Economics, Business, Accounting & Society Review
Volume 4, Nomor 1, p. 138 - 150
ISSN 2810-0115

Enhancing Fraud Detection in Indonesian Audit Practice: The Role of Professional Skepticism, Audit Technology, And Industry Specialization

Arrum Azzahra Rusli[1*], Yusnaini[2], Sukanto[3]

[1,2,3]*Department of Accounting, Sriwijaya University, Palembang, Indonesia*
**Corresponding author: Arrum Azzahra Rusli*
Corresponding email: arrumazzahraa@gmail.com

ARTICLE INFO
Article history:
Received 15 January 2025
Revised 07 March 2025
Accepted 30 April 2025
Available Online 03 May 2025

Keywords:
Fraud Detection, Professional Skepticism, Auditor Ethic, Audit Technology, Auditor Industry Specialization

Cite as:
Rusli, A. A., Yusnaini, Y., & Sukanto, S. (2025). Enhancing Fraud Detection: Roles of Skepticism, Audit Technology, and Industry Specialization in Indonesia. Economics, Business, Accounting & Society Review, 4(1), 138–150. https://doi.org/10.55980/ebasr.v4i1.203

ABSTRACT
Fraud remains a persistent threat to financial reporting, particularly in developing countries like Indonesia where corruption is deeply entrenched. Despite advancements in auditing standards, limitations in fraud detection continue to undermine audit quality and public trust. This study aims to investigate the impact of professional skepticism, auditor ethics, and audit technology on fraud detection, with auditor industry specialization as a moderating variable. Using a quantitative approach, data were collected via questionnaires from 233 public accountants across 88 Indonesian public accounting firms and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that professional skepticism and audit technology significantly enhance fraud detection, while auditor ethics does not show a direct significant effect. Industry specialization significantly moderates the relationship between professional skepticism and fraud detection, as well as between auditor ethics and fraud detection. However, it does not moderate the effect of audit technology on fraud detection. These results suggest that skepticism and technology are critical competencies in fraud detection, but their effectiveness is further amplified when coupled with contextual industry expertise. Conversely, ethical awareness alone is insufficient unless supported by domain-specific knowledge. The study underscores the importance of enhancing professional training and developing sector-specific audit practices to strengthen fraud detection capabilities in Indonesia.

1. Introduction

Fraud in financial reporting remains one of the most persistent threats to the credibility and integrity of both public and private organizations globally. The detection of fraud is not only a regulatory obligation but also a critical step in preserving investor confidence and maintaining efficient capital markets. Fraud detection serves as an essential initial step in identifying red flags and restricting opportunities for fraudulent activities to persist (Austin, 2023; Litan et al., 2024). In developing countries such as Indonesia, corruption continues to be the most dominant form of fraud, deeply embedded in both public institutions and corporations (Achmad et al., 2022; Junaidi et al., 2024). Over one thousand corruption cases have been investigated by the Corruption Eradication Commission (KPK) and Indonesia Corruption Watch from 2004 to 2023, exposing

substantial weaknesses in internal control systems (Achmad et al., 2022). While the Statement on Auditing Standards (SAS) No. 82 outlines the responsibility of auditors in detecting material misstatements, the inherent limitations of audit procedures mean that not all fraud can be detected, especially when schemes are well-concealed (Aghazadeh & Joe, 2022; Backof et al., 2022). Given the complexity of fraud, external auditors can only provide reasonable assurance, and not absolute certainty, regarding the fairness of financial statements (Ashtiani & Raahemi, 2022; Eulerich et al., 2023). Therefore, strengthening auditors' ability to assess fraud risk and respond with appropriate procedures is vital in enhancing the reliability of financial information (Austin, 2023; Hilal et al., 2022).

In this context, technological innovations in auditing offer promising tools to enhance fraud detection. The implementation of data analytics and intelligent systems enables auditors to detect anomalies that would otherwise go unnoticed through conventional (Eulerich et al., 2023; Nguyen et al., 2024). Nonetheless, several high-profile fraud cases continue to reveal lapses in audit execution. The WanaArtha Life scandal in Indonesia serves as a recent example in which auditors failed to detect manipulative financial reporting practices involving high-risk savings plan insurance products, prompting the Financial Services Authority (OJK) to impose administrative sanctions on KAP and APs involved. These violations, including non-compliance with POJK No. 9/2023, highlight deficiencies in audit quality, professional ethics, and the effectiveness of current regulatory oversight mechanisms (Carrera & Van Der Kolk, 2021; Dharmasiri et al., 2022).

Given these recurring failures, researchers have attempted to identify key determinants that influence the effectiveness of fraud detection by auditors. Among the most studied are professional skepticism, auditor ethics, audit technology, and auditor industry specialization (Chen et al., 2023; Fullerton & Durtschi, 2011). Professional skepticism—an auditor's disposition to maintain questioning mind and delay judgment—is recognized as essential, especially when auditors are confronted with overconfident management or ambiguous evidence (Aghazadeh & Joe, 2022; Hurtt, 2010). Ethical awareness, likewise, has been shown to be a critical attribute for auditors in identifying and responding to ethical dilemmas inherent in fraud-prone environments (Yulianti et al., 2024). In parallel, the adoption of audit technologies, such as machine learning and forensic analytics, has demonstrated significant potential in improving fraud detection effectiveness and audit efficiency (Ashtiani & Raahemi, 2022; De Santis & D'Onza, 2021; Eulerich et al., 2023).

Despite these developments, empirical findings remain inconclusive and fragmented. Some studies affirm the positive influence of these auditor attributes, while others find limited or context-dependent effects, especially in environments where regulatory enforcement is weak. Furthermore, there is growing interest in understanding the role of auditor industry specialization as a contextual moderator. Industry specialists possess deeper knowledge of sector-specific risks, enabling them to better recognize irregular patterns and anomalies (Bell & Bryan, 2021; Cahan et al., 2022). Prior experience in industry audits allows these auditors to recall fraud patterns and apply higher levels of skepticism and judgment (Hilal et al., 2022; Susanto et al., 2022). Nonetheless, there remains a lack of integrated models that explore how industry specialization interacts with professional skepticism, ethics, and audit technology in influencing fraud detection outcomes (Achmad et al., 2022; Nguyen et al., 2024).

