WORKING PAPER

The quality of internal controls, audit activity levels and fraud

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KEY TAKE-AWAYS

• Weak internal controls are associated with a higher likelihood of fraud, particularly deficiencies in the control environment and control systems.
• Auditors do respond to weak controls by increasing substantive testing, partner involvement, team hours, and assessed audit risk.
• Higher assessed audit risk is the strongest auditor response linked to fraud risk.
• The study found no evidence that additional audit activities themselves are associated with lower fraud incidence or greater fraud detection, after controlling for internal control quality.
• Management override of controls is a major red flag. It is more common in fraud cases and triggers additional audit procedures.
• Auditors are more likely to detect fraud when internal controls are weak, suggesting that weaknesses in controls can make fraud risks more visible.
• Greater involvement of experienced audit team members (partners and managers) is associated with shorter fraud duration.
• Careful decision-making and professional skepticism appear to help reduce how long fraud remains undetected.
• Overall, the findings highlight that strong internal controls remain the primary defense against fraud, while auditors mainly play a monitoring and risk-assessment role.

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Abstract

In this study, we focus on whether the quality of internal controls is associated with fraud, and has an impact on audit activities. Making use of a sample containing 37 companies for which fraud is suspected, as well as 37 companies for which no fraud is suspected, we find that auditors adjust their audit activities when they are of the opinion that the internal controls at the auditee are of low quality. When auditors observe higher audit risks, they are also more likely to identify the condition where a fraud is suspected. Additional analyses show that the quality of internal controls and the audit activities are associated with the duration of the fraud, as well as with the likelihood that the fraud is detected by the auditor.

Acknowledgements

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1. Introduction

In this study, we examine whether auditors adjust their audit activities based on their evaluation of the internal control quality of an organization, and whether the quality of internal controls is associated with fraud[1]. The idea that the intensity of the audit activities and the quality of internal controls are related to fraud is based on a study by *the Association of Certified Fraud Examiners* (ACFE, p. 8) from 2022. According to this study, 49 percent of frauds are associated with a lack of, or with overriding internal controls. In 2026 (p. 5), ACFE reports a number exceeding the 50-percent mark. The ACFE, in addition, finds consistently that the lack of regular management reviews are associated with the incidence of fraud. Such reviews require boards take action to oversee the risk management and internal control systems on an ongoing basis, to review their effectiveness at least annually, to report to shareholders on the results of that review (ICAEW 2019, p. 7). In 18 [16] percent of the cases of fraud reported by the ACFE (2026) [2022] they identify a lack of management reviews.

As part of the audit engagement, the auditor evaluates the quality of the internal controls of the audited organization. In line with audit standards, the auditor adjusts the intensity or type of audit activities in case there are signals that the internal controls do not operate effectively[2]. Potentially, these adjustments to the audit activities could allow for the auditor to take into account fraud signals. Furthermore, a study by the NBA (2022) provides an overview of certain factors that could potentially aid or limit fraud detection by auditors or others, such as (a lack of) professional skepticism of auditors, (a lack of) knowledge with regards to fraud, and (a lack of) knowledge with regards to the organization and its processes. Furthermore, the impact of client relationships and the integral approach of the audit, including the approach and management of the fraud process, and the role and responsibility

[1] In this study, fraud refers to corruption (such as bribery or blackmail), theft of goods, and/or manipulation of financial reporting. We emphasize that in this study, we measure the suspicion of fraud.

[2] Alternatively, the auditor could decide to return the audit engagement, in the case that the internal controls are of such a poor quality that the auditor cannot conduct the audit effectively.

of players in the chain (e.g. the accounting education) with regards to effectively detecting and combating fraud, is not always recognized.

In the first part of this study, we conduct a literature review to examine the potential impact of the first five factors laid out above. We find strong support in the literature regarding the contribution of these factors to fraud detection[3]. When we analyze these factors in line with the fraud triangle[4], we observe that specifically weak internal controls may create the opportunity to commit fraud. We try to gain insights into the role of the auditor in the second part of this study, where we examine how auditors (and their teams) respond to the variation in the quality of internal controls. Specifically, we investigate whether the audit activities are adjusted when internal controls qualify as poor, and if this adjustment is associated with fraud[5].

2. Literature Review

Research on fraud suggests that fraudulent behavior is observed from the top to the bottom of the organization. For example, Campbell and Shang (2022) find that negative evaluations of employers, as reported by employees on Glassdoor[6], are indicative of fraud. When terms such as "favorites," "discrimination," "schemes," "income," "prices," and "safety" are used negatively in these evaluations, there is a higher likelihood of fraud within the organization. The Dutch regulator of AFM (2022) views fraud as a societal issue and expects the accountancy profession to fulfill a gatekeeping role. The AFM (2022; 2023) expressed concerns after their research revealed that the profession still insufficiently employs methods to detect and identify fraud risks. The AFM suspects that this deficiency is due to knowledge levels, role perceptions, and culture. Additionally, the AFM (2023, and 2025) concludes that fraud risk factors are not sufficiently recognized and translated into fraud risks, possibly

[3] The sixth factor is considered to be out of scope for this study, as our focus is on the auditee and the auditor.

[4] The fraud triangle consists of three factors that could explain why people engage in fraud: motivation, rationalization, and opportunity.

[5] When using the word “fraud”, we refer to the suspicion of fraud, as there may be cases in which the presence of fraud has not yet been proven legally.

[6] Glassdoor is a platform on which employees at all hierarchical levels within an organization can post public evaluations of their employer. This platform was launched by recruitment companies. Employees of various companies are invited to share their experiences of working at their company on the site. Future employees can benefit from these reviews, as can employers, who gain an independent perspective on how their employees view them.

resulting in inadequate follow-up actions. In 2025 the AFM found 23 shortcomings in 32 cases where fraud was observed and concluded that "*Audit work on fraud risks is inadequate*" AFM, 2025).

Furthermore, the NBA (2022) has conducted an exploratory study on how audit firms approach fraud and have identified the main causes for cases where fraud (or fraud risks) are detected too late or missed entirely. Their report lists the following key reasons: (i) lack of professional skepticism (referred to by the AFM as culture), (ii) insufficient knowledge on the part of the auditor to recognize signals as indications of fraud (referred to by the AFM as knowledge level, (iii) lack of understanding of the client and their processes (referred to by the AFM as knowledge level), (iv) excessive focus on the relationship with the client (referred to by the AFM as culture), (v) lack of integration between audit work and fraud detection activities (referred to by the AFM as knowledge and culture), (vi) the role and responsibility of players in the chain (including accounting education) to effectively detect and combat fraud is not always recognized.

In this literature review, we focus on the factors mentioned above that may influence the likelihood of fraud being detected and/or occurring. We elaborate on the main causes below by contextualizing them within scientific research and further analyzing them based on the fraud triangle. In the following, we will disregard the sixth factor (the role and responsibility of players in the chain) because this study focuses on the interaction between the auditor and the audited entity.

2.1 Professional Skepticism

Based on prior literature, Nelson (2009) identifies four dimensions that determine professional skepticism of individual auditors and teams: (i) knowledge and experience of the auditor, (ii) personality characteristics of the auditor, (iii) (appropriate) incentives, and (iv) judgment and action.

(i) Knowledge and experience. Specialist knowledge and audit experience may have positive effects on the professionally critical attitude of the accountant in fraud detection and authority (Nelson, 2009; Bouwens, 2016). Knowledgeable accountants are better able to detect errors and complex evidence patterns indicating errors. They are also better able to determine if there are indications of errors and fraud. Knowledge further enables the

accountant to convince the management of the audited company of the necessity of counter measures if irregularities are identified.

(ii) Personal characteristics. This category includes problem-solving ability, ethical disposition, and self-confidence. Existing research confirms that problem-solving ability and self-confidence, combined with a strong ethical awareness, lead to a professionally critical attitude. Ethical awareness pertains to the internal judgments of the accountant. In this context, Elster (1989) speaks of social norms. In his theory, a professional feels uncomfortable when making a decision that contradicts their beliefs. For this reason, the professional will make a concerted effort to prevent the violation of social norms.

