

An Analysis of the Determinants Influencing Internal Auditors' Ability to Detect Fraud in Indonesian State-Owned Enterprises

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Abstract

This study examines persistent challenges in fraud detection within Indonesian State-Owned Enterprises (BUMN), despite the formal establishment of internal audit mechanisms. Motivated by recurring large-scale corruption cases that remained undetected over extended periods, the study aims to identify and empirically analyse the key determinants influencing internal auditors' ability to detect and disclose fraud. A mixed-methods explanatory design was employed, integrating quantitative and qualitative approaches. Data were collected from 85 internal auditors through structured questionnaires, supported by in-depth interviews and Focus Group Discussions (FGDs) involving auditors from BUMN, the Financial and Development Supervisory Agency (BPKP), and the Inspectorate General. Quantitative data were analysed using multiple linear regression, while qualitative data were examined through thematic analysis and visualized using a mind mapping approach. The results reveal that six determinants auditor competence, independence and objectivity, management support, internal control systems, organizational culture, and audit technology have positive and significant effects on fraud detection capability, explaining 70.9% of the variance ($R^2 = 0.709$). Auditor competence and independence emerge as the most influential factors. This study proposes a determinant-based model of internal audit effectiveness and highlights the need for integrated reforms to strengthen audit capability and accountability within BUMN.

Keywords: Internal Audit Effectiveness, Fraud Detection Capability, State-Owned Enterprises

INTRODUCTION

State-Owned Enterprises (SOEs), or Badan Usaha Milik Negara (BUMN) in Indonesia, are strategic economic actors in which the government holds majority or full ownership. Alongside private enterprises and cooperatives, BUMN play a critical role in supporting national development, driving economic growth, and generating state revenue (Budi Yuniarso et al., 2025). Given their economic significance, ensuring accountability and transparency within BUMN has become a central concern in public sector governance.

In recent years, however, Indonesia has experienced a series of large-scale corruption scandals involving BUMN, raising serious concerns about the effectiveness of internal audit mechanisms responsible for oversight (Alwi Rahman Kusnandar, 2025; Syakirun Ni'am, 2025). A series of major corruption cases in Indonesian State-Owned Enterprises (SOEs) highlights systemic delays in fraud detection, indicating fundamental weaknesses in internal audit effectiveness. High-profile cases such as Pertamina, Timah, and Duta Palma, along with TPPI, Asabri, Jiwasraya, and Garuda Indonesia, demonstrate prolonged gaps between occurrence and disclosure, often spanning multiple years. This persistent failure in fraud detection represents a significant agency problem. Within the framework of Agency Theory, internal auditors act as agents responsible for mitigating information asymmetry between SOE management and the state as the principal. The inability of these agents to uncover long-term fraud suggests a breakdown in the monitoring mechanism, where institutional pressures may override the auditor's fiduciary duty to protect public assets (Abiyyu & Mustafida, 2024).

However, the prolonged duration of undetected fraud cases, as evidenced by the preceding discussion, suggests that the mere existence of internal audit structures is insufficient to ensure effective fraud detection. This is particularly concerning given that internal audit units are formally mandated within BUMN as part of governance and control mechanisms. Their establishment is grounded in Article 67 of Law No. 6 of 2023, which requires internal supervisory functions in state-owned entities and is further reinforced by Regulation No. 02/MBU/03/2023 issued by the Ministry of State-Owned Enterprises, which governs corporate oversight and operational accountability.

Despite these regulatory frameworks, the persistence of undetected fraud indicates a critical gap between formal institutional design and actual audit effectiveness. This raises a fundamental research question: what factors determine the ability of internal auditors to detect and disclose fraud within BUMN?

Previous studies have examined the role of internal audit in terms of fraud prevention, detection, and reporting (Bonrath & Eulerich, 2024; Brink et al., 2022). While these studies provide valuable insights into the functional responsibilities of internal

auditors, they remain limited in explaining why significant fraud cases continue to persist undetected over extended periods. In particular, prior research has largely overlooked the multidimensional factors that influence the effectiveness of internal auditors in practice.

Existing literature predominantly adopts a role-based perspective, focusing on what internal auditors are expected to do, rather than examining the underlying determinants that shape their actual effectiveness in detecting fraud. Moreover, empirical studies rarely integrate human, organizational, and technological dimensions into a unified analytical framework. As a result, there remains limited understanding of how these interrelated factors collectively influence fraud detection capability, particularly within the complex governance environment of BUMN.