Attribution Theory

Heider's attribution theory, proposed in 1958, examines how individuals attribute causes to events and behaviors, influencing their attitudes and actions (Malle, 2008). Heider developed this theory by saying that a combination of internal and external forces determines a person's behavior. Internal forces include traits, characters, attitudes, abilities, skills, and efforts. Before concluding whether a person's behavior is influenced by these factors, one must have three important pieces of information about the concept to understand the causes of a person's behavior. In the context of fraud detection, attribution theory can be relevant in understanding how auditors and investigators assess and attribute the causes of fraud. Factors within the individual auditor affect the auditor's competence in terms of professional skepticism, auditor ethics, and specialization (Chen et al., 2023). The burden of the task causes the auditor to be inconsistent and irresponsible.

Technology Acceptance Model (TAM) Theory

TAM is one of the adaptation theories of TRA (Theory of Reasoned Action) which was previously introduced by Ajzen and Fishbein in 1980 and proposed by Davis in 1989. TAM explains a causal relationship between a belief (the benefits of a system and its ease of use) and the behavior, needs

and users of a system. TAM is a theory that explains the perception of technology users (Muda et al., 2020). The construct of perceived usefulness will influence the construct of behavioral intention to use. In addition, the construct of attitude toward using will influence the attitude toward using. The two main constructs that influence the technology system are the perception of usefulness and the perception of ease of use of technology.

1.1 Hypotheses Development

Professional Skepticism

Professional skepticism is an important internal factor of auditors to help them detect fraud (Wahidahwati & Asyik, 2022). The skeptical attitude of auditors makes them more alert in recognizing discrepancies or irregularities in financial information. This is important because these discrepancies can be an indication of fraudulent activity. Attribution theory is used in this study to test professional skepticism affects Fraud Detection (Nazri et al., 2023). Based on these assumptions, it can be concluded that high professional skepticism possessed by an auditor can help him and improve his ability to detect fraud well.

H1: Professional Skepticism Has a Positive Effect on Fraud Detection

Auditor Ethic

The code of ethics serves as a guide in carrying out or carrying out the profession (Yulianti et al., 2024). Ethics are basically related to morals that serve as guidelines for a person or group of people to regulate their behavior, as well as being a benchmark in assessing the good and bad of an action. An auditor must comply with ethical rules in carrying out his duties to make it easier for the auditor to detect fraud. Detecting fraud in auditing a company's financial statements requires the auditor to have ethics, because an ethical auditor has integrity and objectivity in carrying out his work. By integrating ethical considerations into the audit process, auditors can better navigate the complexities of the modern financial environment and effectively identify and address fraudulent activity.

H2: Auditor Ethic Has a Positive Effect on Fraud Detection

Audit Technology

Audit technology is described as tools and techniques provided to assist auditors in managing an organization's information systems by performing a series of tasks that are their right, namely fraud detection (Samagaio & Diogo, 2022). Proficiency in working, especially in detecting fraudulent activities, can be influenced by the competence and integration of technology-based audit methods. Where the use of technology increases the likelihood of auditors identifying anomalies such as fraudulent behavior that may have gone unnoticed. As a result, this technology can be used effectively to uncover risks and facilitate Fraud Detection. By utilizing these technological tools, auditors can increase their effectiveness in detecting fraud and improve the efficiency of their work. The emphasis on the use of technological advances further enhances our understanding of the potential benefits of integrating technology into the audit process.

H3: Audit Technology Has a Positive Effect on Fraud Detection

Auditor Specialization Industry

Auditors who specialize in an industry have a deep understanding of the business norms, regulations, and risks unique to that industry. Auditor industry specialization strengthens the influence of professional skepticism using the Hurtts scale on fraud detection because auditors who are familiar with the ins and outs of an industry are more likely to apply skepticism appropriately and effectively (Soroushyar, 2023). Specialization can lead to overconfidence, which causes auditors to reduce their professional skepticism. Specialized auditors can more easily identify ethical deviations that may not be apparent to general auditors. Specialization in an industry makes auditors more vigilant and more ethical in dealing with suspicious situations because they better understand what could be considered a deviation from proper industry practice (Bell & Bryan, 2021; Cahan et al., 2022). Auditors who specialize in an industry have a deeper understanding of the business processes and technologies used in that sector. This allows them to more effectively utilize audit technology tools such as data analytics, machine learning, and AI to identify patterns and anomalies that may indicate fraud (Nguyen et al., 2024). Auditors who specialize in a sector are

better able to tailor audit technology to the specific risks and processes of that industry, increasing the chances of detecting fraud.

H4: Auditor Industry Specialization Moderates the Effect of Professional Skepticism on Fraud Detection
H5: Auditor Industry Specialization Moderates the Effect of Auditor Ethic on Fraud Detection
H6: Auditor Industry Specialization Moderates the Effect of Audit Technology on Fraud Detection