(iii) (Appropriate) Incentives. It is important to focus the auditors' attention on the quality of the audit and make it clear that they are expected to ensure that (material) discrepancies are corrected. The hiring policies of the accounting firm can also be mentioned here, as it is essential that accounting organizations focus on hiring accountants who perform quality work, thus reducing the likelihood of fraud going unnoticed. Ethical awareness can also result from the incentives to which the accountant is exposed (De Cremer, 2009; Umphress, Bingham & Mitchell, 2010; Bazerman and Tenbrunsel, 2011).[7]

(iv-a) Judgment. If the incentives are aligned correctly, the professionally critical attitude in the accountant's judgment is largely determined by cognitive capacity. Depending on this capacity, procedures and guidelines can help increase the likelihood of fraud detection. This can include predefined statements regarding the likelihood of fraud, as well as procedures that must be followed to conduct an adequate audit.

(iv-b) Action. Audit firms can promote professional skepticism among their own employees and partners. As part of the evaluation procedure, the audit firm might choose to assess the actions of individual accountants to determine whether they have sufficiently committed to detecting and addressing fraud. The evaluation of actions (both objective and subjective) serves as the final element where the previously described determinants converge in the accountant's decision to take or refrain from certain actions. This can include: (i) asking clarifying questions, (ii) the extent to which the accountant probes further, validates statements, and reflects on sources, (iii) the extent to which the accountant is aware of

[7] A partner who indicates that an audit must be completed on time, "whatever it takes", sends the signal that team members are primarily evaluated on timely delivery rather than the quality of their work. "Whatever it takes" perhaps suggests that it is acceptable to set ethics aside if necessary.

potential biases about the audited entity, such as rationalizing away signs of fraud, (iv) actions taken in the face of confrontations, and (v) actions taken as a team member.

2.2 Insufficient practical experience with what constitutes fraud

As highlighted by Nelson (2009), there is a greater likelihood that an auditor will detect fraud if they can build on direct and relevant experience with suspicions or indications of fraud. This experience, such as recognizing fraud patterns, is not always present in practice among individual accountants or teams (NBA, 2022). If teams lack experience, compensatory measures can be considered. For instance, specialized forensic accountants can be added to the team if it becomes apparent that there is little or no experience with fraud detection and/or handling within the team.

It is important to recognize that even small (management) frauds are relevant. One of the misconceptions is that immaterial errors can be ignored because immaterial deviations do not need to be corrected. In academic literature, this is referred to as the "slippery slope." Research by Schrand and Zechman (2012) shows that every large fraud started with seemingly negligible facts[8]. According to recent analyses by Audit Analytics (Audit Analytics, 2021; 2022)[9], revenue is the most manipulated item when measured by the number of forced corrections in financial statements. Financial incentives play a significant role in this context: managers who see more revenue as a higher bonus are more inclined to manipulate revenue.

The tendency to manipulate increases when bonuses are tied to results such as revenue or profit. However, this tendency is mitigated when it is ensured that the manager identifies with the company (Abernethy, Bouwens, and Kroos, 2017). Therefore, the accountant should be aware of the extent to which managers genuinely identify with the company's values. As such, it is important to consider fraud risks from a multidimensional perspective. While

[8] An example involves calling a customer to request that they record a purchase today instead of tomorrow. If it turns out the following year that these calls do not generate sufficient revenue, customers may be approached more aggressively to place the order in advance. If there is still insufficient revenue, the company may resort to manipulating revenue, possibly with the justification that "the order was going to be placed anyway."

[9] In 2021, corrections related to the valuation of equity and debt ranked highest. This was primarily due to the formation of SPACs, which used instruments such as warrants that subsequently failed on a large scale. Revenue ranked second in 2021.

incentives increase the risk of fraud (implicit pressure), this risk can be mitigated by narrowing the scope for rationalization, ensuring that employees identify with the firm.

2.3 Understanding and extensive knowledge of the client and the processes

The business model of the auditee is one of the first dimensions auditors examine when trying to estimate the required intensity of the audit. Typically, auditors consider the following four dimensions: what is offered to the customer, what production resources are needed to deliver the offering to the customer, which processes help the company deliver the offering, and to what extent does delivering to the customer now and in the future accompany profit? (see, for example, Christensen, 1997; Johnson, Christensen, and Kagermann, 2008).

Business models are increasingly characterized by high complexity, and the pace at which even disruptive business models emerge is accelerating (Bocken and Geradts, 2020). Given the continuous change, it is important for auditors to sufficiently immerse themselves in the activities of the audited entity. Auditors are expected to have in-depth knowledge of the risks associated with the implementation and execution of business models.

Innovative business models typically involve increased risks, but even the exercise of a traditional business model carries fraud risks. Wang, Stuart, and Li (2021) show that innovation is linked to the likelihood of fraud, but that honest companies also focus on technical innovations, while fraudulent companies implement limited innovations (variations on the same theme) and hardly hire new people to shape the innovation. Moreover, they are more likely to claim government subsidies. The NBA (2022) writes, among other things: "*For adequate and professional judgment regarding fraud risk factors and fraud risks, in-depth knowledge of the entity's internal control systems and (administrative) processes is crucial*." The NBA places knowledge about the business model and the consequences of business model innovations in the context of translating these models into the presence and functioning of internal controls.

The NBA fraud cause analysis team has found that the reason for undetected frauds lies in a lack of in-depth knowledge and relevant insight into how and with what the involved company conducts its business (NBA, 2022). This lack of insight then manifests itself "*in the*

quality of risk assessment and the nature, extent, and depth of the auditor's approach" (NBA, 2022).

2.4 Excessive focus on the relationship with the client

The NBA fraud cause analysis team has noted that the extent to which other interests, such as the interests of the client, prevail, influences the degree to which the audit team critically examines the data collected from the audited entity[10]. Determinants may include the importance attached to maintaining a good client relationship. Research in this area shows that it is a balancing act between ensuring that the audit team sees and receives all relevant information and the extent to which the obtained information is critically evaluated (Causholli and Knechel, 2012). The importance of collecting audit evidence should not be underestimated: Beasley, Carcello, and Hermanson (2001) state that when an audit is deficient, 80 percent of the cases also involve a lack of collected audit information. As the collection of information necessitates a closer relationship between the audited organization and the auditing accountant, the critical attitude is often unconsciously abandoned. This can be cited as a cause for inadequate actions in the face of fraud or for frauds that go undetected. This can hinder the critical stance of an audit team or responsible external auditor. However, the independence of team members can play a mitigating role. In the case that the senior partner (intentionally or unintentionally) places the client relationship above an adequate audit, the degree to which the team has the freedom to counteract this can serve as a safety valve.

2.5 Integrated approach and management of fraud during the audit

The NBA fraud cause analysis identifies the approach of the audit team as the fifth reason why fraud occurs and/or goes undetected. This involves considering whether the team has paid sufficient attention to fraud from the beginning to the end of the audit, and whether team members have been given the opportunity to raise fraud signals at any point during the audit.

[10] According to the NBA fraud cause analysis, time pressure also plays a role here. Within a very short time frame, an enormous number of documents must be collected, making it more difficult to detect fraud.

A concern raised by the NBA in this context is that the audit focuses on excluding material misstatements in the financial statements, which can result in missing fraud. This orientation can make it more challenging to draw attention to fraud risks within the audited entity.

This ties back to the point Schrand and Zechman (2012) noted, namely that large frauds invariably start with small, almost negligible transgressions. Carpenter (2007) emphasizes the importance of team dynamics, particularly through brainstorming sessions within audit teams. Her research shows that teams in which team-wide brainstorming sessions are common generate better ideas about whether, where, and how fraud might be committed. Teams perform better in forming these ideas than individual auditors. McAllister, Blay, and Kadous (2021) demonstrate that including a highly critical auditor in the audit team can introduce enough dynamism to encourage team-wide brainstorming.

2.6 Opportunity and the fraudster

When considering the causes identified in the exploratory NBA fraud cause analysis, it is useful to place them in the context of the fraud triangle (Cressey, 1953). When following this approach, one dimension stands out: the opportunity to commit (undetected) fraud. If the auditor does not know the business model, it is less likely that they will detect fraud compared to when they do. If an audit team does not theorize or include critically-minded accountants about how fraud can be committed, it is more likely that fraud will go unnoticed. Small frauds that are ignored have the same chance to grow to unmanageable proportions as in the case of Wirecard.

