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ORIGINAL ARTICLE

The Time Dependence of Audit Firm Alumni Effects: Evidence from Audit Committees

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This article empirically examines the time dependence of audit quality and audit fee effects resulting from the presence of audit firm alumni (AFA) on audit committees (ACs) in the German setting. Following the European Union's audit reform in 2014, the subject of this study is of particular importance, as European regulators have strengthened the position of ACs, while simultaneously restricting the presence of AFA on ACs. We find that the presence of AFA who have recently left their former employer on ACs is associated with higher audit quality, while we fail to find a significant effect on audit quality with regard to AFA who have left audit firms a longer period of time ago. In addition, the presence of AFA on ACs does not seem to affect audit fees. To the best of our knowledge, this study is the first to demonstrate time-dependent AFA effects related to ACs.

KEYWORDS

Abnormal Accruals, Audit Committee, Audit Fees, Audit Firm Alumni, Audit Quality, Cooling-off Periods, Corporate Governance, Earnings Benchmark Test, Germany, Time Dependence of Alumni Effects

1 | INTRODUCTION

Audit firms are not only known for their comparably high staff turnover but also for the considerable effort they make to keep in touch with their former employees, for example, through alumni relations programs that offer ways to maintain contacts with their alma mater (Basioudis, 2007). Ex-auditors exhibit particularly high degrees of knowledge on accounting and internal control systems (Naiker & Sharma, 2009) and thus are natural candidates for influential financial reporting positions within audited companies. Following this argumentation, it is not surprising that the presence of audit firm alumni (AFA)—well-connected with their former employers—in influential positions in client companies has been common practice for several decades (Basioudis, 2007; Imhoff, 1978).

However, regulators around the globe seem to be increasingly anxious of situations in which AFA serve in monitoring and

executive positions concerned with the accounting system of an entity that is audited by their alma mater. Following corporate accounting scandals and the global financial crisis, regulators have enacted rules partially restricting the appointment of AFA to such positions. The concerns expressed by regulators seem to be shared by users of financial statements, as prior literature has shown that they perceive auditor independence to be jeopardized if ex-auditors accept positions within companies that are audited by their former employer (Koh & Mahathevan, 1993). Rules restricting the employment of AFA explicitly refer to the recency of the relationship between AFA and audit firms. In the same vein, scholars have argued that and investigated whether alumni effects are time-dependent (e.g., Basioudis, 2007; Naiker & Sharma, 2009; Naiker, Sharma, & Sharma, 2013).¹ However, despite the audit committee (AC) being auditors' primary contact at the client during the audit and AFA being excluded from serving on ACs based on cooling-off

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restrictions, prior research has so far not considered the potential time dependence of AFA effects on audit characteristics such as audit quality and audit fees. Thus, this study aims to investigate the existence of time-dependent audit quality and audit fee effects arising from AFA presence on ACs.

Following the European Union's reform of the audit market in 2014, it seems important to study the time dependence of effects resulting from the presence of AFA on ACs in more detail. European regulators have strengthened the position of ACs by extending their competencies and emphasizing their importance in interacting with the auditor, while simultaneously restricting the presence of AFA on the ACs of client companies by imposing cooling-off periods for such positions (European Union, 2014a, 2014b). In particular, a cooling-off period of 2 years is required with regard to ACs of public-interest entities (European Union, 2014a). Some member states of the European Union even require much longer cooling-off periods (e.g., 5 years) (FEE, 2016).

We run multivariate analyses on 477 firm-year observations from the major German stock indices for the period 2012–2016 to empirically examine the existence of time-dependent audit quality and audit fee effects arising from AFA presence on ACs. Our findings show that the presence of AFA who have recently left their former employer on the AC is positively associated with audit quality. The observed effect is also economically significant, given that companies that have AFA who have recently worked for the company's current audit firm on their AC are 15.4% less likely to report a small profit and have, on average, substantially lower abnormal accruals than other companies. In contrast, audit quality does not seem to be affected by the presence of AFA who have left the audit firm a longer period of time ago. Our results therefore suggest that a time dependence of alumni effects on audit quality exists in the way that these effects fade over time. However, we do not find the presence of AFA on the AC to be significantly associated with the level of audit fees, implying that there might be audit characteristics that are not affected by AFA.

We contribute to the literature in the following ways. First, this article is, to the best of our knowledge, the first to examine the time dependence of audit quality and audit fee effects arising from AFA presence on ACs. Second, in contrast to prior studies, which fail to demonstrate a recency effect (Naiker et al., 2013; Naiker & Sharma, 2009), this article reports evidence of the existence of a time dependence of AFA effects. Specifically, our results suggest that the time between leaving the audit firm and joining a client's AC impacts audit quality. Third, taking into account that the effect arising from the presence of AFA who have recently left the audit firm is positive (higher audit quality), this article is the first to provide evidence of potential adverse consequences that might arise from cooling-off rules restricting the presence of AFA on client companies' ACs. Fourth, given that the presence of AFA on client companies' ACs is an international phenomenon, our results are of general interest to regulators, preparers and users of financial statements, and researchers in other jurisdictions that have imposed cooling-off restrictions on AFA.

The remainder of this study is organized as follows. The next section elaborates on the role of German ACs in the audit process. The third section reviews relevant previous research and develops the article's hypotheses. This is followed by sections outlining the research design, data, and sample selection. The main results of the study are presented in the sixth section. The seventh section presents additional analyses and the eighth and final section provides the main conclusions and limitations of this study.

2 | THE ROLE OF GERMAN AUDIT COMMITTEES IN THE AUDIT PROCESS

ACs play a crucial role in the audit process of German listed companies. German ACs are responsible for a broad range of issues related to the external audit and act as auditors' primary contact at the client (Köhler, 2005). For instance, Köhler (2005) reports that in many cases auditors attend every AC meeting and that responsibilities related to the audit are perceived as being the top duties of the AC.

In general, the influence AC members can exert on the audit process is determined by the regulatory context in which ACs operate. The manifold duties that German ACs shall fulfill are outlined in the German Stock Corporation Act (*Aktiengesetz* [AktG] (2019)) and the German Corporate Governance Code (*Deutscher Corporate Governance Kodex* [DCGK]).² With regard to the audit process, the AktG and the DCGK state that the AC shall generally address "the audit" (DCGK, section 5.3.2; AktG, section 107, para. 3, sentence 2). German law and regulations therefore assign a comprehensive supervisory function to the AC, which, in turn, allows the AC to take actions concerning all aspects related to the audit and to influence auditors' work.

On the other hand, despite the general responsibility of ACs with regard to the audit, particularly the DCGK also names more specific ways in which ACs can influence the audit process. Specifically, the DCGK states that the AC is responsible for monitoring auditor independence and the effectiveness of the internal control system, the audit fee agreement, and the determination of the key audit areas (DCGK, section 5.3.2). While all of the mentioned responsibilities should have a high relevance for the characteristics of the audit, such as audit quality and audit fees, particularly the latter requires close cooperation between AC members and auditors and gives AC members a very direct opportunity to influence the audit process and its outcomes. Further audit-related functions that are assigned to the AC but not related to the execution of the audit per se are auditor selection, the issuance of the audit engagement, and the monitoring of additional services rendered by the auditor (DCGK, sec. 5.3.2; AktG, sec. 107, para. 3, sentence 2). Overall, given that the AC is involved in a high number of material matters related to the audit process, AC members are able to exert significant (positive or negative) influence on audit characteristics. Potential ways in which AFA serving on ACs might make use of this general possibility are considered in the next section of this article.

3 | RELEVANT PREVIOUS RESEARCH AND HYPOTHESES DEVELOPMENT

3.1 | Audit quality

3.1.1 | Previous research

Only few studies have so far considered the impact that the presence of AFA in different positions within audited companies could have on financial reporting and audit quality. Particularly, investigations referring to the impact of AFA serving on a company's AC are scarce; rather, existing research investigating alumni effects has focused on executive functions within audited companies.

For instance, Lennox (2005) finds that companies employing executives who have previously worked for the company's current audit firm have a higher probability to receive clean audit opinions. The author concludes that affiliations between executives and audit firms might negatively affect audit quality. Potential threats arising from AFA affiliations are also highlighted by Menon and Williams (2004), who find that the presence of AFA in officer or director positions is positively associated with the magnitude of abnormal accruals and the likelihood to meet analysts' earnings forecasts. Focusing on CFO appointments, Dowdell and Krishnan (2004) find that companies that hire AFA as CFOs have larger discretionary accruals than companies that hire executives without auditor affiliations. However, Geiger, North, and O'Connell (2005) do not observe a significant association between the presence of AFA in influential accounting and finance positions and accrual-based earnings management proxies. Lastly, two studies have focused on former audit partners serving as members of ACs and document positive outcomes. For instance, Christensen, Omer, Shelley, and Wong (2019) find that the presence of a former audit partner affiliated with the company's incumbent audit firm on the AC is associated with higher audit quality as measured by restatements and failures to report material weaknesses in a timely manner. In addition, Naiker and Sharma (2009) document a negative association between having a former audit partner affiliated with the company's current audit firm on the AC and performance-adjusted discretionary accruals. The authors suggest that former audit partners effectively restrict managerial discretion over earnings management, however, without drawing any conclusions on audit quality.

3.1.2 | The impact of affiliation on audit quality

High-quality oversight of the audit process necessitates reasonable knowledge of auditing standards and procedures which, in turn, enables AC members to independently assess the matters presented to them and enhance the value of the external audit (Bull & Sharp, 1989; Kral, 2016). While auditors in general might therefore be able to act as valuable members of the AC, alumni of the incumbent auditor might even induce an additional increase in monitoring quality

resulting from audit firm-specific knowledge. Their detailed knowledge on and extensive experience with procedures applied by the audit firm might enable them to more effectively control the audit process, leading to a more favorable outcome of the audit (i.e., higher audit quality).

However, it is also conceivable that extensive knowledge of AC members concerning audit firms' methods could adversely impact audit quality. As Lennox (2005) notes, experience gained through working for the audit firm that is commissioned to audit the financial statements might be used to circumvent audit testing procedures. Thus, audit quality could even be impaired if AFA serving on the AC have private information concerning the procedures employed by the auditor and are able to misuse this information, for example, by colluding with other individuals involved in the company's financial reporting and informing them on how audit testing procedures could be evaded.

Apart from arguments referring to the superior knowledge and skills of AFA, potential trust and shared experience between AFA involved in the audit on client side and audit firm personnel could have positive as well as adverse effects on audit quality.