To address this gap, while previous studies have extensively examined fraud detection using quantitative lenses, they often fail to capture the nuanced 'silencing' of internal auditors within high-pressure state environments. This study fills a critical gap by employing a mixed-methods explanatory design, moving beyond statistical correlations to uncover the underlying systemic barriers that impede fraud disclosure. By integrating the Fraud Hexagon Theory with qualitative insights from FGDs, this research provides a more granular understanding of how institutional pressure and auditor skepticism interact in the Indonesian SOE context (Yusnaini et al., 2025). The study aims to identify and empirically analyze the key determinants influencing the ability of internal auditors to uncover fraud within Indonesian State-Owned Enterprises (BUMN). Specifically, the study examines six critical factors: auditor competence, independence and objectivity, management support, internal control systems, organizational culture, and audit technology.

The novelty of this research lies in its integration of a determinant-based analytical framework with a mind mapping approach to capture the interrelationships among these factors. By combining quantitative analysis with qualitative insights, this study offers a comprehensive and systemic understanding of fraud detection capability. This approach represents a state-of-the-art contribution to the literature by moving beyond descriptive accounts of audit roles toward an empirically grounded and multidimensional model of internal audit effectiveness. Consequently, this study aims not only to empirically analyze the determinants of fraud detection but also to construct a strategic framework for the Ministry of SOEs to reform the internal audit oversight system, ensuring higher accountability in public resource management.

THEORETICAL REVIEW

Literature Review and Theoretical Foundation

This study is situated within the context of Indonesian State-Owned Enterprises (BUMN), where governance structures and organizational constraints often limit the effectiveness of internal audit functions (Volodina et al., 2022). Internal auditors are widely recognized as key agents in promoting accountability, transparency, and integrity within public-sector institutions. Prior studies highlight that auditor competence and the effectiveness of internal control systems play a significant role in improving audit quality and preventing fraudulent financial reporting (Bonrath & Eulerich, 2024; Eulerich et al., 2025). However, their effectiveness in detecting fraud is not solely determined by their formal roles, but rather by a complex interaction of individual, organizational, and systemic factors (Natsir et al., 2025).

Prior literature identifies three primary roles of internal auditing: fraud prevention, fraud detection, and fraud reporting (Bonrath & Eulerich, 2024; Brink et al., 2022). While these functional perspectives provide an important foundation, they tend to emphasize what internal auditors are expected to do, rather than what determines their effectiveness in practice. This limitation necessitates a broader analytical approach that focuses on the determinants of audit performance.

From a theoretical perspective, this study integrates the fraud-oriented systems audit approach, which emphasizes the identification of structural and procedural vulnerabilities that enable fraud to occur (Arsyad & Natsir, 2024). This approach shifts the focus from individual misconduct to systemic weaknesses within organizational processes. In addition, the study adopts the fraud hexagon theory, which expands the traditional fraud triangle by incorporating six drivers of fraud: pressure, opportunity, rationalization, competence, arrogance, and collusion (Khamainy et al., 2022). Integrating the Fraud Hexagon Theory is pivotal, as it allows for a dual-perspective analysis: it maps the perpetrator's opportunities and pressures while simultaneously testing the auditor's ability to remain skeptical against these six dimensions. This study posits that an auditor's effectiveness is contingent upon their capacity to decode the complex 'collusion' and 'arrogance' dimensions often found in SOE scandals (Achmad et al., 2022; Vousinas, 2019). This framework provides a comprehensive understanding of the behavioral and organizational conditions that facilitate fraud.

Furthermore, empirical insights from governance studies in Indonesian public-sector enterprises highlight the importance of institutional context in shaping audit effectiveness (Arif et al., 2025). These studies suggest that governance quality,

organizational culture, and structural arrangements significantly influence the ability of internal auditors to perform their roles effectively.

Conceptual Framework

Building upon the theoretical foundations, this study adopts a determinant-based framework to examine the factors influencing fraud detection capability. Specifically, six key variables are identified:

1. Auditor Competence – reflecting technical expertise, analytical capability, and professional judgment
2. Independence and Objectivity – ensuring unbiased audit processes
3. Management Support – providing resources and institutional backing
4. Internal Control Systems – establishing procedural safeguards
5. Organizational Culture – shaping ethical behaviour and transparency
6. Audit Technology – enhancing data analysis and fraud detection capability

These variables represent a multidimensional perspective, integrating human, organizational, and technological dimensions of audit effectiveness.