1.2 Conceptual Framework

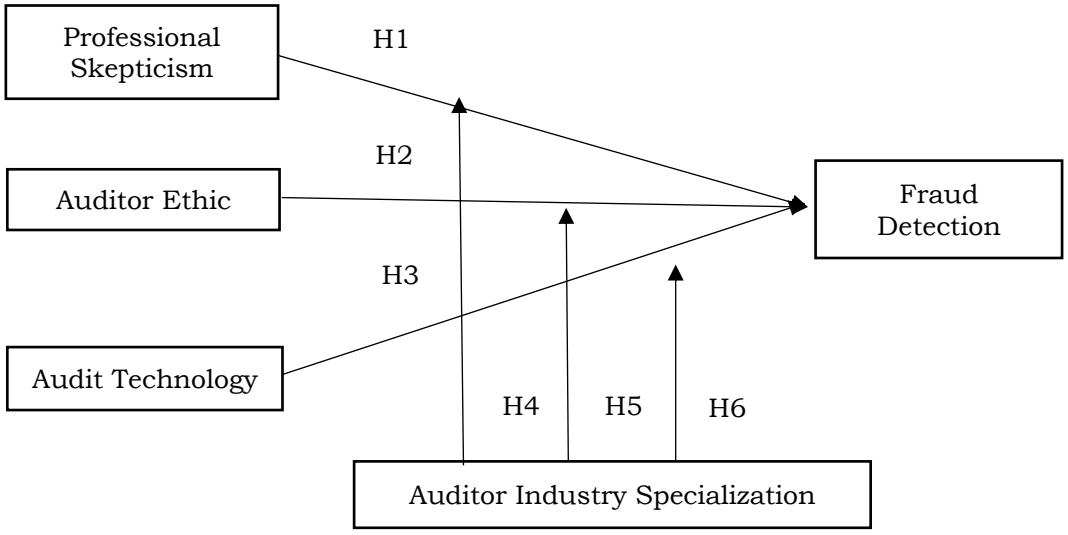

Figure 1. Conceptual Framework

2. Methods

The population targeted in this study consisted of all registered Public Accountants (Auditor Publik or AP) actively working in Public Accounting Firms (Kantor Akuntan Publik or KAP) across Indonesia. According to the most recent data, the total number of APs working in these firms amounted to 1,061 individuals. To determine an appropriate sample size that could adequately represent the entire population while maintaining statistical reliability, the researchers employed the Slovin formula. This formula is commonly used in social science research when the population size is known, but the level of precision desired must be considered. Based on this calculation and rounding up the result, the minimum required number of respondents for the study was established at 100 participants. However, to enhance the generalizability and robustness of the findings, the researchers decided to distribute questionnaires to all KAPs operating within Indonesia. This inclusive distribution strategy yielded a highly satisfactory response rate. From the total contacted, 88 KAPs responded positively, and within these firms, a total of 233 public accountants agreed to participate and provided usable responses, surpassing the minimum sample requirement. This broader sample size increased the reliability of the data and allowed for more nuanced analysis across different variables.

For data analysis, this study utilized the Partial Least Squares (PLS) method, executed using SmartPLS software version 4. PLS is a widely recognized variance-based Structural Equation Modeling (SEM) technique known for its flexibility, ability to handle complex models, and suitability for predictive analysis, particularly when the sample size is relatively small or when the data does not meet normal distribution assumptions. This method is considered particularly appropriate for exploratory studies involving latent variables measured through multiple indicators.

The key variables examined in the research include fraud detection as the dependent variable (Y), which was measured using five indicators. The independent variables were professional skepticism (X1) with six indicators, auditor ethics (X2) with four indicators, and audit technology (X3) with five indicators. In addition, auditor industry specialization (Z) was included as a moderating variable and was measured using five indicators. Prior to testing the hypotheses, it was essential to ensure the validity and reliability of the measurement model. Therefore, the outer model evaluation was conducted, which involved assessing convergent validity through indicator loadings and Average Variance Extracted (AVE), and evaluating construct reliability using Cronbach's Alpha

and Composite Reliability values. Only after passing these assessments did the study proceed to hypothesis testing.

3. Results

3.1 Outer Model Analysis

Tabel 1. Outer Loadings

No	SP	EA	TA	FD	SIA
1	0.847	0.831	0.828	0.851	0.819
2	0.899	-0.022	0.76	0.795	0.942
3	0.07	0.9	0.758	0.865	0.903
4	0.844	0.79	0.898	0.931	0.907
5	0.131	0.902	0.911	0.846	0.824
6	0.7		0.738		
7	0.845				

Source: SMART PLS 4 Output

In table 1, it is known that there are indicators declared invalid because they have a value of less than 0.7. The indicators are in the Professional Skepticism (SP) variable for questions number 3 and 5, each with a value of 0.07 and 0.131, and in the Audit Ethics (EA) variable, there is one invalid question in number 2 with a value of -0.022. For invalid indicators, they must be removed from the model which is carried out by re-estimating.

Tabel 2. Outer Loadings Re-Estimation

No	SP	EA	TA	FD	SIA
1	0.845	0.83	0.828	0.851	0.819
2	0.899	-	0.76	0.795	0.942
3	-	0.899	0.758	0.865	0.903
4	0.847	0.791	0.898	0.931	0.907
5	-	0.903	0.911	0.846	0.824
6	0.701		0.738		
7	0.846				

Source: SMART PLS 4 Output

Based on table 2, it is known that all variables including Professional Skepticism (SP), Audit Ethics (EA), Audit Technology (TA), Fraud Detection (FD) and Auditor Industry Specialization (SIA) all have outer loading values above 0.7 so that all questions in the indicators in this research variable are declared valid.

Tabel 3. AVE

No	Variable	*AVE*	
1	Professional Skepticism (X1)	0.735	AVE > 0.5 = Valid
2	Auditor Ethic (X2)	0.737	AVE > 0.5 = Valid
3	Audit Technology (X3)	0.776	AVE > 0.5 = Valid
4	*Fraud Detection* (Y)	0.689	AVE > 0.5 = Valid
5	Auditor Industry Specialization (Z)	0.67	AVE > 0.5 = Valid

Source: SMART PLS 4 Output

All variables including the independent variables of Professional Skepticism (X1), Audit Ethics (X2), and Audit Technology (X3) as well as the dependent variables of Fraud Detection (Y) and Audit Industry Specialization moderation (Z) have AVE values greater than 0.5. This proves that the construct has achieved the convergent validity requirements because the AVE values are all > 0.50.

Tabel 4. Reability

No	Variable	*Cronbach Alpha*	rho_A	Composite Reability
1	Professional Skepticism (X1)	0.879	0.892	0.917
2	Auditor Ethic (X2)	0.91	0.913	0.933
3	Audit Technology (X3)	0.927	0.931	0.945
4	*Fraud Detection* (Y)	0.885	0.895	0.917
5	Auditor Industry Specialization (Z)	0.9	0.914	0.924

Source : SMART PLS 4 Output

All constructs have Cronbach's Alpha values of more than 0.7, so it can be said that all constructs are reliable.