On the one hand, it can be argued that trust and shared working experience of auditors and AFA interacting during the audit could lower auditors' professional skepticism and objectivity (Dowdell & Krishnan, 2004; Lennox, 2005) and thereby negatively affect audit quality. Auditors are likely to trust individuals who have worked for the same audit firm (Menon & Williams, 2004) and might be convinced that errors or irregularities in the client's financial reporting system are less likely to occur if AFA are present in a responsible position within the client company. Supporting this argumentation, Beasley, Carcello, and Hermanson (2000) note that auditors tend to rely on former colleagues serving in a client company and exert substandard professional skepticism in audit settings in which AFA are present.

On the other hand, as Garrett, Hoitash, and Prawitt (2014) note, trust between individuals is assumed to be associated with higher levels of collaboration, communication, and information sharing. Similar effects might arise if shared experience and similarities between individuals exist (Rogers & Bhowmik, 1970). It is therefore conceivable that situations in which auditors and AC members have similar experiences and backgrounds will result in more thorough and open communication and a higher willingness to share information relevant to the audit. As information provided by the client is crucial to carrying out the audit (Rennie, Kopp, & Lemon, 2010), a more comprehensive information flow and more extensive collaboration might ultimately enhance audit quality.

3.1.3 | The joint impact of affiliation and recency on audit quality

The mentioned arguments concerning possible knowledge effects and effects arising from trust or shared experience might only be valid in situations in which a member of the AC has recently

worked for the company's current audit firm. As Basioudis (2007) notes, it is likely that potential alumni effects disperse over the years, specifically if there is a long period of time between working for the audit firm and serving in a responsible position on the side of the auditee. For instance, it appears likely that an alumnus who has ultimately participated in an audit conducted by the company's current audit firm decades ago does not have significant advantages in knowledge compared to unaffiliated members of the AC, as audit standards and procedures might significantly change over time.

The same argumentation should hold in terms of trust and shared experience between AFA and auditors, as alumni's relations and their identification with their former employers are assumed to be stronger if less time has elapsed since leaving the audit firm (Lennox & Park, 2007).

Based on the contrasting arguments and the potential time dependence of alumni effects, we state Hypothesis 1 (H1) in the null form as follows:

H1. *The presence of alumni who have recently worked for the company's current audit firm on the AC is not associated with audit quality.*

3.2 | Audit fees

3.2.1 | Previous research

As for audit quality, there has only been little research considering the impact that the presence of alumni of the incumbent auditor in client companies might have on fees charged by the auditor. However, there are studies that have attempted to explore the role of alumni in influencing fees considering different positions within client companies.

Basioudis (2007) finds a negative association between the presence of AFA on the board of directors and audit fees, implying that audit firms tend to charge lower fees if alumni are present in director positions within client companies. Focusing on the presence of former audit firm partners on ACs, Naiker et al. (2013) find a negative association with respect to non-audit services. Finally, also considering non-audit services, Ye, Carson, and Simnett (2011) demonstrate a positive association for cases in which AFA are present on client boards.

3.2.2 | The impact of affiliation on audit fees

As Iyer, Bamber, and Barefield (1997) note, AFA generally tend to provide economic benefits to their former employers. Lennox and Park (2007) empirically investigate this notion and demonstrate that public companies show a comparatively high propensity to appoint their officers' former employers as audit firms, which might be one possibility for audit firms to profit from the presence of alumni in potential client companies. The assumption that AFA have an inclination to provide benefits to their former employers is

further supported by the results obtained by Dhaliwal, Lamoreaux, Lennox, and Mauler (2015), who demonstrate that an audit firm has a higher probability to be chosen by a client if an alumnus of that audit firm is serving in a management position within the client company. Apart from that, it is also conceivable that AFA attempt to provide benefits to their former employers in other ways. For instance, Steele and Basioudis (2000) point out that alumni might also benefit their former employers by favorably influencing audit fees. Since conducting negotiations concerning audit fees is one major function of ACs³ (Basioudis, 2007), AFA serving on ACs could act as effective supporters of audit firms in this regard.

However, the presence of AFA on the AC of a client company could also have an influence on the way the audit firm acts in fee negotiations. Basioudis (2007) notes that the presence of alumni in influential positions within a client company could be associated with lower levels of inherent and control risk by audit firms. In particular, the presence of an alumnus could prompt the audit firm to make more favorable assessments with regard to objectivity, expertise, and competence which, in turn, lead to more favorable assumptions regarding the risks related to the client company (Basioudis, 2007). This should particularly apply to the presence of AFA on ACs, as ACs are responsible for monitoring the company's financial reporting process and, thus, likely to have an influence on risks associated with financial reporting. Since risk assessments are one major determinant of audit fees (Hay, Knechel, & Wong, 2006), there could be a substantial decrease in audit fees due to more favorable risk assessments caused by the presence of AFA on a company's AC.

Besides personal incentives of AFA and risk perceptions related to the presence of those in client companies, audit fees might also be directly influenced through the effort that is necessary to conduct the audit. As argued above, alumni affiliations can favorably impact information sharing, collaboration, and communication between ACs and auditors and thereby lead to a work climate in which financial reporting problems are more openly addressed. At the same time, the mentioned improvements in information sharing, collaboration, and communication between members of the AC and auditors should result in increased audit efficiency. For instance, as auditors largely rely on client communication during the audit, reducing communication barriers can be a key instrument to enhance audit efficiency (Golen, Catanach, & Moeckel, 1997). Since enhancements of audit efficiency are, in turn, likely to result in a reduction of the number of hours billed, it is conceivable that the presence of AFA on client ACs is negatively associated with audit fees.

3.2.3 | The joint impact of affiliation and recency on audit fees

The time that has elapsed since an audit firm alumnus has left the former employer can be assumed to have a considerable impact on the existence of potential effects that the presence of the alumnus has on

audit fees charged. Iyer et al. (1997) argue that the identification of AFA with their former employers and their inclination to benefit these might decrease over time. Following this argumentation, alumni who have more recently left the audit firm should be more likely to influence audit fees in favor of their former employer than those who have left the audit firm many years ago.

In addition, the time that has passed since the alumnus has worked for the respective audit firm could also affect the way he/she is judged by the audit firm. While positive perceptions regarding objectivity, expertise, and competence of the alumnus might exist shortly after the working relationship has ended, these perceptions might diminish as time goes by. Taking this potential time dependence of alumni relationships into account, it is likely that risk assessments made by audit firms are only considerably lower if the alumnus has recently left the audit firm. Consequently, only the presence of an alumnus who has recently left the audit firm should lead to a reduction in the amount of audit fees.

Moreover, as outlined above, AFA who have more recently left audit firms should have stronger relationships with their former employers than those who have left the audit firm many years ago. As strong relationships might increase audit efficiency via more extensive communication, collaboration, and information sharing between auditors and AC members, it is likely that a potential reduction of audit fees will be more pronounced (or even exclusively existent) if the alumnus has left the audit firm (more) recently.

Based on the contrasting arguments and the potential time dependence of alumni effects, we state Hypothesis 2 (H2) in the null form as follows:

H2. *The presence of alumni who have recently worked for the company's current audit firm on the AC is not associated with audit fees.*

4 | RESEARCH DESIGN

To test the article's hypotheses, two models adapted from Lesage, Ratzinger-Sakel, and Kettunen (2017), who also investigate a determinant of audit quality and audit fees in a European setting, are estimated. Model 1 tests the potential impact of the presence of AFA on a company's AC on audit quality, while Model 2 is used to capture potential effects concerning audit fees. In both models, we control for industry and year fixed effects and cluster standard errors at the firm level. All continuous variables are winsorized at the 1st and 99th percentiles.

$$\begin{aligned}
 AQ = & \beta_0 + \beta_1 * AlumnumCPAshort + \beta_2 * AlumnumCPAlong & (1) \\
 & + \beta_3 * UnaffCPAshort + \beta_4 * UnaffCPAlong + \beta_5 * ExecAlumnumCPA \\
 & + \beta_6 * \%OtherExperts + \beta_7 * AveAddDirectorships + \beta_8 * ACSIZE \\
 & + \beta_9 * ACMMeetings + \beta_{10} * FirmSize + \beta_{11} * Loss_{t-1} + \beta_{12} * CFO \\
 & + \beta_{13} * Leverage + \beta_{14} * SalesGrowth + \beta_{15} * PPEGrowth + \beta_{16} * Big4 \\
 & + \beta_{17} * Switch + \beta_{18} * BTM + \beta_{19} * Issuance + fixed\ effects + \varepsilon_1.
 \end{aligned}$$

$$\begin{aligned}
 AF = & \lambda_0 + \lambda_1 * AlumnumCPAshort + \lambda_2 * AlumnumCPAlong & (2) \\
 & + \lambda_3 * UnaffCPAshort + \lambda_4 * UnaffCPAlong \\
 & + \lambda_5 * ExecAlumnumCPA + \lambda_6 * \%OtherExperts \\
 & + \lambda_7 * AveAddDirectorships + \lambda_8 * ACSIZE + \lambda_9 * ACMMeetings \\
 & + \lambda_{10} * FirmSize + \lambda_{11} * Leverage + \lambda_{12} * Big4 + \lambda_{13} * Switch \\
 & + \lambda_{14} * BTM + \lambda_{15} * Issuance + \lambda_{16} * InvRec + \lambda_{17} * Segments \\
 & + \lambda_{18} * Subsidiaries + \lambda_{19} * Loss_t + \lambda_{20} * ROA + \lambda_{21} * LQD \\
 & + \lambda_{22} * Index + \lambda_{23} * Cross-listing + \lambda_{24} * FYEnd + \lambda_{25} * NAF \\
 & + fixed\ effects + \varepsilon_2.
 \end{aligned}$$

All variables are defined in Appendix A.

As dependent variable in Model 1 we use three different measures of signed abnormal accruals based on cross-sectional versions of the Jones model (Jones, 1991) (AQJ), the modified Jones model (Dechow, Sloan, & Sweeney, 1995) (AQDSS), and the augmented Jones model (Kothari, Leone, & Wasley, 2005) (AQKLW), as well as a binary variable capturing the likelihood of reporting small profits (earnings benchmark test) calculated in accordance with Carey and Simnett (2006) (AQCS).⁴ The dependent variable used in Model 2 is the natural logarithm of audit fees (AF).