To structure and visualize the interrelationships among these variables, this study employs a mind mapping approach. Mind mapping is a systematic visualization technique that organizes complex information into interconnected structures, enabling clearer understanding of relationships among key elements. It facilitates both analytical and integrative thinking, making it particularly useful in identifying core problems and developing comprehensive solutions (Guerrero J. M., & Ramos, 2015)

In this study, mind mapping serves as a bridge between theoretical conceptualization and empirical testing. It provides a structured representation of how the six determinants interact in influencing fraud detection capability. This conceptual structure is subsequently operationalized into measurable variables and empirically tested using regression analysis, ensuring alignment between theory and empirical findings.

Hypothesis Development

Based on the theoretical framework and prior empirical studies, the following hypotheses are proposed:

Auditor Competence and Fraud Detection Capability

Auditor competence is a fundamental determinant of audit effectiveness. Competent auditors possess the knowledge and skills necessary to detect complex fraud schemes and

analyze irregularities. Prior studies confirm that competence significantly improves audit quality and fraud detection (Novatiani et al., 2024).

H1: Auditor competence has a positive and significant effect on fraud detection capability.

Independence and Objectivity

Independence ensures that auditors can perform their duties without bias or interference. Lack of independence may lead to compromised audit findings and reduced fraud detection effectiveness. Empirical evidence highlights the critical role of independence in enhancing audit credibility (Bonrath & Eulerich, 2024; Hotimah & Kuntadi, 2024).

H2: Independence and objectivity have a positive and significant effect on fraud detection capability.

Management Support

Management support provides the resources, authority, and institutional environment necessary for effective auditing (Arena & Azzone, 2009). Organizations that support audit functions enable deeper investigation and more accurate reporting. Prior research demonstrates a positive relationship between management support and audit effectiveness (Joseph Elikem Kofi Ziorklui et al., 2024; Oyedotun et al., 2025)

H3: Management support has a positive and significant effect on fraud detection capability.

Internal Control Systems

Internal control systems serve as the first line of defense against fraud. Strong control mechanisms facilitate monitoring, risk assessment, and early detection of irregularities. Empirical findings indicate that effective internal controls significantly enhance fraud detection (Rahmasari & Setiawan, 2022)

H4: Internal control systems have a positive and significant effect on fraud detection capability.

Organizational Culture

Organizational culture influences ethical behavior and the willingness to report fraud. A strong ethical culture promotes transparency, while a weak culture may tolerate misconduct. Prior studies highlight the role of ethical climate in fraud prevention (Rifai & Mardijuwono, 2020)

H5: Organizational culture has a positive and significant effect on fraud detection capability.

Audit Technology

Audit technology enhances auditors' ability to analyze large datasets and identify anomalies. The adoption of data analytics and digital tools has been shown to significantly improve fraud detection effectiveness (Almagrashi et al., 2023; Ikhsan et al., 2022; Samagaio & Diogo, 2022)

H6: Audit technology has a positive and significant effect on fraud detection capability.

Conceptual Model

Based on the proposed hypotheses, this study develops a conceptual model that illustrates the relationship between the independent variables and fraud detection capability.

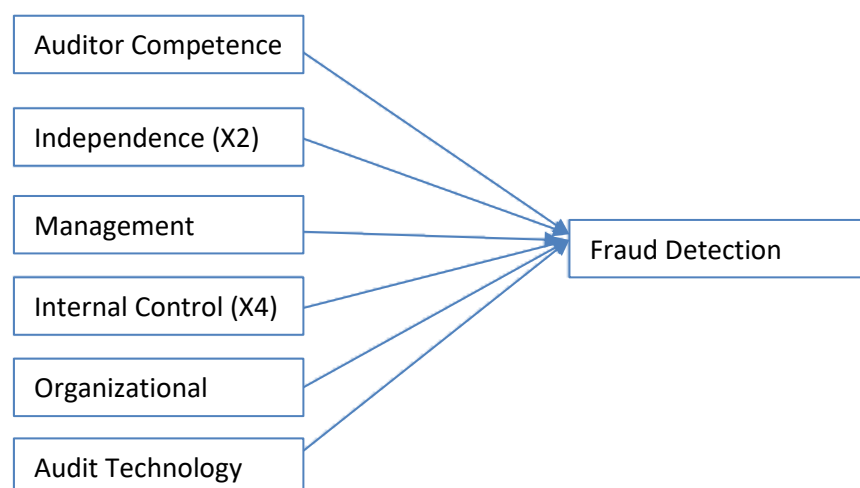


Figure 1. Conceptual Research Model

The conceptual model proposes that fraud detection capability is directly influenced by six key determinants: auditor competence, independence, management support, internal control systems, organizational culture, and audit technology. These variables collectively represent a comprehensive framework that captures the multidimensional nature of internal audit effectiveness.