3.2 Inner Model Analysis

Tabel 5. F Square

No	Variable	Fraud Detection (Y)
1	Professional Skepticism (X1)	0.176
2	Auditor Ethic (X2)	0.000
3	Audit Technology (X3)	0.351
4	Auditor Industry Specialization (Z)	0.436

Source: SMART PLS 4 Output

Variables Professional Skepticism and Auditor Industry Specialization have f2 values in the range above 0.35 which means they have a large effect size (influence) on the Fraud Detection variable (Y). The Professional Skepticism variable has an f2 value in the range above 0.15 to 0.35 which means it has a moderate effect size (influence) on the Y variable of the study, Fraud Detection. For the Audit Ethics variable, it is in the range of less than 0.02, so it can be said that the variable has no effect at all on the Fraud Detection variable (Y).

Tabel 6. R Square

Variable	R-Square	R-Square Adjusted
Fraud Detection (Y)	0.942	0.94

Source: SMART PLS 4 Output

R-Square is 0.942 which means that the ability of the variables Professional Skepticism (X1), Audit Ethics (X2), Audit Technology (X3), Fraud Detection (Y), and Audit Industry Specialization (Z) in explaining the Fraud Detection variable (Y) is 94.2%, which is greater than 50% and 0.942 is above 0.75, so the influence of all exogenous constructs of Professional Skepticism (X1), Audit Ethics (X2), Audit Technology (X3), Fraud Detection (Y), and Audit Industry Specialization (Z) indicates that the model is strong, while the remaining 5.8% is influenced by other variables.

3.3 Path Coefficient

Tabel 7. R Square

Variable	T Statistics	P Values
Professional Skepticism -> Fraud Detection	4.401	0.000
Auditor Ethics -> Fraud Detection	1.497	0.134
Audit Technology -> Fraud Detection	7.270	0.000
*SIA*SP -> Fraud Detection*	3.389	0.001
*SIA*EA -> Fraud Detection*	2.617	0.009
SIA*TA -> Fraud Detection	0.192	0.848

Source : SMART PLS 4 Output

Based on the calculation obtained, the T statistic value for the Professional Skepticism variable is 4.401> 1.96 with a P Value of 0.000 <0.05. This shows that H1 is accepted so that it can be explained that the Professional Skepticism variable directly affects Fraud Detection. The T statistic for the Auditor Ethics variable is 1.497 <1.96 with a P Value of 0.134> 0.05. This shows that H2 is rejected so that it can be concluded that the Auditor Ethics variable does not affect Fraud Detection. The T statistic for the Audit Technology variable is 7.270> 1.96 with a P Value of 0.000 <0.05. Thus, H3 is accepted and it can be concluded that the Audit Technology variable has a significant effect on Fraud Detection.

Based on the result obtained, the t statistic value for the Auditor Industry Specialization variable strengthens the influence of Professional Skepticism on Fraud Detection by 3.389> 1.96 with a P Value of 0.001 <0.05. This shows that H4 is accepted so that it can be explained that Auditor Industry Specialization is able to moderate Professional Skepticism on Fraud Detection. for

the Auditor Industry Specialization variable strengthens the influence of Auditor Ethics on Fraud Detection by 2.617> 1.96 with a P Value of 0.009 <0.05. This shows that the fifth hypothesis is accepted and it can be concluded that Auditor Industry Specialization is able to moderate Auditor Ethics on Fraud Detection. The t statistic for the Auditor Industry Specialization variable strengthens the influence of Auditor Ethics on Fraud Detection is 0.192 <1.96 with a P Value of 0.848> 0.05. This shows that H6 is accepted so it can be concluded that Auditor Industry Specialization is not able to strengthen the relationship between Audit Technology and Fraud Detection.