The test variable included in Models 1 and 2 is *AlumnumCPAshort*, which is a dummy variable that equals 1 if a former auditor who has recently worked for the client company's incumbent audit firm is present on the client company's AC, and 0 otherwise. Following Lennox (2005), we use a median split approach to determine the recency of the AFA-audit firm relationship. As the median length of time since AFA have left their previous employers is 9 years in our sample, *AlumnumCPAshort* only captures the presence of those alumni on the AC who have left the client company's current audit firm less than 9 years before the company's fiscal-year end in the respective year.⁵ This approach is largely in line with Basioudis (2007), who classifies AFA-audit firm relationships as recent if AFA have left the audit firm within the last 10 or 15 years. If the presence of AFA who have recently left their former employer on ACs is associated with higher (lower) audit quality, then the coefficient on our test variable in Model 1 is expected to be negative (positive), indicating a lower (higher) magnitude of earnings management. If the presence of AFA who have recently left their former employer on ACs is associated with higher (lower) audit fees, then the coefficient on our test variable in Model 2 is expected to be positive (negative).

To control for other alumni effects related to AC members and to further investigate the time dependence of alumni effects, we also include *AlumnumCPAlong*, which captures those alumni affiliations of AC members that are not covered by *AlumnumCPAshort*. In accordance with Basioudis (2007), we have assigned AFA who have worked for an extinct audit firm (e.g., Peat, Marwick, Mitchell) to the audit firm that became the successor of the extinct firm (e.g., KPMG).⁶

Furthermore, we also add two dummy control variables that capture the presence of former auditors not affiliated with the company's incumbent audit firm on the AC (i.e., *UnaffCPAshort* and *UnaffCPAlong*) to our models. Like AFA, unaffiliated ex-auditors on the AC might affect audit quality and audit fees, as they also have reasonable

knowledge and experience that might enable them to exert substantial influence on the audit process. Similar to the variables that account for the presence of AFA on the AC, *UnaffCPAshort* captures the presence of those former auditors who have left their former employer less than 9 years ago and *UnaffCPAlong* captures the presence of other unaffiliated ex-auditors on the AC.

Lastly, we also control for the presence of AFA serving as executives by adding *ExecAlumnusCPA* to our models, as previous studies (e.g., Basioudis, 2007; Lennox, 2005; Menon & Williams, 2004) have shown that AFA serving in executive positions are likely to affect companies' financial reporting as well as aspects related to the audit. *ExecAlumnusCPA* equals 1 if a former auditor who has worked for the client's incumbent audit firm is present on the client's executive board, and 0 otherwise.⁷

4.1 | Audit committee characteristics

Several studies have so far investigated the role of ACs in financial reporting and demonstrated that different characteristics of the AC can have an impact on its monitoring quality and effectiveness, which are, in turn, expected to have an influence on characteristics of the audit, for example, on audit quality (Bédard & Gendron, 2010). Among the most researched AC characteristics that are assumed to have an impact on the AC's working effectiveness are its size, meeting frequency, and accounting and auditing expertise (Bédard & Gendron, 2010). While the evidence on the role of AC size is mixed, many previous studies have documented positive effects of accounting and auditing expertise and the AC's meeting frequency on AC effectiveness (Bédard & Gendron, 2010). Furthermore, more recent studies have found the number of AC members' additional directorships to be negatively associated with monitoring quality (e.g., Sharma & Iselin, 2012). To account for the potential impact of the mentioned AC characteristics, we add four control variables (i.e., *%OtherExperts*, *AveAddDirectorships*, *ACSize*, and *ACMeetings*) to our models that are expected to capture effects related to ACs' design and activity. In this context it should be noted that *%OtherExperts* is defined as the number of accounting experts (following prior studies, e.g., DeFond, Hann, & Hu, 2005)⁸ serving on the AC divided by the total number of AC members, but only covers those accounting experts who are not former auditors to avoid overlaps with the variables mentioned in the previous section.

4.2 | Characteristics related to the audit engagement

As switches of a company's audit firm are likely to result in lower audit quality due to losses in client-specific knowledge (Chen, Lin, & Lin, 2008; Tanyi, Raghunandan, & Barua, 2010), as well as in reductions in the amount of audit fees paid (Deis & Giroux, 1996; Köhler, Marten, Ratzinger, & Wagner, 2010; Köhler & Ratzinger-Sakel, 2012), both models control for whether the incumbent auditor has audited the

financial statements of the respective company in the previous year or not (*Switch*). Furthermore, both models control for whether the company is audited by a Big 4 audit firm or not (*Big4*), as many previous studies have demonstrated that Big 4 audit firms are likely to provide higher audit quality (e.g., Lin & Hwang, 2010) and to charge higher audit fees (e.g., Campa, 2013). In contrast to prior studies investigating audit quality and audit fee effects (e.g., Basioudis & Francis, 2007; Minutti-Meza, 2013), our models do not account for auditor industry specialization due to the special characteristics of the German audit market and the German economy as a whole. Depending on the definition that is used, 95 to 99.95% of German companies are small and medium-sized enterprises (SMEs) (Friedrich-Ebert-Stiftung, 2016; KfW Research, 2018). Furthermore, many very large German companies are not listed on a stock exchange. For instance, in 2018, 55 of the largest 100 German companies (as measured by total revenues) were nonlisted companies (Boerse.de, 2019). Given the structure of the German economy, audit firms generate (by far) most of their audit fees (and, presumably, obtain most of their industry expertise) in the private segment. Therefore, the approach of previous studies to determine auditor industry specialization based on the market shares that audit firms have in a sample of listed companies (see, e.g., Basioudis & Francis, 2007) is not likely to yield reliable results in the German setting. Thus, we refrain from including an auditor industry specialization variable in our models.

4.3 | Company characteristics

To account for the potential impact that company characteristics might have on audit quality and audit fees, we include the company-specific control variables that have been used by Lesage et al. (2017) and proposed by other scholars (e.g., DeFond & Zhang, 2014; Hay et al., 2006) in Models 1 and 2. In doing so, we include a variable controlling for client size (*FirmSize*) in Model 1, as prior research has shown that auditors act more conservatively when auditing larger clients (e.g., Reynolds & Francis, 2000). Furthermore, we add variables that control for financial condition (*Loss_{t-1}*, *CFO*, and *Leverage*) and growth (*SalesGrowth*, *PPEGrowth*, and *BTM*) to the model, as high-growth companies and companies that are in a weak financial condition are more likely to manage earnings to a greater extent (Matsumoto, 2002; Poitras, Wilkins, & Kwan, 2002). Finally, we also include a variable capturing the issuance of equity (*Issuance*) in our audit quality model. In general, it is expected that companies that issue equity also have higher incentives to manage earnings (Yoon & Miller, 2002).

With regard to Model 2, we include a variable that controls for client size (*FirmSize*), as numerous studies have provided evidence of a positive association between the size of the auditee and audit fees (Hay, 2013). Furthermore, we add variables that capture client complexity (*InvRec*, *Segments*, and *Subsidiaries*), which is also assumed to have a positive impact on the amount of audit fees paid (Hay et al., 2006) to the model. As prior research has demonstrated that a client's financial situation and profitability are negatively associated with audit

fees (e.g., Pratt & Stice, 1994), we add several measures of financial condition (*Loss_t*, *Leverage*, *ROA*, and *LQD*) to our model. Following Lesage et al. (2017), we further control for several capital market-related aspects (*Index*, *Cross-listing*, *BTM*, and *Issuance*). In particular, companies that have a cross-listing (e.g., Choi, Kim, Liu, & Simunic, 2009), are listed on a prime stock index (e.g., Krauß, Pronobis, & Zülch, 2015), and issue equity (e.g., Bédard & Courteau, 2015) are likely to pay higher audit fees. We also control for a potential busy season effect by including a variable indicating whether a company's respective fiscal year ends on the most common fiscal year end (i.e., December 31 in Germany) or not (*FYEnd*), as audit fees are likely to be higher for busy season audits (Hay et al., 2006). Lastly, we also control for clients' non-audit fee ratios (*NAF*). In this regard, it can be assumed that the additional provision of non-audit services to a client leads to a lower level of audit fees due to synergies and/or cross-subsidization or to a higher level of audit fees if organizational changes resulting from non-audit services lead to additional audit effort (Hay et al., 2006).

5 | DATA AND SAMPLE SELECTION

The initial sample comprises 800 firm-year observations related to all companies that are included in the major German stock indices (i.e., DAX, MDAX, TecDAX, and SDAX) at the end of the years 2012–2016. On a general basis, these indices exclusively include large listed companies (Schiebel, 2007). All companies included in the major stock indices are part of the Prime Standard market segment of the Frankfurt Stock Exchange and, thus, have to fulfill the highest reporting and disclosure requirements (Oehmichen, Rapp, & Wolff, 2012). We drop observations from the financial services industries (117) and observations for which accounting and AC data was not fully available (72). Furthermore, we exclude observations referring to companies that did not establish an AC in the respective year (84) and/or were not domiciled in Germany⁹ (50), leaving a final sample of 477 firm-year observations. Details of our sample selection process are presented in Table 1.

Data on AC characteristics is hand collected from companies' annual reports. Regarding our AFA variables (i.e., *AlumnusCPAshort*

and *AlumnusCPAlong*), we use the CVs of AC members and other publicly accessible sources (e.g., online professional network services) to identify AC members who are former auditors affiliated with the respective company's incumbent audit firm and to determine the length of time since such members of the AC have left the audit firm. CVs and other publicly accessible sources are also used to identify other former auditors serving on client companies' ACs and executive boards (as captured by *UnaffCPAshort*, *UnaffCPAlong*, and *ExecAlumnusCPA*) and other accounting experts (as captured by *%OtherExperts*). Any audit data is manually collected from companies' annual reports and from auditors' reports, respectively. Accounting data required to calculate our audit quality measures and several firm-specific control variables is obtained from the Compustat Global Database. Market values of equity that are required to calculate the ratio of book value of equity to market value of equity (as captured by *BTM*) are obtained from the Worldscope Database. Finally, data on our sample companies' listings is collected from the New York Stock Exchange (concerning *Cross-listing*) and Deutsche Börse Group (concerning *Index*) websites.