The Association of Certified Fraud Examiners (ACFE) reported in 2026 that frauds committed by employees are mostly attributable to the functioning of internal controls. We summarize these in Figure 1.

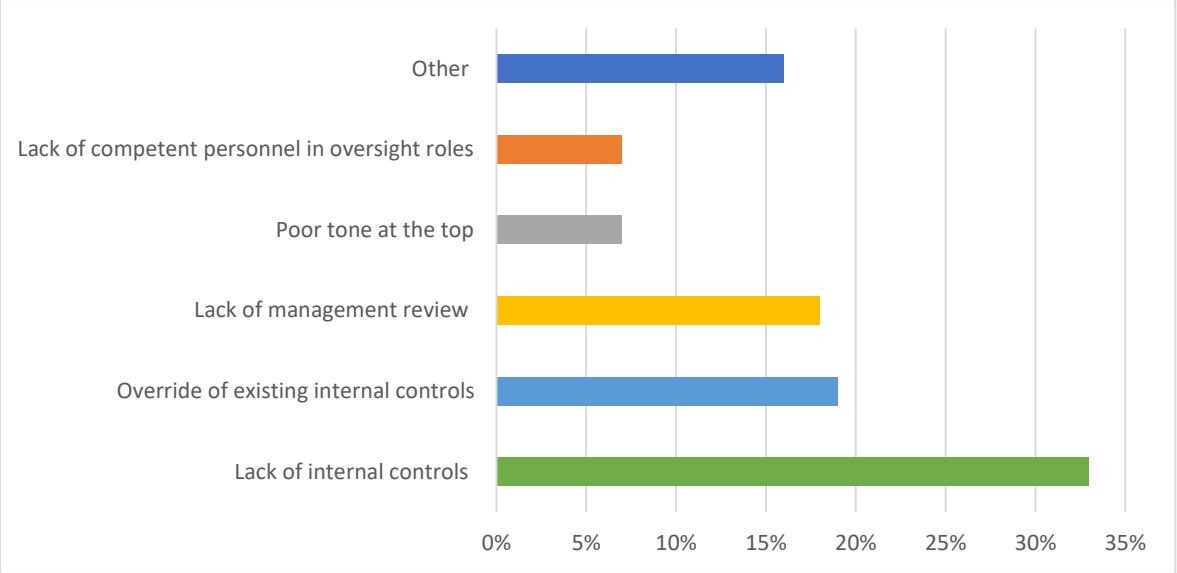


Figure 1: ***Issues in Internal Controls in Fraud Cases (source: ACFE, 2026, p. 49)***

We observe that limitations in internal controls (lack of presence and its functioning, measured by management override) are by far the most important factor in providing opportunities for fraud. Internal controls must be documented and embedded in the systems. They must also work in practice, which means they do not only exist on paper but are also implemented in systems and used by the employees of the audited organization. If internal controls can be easily ignored, the system fails. Thirdly, the importance of regular checks on the effectiveness of internal controls emerges (management reviews). This lack of management reviews is consistent with previous remarks regarding the understanding of the business model and the changes made to it over time. Fourthly, weak leadership (the tone at the top) is highlighted as a significant cause. If leadership does not emphasize the importance of internal controls and does not adhere to them, it is likely that others will emulate this behavior. Inadequate management oversight is identified by the ACFE (2022, and 2026) as the fifth cause. Again, we see the opportunity provided by weaker internal controls as a fundamental circumstance that facilitates fraud.

As the ACFE (2026) analysis also indicates, the opportunity for fraud is primarily offered by the company involved. It is the auditor who, in the second instance, identifies weaknesses in internal controls and adjusts the audit accordingly. An important tool in this context is the interim audit, during which the auditor determines to what extent the company's internal controls mitigate the risk of material misstatements.

In this study, we focus on how the audit team deals with the quality of those internal controls. This approach is reflected in the audit plan and in how the team sets up the audit of internal controls, as well as how the team acts based on evidence regarding the effectiveness of the internal controls throughout the audit.

The hypotheses we are testing are as follows:

H1: The quality of internal controls is associated with changes in the work of the external auditor.

H2: Changes in the work of the external auditor, conditional on the quality of the internal controls, are associated with fraud.

The hypotheses are graphically represented in Figure 2.

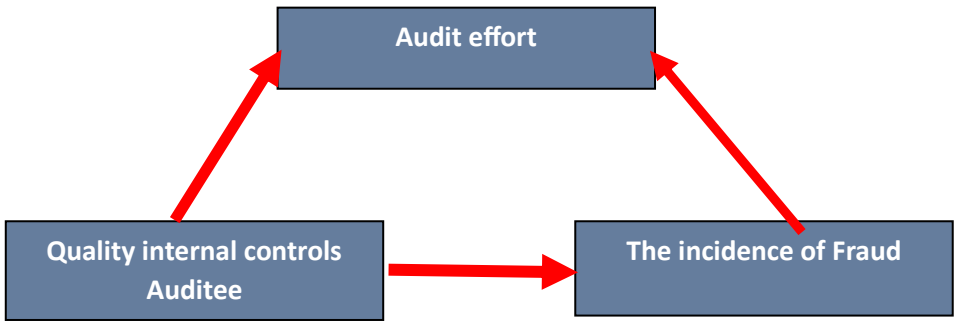


Figure 2: ***Graphical presentation of the hypotheses***

3. Research Method

3.1 Methodology and data collection

Over 2022 and 2023, we collected data reflecting audits executed between 2019 and 2021 via a questionnaire (see also Appendix A and B) from auditors of 37 firms where the auditors suspected a high likelihood of material or non-material fraud. Slightly more than 40% of the suspected frauds are considered material in a qualitative (impact on society) or quantitative

sense (amount involved in the fraud). However, this does not mean that we qualify non-material frauds as unimportant. As indicated in Section 2, there is a so-called "slippery slope" where all major frauds begin with negligible facts. Additionally, approximately 10% of the companies where fraud is suspected are not legally required to undergo audits, meaning they voluntarily undergo an audit.

Auditors were approached via the Dutch association of auditors (the NBA) with the request to complete the questionnaire for the fraud cases[11] they were aware of. The audit procedures for these fraud cases are compared in the analyses with the audit procedures at 37 control firms that did not have a recorded fraud condition. These 37 contrast companies are very similar in characteristics to the other companies, except that there is no suspicion of fraud at these companies[12]. The fraud companies and non-fraud companies were selected by the auditors.

3.2 Summary Statistics on the 37 Fraud Cases

Throughout the study we identify fraud companies as companies where according to the auditor report a fraud is formally suspected to exist. From a legal standpoint these frauds have yet to be proven. For fraud companies, we collected information about the details of the fraud. We summarize below in a set of figures who was involved in the frauds and what type of fraud is suspected. Figure 3 shows which parties within the companies were involved in the frauds.

[11] This request was sent to all accounting firms registered in the Netherlands. Some firms indicated that they had not handled any fraud cases during the relevant period. These firms were therefore not included in the research. Additionally, some firms chose to limit their responses to the ten most impactful fraud cases.
[12] Although it cannot be completely ruled out that undetected fraud exists at these companies, this likelihood is considered very small. This probability is further reduced because the accountants have carefully selected the companies.



Figure 3: *Involvement in fraud*

Figure 3 shows that in most cases, middle management was involved in the detected fraud (in slightly more than 50% of the cases). We also see that top management, external parties[13], and rank-and-file personnel are implicated with fraud.

Figure 4 provides an overview of the types of frauds that were committed. In this figure, we see that the largest number of fraud cases involved the direct misappropriation of assets (51% of the cases). Fraudulent financial reporting (including earnings management) and corruption account for 32% and 30% of the total number of frauds[14], respectively.

[13] This can, for example, include people from outside who take money or other resources by force.
[14] The percentages add up to more than 100%, because in some cases there were multiple instances of fraud.

