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Internal auditing's role in preventing and detecting fraud: An empirical analysis

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Internal auditing plays a pivotal role in preventing and detecting fraudulent activities. However, the orientation and role of internal auditing in dealing with fraud risk can vary significantly across different companies. This study examines the relationship between the internal audit function (IAF) and fraud, providing new insights into the current practices of internal auditing. Using a survey dataset comprising responses from 275 Chief Audit Executives across Germany, Switzerland and Austria, we investigate factors that correlate with an increased propensity for IAFs to engage in fraud prevention and detection. Our findings suggest that a robust corporate governance environment significantly influences the extent to which the IAF is involved in preventing and detecting fraud. Shedding light on the positioning of internal auditing between management and the audit committee with respect to fraud, our results show that increased IAF involvement with management positively affects the level of activities to prevent and detect fraud, while increased IAF involvement with the audit committee has the opposite effect. Furthermore, we find that the propensity of IAFs to engage in fraud prevention and detection increases when the IAF applies technology-based auditing techniques for risk identification. Our results have implications for building appropriate protection against the steadily increasing risk of fraud within organizations, while holistically addressing the ambiguity regarding the responsibility for preventing and detecting fraud.

KEYWORDS

corporate governance, fraud, internal auditing

1 | INTRODUCTION

In today's increasingly complex and demanding organizational structures, fraud is becoming more prevalent. This rise underscores the importance of maintaining and developing robust protections against fraud risk. Uncertainty and disruption often lead to established processes and controls being circumvented, creating fertile ground for fraud (Karpoff, 2021). Experts, such as the president and CEO of the Association of Certified Fraud Examiners (ACFE), anticipate a

significant increase in fraud in the coming years (Dorris, 2021), while large accounting firms emphasize the need for immediate responses to this heightened risk exposure through reports and white papers.

The question of who is responsible for preventing and detecting fraud regularly comes up (e.g., Baker Tilly, 2013). The responsibility often falls on the IAF, the third line in the Three Lines Model (TLM) (e.g., Eulerich, 2021). The IAF provides assurance and insight on governance adequacy and risk management effectiveness (e.g. Eulerich & Lohmann, 2022). While tips from various parties, such as employees,

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vendors or customers, detect most fraud cases, the IAF is of utmost importance for organizations in dealing with the risk of fraud (ACFE, 2020).¹ The presence of an IAF can reduce median losses from fraud by 33% (ACFE, 2022). The IAF serves as a central control mechanism to achieve compliance and prevent fraud (Friedberg, 1998; Ma'ayan & Carmeli, 2016).

Most research on the antecedents and determinants of corporate fraud focuses on organizational-level factors (Mutschmann et al., 2021). Past studies have assessed several factors critical to the relevance of internal auditors in fraud prevention or detection (Kabuye et al., 2017; Khelil et al., 2016; Norman et al., 2010). The profession of internal auditing has emphasized the role of internal auditing through guidance aimed at improving its effectiveness (The IIA, 2019). However, existing research on the role of internal auditing in fraud risk management is limited for several reasons. Few studies present empirical evidence on factors associated with the role of internal auditing in managing fraud risk. Most studies use experimental methods (Asare et al., 2008; Norman et al., 2010) or have limited sample suitability (Drogalas et al., 2017; Kabuye et al., 2017; Khelil et al., 2016). Prior studies often overlook recent developments, such as the growing importance of innovative IT tools or new whistleblowing legislation. Most research focuses on specific industries or countries with unique characteristics, such as high corruption levels. Consequently, previous research does not offer generalizable results, and there is no consensus on the concept of the role of internal auditing in managing fraud risk and its determining factors. This lack of consensus is surprising, given that parts of the Institute of Internal Auditors' (IIA) global International Professional Practice Framework and anecdotal evidence directly link internal auditing to fraud prevention and detection.

In response to Mutschmann et al.'s (2021) call for further research, we aim to address this research gap by conducting a broader exploration of the potential driving factors that may influence the propensity of Internal Audit Functions (IAFs) to manage fraud risk. With the increasing importance of fraud risk management, the purpose of the study is twofold. Firstly, we examine the circumstances and regulations that shape the role of the IAF in managing such unethical practices. Secondly, we aim to deepen the understanding of the main drivers that shape the IAF's role in this context.

We analyse potential drivers using ordered logistic regression models on a diverse survey data set, comprising responses from 281 chief audit executives across three European countries. Our findings suggest a strong governance environment and technology-based auditing techniques positively correlate with the IAF's role in fraud risk management. Interestingly, additional meetings with management strengthen the IAF's role in managing fraud risk, while more meetings with the audit committee show a negative association. Identifying these drivers can help organizations bolster fraud protection and highlight the importance of internal auditing.

The paper is structured as follows: section 2 reviews relevant literature and develops hypotheses. Section 3 describes the research method and section 4 presents the results. The final section discusses the results, connects them to existing research and theory and offers

concluding remarks including implications for future research and potential limitations of the study.

2 | LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 | The current landscape of fraud risk management

As a result of ongoing corporate fraud scandals, the need for good corporate governance in terms of effective fraud risk management has become increasingly important. Prior scandals revealed unseen issues within businesses and the accounting profession, leading to significant damage to the reputation of the entire profession (Free, 2015). The effects were devastating as the public's confidence in the financial markets was destroyed. The consequence was the implementation of the Sarbanes-Oxley Act in 2002, which had the main objective to regain public confidence by creating a quasi-public institution for oversight, regulating auditing and involving auditors more in enforcing existing laws against theft and fraud by corporate officers (Coates & Srinivasan, 2014; Green, 2004; Ma'ayan & Carmeli, 2016). At the same time, penalties for fraudulent financial reporting have risen significantly to meet society's perception of fraudulent behaviour (Coram et al., 2008). The ongoing existence and reoccurrence of fraud cases, despite changes and adjustments in regulation, emphasize the importance for companies to strive for effective handling of fraud.

The IIA (2019) defines fraud² as "any illegal act characterized by deceit, concealment, or violation of trust" (p.1). Fraud is not unique to specific types of organizations meaning that every organization can potentially become a victim of fraud. The Association of Chartered Certified Accountants (2021) highlights that fraud can potentially impact not only a firm's reputation but also its bottom line. Recent reports and publications emphasize the increasing prevalence and importance of fraud, which underscores the necessity to establish proactive responsibilities in relation to fraud (Holm et al., 2012). The role of internal auditing is generally described as a line of defence that has a pivotal responsibility in monitoring risks as well as preventing and detecting fraud.³ Still, whenever it comes to fraud cases, the focus shifts to a company's overall corporate governance. Given that fraud is one of the top risks organizations face, internal auditors, as a driver of effective risk management, are frequently expected to take responsibility for preventing,⁴ deterring and detecting fraud.