Table 2 provides basic descriptive information regarding our sample.¹⁰ The means of the abnormal accruals measures based on the models developed by Jones (1991), Dechow et al. (1995), and Kothari et al. (2005) are -0.005 , -0.005 , and -0.007 , respectively, while the mean of the binary variable used to identify companies reporting small profits is 0.247. The values related to the abnormal accruals measures are largely in line with prior studies (e.g., Menon & Williams, 2004). In contrast, the mean of the earnings benchmark test measure is considerably higher than the mean that is reported by Carey and Simnett (2006).¹¹ The mean audit fee paid by our sample companies is 2,041 k€. Due to the fact that our sample only comprises companies that are included in the major German stock indices, this value is considerably higher than the values presented in other studies that have investigated audit fees in the German market using broader samples (e.g., Köhler & Ratzinger-Sakel, 2012). AC members who are former auditors affiliated with the company's incumbent audit firm could be identified in 7.2% of all firm-year observations in our sample, which is largely consistent with other studies investigating the role of AFA (e.g., Menon & Williams, 2004). With regard to the length of time since AFA serving on the AC have left their previous employers, we observe a median (mean) of 9 years (12.471 years), while we find a minimum of 2 years and a maximum of 35 years concerning this aspect. As further analyses with regard to the professional backgrounds of AFA show, AFA have not held other positions within client companies before they were appointed to the AC. Furthermore, in the vast majority (i.e., about 94%) of cases, the respective AFA is the chairman of the AC.

The correlation matrix of the dependent and independent variables is reported in Table 3. As can be seen from the table, our variable of interest (i.e., *AlumnusCPAshort*) is negatively and significantly correlated with all accruals measures (i.e., *AQJ*, *AQDSS*, and *AQKLW*) and with the binary variable capturing the likelihood of reporting small profits (i.e., *AQCS*), while it is not significantly correlated with the audit fee measure (i.e., *AF*). Interestingly, the variable capturing less recent

TABLE 1 Sample selection

	<i>Total</i>
All firm-year observations in the major German stock indices at the end of the years 2012–2016	800
Less: Firm-year observations in financial services industries	117
Less: Firm-year observations with missing data	72
Less: Firm-year observations related to companies which have not established an AC in the respective year	84
Less: Firm-year observations related to companies which are listed but not domiciled in Germany	50
Final sample	477

TABLE 2 Descriptive statistics

Variables	Mean	Median	SD	Min	Max
AQJ	-0.005	0.000	0.045	-0.191	0.096
AQDSS	-0.005	-0.002	0.047	-0.191	0.104
AQKLW	-0.007	0.000	0.042	-0.190	0.085
AQCS	0.247	0.000	0.432	0.000	1.000
AF(000 €)	2,041.130	801.000	3,123.181	133.000	16,000.000
AlumnusCPAshort	0.034	0.000	0.180	0.000	1.000
AlumnusCPAlong	0.038	0.000	0.191	0.000	1.000
UnaffCPAshort	0.063	0.000	0.243	0.000	1.000
UnaffCPAlong	0.069	0.000	0.254	0.000	1.000
ExecAlumnusCPA	0.038	0.000	0.191	0.000	1.000
%OtherExperts	0.240	0.250	0.221	0.000	1.000
AveAddDirectorships	2.247	2.000	1.579	0.000	8.000
ACSize	4.356	4.000	1.294	2.000	8.000
ACMeetings	4.683	5.000	1.558	1.000	9.000
FirmSize(000000 €)	18,934.190	2,947.433	45,267.930	72.746	309,644.000
Loss _{t-1}	0.113	0.000	0.317	0.000	1.000
CFO	0.082	0.077	0.062	-0.078	0.296
Leverage	0.580	0.591	0.163	0.161	0.926
SalesGrowth	0.047	0.044	0.127	-0.418	0.515
PPEGrowth	0.074	0.047	0.190	-0.336	1.125
Big4	0.920	1.000	0.271	0.000	1.000
Switch	0.057	0.000	0.231	0.000	1.000
BTM	0.687	0.563	0.455	0.000	2.310
Issuance	0.379	0.000	0.486	0.000	1.000
InvRec	0.311	0.318	0.147	0.026	0.638
Segments	1.460	1.386	0.329	0.693	2.303
Subsidiaries	11.934	9.327	8.641	2.000	43.497
Loss _t	0.109	0.000	0.312	0.000	1.000
ROA	0.041	0.040	0.055	-0.140	0.255
LQD	1.809	1.584	1.065	0.633	8.043
Index	0.243	0.000	0.429	0.000	1.000
Cross-listing	0.023	0.000	0.150	0.000	1.000
FYEnd	0.851	1.000	0.356	0.000	1.000
NAF	0.306	0.286	0.202	0.000	0.808
RawLength	12.471	9.000	9.627	2.000	35.000

Note. For definitions of the variables, please see Appendix A.

alumni affiliations (i.e., *AlumnusCPAlong*) is not significantly correlated with any of the dependent variables employed in this study. Turning to the other variables capturing the presence of former auditors (i.e., *UnaffCPAshort*, *UnaffCPAlong*, and *ExecAlumnusCPA*), correlations are somewhat mixed. While there are some significant correlations, none of the variables is significantly correlated with all proxies of audit quality. Moreover, there is a significant negative correlation between *UnaffCPAlong* and audit fees, while the other variables that capture the presence of former auditors are not significantly correlated with audit fees.

The correlation matrix suggests that multicollinearity does not bias our results as the vast majority of correlations is below 30%. However, we additionally calculate variance-inflation factors to check for multicollinearity. The results of our calculation provide no indication of the existence of multicollinearity problems, as the variance-inflation factors of all independent variables are substantially lower than the threshold variance-inflation factor of 10 (Gujarati & Porter, 2009). For Model 1, variance-inflation factors range from 1.09 to 1.88 with a mean variance-inflation factor of 1.25. For Model 2, the range is from 1.12 to 4.97 with a mean variance-inflation factor of 1.71.

TABLE 3 Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) AQJ	1																
(2) AQDSS	0.967***	1															
(3) AQKLW	0.914***	0.880***	1														
(4) AQCS	-0.010	-0.012	0.023	1													
(5) AF	-0.004	-0.011	-0.009	0.146***	1												
(6) AlumnusCPAshort	-0.238***	-0.228***	-0.262***	-0.080*	0.005	1											
(7) AlumnusCPAlong	0.003	0.006	0.026	-0.063	-0.004	-0.037	1										
(8) UnaffCPAshort	0.089*	0.107**	0.045	0.052	-0.047	-0.048	-0.051	1									
(9) UnaffCPAlong	-0.004	0.001	0.005	0.035	-0.121***	-0.051	-0.054	-0.071	1								
(10) ExecAlumnusCPA	-0.094**	-0.098**	-0.100**	-0.037	-0.035	-0.037	-0.039	-0.051	0.076*	1							
(11) %OtherExperts	-0.064	-0.069	-0.052	-0.100**	-0.045	-0.071	-0.112**	-0.016	-0.092**	-0.104**	1						
(12) AveAddDirectorships	-0.002	-0.047	0.023	0.136***	0.044	-0.003	0.039	0.116**	0.055	0.038	-0.003	1					
(13) ACSize	0.067	0.076*	0.072	0.161***	0.506***	0.030	0.039	0.116**	-0.056	-0.004	-0.163***	0.108**	1				
(14) ACMeetings	-0.088*	-0.078*	-0.082*	-0.011	0.281***	0.001	-0.144***	-0.031	0.082*	0.040	0.029	0.075	0.193***	1			
(15) FirmSize	0.025	0.023	0.011	0.153***	0.903***	0.031	-0.001	-0.090*	-0.154***	0.010	-0.100**	0.110**	0.517***	0.263***	1		
(16) Loss _{t-1}	-0.106**	-0.098**	-0.059	0.225***	0.065	-0.067	-0.036	-0.011	-0.019	0.068	0.079*	0.051	-0.047	0.043	-0.009	1	
(17) CFO	-0.369***	-0.357***	-0.431***	-0.204***	-0.196***	0.170***	0.113**	0.024	0.139***	-0.010	-0.022	-0.038	-0.100**	-0.100**	-0.235***	-0.215***	1
(18) Leverage	-0.076*	-0.067	-0.027	0.241***	0.449***	0.107**	0.016	-0.072	-0.118**	-0.161***	-0.066	-0.002	0.295***	0.096**	0.468***	0.114**	-0.175***
(19) SalesGrowth	-0.016	-0.030	-0.003	-0.076*	-0.168***	0.010	-0.040	-0.122***	0.028	0.081*	-0.012	0.042	-0.174***	-0.069	-0.151***	-0.069	0.183***
(20) PPEGrowth	0.083*	0.060	0.096**	-0.123***	-0.168***	-0.041	0.011	-0.088*	0.016	0.050	-0.005	0.040	-0.120***	-0.076*	-0.125***	-0.181***	0.040
(21) Big4	-0.053	-0.068	-0.062	0.061	0.345***	0.055	-0.145***	0.012	-0.072	0.058	-0.049	0.111**	0.297***	0.269***	0.254***	0.081*	-0.075
(22) Switch	0.008	0.031	0.009	-0.035	-0.181***	-0.046	0.047	0.049	0.076*	-0.001	-0.068	0.030	-0.089*	-0.038	-0.139***	-0.059	0.009
(23) BTM	0.090**	0.085*	0.134***	0.234***	0.172***	-0.111**	-0.081*	-0.050	-0.169***	0.104**	-0.194***	0.050	0.066	-0.011	0.213**	0.105**	-0.306***
(24) Issuance	-0.135***	-0.150***	-0.095**	0.062	0.006	-0.050	-0.019	-0.060	-0.043	0.049	0.022	0.167***	-0.089*	0.015	0.017	0.048	-0.081*
(25) InvRec	0.167***	0.150***	0.168***	-0.002	-0.250***	-0.079*	0.095**	-0.070	0.062	-0.169***	-0.012	-0.024	-0.204***	-0.140***	-0.255***	-0.032	-0.173***
(26) Segments	0.130***	0.118**	0.113**	0.127***	0.410***	-0.112**	0.008	-0.072	-0.057	-0.152***	-0.009	0.053	0.201***	-0.021	0.402***	-0.020	-0.012
(27) Subsidiaries	0.028	0.017	0.029	0.163***	0.752***	0.019	-0.023	-0.117**	-0.078*	0.067	-0.060	0.105**	0.382***	0.202**	0.776**	-0.001	-0.165***
(28) Loss _t	-0.212***	-0.196***	-0.138***	-0.201***	0.044	-0.065	-0.069	-0.063	0.011	0.107**	0.127***	-0.004	-0.076*	0.088*	-0.006	0.321***	-0.335***
(29) ROA	0.234***	0.211***	0.092**	-0.264***	-0.190***	0.057	0.063	0.115**	0.154***	-0.082*	-0.025	-0.042	-0.076*	-0.111**	-0.189***	-0.359***	0.660***
(30) LQD	0.101**	0.102**	0.069	-0.134***	-0.414***	-0.063	-0.086*	0.065	0.042	0.019	0.119***	-0.044	-0.307***	-0.140***	-0.445***	0.038	-0.010
(31) Index	0.058	0.048	0.039	-0.065	0.669***	-0.024	-0.010	-0.147***	-0.058	0.016	-0.040	0.050	0.346***	0.206**	0.743**	-0.048	-0.027
(32) Cross-listing	-0.011	-0.021	-0.054	-0.088*	0.096**	-0.029	-0.030	-0.040	-0.042	0.336***	-0.067	0.082*	-0.021	0.211***	0.186***	-0.055	0.031
(33) FYEnd	-0.049	-0.020	-0.038	-0.047	-0.028	-0.086*	0.052	0.108**	0.021	-0.072	-0.045	-0.161***	-0.140***	0.013	0.000	-0.037	0.020
(34) NAF	-0.042	-0.056	-0.005	0.080*	0.243***	-0.017	-0.023	-0.044	-0.100**	0.023	-0.099**	0.007	0.174***	0.122***	0.298***	0.049	-0.116**