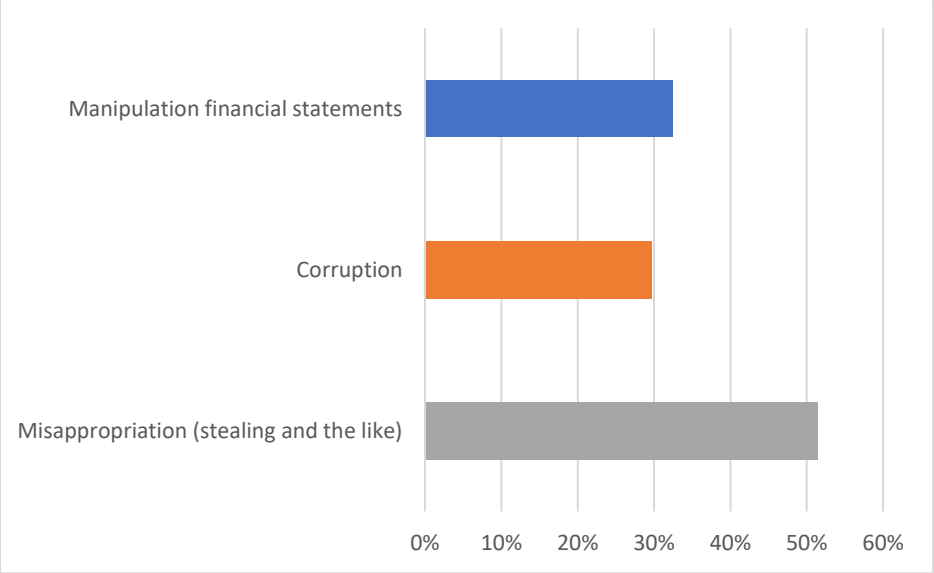


Figure 4: *Fraud types*

Based on our data regarding the extent of fraud, fraudulent financial reporting involves the highest amounts, while in 32% of cases such manipulation was involved[15]. Figure 5 indicates who were involved in the suspected fraud, categorized per type of fraud.

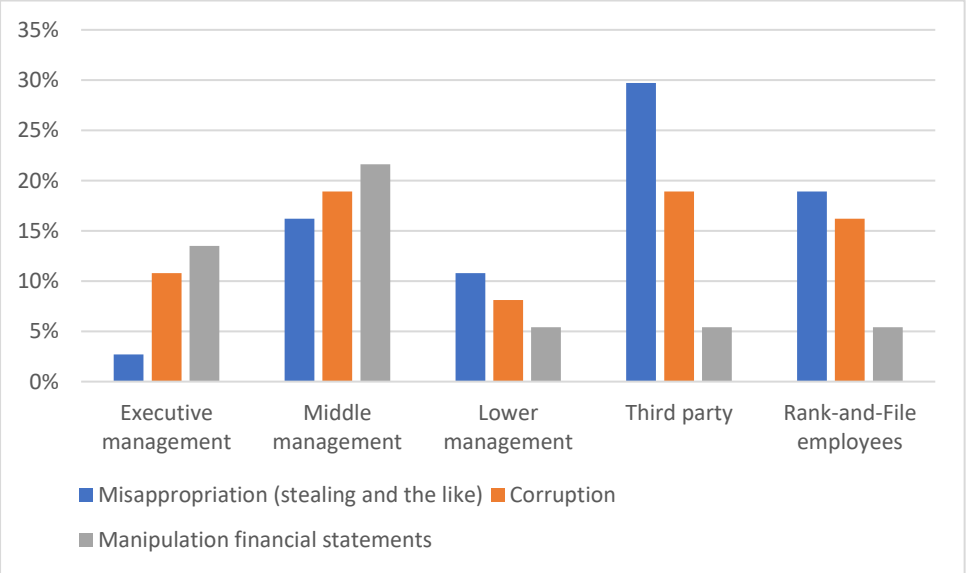


Figure 5: *Types of fraud different parties are involved in*

Figure 5 shows that middle management, lower-level employees, and external parties are most often involved in the misappropriation of assets. Lower management is somewhat less frequently involved in this type of fraud, and top management is hardly involved in this type

[15] This is consistent with the findings of the ACFE report (2026).

of fraud. Corruption hardly occurs among lower management, but it does occur among middle management, top management, and lower-level employees. External parties are also often involved in corruption. This can be explained by the fact that more than 50% of the corruption cases in this sample involve bribery, and external parties are always involved in bribery. In fraudulent financial reporting, top and middle management are primarily involved. This can be explained by the fact that top and middle management often have direct influence over financial reporting.

Looking at the duration of the frauds[16], we observe that slightly more than half of the frauds in our sample had a duration of a year or less. Approximately a quarter of the frauds lasted two or three years. The remaining frauds lasted longer than three years.

In Figure 6, we show which accounts are targeted by fraudulent financial reporting. Fraudulent financial reporting can involve either an increase or decrease in a ledger account, leading to the account being higher or lower than the actual value that should have been reported in the annual financial statements.

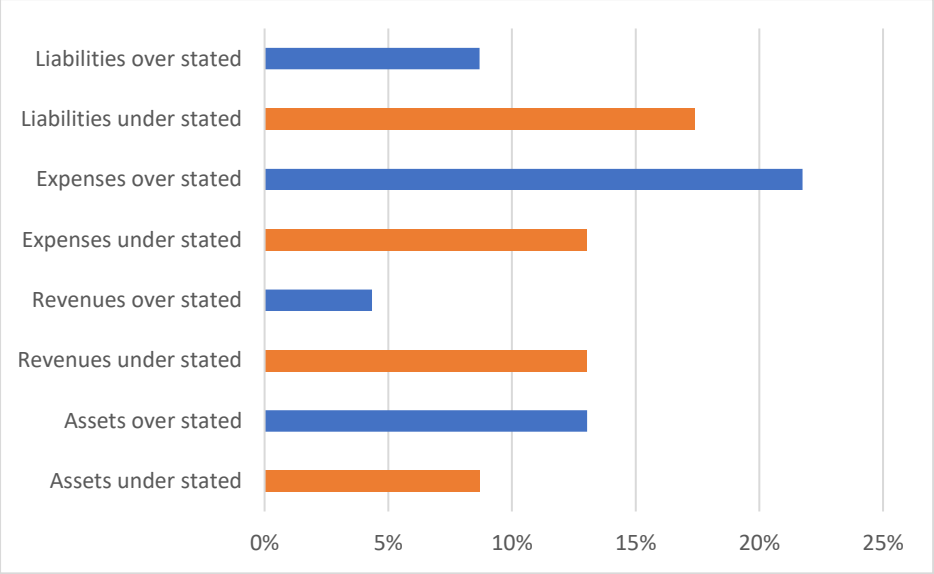


Figure 6: How financial statements are affected by fraud

Figure 6 shows that in most fraud cases, expenses were overstated[17]. Higher expenses can lead to increased costs, which lowers the financial results. Another way the results were

[16] We requested accountants to indicate the duration of the fraud. However, it is sometimes difficult to pinpoint the exact moment at which fraud commenced. In such cases, we asked the accountants to provide an estimate.
[17] Fraudulent financial reporting can be accompanied by other types of fraud. For example, the misappropriation of assets could be concealed by recording higher expenses.

lowered was through the reporting of understated revenue. Reporting understated expenses and overstated revenue aims to increase the results. Overstated/understated debt and asset positions can, depending on the specific account, lead to either an increase or decrease in the results. Figure 7 shows who discovered/reported the fraud cases in our sample.

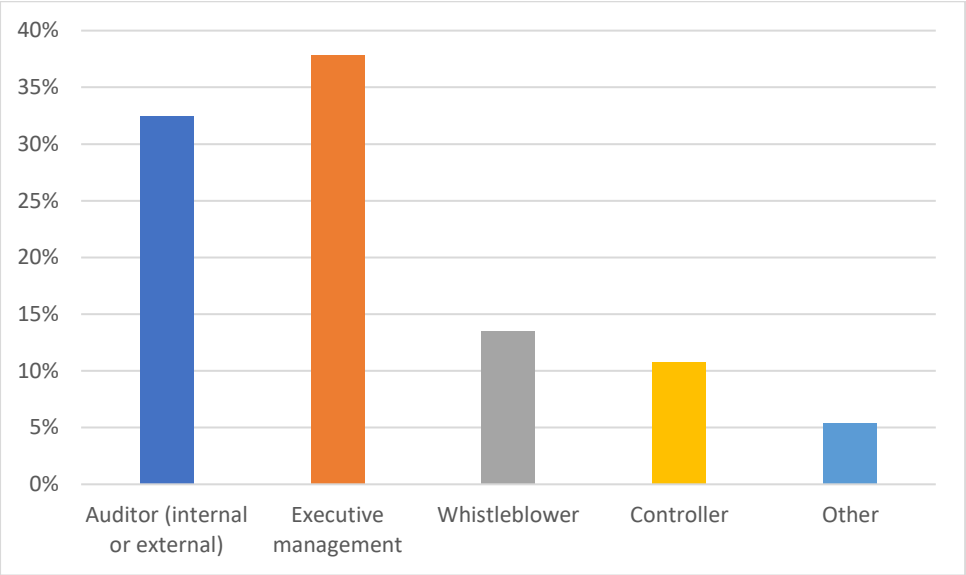


Figure 7: *Who is the first to report/detect the fraud*

Most of the fraud cases in our sample were discovered by the organization's executive management. The remaining fraud cases were uncovered by whistleblowers, internal controllers within the organization, or others (including the tax authorities and the FIOD). Note, that the ACFE 2026 report states (p. 23) that employees are the most likely group to provide the deciding tip to senior management that occupational fraud is occurring. It is, therefore, entirely possible that the initial notification of fraud in our sample also originates from employees who tipped auditors and executive management.