Internal auditing's role in fraud prevention and detection becomes clearer when considering the core principles as defined by the IIA. According to the IIA (2021), internal auditing is an independent function that provides objective assurance and consultation to improve an organization's operations. It applies a systematic, disciplined approach to evaluate and enhance the effectiveness of risk management, control and governance processes. This role positions internal auditing as a key player in adding value to an organization, particularly through its efforts in fraud prevention and detection. As such, internal auditing

can significantly contribute to operational performance by increasing the effectiveness of fraud prevention and detection measures (Asare et al., 2008; Norman et al., 2010). Besides, internal auditing can indirectly create value by fostering an ethical culture thereby preventing fraud (Ma'ayan & Carmeli, 2016).⁵ There are several Standards published by the IIA addressing the role of internal auditors in monitoring, preventing and detecting fraud risks and directing those risks in audits and investigations which are portrayed in Appendix A. These encompass, for example, the required knowledge for evaluating fraud risk, reporting about fraud and the consideration of fraud when developing engagement objectives.

We refer to the framework by Murphy and Dacin (2011), which largely builds upon the fraud triangle, a model that predicts the likelihood of fraud within an organization by considering three factors: opportunity, rationalization and pressure. This framework serves as a theoretical foundation for illustrating the relevance of internal auditing activities. The preventive and detective work of internal auditors primarily addresses the opportunity component within this framework, as internal auditors are expected to reduce future opportunities for fraud by identifying ineffective controls. While most existing research has focused on organizational-level characteristics affecting the perceived opportunity to commit fraud, recent studies have started to explore the other two components of the fraud triangle, which are mostly related to individual characteristics (Mutschmann et al., 2021). The following steps within the respective pathways of the framework are related to awareness, and intuition coupled with rationalization and reasoning. Internal auditors are expected to promote an ethical culture, which may lead to increased awareness of what constitutes fraud and its related severity. In the long run, this is expected to clarify that fraud is undesirable within organizations so that employees are mindful that fraud is unacceptable and that its costs exceed its benefits. Given an individual's awareness of fraudulent behaviour, both intuition and reasoning may be altered through further anti-fraud means such as an anti-fraud guideline, specific training or effective whistleblowing channels. Overall, these pathways offer a demonstration of internal auditors' efforts toward preventing and detecting fraud (see Stevens et al., 2005 for insights into how ethics impacts decision-making under pressure). Internal auditing mainly addresses the three main decision points issues and thereby fighting fraud (Figure 1).

While external auditors are often held responsible for managing fraud, their effectiveness is potentially hampered by their detachment from the firms they audit. Their main responsibility lies in detecting material misstatements in financial reports caused by fraudulent activities. However, this focus restricts their scope, potentially limiting their overall effectiveness in fraud management.⁶ DeZoort and Harrison (2018) confirm the mentioned separation of duties by concluding that external auditors perceive their responsibility as predominantly linked to fraud in financial statements. Conversely, internal auditors believe they bear equal responsibility across all types of fraud. This gap between prescribed and perceived responsibilities underscores the complexity of delineating fraud detection and management roles. Considering these constraints, and the division of duties within an

organization, a large part of fraud risk management falls under the purview of the IAF.⁷ Yet, as Grossi et al. (2007) revealed, varying organizational structures can lead to different responsibilities.

Although the expectation regarding the role of internal auditing in managing fraud appears to be clear-cut, the frequency of fraud occurrences and the varying relevance of fraud to the IAF suggest that there are specific conditions needed for the IAF to fulfil its role effectively in fraud risk management. As a result, the research question for our study is:

RQ: What are the factors that influence the focus of internal auditors on fraud prevention and detection?

2.2 | Research hypotheses

2.2.1 | Governance environment

Recent fraud scandals revealed profound weaknesses in corporate governance structures (Nasir et al., 2019). As the quality of corporate governance appears to be of crucial relevance when it comes to fraud, regulators have enacted rules intended to strengthen the quality of corporate governance (Bhagat & Bolton, 2019). Agency theory suggests that the likelihood of fraud depends on specific internal governance structures of organizations (Dalton et al., 2007). Accordingly, managerial misbehaviours are found to be prevented through effective corporate governance systems (Liu, 2016). One way that companies are responding to these new rules is by implementing governance frameworks such as the TLM.⁸ The TLM aids in structuring the responsibilities of key players and providing organizations with effective structures as well as processes for achieving their objectives and supporting strong governance and risk management (The IIA, 2020). The model ensures alignment of all organizational activities and goals with the interests of various internal and external stakeholder groups. It also underscores the positioning of internal auditing and the increasing complexity of today's business world. It underscores the importance of regular communication and interaction among these entities to ensure the internal audit's work aligns with the organization's strategic and operational needs. Prior research finds that an inadequate positioning of the IAF can significantly change or even limit internal auditing's value-adding work (Caplan & Kirschenheitner, 2000). However, recent literature challenges the role of internal audit as a thriving governance tool, emphasizing the risk of overreliance and the complexity of ethical issues (Roussy & Rodrigue, 2018).

While the TLM is targeted at overarching organizational structures, whistleblowing is a key governance mechanism at the micro level that is currently experiencing a major upswing, mainly driven by the change in the regulatory environment within the European Union (EU) and the United States (see Vandekerckhove (2021) for a discussion on the former). Whistleblowing channels in organizations have a dual impact. Firstly, they function as a critical tool for fraud detection, providing individuals with a means to report