(Continues)

TABLE 3 (Continued)

Variables	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
(18) Leverage	1																
(19) SalesGrowth	-0.067	1															
(20) PPEGrowth	-0.135***	0.356***	1														
(21) Btg4	0.046	-0.117**	-0.155***	1													
(22) Switch	-0.046	0.007	0.018	-0.263***	1												
(23) BTM	0.111**	-0.104**	-0.060	0.083*	-0.020	1											
(24) Issuance	0.079*	0.178***	0.116**	-0.121***	0.089*	-0.048	1										
(25) InvRec	-0.030	0.008	0.051	-0.017	0.013	0.081*	-0.181***	1									
(26) Segments	0.293***	-0.101**	-0.120***	0.047	-0.029	0.071	-0.097**	-0.065	1								
(27) Subsidiaries	0.415***	-0.073	-0.128***	0.178***	-0.136***	0.201***	0.112**	-0.202***	0.366***	1							
(28) Loss _t	0.054	-0.240***	-0.146***	0.053	0.002	0.153***	0.101**	-0.066	-0.108**	-0.042	1						
(29) ROA	-0.321***	0.190***	0.158***	-0.065	-0.003	-0.327***	-0.193***	0.048	-0.022	-0.120***	-0.619***	1					
(30) LQD	-0.619***	0.006	0.071	-0.059	-0.006	-0.084*	0.008	0.019	-0.140***	-0.394***	0.114**	0.098**	1				
(31) Index	0.199***	-0.040	-0.014	0.167***	-0.118**	0.031	0.060	-0.304***	0.344***	0.650***	-0.057	0.020	-0.238***	1			
(32) Cross-listing	-0.058	0.042	0.007	0.045	-0.038	-0.084*	0.139***	-0.127***	-0.015	0.290***	-0.054	0.075	-0.056	0.271***	1		
(33) FVEnd	0.012	0.025	-0.012	-0.101**	0.026	0.036	0.096**	-0.171***	-0.144***	0.022	0.033	-0.025	-0.039	0.059	0.025	1	
(34) NAF	0.245***	-0.060	-0.030	-0.065	-0.104**	0.031	0.156***	-0.195***	0.063	0.301***	0.049	-0.140***	-0.160***	0.209***	0.067	0.060	1

In a further analysis, we explore the characteristics of companies that have AFA on their ACs. This analysis is particularly interesting, as it might be that companies with specific properties or in specific situations (e.g., in terms of their financial situation) are more likely to appoint AFA to their ACs than other companies, for instance, because of special demands in terms of corporate governance. On the other hand, it might also be that AFA themselves are selective with regard to the positions that they accept and carefully analyze a company's situation before they are willing to become members of the company's AC.¹² To analyze which characteristics might influence the presence of AFA on ACs, we compare companies with and without AFA serving on the AC concerning the mean values of all company characteristics variables mentioned in section 4.3.

The results of this analysis are provided in Table 4. As can be seen from the table, the mean values of six variables are significantly different between both groups of companies. In particular, companies that have AFA on their ACs are significantly more profitable as measured by CFO and ROA and also less likely to have negative net income in the current fiscal year. However, these companies, on average, also have significantly higher leverage, a lower ratio of current assets to current liabilities (liquidity ratio) as well as a lower book-to-market ratio. Thus, the presence of AFA on companies' ACs seems to be associated with relatively high profitability but also with higher risks related to companies' capital structure and prospects for growth. A

TABLE 4 Differences between companies with and without AFA on the AC

Variables	Companies with AFA on AC	Companies without AFA on AC	Diff. t test
	Mean	Mean	
FirmSize	8.368	8.222	0.647
Loss _{t-1}	0.029	0.120	0.110
CFO	0.127	0.079	0.000***
Leverage	0.631	0.576	0.058*
SalesGrowth	0.037	0.048	0.629
PPEGrowth	0.059	0.075	0.648
BTM	0.461	0.704	0.003***
Issuance	0.294	0.386	0.288
InvRec	0.320	0.311	0.738
Segments	1.374	1.467	0.111
Subsidiaries	11.814	11.944	0.933
Loss _t	0.000	0.117	0.034**
ROA	0.058	0.040	0.060*
LQD	1.396	1.841	0.019**
Index	0.206	0.246	0.600
Cross-listing	0.000	0.025	0.354
FYEnd	0.824	0.853	0.640
NAF	0.285	0.308	0.523

Note. AFA = audit firm alumni; AC = audit committees. For definitions of the variables, please see Appendix A.

possible explanation for the described results is that companies with a more complex funding situation and higher growth expectations might perceive a higher demand for monitoring and therefore appoint AFA to their ACs. This is also in line with previous studies that suggest that the demand for various forms of monitoring is likely to increase with higher levels of leverage, higher liquidity risk, and higher prospects for growth (e.g., Carcello, Hermanson, & Raghunandan, 2005; Gompers, 1995; Menon & Williams, 1994). However, only those companies that are—at the same time—sufficiently profitable are able to attract AFA, as AFA seem to avoid joining companies with a weak (short-term) performance.

6 | RESULTS

Table 5 presents the results of our regressions investigating the associations between the presence of AC members who have recently worked for the company's current audit firm and audit quality (Panel A) as well as audit fees (Panel B). Two-tailed hypotheses testing is carried out with regard to all independent variables included in our models.

Panel A reports that the coefficient on *AlumnusCPAshort* is negative and significant for all audit quality measures (−0.042, $p = 0.035$ for AQJ; −0.042, $p = 0.032$ for AQDSS; −0.041, $p = 0.024$ for AQKLW; −0.827, $p = 0.062$ for AQCS).¹³ The effect reflected by the mentioned coefficients on *AlumnusCPAshort* is also economically significant, considering the ranges of the accruals measures documented for our sample companies (range from −0.191 to 0.096 for AQJ; range from −0.191 to 0.104 for AQDSS; range from −0.190 to 0.085 for AQKLW). Furthermore, the coefficient on *AlumnusCPAshort* that is obtained from the earnings benchmark test model shows that companies that have AFA who have recently worked for the company's current audit firm on their AC are 15.4% less likely to report a small profit,¹⁴ which also emphasizes the result's economic significance. Overall, our results suggest that the presence of AFA who have recently worked for the company's current audit firm on the AC has the potential to increase audit quality.

In contrast, the coefficient on *AlumnusCPAlong* is insignificant for all measures of audit quality (0.000, $p = 0.970$ for AQJ; −0.002, $p = 0.902$ for AQDSS; 0.009, $p = 0.519$ for AQKLW; −0.475, $p = 0.264$ for AQCS), thereby providing evidence of substantial differences between both groups of AFA and of the time dependence of alumni effects. Similarly, the coefficients on the other variables that capture the presence of former auditors (i.e., *UnaffCPAshort*, *UnaffCPAlong*, and *ExecAlumnusCPA*) are almost entirely insignificant in all model specifications.

Overall, our results with respect to audit quality reject H1, as the presence of AFA who have recently worked for the company's incumbent audit firm on the AC is positively associated with audit quality. Our results differ from the results reported by Naiker and Sharma (2009) and Naiker et al. (2013) who do not find a time dependence of alumni effects concerning AFA serving on ACs. A likely reason for the differing results is that the groups of AFA

TABLE 5 Multivariate results

Panel A: Audit quality models								
Variables	AQJ		AQDSS		AQKLW		AQCS	
	β	p	β	p	β	p	β	p
Constant	0.079***	0.003	0.080***	0.002	0.067***	0.005	-3.181***	0.000
AlumnusCPAshort	-0.042**	0.035	-0.042**	0.032	-0.041**	0.024	-0.827*	0.062
AlumnusCPAlong	0.000	0.970	-0.002	0.902	0.009	0.519	-0.475	0.264
UnaffCPAshort	0.014	0.202	0.019*	0.082	0.006	0.539	0.435	0.134
UnaffCPAlong	0.002	0.871	0.003	0.852	0.007	0.587	0.776**	0.044
ExecAlumnusCPA	-0.027	0.161	-0.027	0.180	-0.031	0.122	-0.530	0.325
%OtherExperts	-0.022	0.105	-0.024*	0.092	-0.016	0.172	-0.479	0.262
AveAddDirectorships	0.001	0.799	-0.001	0.791	0.001	0.725	0.101*	0.077
ACSize	0.001	0.594	0.002	0.442	0.002	0.401	0.131	0.140
ACMeetings	-0.003**	0.025	-0.003*	0.057	-0.003*	0.058	-0.050	0.382
FirmSize	0.001	0.723	0.001	0.736	-0.002	0.498	-0.008	0.908
Loss _{t-1}	-0.022***	0.007	-0.021**	0.011	-0.017***	0.006	0.621***	0.007
CFO	-0.370***	0.000	-0.369***	0.000	-0.382***	0.000	-1.566	0.331
Leverage	-0.034	0.129	-0.034	0.138	-0.014	0.465	1.772***	0.007
SalesGrowth	0.028	0.173	0.026	0.238	0.028*	0.088	0.162	0.824
PPEGrowth	0.014	0.330	0.010	0.488	0.015	0.243	-0.821	0.176
Big4	-0.003	0.856	-0.006	0.660	-0.001	0.916	-0.152	0.661
Switch	-0.006	0.518	-0.002	0.840	-0.004	0.647	-0.427	0.227
BTM	-0.004	0.455	-0.004	0.436	0.002	0.632	0.572***	0.006
Issuance	-0.019***	0.001	-0.020***	0.000	-0.016***	0.001	0.207	0.158
Year	Controlled		Controlled		Controlled		Controlled	
Industry	Controlled		Controlled		Controlled		Controlled	
Observations	477		477		477		477	
Adj. R ²	31.53%		30.46%		35.22%		Pseudo R ² = 21.99%	
p-value	0.000		0.000		0.000		0.000	