Furthermore, we collected data on internal controls. We assessed the state of internal controls consistent with internal-control dimensions identified by Hammersley, Myers and Shakespeare (2008). These dimensions are: (1) processing of financial relevant facts (such as revenue and goodwill); (2) control system (such as compliance with procedures); (3) control environment (such as documentation); (4) personnel and functions (such as the quality of personnel, the way they executed their duties); (5) dominant management.

We added the variable of "*dominant management*" as auditors indicated that this was an important factor they considered when vetting the presence and working of internal controls. However, dominant management is to be considered a determinant of the working of internal controls, rather than as a dimension of internal control and will be treated accordingly throughout the study.

For dimensions 1 through 4, we asked accountants to indicate the extent to which they agree with statements about deficiencies in internal controls. For each dimension, we measure the responses on a scale from 1 to 7, where 1 means completely disagree (indicating no deficiencies) and 7 means completely agree (indicating deficiencies). We then take the average of all statements within a dimension. The exact statements per dimension are reproduced in Appendix A. This approach does not allow us to determine with absolute certainty whether a deficiency is present or not. However, it is primarily the variation that is meaningful. For example, a score of 1 on internal control is significantly better than a score of 4. Greater variation indicates more diverse opinions about the quality of the internal control measure.

Dominant management was measured as a dichotomous variable (present or absent). This allowed respondents to isolate and express the decisive factor determining management's dominance (e.g., Brown, 2016).

Figure 8 shows the mean scores for each of the four dimensions of Internal controls. It suggests that the quality of internal controls in companies with fraud is lower compared to companies without fraud (all mean scores for fraud companies are higher than those for non-fraud companies). Auditors believe that the quality is the lowest for fraud companies in the control environment (mean of 3.31), control systems (mean of 3.31), and personnel and functions (3.04). Overall, we see that auditors believe that internal controls are of lower quality in fraud companies than in companies where no fraud has been observed.

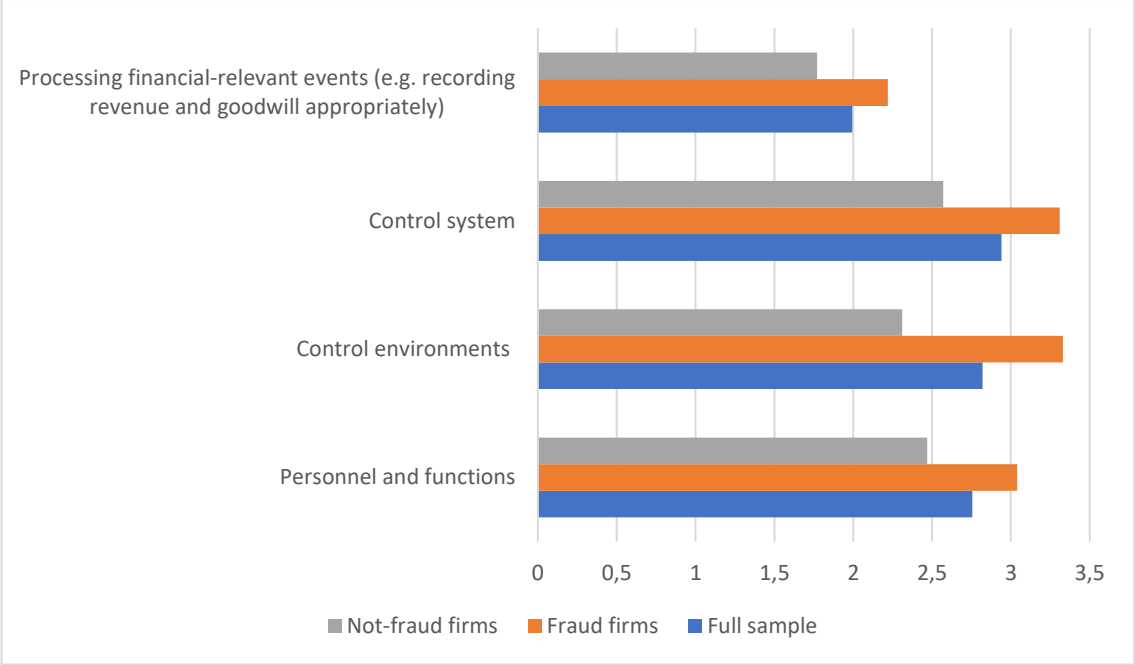


Figure 8: *Weaknesses in internal controls comparing Fraud with Non-Fraud firms.* [18]

3.2 Measures

In the remainder of the report, we will conduct analyses using various measures to approach the constructs. We investigate three aspects of fraud: all frauds, fraud detected by the accountant, and duration. *Fraud* is a dummy variable that takes the value of 1 for companies where concerns are raised about a potential fraud, and 0 if it is a non-fraud company. *Fraud detected by the auditor* is a dummy variable that takes value 1 if the alleged fraud at the company was discovered by the auditor, and 0 if the fraud was discovered by another party. The duration of the fraud is measured as the number of years the fraud went undetected. In many cases, this is an estimate issued by the lead partner of the audit firm where we collected the data from because it is difficult to pinpoint the exact moment when the fraud began.

The activities of the auditor are approached using several measures. Fee is the budgeted audit fee and is measured as the natural logarithm of the amount paid. Partner hours

[18] We also asked the question: "Is there dominant management?" Auditors believe that dominant management is present in most fraud companies (in approximately 56% of cases). This number is much lower in non-fraud companies, where it is indicated in 37% of cases. However, the difference is not statistically significant.

represent the number of hours the partner [19]has worked on the audit relative to the budgeted partner hours. Change in team hours is measured as the number of team hours in the year the fraud was detected relative to the budgeted number of hours. Substantive testing is measured as the extent to which substantive tests are used during the audit. This can range from 0 (no substantive testing) to 100 (only substantive testing). Offshoring measures the extent to which offshoring is used on a scale of 1 to 7, where 1 stands for no offshoring and 7 stands for extensive offshoring. Data analytics measures the extent to which data analytics is used by the accountant on a scale of 1 (not at all) to 7 (very much). Seniority indicates the extent to which senior auditors (partners and managers) are used in the audit of internal controls (percentage of hours relative to the total team hours). Audit risk reflects the assessed audit risk. This is measured on a scale of 1 to 7, where 1 represents low audit risk and 7 represents high audit risk.

As mentioned in the previous section we measure the quality of internal controls in four dimensions: processing of financial relevant facts, control systems, control environment, and personnel and functions. For each dimension, we use purpose-developed items (see Appendix A) that we measure on a scale from 1 to 7, where 1 means completely disagree (indicating no deficiencies) and 7 means completely agree (indicating deficiencies). The average score for the different statements per dimension is then calculated. A higher score on a dimension corresponds to a lower quality of internal controls. The items we include to gauge the quality of internal controls are based on Hammersley et al. (2008). The dimension "dominant management" is measured as a dummy variable, taking the value 1 if accountants believe there is dominant management, and 0 otherwise.

In the analyses, a number of control variables are also used, namely the size of the organization and the audit firm performing the audit (Big_4). Organization size is measured by the natural logarithm of the organization's total assets. Big_4 is a dummy variable indicating whether the audit was conducted by a Big Four firm (value = 1) or not (value = 0).