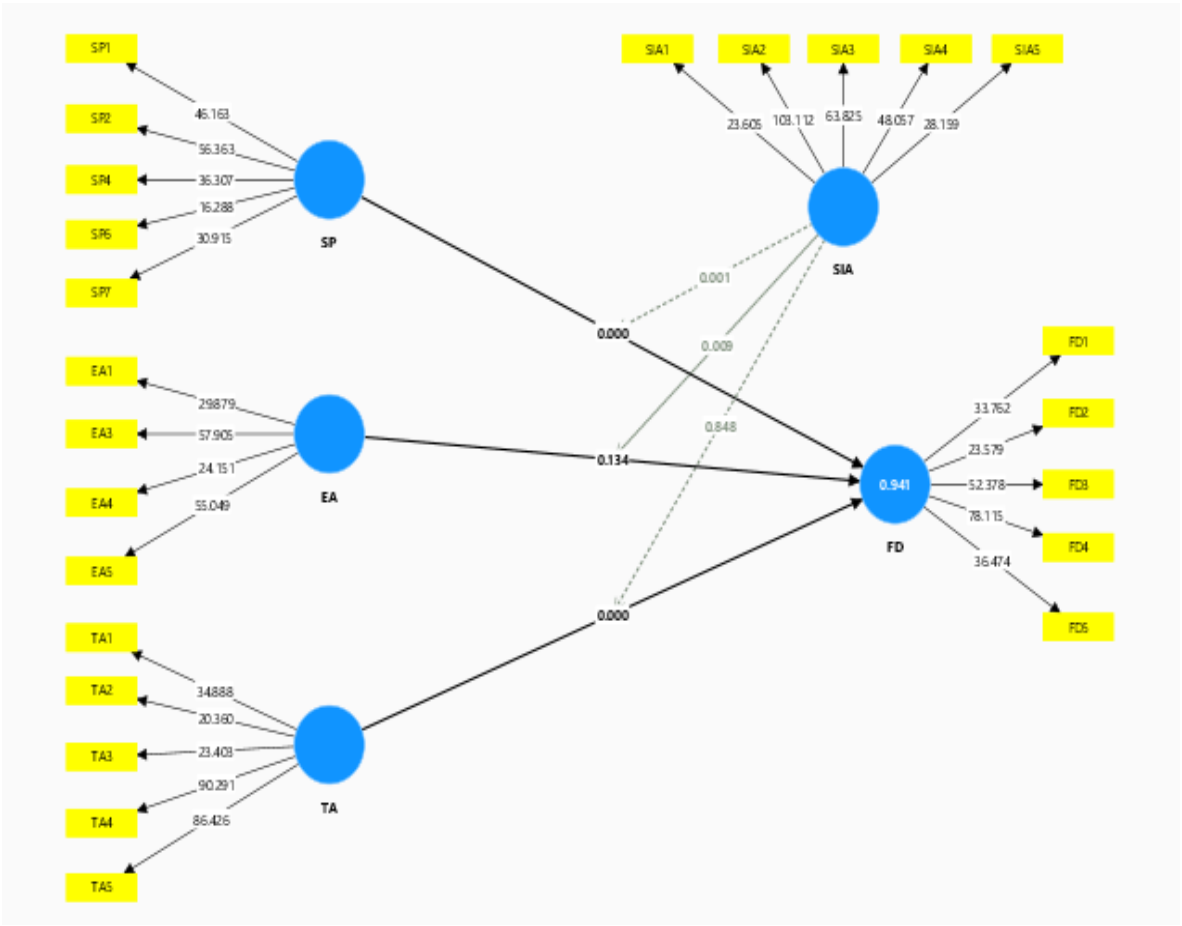

Figure 2. The Influence of Exogenous Variables on Endogenous Variables Moderated by Auditor Industry Specialization Variables

4. Discussion

4.1 The Effect of Professional Skepticism on Fraud Detection

The results show that professional skepticism has a positive effect on Fraud Detection. The initial hypothesis of this study can be accepted because the significance value is 0.000 < 0.05 and the t-statistic value is 4.401. The coefficient of the independence variable is positive, which means that auditors who are increasingly skeptical will be able to detect fraud at the audit planning stage and will detect it at the next audit stage.

Attribution theory explains a person's motivation and behavior, that good auditors are more confident in their work, so that auditors are able to be skeptical to conduct quality audits in their work. Professional skepticism is an important internal factor for auditors to help them detect fraud. Skepticism states the auditor's alertness to conditions that may indicate misstatement, so assessing audit evidence is very important. Therefore, State Finance Law No. 01 atat 30 (2007) requires auditors to have professional skepticism. Auditors should be able to maintain an attitude of professional skepticism in their assignments to make it easier for auditors to detect the possibility of fraud in the financial statements they audit and to improve fraud detection

capabilities. Attribution theory explains a person's motivation and behavior, that good auditors are more confident in their work, so that auditors are able to be skeptical to conduct quality audits in their work (Martinov-Bennie et al., 2022). Professional skepticism is an important internal factor for auditors to help them detect fraud.

In audits or fraud investigations, auditors should not immediately draw conclusions without adequate audit evidence. The auditor's tendency to withhold judgment when the available information is not sufficient to draw conclusions. Auditors must keep an open mind to the possibility of fraud and not easily believe the information or explanations provided so that the evidence can reach rational and accountable conclusions (Alsharif & Symons, 2021). This study shows that auditors are interested in what causes people to behave the way they do. This is based on the affective and motivational dimensions of skepticism to not only focus on documents and numbers, but also understand the motives and patterns of human behavior that underlie suspicious actions (McMartin & Pickavance, 2024). Auditors have an inquisitiveness towards psychological, social, and situational factors that can also drive someone to commit fraud.

4.2 The Effect of Auditor Ethic on Fraud Detection

The t-statistic value is 1.497 <1.96 with a P Value of 0.134> 0.05. This proves that the auditor's ethics variable does not directly have a significant effect on fraud detection in Public Accounting Firms (KAP) in Indonesia. This shows that the more the auditor understands audit ethics, the less likely the auditor is to detect fraud. This code of ethics functions as a guideline for carrying out or carrying out the work (Poje & Zaman Groff, 2022). Ethics are basically related to morals that serve as guidelines for a person or group of people to regulate their behavior, as well as being a benchmark for assessing the good and bad of an action (Mardawi et al., 2023). An auditor must comply with ethical rules in carrying out his duties to make it easier for the auditor to detect fraud.

Based on attribution theory, understanding how auditors assess the causes of unusual financial behavior or events in the context of auditing and fraud detection. Internally caused behavior is behavior that is believed to be under the personal control of the individual concerned, while external behavior is seen as the result of external causes that force the individual to behave (Wahidahwati & Asyik, 2022). Attribution theory knows what factors influence auditors when carrying out assignments, especially on personal qualities. Fraud detection in financial statement audits requires auditors to have ethics, because ethical auditors have integrity and objectivity in carrying out their work (Dharmasiri et al., 2022). If an auditor follows the regulated professional ethics, it will guarantee quality and improve the auditor's fraud detection capabilities.

This study shows that auditor ethics do not have a significant effect on fraud detection. This is because fraud detection requires more than just a general ethical commitment. Auditors can be ethical in general, but passive towards fraud because they consider it not a top audit priority. Ethics alone are not enough for auditors if they do not have adequate technical skills or professional skepticism (Aghazadeh & Joe, 2022). Good ethics cannot directly guarantee skepticism and sensitivity to fraud. Another factor is the auditor's view that all actions that can harm others, no matter how small, must be avoided. Auditors are committed to preventing losses to stakeholders and refusing to allow errors or fraud that have the potential to harm the public, no matter how small. Auditors should be able to have a high moral view, for example by not tolerating risks to the public, such as investigating anomalies, reporting fraud, and refusing pressure from management.