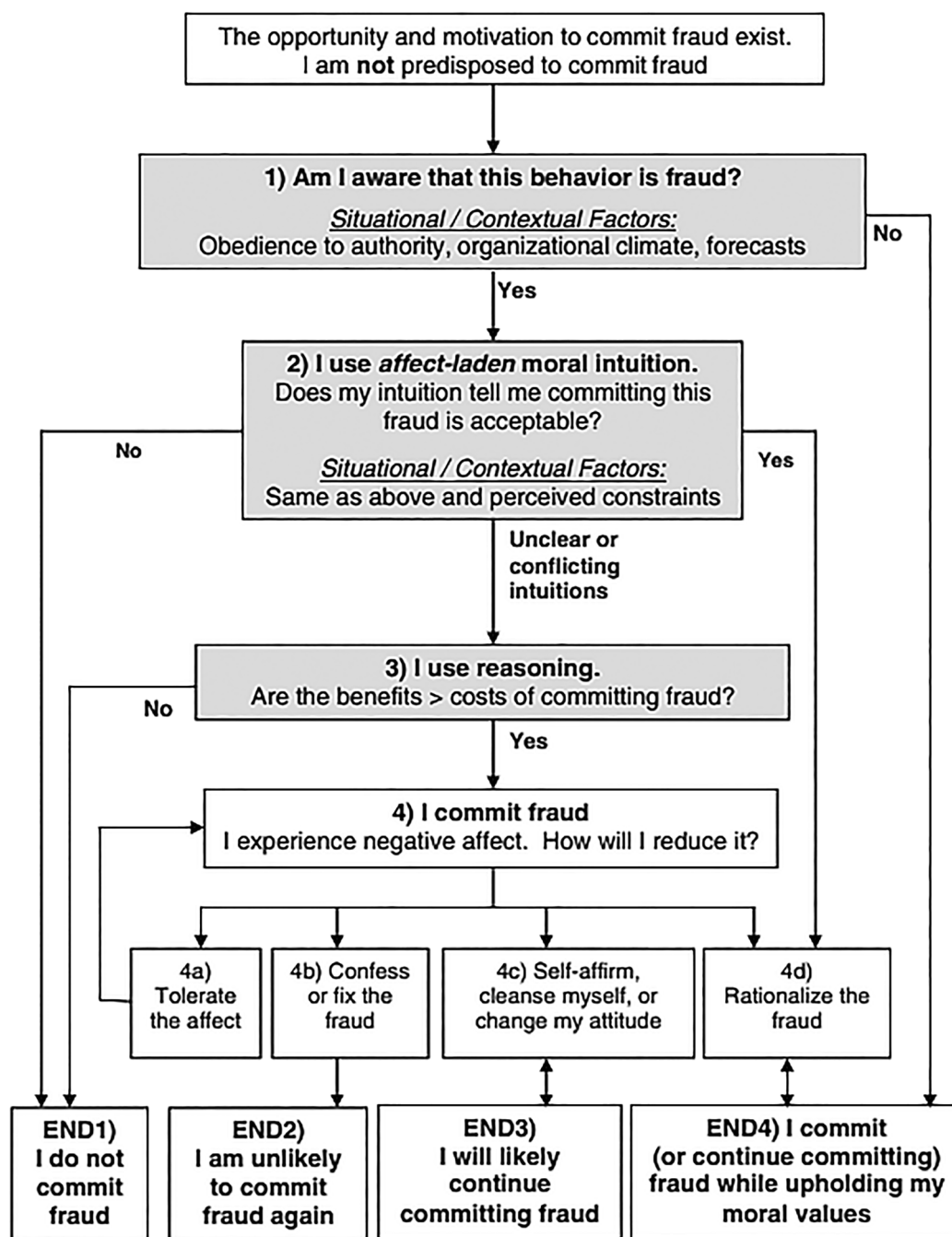


FIGURE 1 The framework: psychological pathways to fraud (Murphy & Dacin, 2011).

fraudulent activities (Dyck et al., 2010). Essentially, they offer a conduit for individuals to sound the alarm when they suspect or observe fraud. Secondly, these channels can also play a significant role in fraud prevention (Johansson & Carey, 2016). The presence of effective whistleblowing systems can signal the organization's stance against fraud, emphasizing the risks and consequences for potential fraudsters. It creates a perception of increased surveillance and heightened risk of exposure, thereby potentially deterring fraudulent behaviour. Moreover, the establishment of whistleblowing channels can enhance the organization's overall ethical climate. It encourages not only employees but also individuals external to

the organization to report suspected fraud (Johansson & Carey, 2016; Keenan, 2000). Therefore, the inclusion of these channels can lead to a more transparent, vigilant and ethically inclined environment.

Considering the escalated complexity of fraud cases and the necessity for defined structures and authority within organizations, we define a strong governance environment as one incorporating governance models like the TLM and robust whistleblowing mechanisms. Such an environment, besides assisting in fraud detection, significantly shapes the organization's overall ethical climate. This specific understanding guides us to the following hypothesis:

H1. A strong governance environment is associated with internal auditing taking a more distinct role in fraud prevention and detection.

This expectation, however, is not without tension. A strong governance environment, characterized by structured governance models like TLM and robust whistleblowing mechanisms, guides internal auditing to take a more streamlined role in fraud prevention and detection. Conversely, in a weak governance environment, where these mechanisms are deficient or absent, internal auditing may be compelled to adopt a more proactive and distinct role in fraud prevention and detection due to potentially higher instances of fraud.

2.2.2 | Independence and objectivity

The concept of objectivity is fundamental to effective internal audit services, where an unbiased mental attitude is crucial (Reding et al., 2013). This objectivity assumes heightened importance when the IAF serves as a governance mechanism, ensuring effectiveness and credibility (Messier et al., 2011).

Even though objectivity is anchored in the definition of internal auditing, certain factors could potentially compromise the objectivity of IAFs. Among the most significant is the relationship IAF shares with different stakeholders within an organization. Prior research reveals that the relationship with different stakeholders is an important predictor of the output generated by the work of internal auditors (Eulerich et al., 2017). This output is also influenced by internal dynamics such as reporting lines (Rose et al., 2013), the utilization of the IAF as a management training ground (Hoos et al., 2018) and sourcing decisions (Ahlawat & Lowe, 2004).

Critically, the objectivity of the IAF is questioned when senior management wields excessive influence over them (Messier et al., 2011; Rose et al., 2013). For instance, senior management's expectations can significantly influence internal auditing, potentially shifting the focus away from internal-control-based activities to more operationally focused audits and consulting-related services (Abbott et al., 2010; Sarens & De Beelde, 2006). This creates a conflict of interest and competing demands regarding the allocation of resources and the scope of IAF activities (Hermanson & Rittenberg, 2003).

This tension is illustrated in Norman et al.'s (2010) finding that internal auditors feel more threatened by management when they report directly to the audit committee, subsequently decreasing the assessment of the risk of fraud. This hints at a potential ethical conflict inherent to the IAF (Khelil et al., 2016). Despite this challenge, the importance of the audit committee in proactively promoting IAF independence is emphasized (Jaggi, 2022). Objectivity is essential for an internal auditor's unbiased assessments, judgments and decisions, though (Hazami-Ammar, 2019).

Taken together, these considerations reveal a nuanced relationship between the IAF's objectivity and independence and its ability to

manage fraud effectively. The following hypothesis is not without tension. While one would naturally anticipate that when the IAF is permitted to maintain its independence and objectivity, it will take on a more defined role in fraud prevention and detection, previous findings (e.g., Norman et al., 2010) offer a different perspective. They highlight that the IAF might feel threatened by management, thereby decreasing the assessment of the risk of fraud.

Taking into account these conflicting viewpoints, we put forward our hypothesis:

H2. More objective and independent IAFs are positively associated with internal auditing taking a more distinct role in fraud prevention and detection.