We do not report summary statistics on the size of the companies involved, the firms, or details about the audits performed (such as audit fees and hours spent) because these data could potentially be traceable to individual companies and audit firms.

[19] Here, we use the term partner, although in some cases the organization does not have partners and we should strictly refer to an external auditor or signing auditor.

4. Results

4.1 Quality of internal controls and fraud

Before testing the hypotheses, this sub-section first examines whether the quality of internal controls is associated with fraud. To this end, we compared the 37 fraud cases with similar companies where no fraud is suspected. The regression equation is as follows:

$$Fraud_i = \alpha + \beta_1 IC_1 + \beta_2 Size_organization_i + \beta_3 Big_4_i + \varepsilon_i \quad (1)$$

In the regression equation, IC stands for the quality of internal controls, Size_organization stands for the natural logarithm of the total assets of the auditee, and Big_4 represents the audit firm that performed the audit.

We make use of logistic regressions to test the above regression equation. Table 1 indicates the direction and significance of the association between the quality of internal controls and fraud using signs. We use only signs as an indication of a meaningful association between the variables because we believe that given the sample size, the coefficients are not informative. In this analysis we added Dominant management as a potential factor to affect the incidence of fraud as this factor was mentioned by auditors as a risk factor in this regard. Of course, *Dominant management* in itself does not reflect an internal control state per se.

	Fraud
Personnel and functions	0.273
Control environment	0.540***
Control system	0.598**
Processing of financial relevant facts	0.436
Dominant management	0.164

Table 1: Internal control states and the incidence of fraud

The results presented in Table 1 suggest that lower-quality internal control states are associated with a higher incidence of fraud. That is, we observe that a lower quality of the control environment, control system surface more often in companies where fraud is suspected (p-values are less than 0.01 and 0.05 respectively). The quality of the dimension "*personnel and functions*," as well as weaknesses in *processing financial relevant fact* and the presence of *dominant management*, have no direct relationship with fraud within the sample.

4.2 Quality of internal controls and audit activities

Hypothesis 1 states that the activities of auditors are adjusted when the auditor believes there are deficiencies in internal controls. To test this hypothesis, we use the following regression equation:

$$Audit\ activities_i = \alpha + \beta_1 IC_1 + \beta_2 Size_organization_i + \beta_3 Big_4_i + \varepsilon_i \quad (2)$$

Audit activities represents the activities of the auditor (fee, substantive testing, offshoring, data analytics, team seniority, partner hours, change in team hours, and risk assessment), *IC* represents the quality of internal controls on different dimensions, *Size_organization* represents the natural logarithm of the total assets, and *Big_4* represents the audit firm that performed the audit.

The regression model is tested through a robust regression model, where outliers (extreme values) receive less weight in the analysis, thereby reducing their potential influence on the results. Each internal control perspective is tested separately because the perspectives are correlated, and this correlation can affect the results (potentially leading to incorrect conclusions).

The results of the analysis are presented in Table 2. First, it appears that lower quality in the dimensions "personnel and functions" and "control system" leads auditors to rely more on substantive testing and less on system-based testing (both p-values < 0.05). Secondly, it is shown that lower quality in the "processing of financial relevant facts" leads to less offshoring. This could possibly be explained by the fact that it is more difficult to outsource the audit of financial facts if there are deficiencies in the system. Thirdly, we observe that

data analytics is more frequently applied when there is dominant management. This might be because dominant management leads to more use of data analytics to identify potential risks. Fourthly, we see that the partner spends more hours on the audit if the quality of internal control is lower in three out of the five dimensions. We also observe that the team spends more hours when internal controls are of lower quality (in four out of the five dimensions). This indicates that lower quality internal controls may be mitigated by more extensive work by the audit teams. Additionally, we see that lower quality in all internal controls (dimensions) is associated with a higher audit risk estimate. This finding stands to reason given that it is commonly expected and found that lower quality internal controls would lead to a higher audit risk assessment (e.g. Peters, Lewis, Dhar, 1989). Finally, no associations were found between lower quality of internal controls, the audit fee[20], and the seniority of the team.

Overall, we see that the auditor's response to lower quality internal controls depends on the type of internal controls where lower quality surfaces. That is, substantive testing is performed to a higher extent when weakness surface in the dimensions personnel and functions and control system ($p < 0.05$) and control environment ($p < 0.10$). We also observe that weaknesses in internal controls prompt auditors to step up partner hours and to make changes in the team hours spent. The auditors typically record that the audit risk becomes higher when internal controls become weaker. However, observed weakness in internal controls do not necessarily lead auditor to reduce off shoring or to use data analytics more intensively. Based on the results presented in Table 2, we can cautiously[21] conclude that we find support for Hypothesis 1: activities of the auditors are adjusted based on the quality of internal controls.

[20] Possible explanations are: (i) no additional work is charged to the client that would lead to a significant increase in the fee, (ii) there is an effect, but it is not visible due to the limited sample size, or (iii) the budgeted fee is used.
[21] The sample size requires us to draw conclusions with caution.

Table 2: Internal control dimensions and activity intensity auditor

	Fee	Substantive testing	Offshoring	Data analytics	Seniority	Partner hours	Changing team hours	Size audit risk
Personnel and functions	0.043	2.794**	-0.127	-0.153	0.003	0.091**	0.065***	0.501***
Control environment	0.016	2.008*	-0.131	-0.152	0.007	0.073*	0.052**	0.445***
Control system	0.081	3.294**	-0.110	-0.027	0.019	0.122**	0.101***	0.613***
Processing financial-relevant facts	0.127	2.291	-0.145	-0.127	0.006	0.130*	0.109***	0.358*
Dominant management	0.292	-0.839	0.195	0.484	0.013	0.018	0.014	0.847*

Table 2 shows whether significant relationships exist between internal controls and measures of auditors' activities. + represents a positive significant relationship, - represents a significant negative relationship, and "No" represents no significant relationship between the two variables. ***, **, * indicate whether the relationship is significant at 1%, 5%, or 10% respectively.

4.3 The effect of adjustments in audit activities

Above, we established that the activities of the auditors are adjusted based on the quality of internal controls (Table 2), and that the quality of internal controls is associated with the incidence of fraud (Table 1). In this sub-section, we investigate whether the activities of the audit team in response to lower quality internal controls are also associated with fraud (Hypothesis 2). For this analysis, we use a logistic regression and the following regression equation:

$$Fraud_i = \alpha + \beta_1 IC_1 + \beta_2 Audit\ activities_i + \beta_3 Size_organization_i + \beta_4 Big_4_i \varepsilon_i \quad (3)$$

This equation helps answer the following question: "Is the variation in the auditor's activities in response to the quality of internal controls also associated with fraud?"

If the activities of the auditor are significantly associated with fraud, while controlling for the quality of internal controls, this would confirm Hypothesis 2. In that case, there is a so-called (partial) mediating effect where the effect of the quality of internal controls influences the accountant's activities, which in turn are associated with fraud.

The results are summarized in Table 3, panel A for the internal control dimensions "personnel and functions," "control environment," and "control system," and panel B for "processing of financial relevant facts" and "dominant management." We compare the companies where fraud occurred with the contrast companies where no fraud was detected.

Table 3: Relation between Internal control perspectives, auditor activity levels and Fraud

Panel A: Path from Personnel and functions, (control environment), and [control measures] via audit activity to Fraud

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Personnel and functions	0.269	0.284	0.237	0.269	0.376*	0.116	0.266	0.098																
Control environment									0.526***	0.548***	0.520**	0.541***	0.684***	0.397*	0.514**	0.438**								
Control systems																	0.532**	0.629**	0.560**	0.616**	0.783***	0.429	0.600**	0.439*
Fee	0.405								0.419								0.455							
Substantive testing		-0.003								-0.004								-0.009						
Offshoring			-0.188								-0.111								-0.197					
Data analytics				-0.045								0.009								-0.180				
Seniority					-0.172								-1.177								-1.089			
Partner hours						0.397								0.331								0.242		
Changing team hours							-0.147								-0.226								-0.303	
Size audit risk								0.398**								0.316*								0.353*

Panel B: Path from Processing financial-relevant facts, (dominant management) via audit activity to Fraud

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Processing financial-relevant facts	0.355	0.435	0.390	0.434	0.664**	0.205	0.370	0.332								
Dominant management									-0.030	0.171	0.201	0.208	0.298	0.291	0.273	-0.179
Fee	0.384								0.422							
Substantive testing		0.001								0.002						
Offshoring			-0.198								-0.253					
Data analytics				-0.068								-0.087				
Seniority					0.445								0.466			
Partner hours						0.394								0.427		
Changing team hours							-0.137								-0.062	
Size audit risk								0.410**								0.437***

Description: Table 3 shows whether significant relationships exist between the internal controls and measures of auditors' activity levels. + represents a positive significant relationship, - represents a significant negative relationship, and "No" represents no significant relationship between the two variables. ***, **, * indicates whether the relationship is significant at 1%, 5%, or 10%, respectively.