4.3 The Effect of Technology Audit on Fraud Detection

The results of the study prove that audit technology has a positive effect on Fraud Detection. The coefficient of the independent variable is positive, which means that the higher the use or utilization of audit technology, the more effective the auditor is in fraud detection, the more often, skillfully and maximally the auditor uses audit technology, their ability to detect is also higher

Auditors must use audit technology because of the increasing demands of audits amidst limited resources such as human resources and competencies. With data analytics, AI, continuous monitoring, blockchain, and specialized software, auditors are better prepared to identify and address fraudulent activities. However, auditing in a technological environment presents several unique challenges and issues that need to be addressed by auditors (Ahmed et al., 2023).

The Technology Acceptance Model (TAM) theory explains how and why someone accepts and uses a technology. Auditors will tend to use audit technology if they believe that the technology is useful in identifying fraud patterns faster, testing data populations, and also accessing suspicious reports or activities quickly (Seethamraju & Hecimovic, 2023). When auditors feel that audit technology is useful and easy to use, they will be more likely to accept and use the technology actively. High and effective use of this technology will improve the auditor's ability to detect fraud more accurately, efficiently, and comprehensively.

Based on the research results, audit technology can affect fraud detection. This is because the technology-based audit process makes it easier for auditors to detect fraud. Audit technology functions as the main tool for auditors in increasing efficiency, expanding audit coverage, and identifying patterns and anomalies that indicate fraud (Hilal et al., 2022). This means that audit technology not only speeds up the process, but also improves the quality and accuracy of fraud detection. Therefore, if technology is used effectively, its ability to detect fraud will also increase. TABK and CATTs can help the auditor carry out his duties in fraud detection.

Another factor is that auditors believe that the audit process supported by technology is more reliable, consistent, and objective, and is able to produce strong audit evidence, especially in the context of fraud. Audit software can carry out systematic and automatic checks on data and will reduce the risk of negligence, subjectivity, or inaccuracy of auditors, so that this consistency makes the audit process more reliable in revealing fraud. Technology-based audit systems store activity logs in real time because each process is clearly recorded and cannot be manipulated without a digital footprint (Eulerich et al., 2023). In addition, the analysis results for handling big data capabilities are more representative and reduce dependence on sampling techniques, thereby increasing the reliability of the audit process.

4.4 Auditor Industry Specialization Moderates the Effect of Professional Skepticism on Fraud Detection

The results of the study indicate that auditor industry specialization can moderate the effect of professional skepticism on fraud detection. This is evidenced by a significance value of 3.389> 1.96 with a P Value of 0.001 <0.05. The coefficient of the independence variable is positive, which means that auditors who are skeptical and also master a particular industry have a much greater ability in fraud detection than skeptical auditors who do not master the industry.

In a study published Zimmerman et al (2023) it was stated that auditors who are more experienced and have industry specialization are better able to identify fraud that may not be clearly visible to general auditors. Auditors who specialize in the industry understand the business processes, control systems, and fraud-prone points that are typical in the industry so that they can strengthen professional skepticism because auditors can be sharper in distinguishing between reasonable and suspicious transactions. Their skepticism becomes more targeted and is not only based on general suspicion, but on intuition based on industry experience.

Non-specialist auditors can also be skeptical, but a lack of understanding of the industry can make them hesitate to follow up on red flags. Specialist auditors can be confident because they know what they can look for, so they are more daring in exploring potential fraud.

This result is in line with attribution theory which explains that individuals will make an assessment of the cause of an event based on the information and understanding they have. Auditors with high skepticism do not immediately believe the client's explanation and tend to look for the real cause of an anomaly (Austin, 2023). However, the accuracy of the auditor is highly dependent on the understanding of the industrial context in which the client's company or agency operates. In this case, the auditor's industry specialization is an important factor that strengthens this attribution ability. Auditors in certain industries know and can easily assess the causes of anomalies more contextually and objectively, so that the fraud detection process is more effective. Thus, auditors who have a certain industry specialization better understand the business patterns and specific risks in that industry, so they can be more effective in applying professional skepticism.

4.5 Auditor Industry Specialization Moderates the Effect of Auditor Ethic on Fraud Detection

Auditor industry specialization can moderate the effect of auditor ethics on fraud detection. This is evidenced by a significance value of 2.617> 1.96 with a P Value of 0.009 <0.05. The coefficient of the independence variable is positive, which means that auditors who have a certain industry specialization and follow and implement audit ethics will be stronger for fraud detection than general auditors.

Specialization in the industry makes auditors more alert and more ethical in dealing with suspicious situations, because they better understand what can be considered a deviation from proper industry practices (Zimmerman et al., 2023). Auditors will integrate their specialization and audit experience with the knowledge they already have. Auditors who specialize have more knowledge and better memory structures than less experienced auditors (De Santis & D'Onza, 2021).

In attribution theory, auditor industry specialization can be a condition or experience that shapes the way auditors think and act. When auditors are highly ethical, they have a strong intention to find and report fraud (Tuan Mansor et al., 2020; Zhang & Wei, 2022). However, intention alone is not enough, it requires supporting external conditions, namely industry specialization. Specialization allows these ethics to operate more effectively, because auditors know where to look, how to assess, and what is suspicious in the context of a specific industry. Based on the results of the study, auditor ethics such as integrity, objectivity, and the courage to report fraud are internal intentions to carry out audits honestly. An auditor who has high ethics but does not understand the characteristics of the industry may fail to detect fraud due to limited technical insight. Meanwhile, auditors who specialize and also know the ethics of auditors will be more effective in detecting fraud because strong ethics meet contextual competence. Specialist auditors make fewer mistakes because they understand the characteristics of the auditor's professional ethics, because their good intentions to detect fraud are supported by technical skills and adequate understanding of the risk of fraud in the industry (Carrera & Van Der Kolk, 2021).

4.6 Auditor Industry Specialization Moderates the Effect of Audit Technology on Fraud Detection

The t-statistic value is 0.192 <1.96 with a P Value of 0.848> 0.05. This shows that auditor industry specialization cannot directly strengthen the influence of audit technology and has no significant effect on fraud detection in Public Accounting Firms (KAP) in Indonesia. This means that even though auditors master technology and have industry specialization, both cannot directly increase the effectiveness of fraud detection.