2.2.3 | Technology

Technological innovations not only enhance the efficiency of internal auditing (Bierstaker et al., 2014; Rakipi et al., 2021) but also amplify the effectiveness, especially in the context of fraud detection (Islam & Stafford, 2021; Li et al., 2018). Audit analytics and data mining approaches are essential tools for allocating resources effectively and reducing the risk of internal fraud in a company.

The utility of technology is extensively explored in both academic literature and practitioner reports, highlighting the use of technological tools to uncover insights, increase fraud detection and optimize the use of physical resources (e.g., CaseWare, 2022; Chandrakala et al., 2020; Green & Choi, 1997; Sarno et al., 2015; The IIA, 2022). The use of data analysis techniques has been linked to increased efficiency, expanded audit coverage (van der Nest et al., 2018) and enhanced audit quality (Moffitt et al., 2018).

The value of technology for IAFs is twofold. Firstly, technology enables a risk-based approach, enhancing the detection of anomalies and red flags. The advancement of technology has given rise to methodologies like continuous auditing, which can significantly improve the effectiveness of risk-based audit planning - a fundamental approach in modern internal auditing (Eulerich et al., 2020). A risk-based approach implies a focus on areas with higher risks or anomalies that have been identified through data analysis, which is only feasible with advanced technology. This approach allows auditors to systematically identify, assess and address risks, which may be particularly beneficial for fraud prevention and detection. Secondly, improved resource allocation facilitated by technology allows a wider range of internal audit tasks. The efficiency gains from using technology free up resources, which can then be allocated to more complex tasks or thorough investigations of anomalies, ultimately leading to higher audit quality.

In light of these considerations, we propose our third hypothesis regarding the importance of technological advancements in IAFs:

H3. A high level of technological development in IAFs is positively associated with internal auditing taking a more distinct role in fraud prevention and detection.⁹

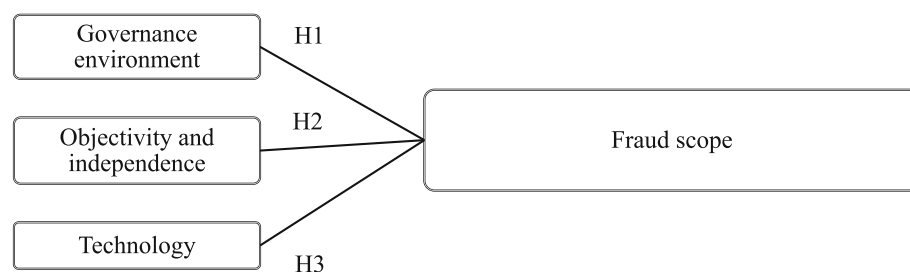


FIGURE 2 Conceptual framework illustrating potential drivers.

With the advancement of technology, the nature of fraud itself is also changing, becoming more sophisticated and complex. This means that even as technology enhances the IAF's fraud detection capabilities, new challenges continue to emerge. Thus, the interplay between technological development, human judgment and evolving fraud schemes creates a dynamic and tense landscape in which IAFs operate. This hypothesis is, therefore, not without tension and reflects a nuanced understanding of the complexities inherent in modern internal auditing.

Our conceptual framework that illustrates the potential drivers of internal audit functions' focus on fraud is presented in Figure 2.

3 | METHODOLOGY

3.1 | Participants and procedure

Our study is based on data from a comprehensive survey of chief audit executives across Germany, Austria and Switzerland. It was jointly conducted by the respective chapter of the IIA.¹⁰ The survey data was collected in early 2020. In total, 4,009 chief audit executives were invited to participate, regardless of their IIA membership status.

The questionnaire comprises over a hundred questions, covering various areas of internal auditing. These areas include the arrangement of internal auditing, staffing, corporate governance and fraud, compensation and success factors for the IAF.¹¹ We received 505 responses, resulting in a response rate of 12.6%. This rate aligns with other studies in the field of internal auditing (e.g., Abbott et al., 2016; Carcello et al., 2005).

We checked the dataset for outliers and removed any identified outliers within the selected variables for the empirical models. For our empirical approach, we only included observations that provided complete answers to all relevant variables. The size of the dataset is favourable for statistical power, given the large number of observations from a wide variety of companies in terms of size, complexity and industries.

3.2 | Model

To assess the effects of potential drivers on fraud risk management, we applied an ordered logistic regression model. The regression equation is as follows:

$$\text{fraud_scope} = \beta_1 \text{corporate_governance} + \beta_2 \text{AC} + \beta_3 \text{management} + \beta_4 \text{technology} + \text{CONTROLS} + \varepsilon$$

The dependent variable, referred to as *fraud_scope*, represents the extent to which the IAF currently focuses on preventing and detecting fraud, measured on a scale from one to five, with five indicating a higher focus. The model includes four independent variables and a vector of control variables to analyse possible drivers and test the hypotheses. To capture the characteristics of the underlying corporate governance structures (H1), we constructed a composite measure using Principal Component Analysis (PCA). This approach aligns with the methodology articulated by Allee et al. (2022) and resonates with the application of PCA within the realm of internal audit research, as demonstrated by D'Onza et al. (2020). The Kaiser-Meyer-Olkin statistic of 53.27% aligns with previous research approaches (e.g., Carter et al., 2019; Mahama & Cheng, 2013). The analysis revealed that only the first component with an eigenvalue larger than one (eigenvalue of 1.31) could be extracted. This component, comprised of four corporate governance-related variables, explains 32.85% of the total variance. The factor loadings for this component range from 0.089 to 0.658, underscoring the diverse yet substantial contributions of each variable to the extracted component.

To test the second hypothesis, we include two variables related to independence and objectivity represented by both key stakeholder groups, management and audit committee. We anticipate diverging interests, potentially placing internal auditors in a position where they face the serving-two-masters issue. Accordingly, we created two dummy variables, *AC* and *management*, denoting whether the IAF has additional personal meetings with the audit committee and management, respectively.¹² We expect the signs of the two variables to be opposite with a negative sign for *AC*. However, since the influence of *management* and *AC* is strongly context-specific (Jaggi, 2022), a prediction for the direction of the coefficient is not feasible. As per prior literature, we expect a positive sign of *management* as this may reduce the distress internal auditors feel when reporting fraud. With respect to the principal-agent theory, the occurrence of fraud can be understood as a failure of the agent (see Zardkoohi et al. (2017) for insights on opportunistic behaviour in principal-agent relationships). Therefore, it seems reasonable to assume that management, as an agent, attributes high priority to the prevention and detection of fraud.

To investigate the relationship between technological advancement and fraud management, our model includes variable *technology*.

