enforcement reforms: The case of Germany. European Accounting Review, 21, 217–251.
Ettredge, M. L., Xu, Y., & Yi, H. S. (2014). Fair value measurements and audit fees: Evidence from the banking industry. Auditing: A Journal of Practice & Theory, 33, 33–58.
European Central Bank. (2013). ESRB risk dashboard: Cutoff date: 2 September 2013. ESRB Risk Dashboard. http://sdw.ecb.europa.eu/reports.do?node=1000003268_ALLPDPDF.

European Union. (2006). Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC. 2006/43/EC. Official Journal of the European Union, 49(L 157), 87–107.

European Union. (2014). Directive 2014/56/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2006/43/EC on statutory audits of annual accounts and consolidated accounts. Official Journal of the European Union, 62(L 158), 196–226.

Fields, L. P., Fraser, D. R., & Wilkins, M. S. (2004). An investigation of the pricing of audit services for financial institutions. Journal of Accounting and Public Policy, 23, 53–77.

Francis, J. R. (1984). The effect of audit firm size on audit prices: A study of the Australian market. Journal of Accounting and Economics, 6, 133–151.

Francis, J. R., Stokes, D. J., & Anderson, D. (1999). City markets as a unit of analysis in audit research and the re-examination of Big 6 market shares. Abacus, 35, 185–206.

Fukukawa, H., Mock, T. J., & Wright, A. (2011). Client risk factors and audit resource allocation decisions. Abacus, 47, 85–108.

Gaver, J. J., & Paterson, J. S. (2007). The influence of large clients on office-level auditor oversight: Evidence from the property-casualty insurance industry. Journal of Accounting and Economics, 43, 299–320.

Gow, I. D., Larcker, D. F., & Reiss, P. C. (2016). Causal inference in accounting research. Journal of Accounting Research, 54, 477–523.

Hausman, J. A., & Taylor, W. E. (1981). Panel data and unobservable individual effects. Econometrica, 49, 1377–1398.

Hay, D. C. (2013). Further evidence from meta-analysis of audit fee research. International Journal of Auditing, 17, 162–176.

Hay, D. C., & Knechel, W. R. (2017). Meta-regression in auditing research: Evaluating the evidence on the big n audit firm premium. Auditing: A Journal of Practice & Theory, 36(2), 133–159.

Hay, D. C., Knechel, W. R., & Willekens, M. (2014). The Routledge companion to auditing. New York: Routledge.

Hay, D. C., Knechel, W. R., & Wong, N. (2006). Audit fees: A meta-analysis of the effect of supply and demand attributes. Contemporary Accounting Research, 23, 141–191.

Hill, J. W., Ramsay, R. J., & Simon, D. T. (1994). Audit fees and client business risk during the S & L crisis: Empirical evidence and directions for future research. Journal of Accounting and Public Policy, 13, 185–203.

Huber, W. D. (2013). Audit fees, PCAOB sanctions, sanction risk, sanction risk premiums, and public policy: Theoretical framework and a call for research. Journal of Accounting, Ethics & Public Policy, 14, 647–663.

Iliev, P. (2010). The effect of SOX section 404: Costs, earnings quality, and stock prices. The Journal of Finance, 65, 1163–1196.

International Auditing and Assurance Standards Board. (2016). 2016–2017 Handbook of international quality control, auditing, review, other assurance, and related services pronouncements (Vol. I). New York: International Federation of Accountants.

International Monetary Fund. (2006). Financial soundness indicators: Compilation Guide. Washington, DC: International Monetary Fund.

International Monetary Fund. (2009). Global financial stability report, April 2009: Responding to the financial crisis and measuring systemic risks. Washington, DC: International Monetary Fund.

Kanagaretnam, K., Krishnan, G. V., & Lobo, G. J. (2010). An empirical analysis of auditor independence in the banking industry. The Accounting Review, 85, 2011–2046.

Kanagaretnam, K., Krishnan, G. V., Lobo, G. J., & Mathieu, R. (2011). Audit quality and the market valuation of banks’ allowance for loan losses. Accounting Perspectives, 10, 161–193.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2006). What works in securities laws? The Journal of Finance, 61, 1–32.