Panel B: Audit fee model		
Variables	AF	
	λ	p
Constant	2.617***	0.000
AlumnusCPAshort	-0.238	0.129
AlumnusCPAlong	0.069	0.679
UnaffCPAshort	0.169	0.386
UnaffCPAlong	0.021	0.814
ExecAlumnusCPA	-0.153	0.377
%OtherExperts	0.004	0.981
AveAddDirectorships	-0.054***	0.009
ACSize	-0.002	0.951
ACMeetings	0.024	0.253
FirmSize	0.484***	0.000
Leverage	-0.227	0.452
Big4	0.587***	0.000
Switch	-0.175*	0.051
BTM	-0.128	0.122

(Continues)

TABLE 5 (Continued)

Panel B: Audit fee model		
Variables	AF	
	λ	p
<i>Issuance</i>	0.028	0.673
<i>InvRec</i>	-0.011	0.969
<i>Segments</i>	0.127	0.334
<i>Subsidiaries</i>	0.027***	0.001
<i>Loss_t</i>	0.171**	0.048
<i>ROA</i>	-0.147	0.816
<i>LQD</i>	-0.013	0.681
<i>Index</i>	-0.081	0.565
<i>Cross-listing</i>	-0.781***	0.006
<i>FYEnd</i>	-0.117	0.318
<i>NAF</i>	-0.162	0.345
<i>Year</i>	Controlled	
<i>Industry</i>	Controlled	
<i>Observations</i>	477	
<i>Adj. R²</i>	87.48%	
<i>p-value</i>	0.000	

Note. For definitions of the variables, please see Appendix A.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

investigated by Naiker and Sharma (2009) and Naiker et al. (2013) appear to be relatively homogenous from a time perspective. In both studies, the number of observations related to AFA who were appointed to the AC within 3 years following the departure from the audit firm is similar to the number of observations related to AFA who left the audit firm more than 3 years ago. This implies that there is not a very broad range with regard to the time of absence from the audit firm because otherwise the second group of AFA (i.e., group with absence >3 years) should be considerably larger than the first group (i.e., group with absence <3 years). In contrast, in our sample, the length of time since AFA have left their previous employers ranges from 2 to 35 years. The higher time-related heterogeneity in our sample is likely be one important factor that makes it easier to detect existing recency effects.¹⁵

Turning to our audit fee model, Panel B reports that the coefficient on our test variable is negative but insignificant (-0.238 , $p = 0.129$). Hence, our results with respect to audit fees fail to reject H2. Furthermore, *AlumnusCPAlong* is also not significantly associated with audit fees (0.069 , $p = 0.679$). As the coefficients on the other variables that capture the presence of former auditors (i.e., *UnaffCPAshort*, *UnaffCPAlong*, and *ExecAlumnusCPA*) are insignificant as well, we do not find the presence of alumni of a company's current audit firm (and of former auditors in general) in our sample companies to be significantly associated with audit fees. Furthermore, due to the insignificant results related to *AlumnusCPAshort* and *AlumnusCPAlong*, we cannot conclude that the recency of working

experience of an alumnus with the company's incumbent auditor has an impact with regard to the amount of audit fees paid.

7 | ADDITIONAL ANALYSES

7.1 | Modifications of test variable

We conduct several additional analyses to examine the robustness of our main results and to further explore how AFA serving on the AC affect audit quality.

In our first additional analysis, we consider modifications to our variables indicating the presence of AFA on companies' ACs.¹⁶ In a first step, we use a cut-off of 5 years to assign AFA to one of the two alumni groups and rerun our regressions. Using this alternative cut-off is particularly interesting, as a cooling-off period of 5 years is currently required in some member states of the European Union (FEE, 2016). In addition, the Corporate Accountability and Listing Standards Committee of the New York Stock Exchange has also recommended a cooling-off period of 5 years for former employees of a listed company's auditor (NYSE, 2002). Using the alternative cut-off, our results continue to hold, as the coefficient on the altered version of *AlumnusCPAshort* is negative and significant for all accruals measures of audit quality¹⁷ (-0.048 , $p = 0.012$ for AQJ; -0.048 , $p = 0.013$ for AQDSS; -0.048 , $p = 0.000$ for AQKLW), while the coefficient on the altered version of *AlumnusCPAlong* is negative but insignificant

(−0.013, $p = 0.332$ for AQJ; −0.014, $p = 0.293$ for AQDSS; −0.006, $p = 0.655$ for AQKLW). In a further test, instead of conducting a median split (as in the main analysis), we use the lower quartile of the length of time since AFA have left their previous employers (i.e., 6 years) as a threshold to determine the recency of the AFA-audit firm relationship. Using the alternative threshold of 6 years, our results, again, continue to hold, as the coefficient on the altered version of *AlumnusCPAshort* is negative and significant for all accruals measures of audit quality (−0.037, $p = 0.042$ for AQJ; −0.037, $p = 0.042$ for AQDSS; −0.037, $p = 0.013$ for AQKLW), while the coefficient on the altered version of *AlumnusCPAlong* is negative but insignificant (−0.014, $p = 0.339$ for AQJ; −0.015, $p = 0.300$ for AQDSS; −0.007, $p = 0.662$ for AQKLW).

7.2 | Single regression approach by Chen, Hribar, and Melessa (2018)

We use several different abnormal accruals measures in our analyses to test whether our results are sensitive to the calculation of the dependent variables used in our audit quality model. In general, studies that use abnormal accruals measures typically apply a two-step procedure, whereby, first, abnormal accruals are estimated as the residual of an ordinary least squares regression and then used as the dependent variable in a second-step regression that tests the respective article's hypotheses (Chen et al., 2018). However, in a recent study, Chen et al. (2018) point out that this procedure can result in biased estimates and recommend estimating abnormal accruals models in a single regression to avoid the bias that might be related to the two-step procedure. Thus, to additionally check the robustness of our results, we reconduct our audit quality analysis using the approach suggested by Chen et al. (2018). In doing so, we estimate the following model that is adapted from Chen et al. (2018).

$$\begin{aligned}
 TA = & \sigma_0 + \sigma_1 * AlumnusCPAshort + \sigma_2 * (1/Assets) + \sigma_3 * (\Delta Sales - \Delta AR) \\
 & + \sigma_4 * PPE + \sigma_5 * AlumnusCPAlong + \sigma_6 * UnaffCPAshort \\
 & + \sigma_7 * UnaffCPAlong + \sigma_8 * ExecAlumnusCPA + \sigma_9 * \%OtherExperts \\
 & + \sigma_{10} * AveAddDirectorships + \sigma_{11} * ACSize + \sigma_{12} * ACMeetings \\
 & + \sigma_{13} * FirmSize + \sigma_{14} * Loss_{t-1} + \sigma_{15} * CFO + \sigma_{16} * Leverage \\
 & + \sigma_{17} * SalesGrowth + \sigma_{18} * PPEGrowth + \sigma_{19} * Big4 + \sigma_{20} * Switch \\
 & + \sigma_{21} * BTM + \sigma_{22} * Issuance + \sigma_q * Interactions + \text{fixed effects} + \varepsilon_3.
 \end{aligned}
 \tag{3}$$

As a dependent variable, the model includes TA, which is defined as income before extraordinary items minus operating cash flows scaled by lagged total assets. *Assets* is current period's total assets. $\Delta Sales$ is the change in total revenues scaled by lagged total assets. ΔAR is the change in total receivables scaled by lagged total assets. *PPE* is property, plant, and equipment scaled by lagged total assets. In accordance with Chen et al. (2018), *Interactions* represents the interactions between the year indicator variables and *1/Assets*, $(\Delta Sales - \Delta AR)$, and *PPE*.

Table 6 shows that the results from our main analysis continue to hold using the single regression approach by Chen et al. (2018), as we

TABLE 6 Single regression approach by Chen et al. (2018)

Variables	TA	
	σ	p
Constant	0.027	0.321
AlumnusCPAshort	−0.022**	0.044
(1/Assets)	0.005	0.160
($\Delta Sales - \Delta AR$)	0.036	0.310
PPE	−0.009	0.421
AlumnusCPAlong	−0.009	0.242
UnaffCPAshort	0.017*	0.084
UnaffCPAlong	0.004	0.734
ExecAlumnusCPA	−0.030**	0.038
%OtherExperts	−0.025	0.132
AveAddDirectorships	0.001	0.573
ACSize	0.000	0.856
ACMeetings	−0.002	0.251
FirmSize	0.007***	0.000
Loss _{t-1}	−0.031***	0.000
CFO	−0.539***	0.000
Leverage	−0.057**	0.014
SalesGrowth	0.017	0.605
PPEGrowth	0.004	0.768
Big4	−0.007	0.535
Switch	0.000	0.990
BTM	−0.016***	0.005
Issuance	−0.022***	0.000
Interactions	Controlled	
Year	Controlled	
Industry	Controlled	
Observations	477	
Adj. R ²	54.33%	
p-value	0.000	

Note. For definitions of the variables, please see Appendix A.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

find a significant negative association between *AlumnusCPAshort* and TA (−0.022, $p = 0.044$), while the coefficient on *AlumnusCPAlong* is, again, insignificant (−0.009, $p = 0.242$). Interestingly, we also find a significant negative coefficient on *ExecAlumnusCPA* and a significant positive coefficient on *UnaffCPAshort*, indicating that audit quality might also be positively influenced by the presence of AFA on a client's executive board and negatively influenced by unaffiliated ex-auditors serving on the AC. However, with regard to the interpretation of this result it has to be considered that both variables—in contrast to *AlumnusCPAshort* and *AlumnusCPAlong*—have shown an inconsistent pattern and/or insignificant results in the main analysis, which might indicate that the result linked to these variables is less reliable.

7.3 | Sensitivity to correlated omitted variables

To investigate the sensitivity of our results to correlated omitted variables, we calculate the impact threshold for a confounding variable (ITCV) in accordance with Frank (2000). The ITCV is defined as “the lowest product of the partial correlation between y and the confounding variable and the partial correlation between x and the confounding variable that makes the coefficient statistically insignificant” (Larcker & Rusticus, 2010). As we calculate ITCVs of -0.024 (for the regression using AQJ as the dependent variable), -0.027 (for the regression using AQDSS as the dependent variable), -0.032 (for the regression using AQKLW as the dependent variable), and -0.010 (for the regression using AQCS as the dependent variable), a correlated omitted variable would have to be at least correlated at 0.100 (or -0.100 , respectively) ($=\sqrt{0.010}$) with our test variable and our proxies of audit quality conditioning on observed covariates to make the coefficient on *AlumnusCPAshort* statistically insignificant. Considering that for the vast majority of our control variables the product of the partial correlations with *AlumnusCPAshort* and our audit quality proxies does not reach this threshold, it seems unlikely that our results are seriously biased by correlated omitted variables.