This variable assesses the extent to which a technology-based auditing approach aids in identifying new risks, rated on a scale from one to five. We posit that the identification of new risks through technology signifies an innovative approach to enhancing efficiency and effectiveness. Consequently, we anticipate a positive coefficient for the *technology* variable.

The model also incorporates control variables to test and, ideally, statistically nullify their impact on the dependent variable. Prior research consistently demonstrates a significant association between a company's listing status and disclosure levels (e.g., Firth, 1979). Therefore, we include *listing* as a dummy variable in our empirical model to account for systematic differences between listed and non-listed organizations. Similarly, we include the size of the IAF as a control variable, given its potential to fundamentally alter the nature of the IAF. Prior studies indicate an association between the size of the IAF, audit activities and other firm characteristics, such as affiliation with the financial sector (Alhajri, 2017). This is also related to the approach of Sarens and Abdolmohammadi (2011) who state that larger IAFs imply more staff in the company whose primary responsibility is to actively monitor the company. Accordingly, the control variable *iaf_size* is included in the model to control for organizational characteristics related to the IAF's size in terms of the number of employees within the IAF. Incorporating the organizational size, *org_size*, depicted by the number of employees, aligns with prior studies such as Carcello et al. (2005), who found a positive association between firm size and the IAF budget, and D'Onza et al. (2020). The variable *finance* is included as a dummy variable referring to the company's industry. Prior literature suggests that the nature of the industry leads to different arrangements of IAFs (Carcello et al., 2005; Sarens & Abdolmohammadi, 2011) as well as a more pronounced risk for fraud (Baucus & Near, 1991). The financial industry, in particular, is known for its unique characteristics and high regulation, often leading to larger IAF budgets. Geographical differences in fraud and attitudes towards its prevention and detection necessitate the inclusion of country-related control variables. Generally, the exposure to fraud risk cannot be abstracted from the cultural context of fraud. Mihret (2014) points out that national culture can provide a useful analytical lens to analyse fraud risk against the cultural context, which is why we include both *Germany* and *Austria* as control variables. In addition, we have included *diversity*, measured by the presence of foreign nationalities in the IAF, as a control variable. Prior research in internal auditing controls for the IAF's *age*, as different levels of IAF maturity are linked to varying tasks. This inclusion allows us to account for these characteristics in our model.¹³

4 | RESULTS

4.1 | Descriptive statistics

Descriptive statistics on the model variables are presented in Table 1. It gives initial insights regarding the data characteristics for the respondents and thereby helps to identify important characteristics of

the respondents' internal audit departments as a foundation for the empirical model.

The dependent variable, *fraud_scope*, has a mean value of 3.89 and a standard deviation of 0.95. Regarding the relationship with the audit committee, 40% of respondents reported additional meetings. Meanwhile, a significant 89% indicated increased interactions with management, suggesting a higher frequency of supplemental meetings with management than with the audit committee. The respondents appear moderate in terms of their technology usage for risk identification given a mean of 3.09 for the variable *technology* with a standard deviation of 1.02.

The average value for the variable *listed* is 0.41, which translates to 41% of the respondents' organizations being listed. The number of full-time equivalents within the internal audit department as a control variable, after log transformation, ranges from 0.00 to 5.99 and has a mean of 1.68. The size of the entire organization, log-transformed, averages at 7.65. Moreover, within the internal audit departments, our data reveals that around 32% of the teams include members of foreign nationalities, as indicated by a mean of 0.31. The organizations of 36% of respondents operate in the financial industry. Meanwhile, our sample includes 65% of respondents from Germany and 19% from Austria. The mean age in the sample is 25.8.

Table A3 shows the correlation matrix for the presented empirical analysis. The Pearson correlation matrix shows no high levels of correlation between any of the independent variables of the model. This is supported by tolerance and variance inflation factors values which are illustrated in Table A4. The results show that the VIF values corresponding to the explanatory variables have a mean of 1.66. Similarly, the tolerances are low, with a mean of 0.60. This signifies minimal multicollinearity, affirming the validity of the proposed model.

4.2 | Regression results

Table 2 presents the results of the ordered logistic regression model used to test our hypotheses. The overall model is statistically significant ($p < 0.001$).

Our analysis reveals that a robust *corporate governance* environment is significantly positively associated with the dependent variable (p -value < 0.01), confirming our first hypothesis. The results for the variables representing personal meetings with the audit committee and management align with our expectations and support our second hypothesis. Specifically, additional private meetings with the audit committee are negatively associated with the dependent variable (p -value < 0.01), while additional private meetings with management are positively associated (p -value < 0.05). These findings echo those of Norman et al. (2010) and highlight the potential conflicts of interest arising from the dual-reporting structure of internal audit functions (Abbott et al., 2010). As hypothesized, the use of technology for risk identification is another significant driver of the dependent variable (p -value < 0.01), supporting our third hypothesis.

Among the control variables, *iaf_size* is statistically significant (p -value < 0.10) with a negative coefficient, while *Austria*, *age* and

TABLE 1 Descriptive statistics.

Variable	Mean	Std. dev.	Min	p25	Median	p75	Max
Dependent variable							
<i>fraud_scope</i>	3.89	0.95	1.00	3.00	4.00	5.00	5.00
Independent variables							
<i>corporate_governance</i>	0.08	1.10	−2.79	−0.68	−0.01	1.07	1.81
AC	0.40	0.49	0.00	0.00	0.00	1.00	1.00
Management	0.90	0.31	0.00	1.00	1.00	1.00	1.00
Technology	3.10	1.02	1.00	3.00	3.00	4.00	5.00
Control variables							
Listed	0.41	0.49	0.00	0.00	0.00	1.00	1.00
<i>iaf_size</i>	1.68	1.13	0.00	0.69	1.61	2.48	5.99
Finance	0.36	0.48	0.00	0.00	0.00	1.00	1.00
Germany	0.66	0.48	0.00	0.00	1.00	1.00	1.00
Austria	0.19	0.40	0.00	0.00	0.00	0.00	1.00
Age	25.62	20.58	0.50	11.00	20.00	30.00	100.00
Diversity	0.32	0.47	0	0	0	1	1
<i>org_size</i>	7.66	1.91	0.40	6.33	7.65	8.85	11.96

TABLE 2 Estimated results for the regression model.

Variable	Coefficient
<i>corporate_governance</i>	0.608*** (0.127)
AC	−0.800*** (0.286)
Management	0.932** (0.405)
Technology	0.321*** (0.108)
Listed	−0.142 (0.291)
<i>IAF_size</i>	−0.260* (0.147)
Finance	−0.487 (0.338)
Germany	0.536 (0.348)
Austria	0.977** (0.402)
Age	0.011* (0.006)
Diversity	0.099 (0.296)
<i>org_size</i>	0.213** (0.088)
Nagelkerke R ²	0.246
Number of observations	275

Note: *, **, *** indicate statistical significance at the $p \leq 0.10$, 0.05 and 0.01 levels, respectively. Standard errors are in parentheses.

org_size are statistically significant (p -value < 0.05, p -value < 0.10, p -value < 0.05, respectively) with positive coefficients.