The model emphasizes that fraud detection is not solely dependent on individual auditor capability but is shaped by an interaction of human, organizational, and

technological factors. This integrated perspective aligns with both the theoretical foundations and the empirical findings of the study.

METHOD

Research Design

This study adopts a mixed-methods explanatory design (Hutchins et al., 2026), integrating qualitative and quantitative approaches to comprehensively examine the factors influencing the ability of internal auditors to detect and disclose fraud within Indonesian State-Owned Enterprises (BUMN). The qualitative component is employed to explore contextual, organizational, and behavioral dynamics, while the quantitative component is used to empirically test the relationships between variables through statistical analysis.

The use of a mixed-methods approach is particularly appropriate given the complexity of fraud detection phenomena, which cannot be fully captured through a single methodological perspective. The qualitative descriptive method enables in-depth understanding of institutional practices and challenges (Sugiyono, 2022). whereas quantitative analysis provides measurable evidence to validate the influence of key determinants identified in the conceptual framework.

Population and Sample

The respondents comprised internal government oversight personnel (APIP). Including internal auditors from BUMN, auditors from the Financial and Development Supervisory Agency (BPKP), and the Inspectorate General, reflecting the strategic role of APIP in ensuring accountability and oversight within public sector governance (Shidqi & Firmansyah, 2024). The quantitative sample comprises 85 internal auditors from five strategically selected BUMN located in South Sulawesi. The sample of 85 auditors meets the minimum requirement for multiple regression analysis, following Joseph F. Hair et al., (2019), who suggest a ratio of 10 to 15 observations per independent variable to ensure adequate statistical power. Furthermore, methodological triangulation was achieved by using qualitative FGD results to 'cross-validate' and explain the nuances of the quantitative findings, ensuring the robustness of the mixed-methods explanatory design (Teddlie & Yu, 2007). These organizations were chosen based on their operational scale and relevance to national economic activities. For the qualitative component, purposive sampling was applied to select key informants, including Heads of internal audit units within BUMN, Senior auditors from BPKP, Representatives from the Inspectorate General. This sampling strategy ensures both depth (qualitative insight) and breadth (quantitative representation).

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Data Collection Techniques

To enhance the validity and reliability of the findings, this study employs data triangulation through three complementary techniques (Bans-Akutey & Tiimub, 2021; Bekhet & Zauszniewski, 2012; Usman & Audu, 2021)

Questionnaires

Structured questionnaires using a Likert scale were distributed to internal auditors to collect quantitative data on the six independent variables (auditor competence, independence, management support, internal control systems, organizational culture, and audit technology) and the dependent variable (fraud detection capability).

In-depth Interviews

In-depth interviews with the heads of internal audit units provided deeper insights into operational challenges, decision-making processes, and direct experiences in detecting fraud, as interviews are recognized as an effective instrument for capturing rich, contextual, and experiential data in social science research (Utibe Monday, 2020).

Focus Group Discussions (FGDs)

FGDs involving auditors from BPKP and the Inspectorate General were conducted to provide comparative perspectives and institutional validation of findings. The combination of these methods (Adekola & Olumati, 2023), strengthens the credibility of the study by integrating multiple sources of evidence and perspectives.

Variable Operationalization

This study examines one dependent variable and six independent variables derived from the conceptual framework:

Dependent Variable

1. Fraud Detection Capability (Y): Refers to the ability of internal auditors to identify, analyse, and disclose fraudulent activities within organizational operations. This includes both detection and reporting dimensions.

Independent Variables

1. Auditor Competence (X1): Technical expertise, analytical skills, and professional judgment
2. Independence and Objectivity (X2): Freedom from interference and unbiased decision-making

3. Management Support (X3): Availability of resources, authority, and organizational backing
 4. Internal Control Systems (X4): Effectiveness of monitoring and control mechanisms
 5. Organizational Culture (X5): Ethical climate and integrity values
 6. Audit Technology (X6): Use of digital tools and data analytics in auditing
- These variables collectively represent the multidimensional determinants of fraud detection capability as hypothesized.