7.4 | Entropy balancing

Next, we consider the possibility that AFA presence on ACs might not be random but rather due to certain company characteristics, which might bias our results. For instance, it is reasonable to assume that AFA prefer to join the ACs of profitable companies (also see section 5) audited by well-known audit firms to avoid conflictual and demanding engagements. Moreover, for these companies audit quality might also generally be higher. To address this issue, we use the entropy balancing approach described by Hainmueller (2012). Entropy balancing is “a preprocessing technique for researchers to achieve covariate balance in observational studies with a binary treatment” (Hainmueller, 2012). In other words, data is preprocessed to generate balanced samples in which the covariate distribution in the control group (in this study: observations without AFA serving on the AC) is very close to the covariate distribution in the treatment group (in this study: observations with AFA serving on the AC) (Hainmueller, 2012; Hainmueller & Xu, 2013). Thus, the entropy balancing approach is helpful in addressing the mentioned problems related to AFA-company matching.

The entropy balancing procedure generates weights for each observation that can be used in subsequent analyses (Hainmueller, 2012; Hainmueller & Xu, 2013). In our case, we use the entropy balancing weights to conduct weighted regressions of our abnormal accruals measures of audit quality¹⁸ on the independent variables that are included in our audit quality model. In doing so, we find that our results continue to hold, as *AlumnusCPAshort* is negatively and significantly associated with all abnormal accruals measures (-0.026 , $p = 0.005$ for AQJ; -0.026 , $p = 0.004$ for AQDSS; -0.024 , $p = 0.005$ for AQKLW), while we do not observe significant results with regard

to *AlumnusCPAlong* (-0.001 , $p = 0.914$ for AQJ; 0.000 , $p = 0.968$ for AQDSS; 0.008 , $p = 0.365$ for AQKLW). Thus, while we acknowledge that the presence of AFA on ACs is not likely to be random, we conclude that our findings are unlikely (solely) driven by AFA-company matching.

7.5 | Impact of working experience with the audit firm and on the AC

In general, it might be the case that AFA who have spent more time with their former employer have more extensive audit experience and audit firm-specific knowledge that could help them to contribute to higher audit quality. On the other hand, AFA who have served on the AC for a longer period of time might contribute to higher audit quality because of additional client-specific knowledge. Thus, in our next additional analysis, we investigate the potential impact of the time AFA have spent with their alma mater and the time they have served on the AC of the client company. On a descriptive level, we find that, on average, AFA have worked for 18.735 years for their former employers, while the average time they have served on the AC is 3.559 years.

To investigate the impact of the time AFA have spent with their alma mater, we replace the AFA variables with a variable that captures the natural logarithm of the number of years AFA serving on the AC have worked for their previous employer. This variable can be interpreted as the magnitude of *audit firm-specific* knowledge that the AC has, irrespective of the time that has passed since the knowledge was obtained. Rerunning our regressions, we do not find the variable capturing working experience with the audit firm to be significantly associated with audit quality. Thus, differences with regard to the number of years that AFA have worked for the audit firm do not seem to cause significant differences concerning audit quality. However, with regard to the interpretation of this result it has to be considered that AFA who join ACs generally have extensive audit experience, which is also reflected in the high average value mentioned above (i.e., 18.735 years). For instance, with regard to audit quality, it might not make a significant difference whether an alumnus has gathered 15 instead of 20 years of audit experience with his/her alma mater.

Next, we investigate whether the time AFA have served on the AC of the client company has an impact on audit quality. To do so, similar to the procedure described above, we replace the AFA variables with a variable that captures the natural logarithm of the number of years AFA have served on the AC and rerun our regressions. This variable can be interpreted as the magnitude of *AFA client-specific* knowledge that the AC has. Again, we do not find a significant result, which indicates that differences with regard to the number of years that AFA have served on the AC do not lead to significant differences concerning audit quality. However, with regard to the interpretation of our result the mixed evidence provided by prior research should be considered. For instance, Yang and Krishnan (2005) report that AC tenure is negatively associated with earnings management,

while Sharma and Iselin (2012) find a positive association between AC tenure and the likelihood of misstatements. Thus, it might be the case that there are positive as well as negative effects linked to AC tenure that might have balanced out in our analysis.

7.6 | Impact of audit partner experience

In our sixth additional analysis, we investigate whether our results are driven by audit partner experience. Specifically, it might be the case that those AFA who have left the audit firm more recently are also more likely to have served in the rank of an audit partner, while those AFA who have left the audit firm many years ago have a lower probability to have served in such a position. Thus, our results might reflect a partner experience effect rather than a recency effect. To test this alternative explanation of our results, we replace *AlumnusCPAshort* and *AlumnusCPAlong* by two variables capturing audit partner experience (i.e., *AlumnusCPApartner* and *AlumnusCPAnonpartner*) in our audit quality model. Information on the rank in which AFA have served at audit firms is, again, obtained from AC members' CVs. *AlumnusCPApartner* is coded 1 for AFA serving on the AC who have worked as partners at client companies' incumbent audit firms, and 0 otherwise. *AlumnusCPAnonpartner* is coded 1 for AFA serving on the AC who have not worked as partners at client companies' incumbent audit firms, and 0 otherwise. Using these new variables, we reestimate the model and find that *AlumnusCPApartner* and *AlumnusCPAnonpartner* are not significantly associated with audit quality. Thus, we conclude that the effect found in our main analysis is not attributable to the rank attained by AFA but rather to the period of time that has passed since AFA have left audit firms.

7.7 | Impact of position within the AC

Finally, we consider whether AFA effects on audit quality might also depend on the position that AFA have within the AC. For instance, AFA serving in a chairman position might be more able to influence the audit process (and, thus, audit quality) than other AC members. This might particularly be due to the central role of the AC chairman who is, for example, responsible for "ensuring open relationships between the audit committee and management, internal auditors, and external auditors" (Tanyi & Smith, 2015). Thus, differences in AFA effects on audit quality might not only exist concerning the time that has passed since AFA have left their previous employers but also with regard to their position within ACs. To test whether differential audit quality effects of AFA serving in chairman and non-chairman positions exist, similar to the analysis conducted in the previous section, we replace *AlumnusCPAshort* and *AlumnusCPAlong* by *AlumnusCPAchairman* and *AlumnusCPAnonchairman* in our audit quality model. *AlumnusCPAchairman* is coded 1 for AFA serving on the AC in the position of a chairman, and 0 otherwise, while *AlumnusCPAnonchairman* is coded 1 for AFA serving on the AC in a nonchairman position, and 0 otherwise. Reestimating our audit quality

model using the alternative test variables, we find that both *AlumnusCPAchairman* and *AlumnusCPAnonchairman* are not significantly associated with our audit quality proxies. Thus, our last additional analysis indicates that the position of AFA within the AC alone (i.e., without consideration of the recency of the relationship between AFA and their former employers) does not determine whether AFA serving on the AC have an impact on audit quality or not.

8 | CONCLUSIONS AND LIMITATIONS

In this article, we empirically examined the time dependence of audit quality and audit fee effects resulting from the presence of AFA on companies' ACs. Our study is motivated by a new European legislation that has led to an increase in the importance of ACs in European companies' corporate governance systems and simultaneously restricted the presence of AFA on ACs of client companies by imposing cooling-off periods for such positions.

Using a sample of 477 firm-year observations on companies included in the major German stock indices at the end of the years 2012–2016, we find that the presence of AFA who have recently left their former employer on the AC is positively associated with audit quality. In contrast, audit quality does not seem to be affected by the presence of AFA who have left the audit firm a longer period of time ago. Furthermore, we fail to find evidence of an association between the presence of AFA on the AC and audit fees. Based on our results, we conclude that only AFA who have recently left their alma mater are capable of distinctively influencing the audit process (and thereby audit quality) and, thus, that a time dependence of alumni effects exists in cases in which AFA serve on ACs. However, they do not seem to exert substantial influence during audit fee negotiations preceding the audit. A possible explanation for this result might be that AFA in their role as AC members personally profit from higher audit quality (e.g., via a lower risk of financial reporting failures and related negative personal consequences). However, the level of audit fees does not sufficiently affect their individual sphere and interests.

Considering that our results suggest that the effects arising from the presence of AFA who have recently left the audit firm are positive, we conclude that the imposition of cooling-off rules restricting the presence of AFA might not be optimal with regard to every position. Precluding AFA who have recently left their former employers from client companies' ACs might simultaneously hinder increases in audit quality and, thus, even result in outcomes contrary to those pursued by regulators.

To the best of our knowledge, this study is the first to examine the time dependence of audit quality and audit fee effects arising from AFA presence on ACs. In doing so, we also provide first empirical evidence of the existence of time-dependent AFA effects in connection with ACs and potential adverse consequences arising from the imposition of cooling-off periods on AFA. The results of our study are relevant to regulators, preparers and users of financial statements, and researchers.

Our study is subject to the following limitations. First, the presence of AFA on a company's AC might not be exogenous but due to specific company characteristics. While we perform additional analyses to mitigate endogeneity concerns, we cannot completely rule out concerns that our results are biased by AFA-company matching. Second, we have used, to the best of our knowledge, all publicly available data and especially the CVs of AC members to identify AFA, unaffiliated former auditors, and other accounting experts serving on the ACs of the companies included in our sample. Nevertheless, we cannot guarantee the correctness and completeness of the CVs and publicly available information. Lastly, as the interaction between ACs and auditors is not publicly observable, it is unclear through which channels AFA serving on the AC are actually influencing audit quality. A more direct investigation of the dynamics of this interaction could therefore be an interesting avenue for future research on ACs and the role of AFA.