4.3 | Sensitivity analysis

We conduct additional analyses to validate our core regression coefficient estimates. When replacing the corporate governance measure with each of the four underlying variables (corporate governance guideline, whistleblowing tips, ethics guideline, resources), we find positive and significant results, supporting the validity of our main inferences (corporate governance = 0.514**, whistleblowing = 0.524***, ethics = 0.851***, resources = 0.494***). Given that fraud risk management might depend on the industry, we add industry-fixed effects to the initial model. We control for those industries that are sufficiently represented in the sample, namely public, manufacturing and service. The results (untabulated) remain similar for this variation, offering further support for our main inferences.

We also run regression models using the same independent variables but varying the dependent variables, as shown in Table A5. One model uses a dependent variable that refers to the use of internal audit results for fraud prevention. This choice stems from the idea that a greater use of internal audit results for fraud prevention indicates an increased focus or relevance of fraud within the scope of internal auditing activities. The question uses the same five-point Likert scale as the replaced one.

In another model, we use a dependent variable that refers to whether the detection and investigation of fraud are considered a success factor for the IAF. This variable mainly relates to the attitude of those who use the audit results, thus broadening the scope of the initial model. This variable also uses a five-point Likert scale.

In a third model, we examine a variable about the extent to which fraud is taken seriously as a threat to the entire organization as a dependent variable. This variable, based on a five-point Likert scale, pertains to the company's overall risk behaviour, resulting in altered significance levels compared to the previous two models. We use this variable as a dependent variable because an increase in the degree to which fraud is taken seriously should also lead to a change in the way fraud is handled.

For these models, hypotheses 1 and 3 remain statistically significant with no substantial changes in signs. These results suggest that our findings are robust to certain variations, except for the audit committee and management variables. We infer that the influence of these two parties primarily affects the objectives of the IAF. However, the alternative fraud indicators used each reflect a different focus, which does not appear to be affected by competing interests.

Recognizing the importance of ethics in fraud, especially given the framework by Murphy and Dacin (2011), we construct another model, as shown in Table A6. This model uses the extent to which ethics is considered a success factor in assessing the work of internal auditors as a dependent variable. The independent variables in this model mostly focus on the different objectives of the IAF, expected to provide an indirect and less biased observation inference. The results show that ethics assume greater importance when asset protection is given greater value. Similar results are found for opportunity management, leadership and compliance activities. The two primary tasks of internal auditing, providing assurance and consulting, show opposing results, with only auditing showing a statistically significant outcome. This shows that the higher relevance of auditing objectives is associated with a lower relevance of ethics. As expected, the existence of a code of ethics is also reflected in the ethical alignment of internal auditing.

5 | DISCUSSION AND CONCLUSION

In light of the persistent and escalating prevalence of fraud, coupled with unclear responsibilities regarding fraud risk management, this paper explores the role of internal auditors in preventing and detecting fraud. Drawing from a sample of 505 Chief Audit Executives from Germany, Switzerland and Austria, we investigate factors associated with a higher propensity of IAFs being involved in fraud prevention and detection. Our results extend previous research on the role of internal auditors in fraud prevention and detection, particularly by highlighting the influence of robust governance environments, the interaction of IAFs with audit committees and management and the importance of technological approaches in identifying risks. Beyond this, our findings enrich the academic literature by providing a nuanced understanding of the factors associated with a higher propensity of IAFs being involved in fraud prevention and detection, thereby offering valuable insights for researchers.

We find a significant positive correlation between robust governance environments and IAFs assuming a more pronounced role in fraud risk management. This result aligns with previous research by

DeZoort and Harrison (2008) on internal auditors' personal responsibilities and Kabuye et al. (2017) on the necessity for appropriate organizational status. Therefore, the findings suggest understanding and improving the IAF arrangement within organizations and thereby suggest that stronger governance environments are more likely to constrain fraudulent activity.

We also analyse the IAFs' interaction with the audit committee and management, responding to Halbouni's (2015) call for research about both, the audit committee and management, as vital components of corporate governance potentially affecting fraudulent activities. We use a measure that goes beyond formal reporting lines. Additional meetings with the audit committee and management show statistical significance but with contrasting coefficients. This result is intriguing against the backdrop of previous research. While it seems logical that management would seek adequate protection against fraud, past research presents conflicting results. This also refers to empirical findings from Sarens and De Beelde (2006), which suggest that senior management's expectations significantly influence internal auditing. Moreover, the results underscore the divergence of interests regarding the scope of internal auditing activities, as discussed in a previous study by Eulerich et al. (2017), namely the internal audit dilemma. The finding concerning the audit committee also responds to Roussy and Rodrigue's (2018) call for more research on the interaction between the IAF and the audit committee.

Another significant finding of our study is the confirmed importance of using technological approaches for identifying risks and the increased focus on fraud prevention and detection by the IAF. This result supports the practicality of such methods. By highlighting the importance of technological approaches for the profession, practitioners may become aware of the benefits. This finding is in line with literature emphasizing the effectiveness of such means in supporting fraud investigations (e.g., Proviti Inc. (2021)).

Our study is subject to limitations. Our sample comprises responses from internal auditors from Germany, Switzerland and Austria. These countries differ in regulatory regimes and culture, both of which are important elements concerning fraud. We address this difficulty by incorporating country-fixed effects in our regression models. Another limitation is that the paper relies on an existing dataset. Therefore, the paper's objective was not considered when creating the survey questions. As a result, the selection of variables was limited to the existing dataset, which may not be entirely suitable for this study.

Our study paves the way for future research. Although our dataset includes three European countries, we believe it would be beneficial to expand the research to a broader range of countries to identify differences and validate our findings. It would also be desirable to have more diverse respondents as this study is limited to chief audit executives. In this context, it would be intriguing to compare the self-assessments of respondents with the responses of other internal auditors. This approach could be broadened by including other organizational entities capable of evaluating the work product of internal auditing. Our findings suggest the need for further research and discussion on innovative methods of fraud prevention and detection.

Specifically, a more efficient and effective approach to managing fraud is desirable, given that fraud risk management is traditionally seen as a conventional auditing activity. This could allow the profession to expand its scope and be perceived as a more supportive unit within organizations.