Data Analysis Techniques

Qualitative Analysis

Qualitative data obtained from interviews and FGDs were analyzed using thematic analysis. The process involved data coding, categorization, identification of recurring patterns, interpretation of underlying meanings. This analysis aimed to uncover contextual factors influencing fraud detection and to support the development of the conceptual framework.

Quantitative Analysis

Quantitative data from questionnaires were analyzed using statistical techniques, including descriptive statistics, to summarize respondent perceptions and variable distributions, validity and reliability tests, to ensure measurement accuracy and internal consistency, multiple linear regression analysis, to examine the effect of independent variables (X1–X6) on fraud detection capability (Y).

The regression model is formulated as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$$

Where:

Y = Fraud Detection Capability

X1 = Auditor Competence

X2 = Independence and Objectivity

X3 = Management Support

X4 = Internal Control System

X5 = Organizational Culture

X6 = Audit Technology

α = Constant

$\beta_1 - \beta_6$ = Regression coefficients

ε = Error term

This analytical approach enables the study to empirically test the proposed hypotheses and determine the relative influence of each factor. Quantitative data obtained from the questionnaires were analysed using IBM SPSS Statistics version 26. The analysis included descriptive statistics, validity and reliability testing, and multiple linear regression to examine the relationships between independent variables and fraud detection capability. Meanwhile, qualitative data from interviews and Focus Group Discussions (FGDs) were analysed using thematic analysis, involving data reduction, coding, categorization, and interpretation to identify recurring patterns and underlying meanings. The integration of quantitative and qualitative findings was conducted to enhance the robustness and comprehensiveness of the analysis.

Research Procedure

The research process consists of four sequential stages (Suryana, 2007) including preparation stage, development of research framework, literature review, and instrument design, data collection stage, distribution of questionnaires, interviews, and FGDs. Data processing stage, data coding, cleaning, statistical analysis, and interpretation, conclusion and reporting stage, synthesis of findings, formulation of conclusions, and development of policy implications.

Validity and Reliability Strategy

To ensure the robustness of the study, several validation strategies were applied method triangulation (questionnaire, interviews, FGDs), source triangulation (BUMN, BPKP, Inspectorate General), statistical validation (validity and reliability tests). These strategies enhance both the credibility of qualitative findings and the generalizability of quantitative results.

RESULTS

Descriptive Analysis of Variables

Descriptive statistical analysis was conducted to provide an overview of respondents' perceptions regarding the key variables influencing fraud detection capability within Indonesian State-Owned Enterprises (BUMN). As presented in Table 1, all variables exhibit mean values above the midpoint of the Likert scale, indicating that, overall,

respondents perceive the internal audit function to be operating at a moderate to relatively strong level.

Table 1. Descriptive Statistics

Variable	N	Min	Max	Mean	Std. Deviation
Auditor Competence (X1)	85	2.40	4.80	3.78	0.51
Independence and Objectivity (X2)	85	2.20	4.70	3.69	0.56
Management Support (X3)	85	2.10	4.60	3.55	0.58
Internal Control System (X4)	85	2.00	4.50	3.49	0.60
Organizational Culture (X5)	85	2.30	4.60	3.52	0.55
Audit Technology (X6)	85	2.00	4.40	3.34	0.62
Fraud Detection Capability (Y)	85	2.30	4.70	3.61	0.57

Source: Primary data processed by the authors (2026).

Among the independent variables, auditor competence (mean = 3.78) records the highest score, suggesting that internal auditors generally possess adequate technical knowledge, analytical capability, and professional judgment. However, the observed standard deviation (0.51) indicates variability across institutions, implying that auditor capacity is not evenly distributed.

Conversely, audit technology (mean = 3.34) exhibits the lowest mean value, highlighting limited utilization of advanced audit tools such as data analytics and Computer-Assisted Audit Techniques (CAATs). This finding reflects a technological gap that may hinder auditors' ability to detect complex fraud schemes.

The dependent variable, fraud detection capability (mean = 3.61), indicates that while auditors are perceived as reasonably capable of detecting fraud, their effectiveness remains suboptimal. This descriptive finding is consistent with the problem highlighted in the Introduction, where major fraud cases in BUMN persisted undetected for extended periods.