Auditors who specialize in an industry have a deeper understanding of the business processes and technology used in that sector. This allows them to more effectively utilize audit technology tools such as data analytics, machine learning, and AI to identify patterns and anomalies that may indicate fraud (Nguyen et al., 2024). Based on the results of the study, if audit technology is not utilized optimally, then specialization also does not help much in the audit process. Even though auditors understand the client's industry well, if the technological tools are not used correctly or inappropriately, the effect on fraud detection remains weak.

Based on the TAM perspective, the use of audit technology by auditors is influenced by perceptions of ease and perceptions of benefits. If the auditor feels that audit technology does not provide added value in the fraud detection process or is difficult to use practically, then the acceptance of the technology will also be low. Although the auditor's industry specialization improves the understanding of the client's business context, it cannot directly increase the acceptance or effectiveness of the use of audit technology. This comes from different competencies, specialization emphasizes understanding the industry while the effectiveness of technology is highly dependent on the auditor's own perception and technological skills (Zhang & Wei, 2022).

Thus, the auditor's industry specialization is unable to strengthen the relationship between audit technology and fraud detection, especially for Public Accounting Firms in Indonesia. From the perspective of this industry specialization, there is no direct relationship between the auditor's ability to audit the industry and their ability to use technology.

5. Conclusion

This study aimed the effect of professional skepticism, auditor ethics, and audit technology on fraud detection with auditor industry specialization as a moderating variable. The findings indicate that Professional skepticism has a significant positive effect on fraud detection. The results of the study indicate that the more skeptical the more able to detect fraud at the audit planning stage and will carry out detection at the next audit stage. Auditor ethics do not have a significant effect on fraud detection. Audit technology results have a positive and significant effect on fraud detection. Although not significant, this is because fraud detection requires more than just a general ethical commitment and the auditor's view that all actions that can harm others, no matter how small, must be avoided. Audit technology has a significant positive effect on fraud detection. The results of this study indicate that the higher the use or utilization of audit technology, the more effective the auditor is in fraud detection, the more often, skillfully and maximally the auditor uses audit technology, their ability to detect is also higher. Auditor industry specialization can moderate professional skepticism and auditor ethic but do not moderate audit technology. This means that even though auditors master technology and have industry specialization, both cannot directly increase the effectiveness of fraud detection. Based on the TAM perspective, the use of audit technology by auditors is influenced by perceptions of ease and perceptions of benefits. If auditors feel that audit technology does not provide added value in the fraud detection process or is difficult to use practically, then acceptance of the technology will also be low.

Further research can add other variables that may possibly affect fraud detection and have not been studied by other studies. For example, measuring audit technology can use indicators of perceived benefits of new technology and perceived technological proficiency. Other variables such as auditor experience, whistleblowing, and red flags can be used for more in-depth research.

6. References

Achmad, T., Ghozali, I., & Pamungkas, I. D. (2022). Hexagon Fraud: Detection of Fraudulent Financial Reporting in State-Owned Enterprises Indonesia. *Economies*, *10*(1), 1–16. https://doi.org/10.3390/economies10010013

Aghazadeh, S., & Joe, J. R. (2022). Auditors' response to management confidence and misstatement risk. *Accounting, Organizations and Society*, *101*, 101348. https://doi.org/10.1016/j.aos.2022.101348

Ahmed, H. M. S., El-Halaby, S., & Albitar, K. (2023). Board governance and audit report lag in the light of big data adoption: the case of Egypt. *International Journal of Accounting and Information Management*, *31*(1), 148–169. https://doi.org/10.1108/IJAIM-04-2022-0088

Alsharif, H., & Symons, J. (2021). Open-mindedness as a Corrective Virtue. *Philosophy*, *96*(1), 73–97. https://doi.org/10.1017/S0031819120000352

Ashtiani, M. N., & Raahemi, B. (2022). Intelligent Fraud Detection in Financial Statements Using Machine Learning and Data Mining: A Systematic Literature Review. *IEEE Access*, *10*, 72504–72525. https://doi.org/10.1109/ACCESS.2021.3096799

Austin, A. A. (2023). Remembering Fraud in the Future: Investigating and Improving Auditors' Attention to Fraud during Audit Testing+. *Contemporary Accounting Research*, *40*(2), 925–951. https://doi.org/10.1111/1911-3846.12843

Backof, A. G., Bowlin, K., & Goodson, B. M. (2022). The Importance of Clarification of Auditors' Responsibilities Under the New Audit Reporting Standards*. *Contemporary Accounting Research*, *39*(4), 2284–2304. https://doi.org/10.1111/1911-3846.12802

Bell, T. B., & Bryan, D. B. (2021). Effectiveness, efficiency, and fee premiums in audits led by industry specialist partners. *Accounting & Finance*, *61*(3), 4513–4572. https://doi.org/10.1111/acfi.12739

Cahan, S. F., Che, L., Knechel, W. R., & Svanström, T. (2022). Do Audit Teams Affect Audit Production and Quality? Evidence from Audit Teams' Industry Knowledge*. *Contemporary Accounting Research*, *39*(4), 2657–2695. https://doi.org/10.1111/1911-3846.12807

Carrera, N., & Van Der Kolk, B. (2021). Auditor ethics: do experience and gender influence auditors' moral awareness? *Managerial Auditing Journal*, *36*(3), 463–484. https://doi.org/10.1108/MAJ-07-2020-2745

Chen, Y.-H., Wang, K.-J., & Liu, S.-H. (2023). How Personality Traits and Professional Skepticism Affect Auditor Quality? A Quantitative Model. *Sustainability*, *15*(2), 1547. https://doi.org/10.3390/su15021547

De Santis, F., & D'Onza, G. (2021). Big data and data analytics in auditing: in search of legitimacy. *Meditari Accountancy Research*, *29*(5), 1088–1112. https://doi.org/10.1108/MEDAR-03-2020-0838

Dharmasiri, P., Phang, S.-Y., Prasad, A., & Webster, J. (2022). Consequences of Ethical and Audit Violations: Evidence from the PCAOB Settled Disciplinary Orders. *Journal of Business Ethics*, *179*(1), 179–203. https://doi.org/10.1007/s10551-021-04786-4