While the majority of research on the antecedents and determinants of corporate fraud centres on organizational-level determinants, our study is unique in its analysis of the correlates of IAF involvement in fraud prevention and detection on a larger scale. As Albrecht et al. (2008) suggest, changes in compliance and fraud detection can only succeed if they either eliminate factors contributing to fraud or assist auditors in managing fraud more effectively. Consistent with this, our study aims to facilitate more effective fraud management, thereby reducing future fraud risk. Thus, our study enhances understanding of internal auditors' roles in fraud prevention and detection, emphasizing the importance of suitable organizational structures and indirectly acknowledging the significant impact of fraud on organizations. Our study allows for the identification of a range of factors associated with a higher likelihood of IAFs participating in fraud prevention and detection. This also addresses the gap between prescribed and perceived responsibility, as highlighted by DeZoort and Harrison (2018) and the issue raised by Mutschmann et al. (2021) that fraud typically only becomes public knowledge when losses have already reached millions. Therefore, our findings are not only crucial for practitioners in the field of internal auditing seeking guidance but also for other organizational practitioners. Our results aid in detecting fraud, structuring responsibilities within organizations and contributing to an appropriate system of internal controls, asset protection and prevention of loss and reputation. Additionally, our results are pertinent for external auditors. Although ISA 240 pertains to the auditor's responsibilities regarding fraud in an audit of financial statements, it could be beneficial for external auditors to understand the specific relationship of internal auditing to fraud to enhance protection against fraud risk. This relates to the ongoing debate on whether internal auditing and external auditing are complementary or substitutable.

Despite the aforementioned limitations, our paper makes significant contributions to understanding the ethical impact and the role of internal auditors in fraud prevention and detection, thereby raising awareness of the importance of certain IAF characteristics.

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CONFLICT OF INTEREST STATEMENT

The authors have no competing interests to declare that are relevant to the content of this article. There was no funding organization. The IRB approval was received by the university. We acknowledge support by the Open Access Publication Fund of the University of Duisburg-Essen.

DATA AVAILABILITY STATEMENT

Requests for data may be made to the authors.

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ENDNOTES

- ¹ The ACFE (2020) states that 15% of the fraud cases are initially detected through internal auditing. In contrast, only 4% are detected by external auditors. This is reinforced by the fact that internal audit not only ranks among the top three recipients of whistleblowing reports but also holds an integral role by acting as an anti-fraud control in the prevention of fraud.
- ² Fraud is present in all spheres of human activities and is consequently not limited to businesses. Accordingly, there are numerous definitions of the term for different parties, which compound the interpretation of fraud.
- ³ According to Petraşcu and Tieanu (2014) the overall task and division of fraud risk management among the organization is constructed as follows. The primary responsibility for implementing mechanisms of preventing and detecting fraud lies with the executive board as it has the specific task to offer explanations in a case of fraud occurrence. Furthermore, the executive board must implement adequate internal control systems, whereas the audit committee has the responsibility to supervise the management of fraud risks and monitor the effort of the executive board against the commitment of fraud.
- ⁴ Furthermore, prior research emphasizes the ethical relevance of auditing (Ma'ayan & Carmeli, 2016), and states that an "internal auditor serves in his/her organization as the arbiter of moral rectitude" (Friedberg, 1998, p. 897). Arel et al. (2012) provide concrete evidence for the effect of the IAF on the moral intensity of ethical decisions regarding fraudulent financial reporting.
- ⁵ This role relates to Standard 2110, outlining the responsibility for promoting appropriate ethics and values within the organization along with Standards 2110.A1 about the evaluation of the organization's ethics-related objectives, programs and activities (The IIA, 2017).
- ⁶ Statement on Auditing Standards (SAS) No. 99 states that "the auditor has a responsibility to plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether caused by error or fraud" The AICPA (2002, p. 1719). The external auditor is required to obtain reasonable, but not absolute, assurance. Most importantly, external auditors are not generally directed to the detection of fraudulent activity as their responsibility is framed by the key concepts of materiality and reasonable assurance (Mancino, 1997).
- ⁷ This is also confirmed by prior research. Eulerich et al. (2017) show in an empirical analysis of internal auditors that investigation of fraud and irregularities ranks as the third most common activity among internal auditors who participated in their study. They point out that a well-working IAF should recognize potential fraud.
- ⁸ The first line comprises all business units and activities that are directly involved in manufacturing, providing and delivering products or services to customers and taking responsibility for managing risks. Furthermore, all necessary supporting functions are included in this line. The second line includes activities that focus on risk-related matters and assists in managing and controlling risks that arise in the first line, while the third line depicts independent and objective assurance and advice on part of internal audit. (The IIA, 2020)

- ⁹ The hypotheses presented are summarized in Figure 2, forming a conceptual framework that illustrates potential drivers of the role of internal auditing in managing fraud. This framework serves as a foundation for the subsequent empirical analysis. The development of these hypotheses aligns with the methodology used and insights gained from key studies in the field of internal auditing, including DeSimone et al. (2021), D'Onza and Sarens (2018) and D'Onza et al. (2015).
- ¹⁰ This study received an IRB approval from the university where the research was conducted.
- ¹¹ The dataset and previous versions of the dataset are also used by Bantleon et al. (2021), Eulerich et al. (2019), Eulerich et al. (2020) and Krane and Eulerich (2020) within various research projects.
- ¹² We choose this specific design to address independence and objectivity as additional meetings signify a unique situation of influence over the IAF, enforcing the pre-existing serving two masters issue inherent to the IAF positioning. The positioning of the IAF between the management and the audit committee is marked by competing interests regarding the respective audit activities. This constellation is commonly referred to as the serving two masters debate and has and caused diverging perspectives among researchers so far (see e.g., Abbott et al. (2010) and Hoos et al. (2018) for a discussion).
- ¹³ The previously described dependent variable along with the independent variables and the control variables, are summarized in Table A2 where the corresponding scaling and the underlying question of the survey are shown. It is consequently believed to offer a more comprehensible foundation for the following empirical results.

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APPENDIX A

TABLE A1: IIA standards related to fraud.

Title of the standard	Standard number	Extract of the standard
<i>Proficiency</i>	1,210.A2	Internal auditors must have sufficient knowledge to evaluate the risk of fraud and the manner in which it is managed by the organization but are not expected to have the expertise of a person whose primary responsibility is detecting and investigating fraud.
<i>Due professional care</i>	1,220.A1	Internal auditors must exercise due professional care by considering the (...) probability of significant errors, fraud or noncompliance.
<i>Reporting to senior management and the board</i>	2060	The chief audit executive must report periodically to senior management and the board. (...) reporting must also include significant risk and control issues, including fraud risks, governance issues and other matters that require the attention of senior management and/or the board.
<i>Risk management</i>	2,120.A2	The internal audit activity must evaluate the potential for the occurrence of fraud and how the organization manages fraud risk.
<i>Engagement objectives</i>	2,210.A2	Internal auditors must consider the probability of significant errors, fraud, noncompliance and other exposures when developing the engagement objectives.