Validity and Reliability Assessment

To ensure the robustness of the measurement model, validity and reliability tests were conducted prior to hypothesis testing.

Table 2. Construct Validity and Reliability

Variable	Factor Loadings	Cronbach Alpha
Auditor Competence	0.76 – 0.81	0.89
Independence	0.79 – 0.82	0.87
Management Support	0.77 – 0.80	0.85
Internal Control	0.75 – 0.78	0.83
Organizational Culture	0.74 – 0.79	0.84
Audit Technology	0.76 – 0.81	0.82
Fraud Detection	0.80 – 0.83	0.90

Source: Primary data processed by the authors (2026).

All factor loadings exceed the threshold of 0.70, confirming strong convergent validity. Additionally, Cronbach's Alpha values range from 0.82 to 0.90, indicating high internal consistency reliability. These results confirm that the measurement instruments used to operationalize the six determinants (X1-X6) and the dependent variable (Y) are both valid and reliable, thereby supporting the suitability of the data for further regression analysis.

Model Fit and Overall Explanatory Power

The goodness of fit of the regression model was evaluated using the coefficient of determination (R^2) and ANOVA test.

Table 3. Model Summary

R	R Square	Adjusted R Square	Std. Error
0.842	0.709	0.686	0.321

Source: Primary data processed by the authors (2026).

The R^2 value of 0.709 indicates that approximately 70.9% of the variance in fraud detection capability can be explained by the six independent variables. This suggests a

strong explanatory power, confirming that the determinant-based framework proposed in Section 2 is empirically supported.

Table 4. ANOVA Results

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	45.872	6	7.645	74.21	0.000
Residual	18.632	78	0.239		
Total	64.504	84			

Source: Primary data processed by the authors (2026).

The ANOVA results show that the regression model is statistically significant ($F = 74.21$; $p < 0.001$), indicating that the independent variables collectively have a significant effect on fraud detection capability.

Regression Analysis and Hypothesis Testing

Multiple linear regression analysis was conducted to examine the individual effects of each independent variable on fraud detection capability.

Table 5. Regression Results

Variable	B	Std. Error	Beta	t-value	Sig.
Constant	0.512	0.284	-	1.80	0.075
Auditor Competence (X1)	0.335	0.069	0.342	4.86	0.000
Independence (X2)	0.298	0.071	0.301	4.20	0.000
Management Support (X3)	0.205	0.066	0.210	3.10	0.003
Internal Control (X4)	0.181	0.068	0.184	2.66	0.009
Organizational Culture (X5)	0.162	0.065	0.165	2.49	0.015
Audit Technology (X6)	0.149	0.070	0.152	2.13	0.036

Source: Primary data processed by the authors (2026).

Based on the regression results presented in Table 5, the estimated regression equation can be expressed as:

$$Y = 0.512 + 0.335X_1 + 0.298X_2 + 0.205X_3 + 0.181X_4 + 0.162X_5 + 0.149X_6 + \varepsilon$$

Key Interpretations:

1. The findings reveal that auditor competence ($\beta = 0.342$) is the most influential determinant, indicating that technical expertise and analytical capability are critical for effective fraud detection. This supports the theoretical argument that human capital is the primary driver of audit performance.
2. Independence ($\beta = 0.301$) emerges as the second strongest factor, emphasizing the importance of objectivity and freedom from managerial interference in ensuring credible audit outcomes.
3. Management support ($\beta = 0.210$) plays a significant enabling role, highlighting that institutional backing and resource availability are essential for effective audit execution.
4. Internal control systems ($\beta = 0.184$) and organizational culture ($\beta = 0.165$) further contribute to fraud detection by providing structural and ethical support mechanisms.
5. Finally, audit technology ($\beta = 0.152$), although significant, has the weakest effect. This suggests that technological adoption within BUMN remains underdeveloped, limiting its potential contribution to audit effectiveness.

The regression results demonstrate that all six independent variables have positive and statistically significant effects ($p < 0.05$) on fraud detection capability. Therefore, all proposed hypotheses (H1–H6) are supported.