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ENDNOTES

- ¹ Naiker and Sharma (2009) find that internal control deficiencies are less likely to occur if an affiliated former audit firm partner serves on the AC of a client company, irrespective of whether the former audit firm partner joined the AC within or after a cooling-off period. Naiker et al. (2013) find a negative association between the presence of affiliated former audit firm partners serving on the AC and the level of non-audit services provided by the auditor. Again, results obtained with regard to affiliated former audit firm partners who meet or do not meet a certain cooling-off period do not differ. Several studies investigating effects arising from the presence of AFA in executive rather than monitoring positions (e.g., Dowdell & Krishnan, 2004) also do not find differing results for executives who join a client company within or after a certain period of time. However, Basioudis (2007) demonstrates a time dependence of audit fee alumni effects related to AFA serving as executives.
- ² German listed companies have to apply the DCGK on a comply-or-explain basis. However, the vast majority of our sample companies fully complies with the recommendations of the relevant section (i.e., section 5.3.2) of the DCGK (von Werder & Danilov, 2018).
- ³ In Germany, ACs' responsibility for audit fee negotiations relates back to section 5.3.2 of the DCGK. However, although the vast majority of sample companies complies with this section of the DCGK, it has to be noted that, under German law, there is no legally binding rule exclusively assigning this function to the AC.
- ⁴ The earnings benchmark test as described by Carey and Simnett (2006) in their main analysis section identifies a company as reporting a small profit if its profit deflated by total assets is between 0% and 2%. However, our probit model is inestimable using the 2% threshold because *AlumnusCPAshort* is equal to zero for all companies that are identified as reporting small profits using this threshold. Therefore, we use the 3% threshold that is used by Carey and Simnett (2006) in their sensitivity analyses.
- ⁵ The authors are aware that most current cooling-off restrictions focusing on AFA typically cover periods shorter than the threshold applied in this study. However, on a conceptual and methodological level, splitting the group of AFA based on the observed median as in Lennox (2005) (and based on the lower quartile in an additional analysis) appears to be a suitable approach for the investigation of a general time dependence of alumni effects. Specifically, this approach takes into account that potential alumni effects are not limited to existing regulatory restrictions but may last for a period of time that exceeds currently required cooling-off periods. However, we also use a cooling-off period required in some member states of the European Union in an additional analysis.
- ⁶ However, our results also hold if we treat these AFA as unaffiliated ex-auditors.
- ⁷ We do not differentiate between former auditors who have recently or not recently left the audit firm with regard to this variable because there is no case in our sample in which an executive has left the audit firm a rather short period of time ago. More specifically, the executive with the most recent audit experience has left the audit firm 13 years ago. This is primarily due to the fact that German executives normally have worked for a rather long period in other management positions for the respective company before they are appointed to the executive board.
- ⁸ Prior studies (e.g., DeFond et al., 2005) consider a member of the AC to be an accounting expert if the respective person has gained professional experience as a chief financial officer, certified public accountant, auditor, controller, or in another major accounting position.
- ⁹ Companies that are listed in Germany but domiciled in another jurisdiction have been excluded because foreign companies are not subject to the DCGK and other German corporate governance rules. Therefore, these companies are not comparable with companies domiciled in Germany, particularly with regard to their ACs.
- ¹⁰ Descriptive statistics are based on data winsorized at the 1st and 99th percentiles.
- ¹¹ However, it has to be considered that Carey and Simnett (2006) use a 2% threshold, while we use a 3% threshold (see endnote 4).
- ¹² We control for potential effects of AFA-company matching on our main results by using the entropy balancing approach described by Hainmueller (2012) (see section 7.4).
- ¹³ In contrast, we do not find *AlumnusCPAshort* to be significantly associated with the absolute amounts of our abnormal accruals measures. Overall, the finding that *AlumnusCPAshort* is negatively and significantly associated with signed abnormal accruals but not significantly associated with absolute abnormal accruals is likely due to auditor conservatism (Kim, Chung, & Firth, 2003). Scholars have demonstrated and argued that most audit adjustments are income-reducing and that managers' income-decreasing accounting choices are less closely monitored by auditors (e.g., Kim et al., 2003; Kinney & Martin, 1994). Thus, auditors seem to have a general preference for conservative accounting practices. AFA (who are former auditors as well) serving on the AC, in turn, should be likely to support the company's auditor in preventing the application of income-increasing accounting choices and requiring income-decreasing accounting choices. As only the magnitude of positive abnormal accruals but not the magnitude of negative abnormal accruals is reduced this way (the magnitude of negative abnormal accruals should even be increased), there is no significant association between *AlumnusCPAshort* and absolute abnormal accruals.
- ¹⁴ This percentage is calculated as follows (also see Carcello & Li, 2013): Coefficient on test variable * probability of a small profit * (1 - probability of a small profit). The mean probability of reporting a small profit is 24.7% in our sample (see Table 2). The coefficient on the test variable in the earnings benchmark test model is -0.827 (see Table 5). $-0.827 * 0.247 * (1 - 0.247) = -0.154$.
- ¹⁵ Time-related homogeneity and heterogeneity are also likely to explain why Basioudis (2007) finds a time dependence of alumni effects, while other studies that focus on AFA serving as executives (e.g., Dowdell & Krishnan, 2004) do not. Similar to our analysis, Basioudis (2007) considers a broader range with regard to the time of absence from the

audit firm, while, for instance, Dowdell and Krishnan (2004) only consider AFA who have left their previous employers less than 5 years ago.

¹⁶ As an additional robustness test, we also rerun our regressions with modifications to our dependent variables and control variables. For instance, we use abnormal accruals calculated in line with the balance sheet approach instead of abnormal accruals calculated using the cash flow statement approach (see Hribar & Collins, 2002), Altman's (1968) Z-Score instead of *Leverage* to proxy for a company's financial condition, and the natural logarithm of sales instead of *FirmSize* to capture company size. Using the alternative dependent and control variables, our results remain largely unchanged.

¹⁷ We cannot use the earnings benchmark test model in this additional analysis, as our probit model is inestimable using the alternative versions of *AlumnusCPAshort* because the alternative versions of *AlumnusCPAshort* are equal to zero for all companies that are identified as reporting small profits.

¹⁸ Our statistical software fails to perform a weighted probit regression following entropy balancing. Thus, we cannot reestimate the model in which the earnings benchmark test variable (AQCS) is the dependent variable.

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APPENDIX A | EMPIRICAL DEFINITIONS OF VARIABLES

Variables	Empirical definition	Data source
<i>Dependent variables and test variable</i>		
AQJ	= Value of abnormal accruals based on the model by Jones (1991)	CGa
AQDSS	= Value of abnormal accruals based on the model by Dechow et al. (1995)	CG
AQKLW	= Value of abnormal accruals based on the model by Kothari et al. (2005)	CG
AQCS	= 1 if a company's net income scaled by total assets is between 0% and 3%; and 0 otherwise	CG
AF	= Natural logarithm of audit fees paid to the auditor	FSb
<i>AlumnusCPAshort</i>	= 1 if a former auditor who is affiliated with the client company's incumbent audit firm and has recently (i.e., less than 9 years ago) worked for this audit firm is present on the client company's AC; and 0 otherwise	CVc, PASd
<i>Controls for AC characteristics</i>		
<i>AlumnusCPAlong</i>	= 1 if a former auditor who is affiliated with the client company's incumbent audit firm but has not recently (i.e., 9 or more years ago) worked for this audit firm is present on the client company's AC; and 0 otherwise	CV, PAS
<i>UnaffCPAshort</i>	= 1 if a former auditor who is not affiliated with the client company's incumbent audit firm but has recently (i.e., less than 9 years ago) worked for another audit firm is present on the client company's AC; and 0 otherwise	CV, PAS
<i>UnaffCPAlong</i>	= 1 if a former auditor who is not affiliated with the client company's incumbent audit firm and has not recently (i.e., 9 or more years ago) worked for another audit firm is present on the client company's AC; and 0 otherwise	CV, PAS
<i>ExecAlumnusCPA</i>	= 1 if a former auditor who is affiliated with the client company's incumbent audit firm is present on the client company's executive board; and 0 otherwise	CV, PAS

(Continues)

Variables	Empirical definition	Data source
%OtherExperts	= Number of accounting experts (as defined by prior studies, e.g., DeFond et al., 2005) serving on the AC who are not former auditors divided by the total number of AC members	CV, PAS
AveAddDirectorships	= Average number of additional directorships of AC members	FS
ACSize	= Number of members the AC has	FS
ACMeetings	= Number of meetings held by the AC	FS
<i>Controls for client characteristics and characteristics related to the audit engagement</i>		
FirmSize	= Natural logarithm of total assets	CG
Loss _{t-1}	= 1 if the company has reported a loss in the year prior to the year of interest; and 0 otherwise	CG
CFO	= Operating cash flow, divided by total assets	CG
Leverage	= Ratio of year-end total debt to total assets	CG
SalesGrowth	= Percentage of annual growth in total sales	CG
PPEGrowth	= Percentage of annual growth in property, plant, and equipment	CG
Big4	= 1 if the company is audited by a Big 4 auditor; and 0 otherwise	AR ^e
Switch	= 1 if the audit engagement is a first-year audit; and 0 otherwise	AR
BTM	= Ratio of book value of equity to market value of equity	CG, WS ^f
Issuance	= 1 if the company has issued equity; and 0 otherwise	CG
InvRec	= Sum of inventory and receivables, divided by total assets	CG
Segments	= Natural logarithm of (business segments + 1)	FS
Subsidiaries	= Square root of the number of subsidiaries	FS
Loss _t	= 1 if the company has reported a loss in the year of interest; and 0 otherwise	CG
ROA	= Net income before extraordinary items, divided by total assets	CG
LQD	= Ratio of current assets to current liabilities	CG
Index	= 1 if the company is listed on the prime German stock index (i.e., DAX); and 0 otherwise	DB ^g
Cross-listing	= 1 if the company is cross-listed on the New York Stock Exchange; and 0 otherwise	NY ^h
FYEnd	= 1 if the company's fiscal year ends on the most common fiscal year-end (i.e., December 31 in Germany); and 0 otherwise	FS
NAF	= Ratio of non-audit fees to total fees	FS
<i>Further variables used in tables</i>		
RawLength	= Raw length of time (in years) since AFA have left their previous employers	CV, PAS
TA	= Income before extraordinary items minus operating cash flows, scaled by lagged total assets	CG
Assets	= Current period's total assets	CG
ΔSales	= Change in total revenues, scaled by lagged total assets	CG
ΔAR	= Change in total receivables, scaled by lagged total assets	CG
PPE	= Property, plant, and equipment, scaled by lagged total assets	CG
Interactions	= Interactions between year indicator variables and 1/Assets, (ΔSales - ΔAR), and PPE	CG

^aCompustat Global Database^bCompanies' financial statements^cAC members'/executives' CVs^dOther publicly accessible sources^eAudit reports^fWorldscope Database^gDeutsche Börse Group^hNew York Stock Exchange