TABLE A2 Variable definitions.

Dependent variable	Description	Name
IAF's scope on fraud prevention and detection	Extent to which the IAF strives for prevention and detection of fraud, where higher values imply a greater extent of fraud prevention and detection.	fraud_scope
Independent variables	Description	Name
Principal component analysis for capturing strength of the corporate_governance environment	Component scores obtained from a principal component analysis of four different questions related to corporate governance (corporate governance guideline, 1 for "exists" and 0 for "otherwise"; ethics guideline, 1 for "exists" and 0 for "otherwise"; importance attributed to whistleblowing tips for risk-based audit planning from 1 "low" to 5 "high"; level to which the IAF considers itself adequately resourced and positioned from 1 "low" to 5 "high")	corporate_governance
Meetings with the audit committee	Dummy variable, additional personal meetings with the audit committee, 1 for "yes" and 0 for "otherwise".	AC
Meetings with the management	Dummy variable, additional personal meetings with the management, 1 for "yes" and 0 for "otherwise".	Management
Technology usage for risk identification	Level indicating the extent to which the IAF uses technology for identifying new risks ranging from 1 "low" to 5 "high".	Technology
Age of IAF	Number of years that the IAF has been established in the company.	Age
Listing status	Dummy variable, company's listing status, 1 for "listed" and 0 for "not listed".	Listing
Size of IAF	Natural logarithm of total full-time equivalent (FTE) of IAF employees	IAF_size
Industry affiliation	Dummy variable, 1 for "credit and financial institutions including banks", "insurance companies", and "pension and social insurance companies" and 0 for "otherwise".	Finance
Germany	Dummy variable, country in which the operation is located, 1 for "Germany" and 0 for "otherwise"	Germany
Austria	Dummy variable, country in which the operation is located, 1 for "Austria" and 0 for "otherwise"	Austria
Diversity	Dummy variable, foreign nationalities being present in the IAF, 1 for "diverse" and 0 for "otherwise"	Diversity
Size of the organization	Natural logarithm of total full-time equivalent (FTE) of employees in the entire organization	org_size

TABLE A3 Correlation matrix.

No	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1	<i>fraud_scope</i>	1.000												
2	<i>corporate_governance</i>	0.255***	1.000											
3	<i>AC</i>	−0.065	0.281***	1.000										
4	<i>Management</i>	0.177***	0.165*	0.098*	1.000									
5	<i>Technology</i>	0.174**	0.132**	0.080	0.071	1.000								
6	<i>Listed</i>	0.044	0.266***	0.364***	0.152**	0.037	1.000							
7	<i>iaf_size</i>	0.006	0.229***	0.295***	0.036	−0.011	0.290***	1.000						
8	<i>Finance</i>	−0.071	0.218***	0.210***	0.101**	0.133**	0.214***	0.214***	1.000					
9	<i>Germany</i>	−0.001	−0.226***	−0.262***	−0.037***	−0.005	−0.130**	−0.063	−0.120**	1.000				
10	<i>Austria</i>	0.099*	0.094*	−0.025	0.135***	−0.005	0.108**	−0.100*	0.028	−0.691***	1.000			
11	<i>Age</i>	0.075	0.097*	0.172***	0.087*	0.035	0.161***	0.437***	0.313***	−0.082	−0.053	1.000		
12	<i>Diversity</i>	0.091*	0.157***	0.157	−0.067	0.050	0.229***	0.470***	−0.065	−0.080	0.035	0.033	1.000	
13	<i>org_size</i>	0.205***	0.167***	0.136***	0.156***	−0.011	0.213***	0.458***	−0.316***	0.004	−0.114**	0.153***	0.252***	1.000

TABLE A4 Collinearity statistics.

	Tolerance	VIF
<i>corporate_governance</i>	0.77	1.30
AC	0.68	1.46
Management	0.91	1.10
Technology	0.94	1.06
Listed	0.74	1.35
<i>iaf_size</i>	0.45	2.23
Finance	0.53	1.22
Germany	0.43	2.31
Austria	0.46	2.18
Age	0.73	1.37
Diversity	0.64	1.56
<i>org_size</i>	0.47	2.11
Mean	0.60	1.66

Variable	Fraud prevention	Success factor	Fraud risk
<i>corporate_governance</i>	0.393*** (0.125)	0.403*** (0.119)	0.567*** (0.111)
AC	0.257 (0.277)	−0.417 (0.262)	−0.017 (0.267)
Management	0.141 (0.397)	0.484 (0.397)	0.130 (0.362)
Technology	0.218* (0.115)	0.310** (0.123)	0.277** (0.129)
Listed	0.020 (0.275)	0.049 (0.253)	0.257 (0.263)
<i>IAF_size</i>	−0.096 (0.148)	0.122 (0.159)	−0.209 (0.137)
Finance	−0.916*** (0.326)	−0.946*** (0.356)	−0.329 (0.307)
Germany	0.862** (0.337)	0.033 (0.357)	0.512 (0.373)
Austria	0.488 (0.399)	0.538 (0.438)	0.702* (0.420)
Age	0.013** (0.006)	0.007 (0.005)	0.011* (0.006)
Diversity	0.363 (0.322)	−0.494* (0.299)	−0.171 (0.319)
<i>org_size</i>	(0.072) −1.219	0.083 (0.110)	0.236*** (0.068)
Nagelkerke R ²	0.158	0.145	0.210
Number of observations	272	269	270

TABLE A5 Additional fraud-related models.

Note: *, **, *** indicate statistical significance at the $p \leq 0.10$, 0.05 and 0.01 levels, respectively. Standard errors are in parentheses.

TABLE A6 Additional analyses - ethics.

Estimated results for the regression model about ethics	
Variable	Coefficient
<i>asset_protection</i>	0.327*** (0.114)
<i>org_improvement</i>	0.179 (0.164)
<i>opportunities_mgmt</i>	0.234** (0.113)
<i>Leadership</i>	0.309*** (0.114)
<i>Compliance</i>	0.870*** (0.148)
<i>Consulting</i>	0.144 (0.118)
<i>Auditing</i>	-0.235* (0.141)
<i>Finance</i>	-0.437* (0.235)
<i>Female</i>	-0.006 (0.004)
<i>code_of_ethics</i>	0.918*** (0.288)
<i>Nagelkerke R2</i>	0.322
<i>Number of observations</i>	291

Note: *, **, *** indicate statistical significance at the $p \leq 0.10$, 0.05 and 0.01 levels, respectively. Standard errors are in parentheses.