The results in Table 3 panels A and B show that the assessed audit risk is associated with fraud (all p-values < 0.10 regardless of the internal control perspective included in the analysis). This means that lower quality internal controls lead to an adjustment in the assessed audit risk, and this adjustment occurs more frequently in companies where fraud is suspected. Given that the quality of internal controls is significant for most perspectives, this indicates partial mediation. We find no results for the audit activities.

Overall, this analysis suggests that the activities of the auditor are adjusted based on the quality of internal controls, and that a change in the assessed audit risk due to lower quality internal controls occurs more frequently in companies where fraud is suspected.

However, we do not find that accountants adjust their activities for companies suspected of fraud based on lower quality internal controls. We therefore cautiously conclude that there is no evidence for Hypothesis 2, i.e. the data does not support the idea that a path exists that runs from weaknesses in internal controls to fraud through audit activities.

4.4 Additional analyses

In this section, we conduct four additional analyses in which we look at (i) the duration of the fraud, (ii) frauds discovered by the auditor, (iii) management override of controls, and (iv) decision-making.

Duration of the fraud. In this additional analysis, we investigate whether the duration of the fraud is associated with (i) the quality of internal controls and (ii) the activities of the auditor. For this, we use a robust regression analysis where the natural logarithm of the duration of the fraud is the dependent variable. The independent variables are the various internal control perspectives to investigate (i) and the activities of the auditor to investigate (ii). We find no association between the duration of the fraud and the quality of the internal controls. This would suggest that lower quality internal controls do not influence the duration of the fraud. The sample size may influence the lack of results. We do find a negative association between seniority within the audit team and the duration of the fraud ($p < 0.05$), which implies that a fraud lasts shorter with a relatively higher input of partners and managers in the audit of internal controls. This could suggest that expertise in the audit of internal controls can help uncover frauds earlier.

Fraud detected by the auditor. In this additional analysis, we investigate whether the quality of internal controls influences whether the accountant detected the fraud. To do this, we perform a logistic regression analysis where the dependent variable is a dummy indicating whether the accountant discovered the fraud (value = 1) or not (value = 0), and the independent variables are the various internal control perspectives. The results of this analysis are shown in Table 4.

Table 4: Quality internal controls and the extent to which auditor detected a fraud

	Fraud detected by the auditor
Personnel and functions	0.801**
Control environment	0.689**
Control system	1.027**
Processing financial-relevant facts	1.112*
Dominant management	1.538*

Description: Table 4 shows whether significant relationships exist between the internal control perspectives and whether the fraud was detected by the auditor. + represents a positive significant relationship, - represents a significant negative relationship, and "No" represents no significant relationship between the two variables. ***,**, * indicate whether the relationship is significant at the 1%, 5%, or 10% level, respectively.

Table 4 shows that for all internal controls, lower quality ICs supplemented with *dominant management* makes it more likely that the auditors will detect fraud when it occurs (p-values vary from < 0.05 to < 0.10). Auditors have expertise relating to various internal controls and may therefore be better able to detect fraud associated with these measures. It appears that opportunity (ICs) and the condition of dominant management which arguably combines opportunity (of management override), pressure (to show good results), and rationalization (it is my shop).

Management override of controls. In previous measures of the quality of internal controls, a statement was included to gauge the level of management override of controls. This risk is important because it can impair the functioning of other internal controls. For this reason, we first examine whether management override of controls, as a standalone internal control measure, is associated with (i) fraud, and (ii) audit activities. For this, we use regression equations (1), (2), and (3), replacing IC with management override of controls. We measure management override of controls based on responses to the following statement:

"During the audit of internal controls, it was found that there was management override of controls." Responses were recorded on a scale from 1 to 7, where 1 means completely disagree and 7 means completely agree.

The analysis of model (1) shows that there is a positive and significant association between management override of controls and the incidence of fraud ($p < 0.01$). This implies that management override of controls occurs more frequently in companies where fraud is suspected. The analysis of model (2) shows that there is a positive and significant relationship between management override of controls and audit risk, partner hours, and substantive testing (all p-values < 0.10). This means that management override of controls is associated with (i) a higher assessment of audit risk, (ii) increased involvement of the partner, and (iii) more substantive testing. Auditors adjust their activities when they suspect management override of controls. There are no significant relationships between management override of controls and the audit fee, offshoring, data analytics, seniority, and change in team hours. The analysis of model (3) shows that none of the activities are significantly associated with fraud. From this, we can conclude that there are no mediating effects of the activities on the relationship between management override of controls and fraud.

Finally, we investigated whether management override of controls is associated with (i) the duration of the fraud and (ii) whether the fraud was detected by the auditor. The results show that management override of controls is not associated with the duration of the fraud ($p > 0.10$). Furthermore, the results indicate a positive association between management override of controls and detection by the accountant ($p < 0.10$). This means that auditors are more likely to discover fraud when they suspect that there is management override of controls.

Decision-making. According to the NBA Cause Analysis, a less professional-critical attitude is one of the reasons why fraud is not uncovered. Literature suggests that a possible lack of professional skepticism is associated with the way decisions are made by the team. In this analysis, we explore whether decision-making is associated with fraud[22]. We measure decision-making based on the average scores on several statements that ask about the importance the team places on careful decision-making (ranging from 1 to 7; see Appendix B for the exact statements).

[22] Caution is warranted here as this information is self-reported by the teams.

In the first regression analysis, the duration of the fraud is the dependent variable, and decision-making is the independent variable. We find that the duration of fraud is shorter when the team places more importance on careful decision-making ($p < 0.05$). This is a possible indication that careful decision-making can help reduce the duration of fraud. In the second regression analysis, the dependent variable is a dummy indicating whether the fraud was discovered by the accountant, and the independent variable is decision-making. We find no association between fraud detection by the accountant and decision-making.

5. Discussion and future research

In this study, we investigate whether the quality of internal controls within an organization influences the audit approach of the accountant and fraud. We test this through regression analyses. In a sample of 37 fraud companies and 37 contrast companies, we observe that auditors adjust their work to match the quality of internal controls. The way auditors adjust their activities depends on the type of internal control measure that is of lower quality. For instance, more substantive testing is performed when the quality of "personnel and functions" and the "control system" is lower, and the risk level under which the audit is conducted is increased in all cases of low quality.

These findings show that auditors respond to the observed quality of internal controls by adjusting their activities. We further find that a change in audit risk due to low-quality internal controls occurs more frequently in companies where fraud is suspected. In such cases, auditors appropriately adjust the audit risk. We do not find that audit activity levels are associated with fraud, conditional on the quality of internal controls.

Furthermore, several exploratory additional analyses were conducted. First, we show that fraud is detected earlier (i.e., lasts for a shorter duration) when more senior team members spend relatively more hours auditing internal controls. This underscores the importance of the expertise of auditors in internal controls.

Second, we find that when auditors believe the quality of internal controls (personnel and functions, control environment, control system, and the processing of financial relevant facts) is lower, it is more likely that the auditor will uncover the fraud. Insight into these internal controls may enable auditors to detect fraud more effectively. We also find that “dominant management” influences the detection of fraud by the auditor.

Third, we find that a specific internal control measure, namely management override of controls, occurs more frequently in companies where fraud is suspected. Auditors respond to this internal control measure by adjusting their activities. When management override of controls is present, the fraud is more often detected by the auditor.

Finally, we find that fraud lasts for a shorter duration when teams value careful decision-making. Careful decision-making is an indication of a professional critical attitude. We do not find that this professional skepticism is associated with the detection of fraud by the auditor.