Eulerich, M., Masli, A., Pickerd, J., & Wood, D. A. (2023). The Impact of Audit Technology on Audit Task Outcomes: Evidence for Technology-Based Audit Techniques*. *Contemporary Accounting Research*, *40*(2), 981–1012. https://doi.org/10.1111/1911-3846.12847

Fullerton, R., & Durtschi, C. (2011). The Effect of Professional Skepticism on the Fraud Detection Skills of Internal Auditors. *SSRN Electronic Journal*, *435*. https://doi.org/10.2139/ssrn.617062

Hilal, W., Gadsden, S. A., & Yawney, J. (2022). Financial Fraud: A Review of Anomaly Detection Techniques and Recent Advances. *Expert Systems with Applications*, *193*, 116429. https://doi.org/10.1016/j.eswa.2021.116429

Hurtt, R. K. (2010). Development of a scale to measure professional skepticism. *Auditing*, *29*(1), 149–171. https://doi.org/10.2308/aud.2010.29.1.149

Junaidi, Hendrian, & Syahputra, B. E. (2024). Fraud detection in public sector institutions: an empirical study in Indonesia. *Cogent Business and Management*, *11*(1). https://doi.org/10.1080/23311975.2024.2404479

Litan, W., Minxun, Q., & Yongzhe, W. (2024). Does audit quality affect firm innovation? *Industrial Marketing Management*, *117*(August 2023), 402–417. https://doi.org/10.1016/j.indmarman.2024.01.011

Malle, B. F. (2008). Fritz Heider's Legacy. *Social Psychology*, *39*(3), 163–173. https://doi.org/10.1027/1864-9335.39.3.163

Mardawi, Z., Seguí-Mas, E., & Tormo-Carbó, G. (2023). Wave after wave: unboxing 40 years of auditing ethics research. *Meditari Accountancy Research*, *31*(6), 1886–1918. https://doi.org/10.1108/MEDAR-05-2022-1698

Martinov-Bennie, N., Dyball, M. C., & Tweedie, D. (2022). Professional skepticism through audit praxis: An Aristotelian perspective. *International Journal of Auditing*, *26*(2), 193–211. https://doi.org/10.1111/ijau.12258

McMartin, J., & Pickavance, T. (2024). Affective Reason. *Episteme*, *21*(3), 819–836. https://doi.org/10.1017/epi.2022.45

Muda, I., Davis, K. V., Erlina, E., Kholis, A., & Gusnardi, G. (2020). Audit Lag Criteria Report as a Determination of the Reliability and Quality of Auditor's Report in Indonesia. *Research in World Economy*, *11*(6), 96. https://doi.org/10.5430/rwe.v11n6p96

Nazri, S. N. F. S. M., Zahba, I. H., Zolkaflil, S., & Zainuddin, N. (2023). The Influence of Professional Skepticism on Fraud Detection: The Case of Malaysian Non – Big 4 Auditors. *Management and Accounting Review*, *22*(1), 201–228. https://doi.org/10.24191/mar.v22i01-09

Nguyen, P. T., Kend, M., & Le, D. Q. (2024). Digital transformation in Vietnam: the impacts on external auditors and their practices. *Pacific Accounting Review*, *36*(1), 144–160. https://doi.org/10.1108/PAR-04-2023-0051

Poje, T., & Zaman Groff, M. (2022). Mapping Ethics Education in Accounting Research: A Bibliometric Analysis. *Journal of Business Ethics*, *179*(2), 451–472. https://doi.org/10.1007/s10551-021-04846-9

Samagaio, A., & Diogo, T. A. (2022). Effect of Computer Assisted Audit Tools on Corporate Sustainability. *Sustainability (Switzerland)*, *14*(2). https://doi.org/10.3390/su14020705

Seethamraju, R., & Hecimovic, A. (2023). Adoption of artificial intelligence in auditing: An exploratory study. *Australian Journal of Management*, *48*(4), 780–800. https://doi.org/10.1177/03128962221108440

Soroushyar, A. (2023). Auditor characteristics and the financial reporting quality: the moderating role of the client business strategy. *Asian Journal of Accounting Research*, *8*(1), 27–40. https://doi.org/10.1108/AJAR-01-2022-0020

Susanto, H., Mulyani, S., Sukmadilaga, C., & Ghani, E. K. (2022). Sustaining Investigative Audit Quality through Auditor Competency and Digital Forensic Support: A Consensus Study. *Sustainability*, *14*(22), 15141. https://doi.org/10.3390/su142215141

Tuan Mansor, T. M., Mohamad Ariff, A., & Hashim, H. A. (2020). Whistleblowing by auditors: the

role of professional commitment and independence commitment. *Managerial Auditing Journal*, *35*(8), 1033–1055. https://doi.org/10.1108/MAJ-11-2019-2484

Wahidahwati, W., & Asyik, N. F. (2022). Determinants of Auditors Ability in Fraud Detection. *Cogent Business and Management*, *9*(1). https://doi.org/10.1080/23311975.2022.2130165

Yulianti, Y., Zarkasyi, M. W., Suharman, H., & Soemantri, R. (2024). Effects of professional commitment, commitment to ethics, internal locus of control and emotional intelligence on the ability to detect fraud through reduced audit quality behaviors. *Journal of Islamic Accounting and Business Research*, *15*(3), 385–401. https://doi.org/10.1108/JIABR-02-2021-0076

Zhang, Y., & Wei, L. (2022). Philanthropy, audit firms culture and auditor independence. *PLOS ONE*, *17*(11), e0277567. https://doi.org/10.1371/journal.pone.0277567

Zimmerman, A. "Ally" B., Barr-Pulliam, D., Lee, J.-S., & Minutti-Meza, M. (2023). Auditors' Use of In-House Specialists. *Journal of Accounting Research*, *61*(4), 1363–1418. https://doi.org/10.1111/1475-679X.12485