Overall, the results show that auditors respond to signals indicative of a lower quality of internal controls by adjusting their activities. Adjusting the risk level occurs more frequently in companies where fraud is suspected. Auditors also uncover fraud more often when the quality of internal controls is lower.

5.1 Limitations

Although the research was conducted with care, there are several limitations that require us to be cautious when drawing conclusions based on the current study.

Sample size. We have 37 fraud cases in our sample, and these cases also differ from each other (in terms of size, impact, and type). This makes it possible that existing associations do not emerge from the results. A larger sample increases the likelihood that these associations will become visible.

No causality. Due to the nature of the data and the way it was collected, this study can only investigate associations, not causal relationships.

Self-reported data. We use self-reported data as the basis for the analyses. Each participant has done their utmost to provide the data as accurately as possible. However, due to privacy reasons, we have not been able to verify the data with external sources, such as records.

5.2 Future research

Many questions remain after this study. We would like to further investigate these, with special attention given to the causes previously identified by the NBA (lack of professional skepticism, lack of knowledge to recognize signs of fraud, lack of knowledge of the client and processes, too much focus on the client relationship, lack of integration between audit

work and fraud detection activities, and support from the chain). While our study provides new insights many questions had to be left unanswered. We mention the most pressing questions that surfaced during our study.

The relation between Internal Controls and Fraud Detection. How do weaknesses in different types of internal controls, particularly preventive and detective controls, affect the extent to which fraud is identified? Is the type of fraud that occurs, such as fraudulent financial reporting, corruption, or theft, associated with weaknesses in specific types of internal controls? Furthermore, what impact does dominant management have on internal controls and the occurrence of fraud, and can dominant management also have a positive influence on the quality and effectiveness of internal controls?

Auditor's Response to Fraud. How do auditors respond when fraud is suspected or detected? Does the composition of the audit team change follow indications of fraud, for example, through the involvement of forensic accountants? Do auditors spend additional hours on the engagement when signs of fraud emerge, and are these additional hours associated with the type of fraud and the effectiveness of the entity's internal controls? In addition, does the discovery or suspicion of fraud lead to increased internal consultation, such as more frequent consultation with technical departments or specialists?

Characteristics and Fraud Risks. To what extent do characteristics of audit firms influence the detection of fraud? Do changes in the audit team or audit firm affect the likelihood of identifying fraud or weaknesses in internal controls? Furthermore, does the nature of individual team members' responsibilities, including their authority or ability to challenge decisions and refuse inappropriate requests, influence fraud detection and the identification of internal control weaknesses? Does the proportion of fraud-focused work relative to routine audit activities affect the duration or type of fraud detected? Finally, do characteristics of the audited entities, such as their sector, organizational structure, public-interest entity (PIE) status, size, and geographical distribution of activities, influence the extent to which fraud is detected?

Parties Involved in Fraud. Which parties are involved in fraud, and how are their roles and positions within the organization associated with the duration and type of fraud that occurs? In particular, does the involvement of different individuals or groups influence how long fraud remains undetected and the nature of the fraudulent activities?

Auditor Knowledge and Fraud Detection. What signs or indicators of fraud can auditors use to recognize potentially fraudulent activities? To what extent does an auditor's understanding of the audited entity's business model, operations, and processes influence the detection of fraud? Furthermore, how does the auditor's knowledge of potential fraud indicators affect the ability to identify and investigate suspected fraudulent activities?

Audit Cycle and Fraud. At what stage of the audit process is fraud typically detected, and how does the timing of detection relate to the duration and type of fraud that has occurred? In particular, are certain types of fraud more likely to be identified during specific stages of the audit, and does earlier or later detection provide insight into how long the fraud has remained undetected?

Actions Taken by the Audited Entity Following the Discovery of Fraud. How do audited entities respond when fraud is discovered? What measures do they take to address fraud, investigate the circumstances, strengthen internal controls, and prevent similar incidents from occurring in the future? Furthermore, are the responses of audited entities associated with the type of fraud discovered and the length of time it remained undetected?

In summary, to gain an in-depth understanding of the work auditors perform in the context of lower quality internal controls and how this may be associated with fraud detection, we propose a follow-up study that further investigates the points mentioned above and uses a significantly larger sample to confirm the current results. The sample could be expanded by involving more firms in the research as well as focusing on all material and non-material frauds that have come to light.

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Appendix A: Internal controls

Part 1: Personnel and Functions

1. To what extent do you agree with the following statements? Rate between 1 and 7 where 1 stands for completely disagree and 7 for completely agree.

During the audit of the internal controls for the year in which the fraud was detected, it was found that:

- ... there was a lack of essential personnel (CFO, controller, etc.).
- ... there was management override of controls.
- ... the audited entity lacked technical knowledge of relevant reporting standards.
- ... the quality of corporate governance was substandard.
- ... the personnel of the audited entity had inadequate training in reporting.
- ... the audited entity lacked staff (including lower levels within the organization).
- ... the internal audit function of the audited entity provided inadequate oversight.

2. Was there dominant management? (1 = Yes, 0 = No)

3. How do you evaluate the reliability of the CEO, CFO, and controllers working at the audited entity? (1 = Very unreliable, 5 = Very reliable)

Part 2: Control Environment

4. To what extent do you agree with the following statements? Rate between 1 and 7 where 1 stands for completely disagree and 7 for completely agree.

During the audit of the internal controls for the year in which the fraud was detected, it was found that:

- ... there were internal control weaknesses that could be considered red flags or could prevent fraud.

- ... there was insufficient documentation or procedures to support transactions or additional journal entries.

- ... there was inadequate communication between management and accounting staff and/or accountants, preventing correct recording of transactions.

Section 3: Control System

5. To what extent do you agree with the following statements? Rate between 1 and 7 where 1 stands for completely disagree and 7 for completely agree.

During the audit of the internal controls for the year in which the fraud was detected, it was found that:

- ... there was a lack of timely and/or adequate control of balance sheet items and income statement items.

- ... there was an incomplete analysis of balance sheet items and income statement items.

- ... there was no timely preparation of account reconciliations.
- ... there was inadequate control over non-routine transactions.
- ... there was a lack of discipline in the financial reporting of the audited entity.
- ... approval procedures were not followed.
- ... no follow-up was given to other procedures.
- ... there were inadequate control measures for automated systems.
- ... there was a lack of segregation of duties or inadequate segregation of duties.
- ... there was inadequate access security to the systems.
- ... there were weaknesses in the control of automated systems.
- ... there was a lack of documentation about existing internal controls and systems.
- ... the audited entity linked multiple systems or platforms for financial reporting.
- ... spreadsheets were used separately from the ERP system.
- ... manual systems were used separately from the ERP system.

Section 4: Financial Reporting

6. To what extent do you agree with the following statements? Rate between 1 and 7 where 1 stands for completely disagree and 7 for completely agree.

During the audit of the internal controls for the year in which the fraud was detected, it was found that:

- ... there were problems with the financial report closing procedures.

7. To what extent do you agree with the following statements? Rate between 1 and 7 where 1 stands for completely disagree and 7 for completely agree.

During the audit of the transactions of the company in the year in which the fraud was detected, it was found that there were weaknesses in the processing of:

- ... revenue
- ... expenses
- ... receivables
- ... taxes
- ... inventories
- ... liabilities
- ... consolidation
- ... fixed assets
- ... stock compensation
- ... fair value accounting
- ... foreign currency transactions
- ... goodwill
- ... patents and other intangible assets
- ... accruals
- ... minority interests
- ... deferred revenue
- ... other assets
- ... earnings per share
- ... payables
- ... salaries
- ... subsidiaries
- ... related parties
- ... loans

- ... leases
- ... cash and cash equivalents
- ... share issuance
- ... pension
- ... routine transactions

Appendix B: Measure for Professional Skepticism

Professional-Critical Attitude

Below you will find statements about the decision-making of the audit team. On a scale of 1 to 7, indicate to what extent you agree with the statements.

1. The audit team takes its time when making decisions.
2. The audit team values considering all available information.
3. The audit team does not favor quick decision-making.
4. The audit team ensures that all available information is reviewed before making a decision.
5. The audit team waits to decide on issues until more information can be obtained.