Hypothesis Testing Summary

1. H1 supported: Auditor competence → significant positive effect
2. H2 supported: Independence → significant positive effect
3. H3 supported: Management support → significant positive effect
4. H4 supported: Internal control → significant positive effect
5. H5 supported: Organizational culture → significant positive effect
6. H6 supported: Audit technology → significant positive effect

Overall, the results confirm that fraud detection capability in BUMN is influenced by a multidimensional set of determinants, encompassing human, organizational, and technological factors. The strong explanatory power of the model ($R^2 = 0.709$) reinforces the validity of the conceptual framework and supports the shift from a role-based to a determinant-based perspective, as proposed in this study.

The regression equation indicates that all independent variables have positive coefficients, suggesting that improvements in auditor competence, independence, management support, internal control systems, organizational culture, and audit technology are associated with an increase in fraud detection capability. Among these

variables, auditor competence exhibits the largest coefficient, confirming its dominant role in enhancing audit effectiveness. These findings provide empirical evidence that the effectiveness of internal auditors is not solely dependent on formal roles, but rather on the interaction of competencies, institutional support, governance structures, and technological capacity.

DISCUSSION

The findings of this study provide strong empirical support for the determinant-based framework proposed in Section 2 and offer important insights into the multidimensional nature of fraud detection capability within Indonesian State-Owned Enterprises (BUMN). The results confirm that all six hypothesized factors auditor competence, independence, management support, internal control systems, organizational culture, and audit technology have a positive and significant effect on fraud detection capability. With a high explanatory power ($R^2 = 0.709$), the model demonstrates that fraud detection effectiveness is not driven by a single factor, but rather by the interaction of human, organizational, and technological dimensions. The significant positive effect that found in this study aligns with global auditing standards but adds a unique dimension: in the Indonesian SOE context, skepticism is often stifled by a 'culture of hierarchy.' This confirms that technical competence alone is insufficient if not supported by a whistleblowing system that protects auditors from career-related retaliation, echoing findings in other emerging economies (Latan et al., 2018; Lesmana et al., 2026).

These findings reinforce the central argument presented in the Introduction that the persistence of large-scale fraud cases in BUMN cannot be adequately explained by a role-based perspective of internal auditing alone. Instead, the results validate the need for a determinant-based approach that captures the structural and behavioral constraints affecting audit effectiveness. Furthermore, the integration of qualitative insights from interviews and FGDs strengthens the interpretation of statistical results, providing contextual depth and institutional relevance.

Auditor Competence and Professional Capacity

The results indicate that auditor competence ($\beta = 0.342$) is the most influential determinant of fraud detection capability, supporting H1. This finding is consistent with prior studies emphasizing the critical role of professional expertise in enhancing audit quality (Novatiani et al., 2024). Competent auditors possess the analytical skills and technical knowledge required to identify complex fraud schemes, particularly in environments characterized by sophisticated financial transactions.

However, qualitative evidence reveals that competence gaps remain prevalent, particularly in areas such as forensic accounting, data analytics, and investigative auditing. This suggests that while competence is statistically dominant, it is not yet fully optimized in practice. This finding extends prior research by demonstrating that competence must be continuously developed through targeted training and professional certification to effectively respond to evolving fraud typologies.

Independence and Objectivity

Independence emerges as the second strongest determinant ($\beta = 0.301$), confirming H2 and reinforcing its fundamental role in ensuring audit credibility. This finding aligns with existing literature highlighting that independence is essential for unbiased judgment and effective fraud reporting (Martha & Tapatfeto, 2022; Setiawan et al., 2020).

The qualitative findings further reveal that structural positioning of internal audit units within BUMN often limits auditor autonomy, particularly when reporting lines are aligned with executive management rather than independent oversight bodies. This structural constraint creates a conflict of interest that may discourage auditors from disclosing sensitive findings. Consistent with Bonrath & Eulerich, (2024), this study confirms that strengthening institutional independence is essential for transforming internal audit into a strategic governance function rather than a compliance-oriented unit.

Management Support and Organizational Environment

The positive and significant effect of management support ($\beta = 0.210$) supports H3 and highlights its role as a key enabling factor. This finding is consistent with prior studies emphasizing the importance of resource allocation, leadership commitment, and organizational backing in enhancing audit effectiveness (Arena & Azzone, 2009).

The discussion extends beyond statistical significance by revealing that insufficient management support manifests in limited audit resources, excessive workloads, and restricted access to strategic decision-making processes. These conditions reduce the effectiveness of audit activities and discourage proactive fraud investigation (Rifai & Mardijuwono, 2020). Therefore, management support should not be viewed merely as administrative facilitation, but as a strategic commitment to governance and accountability.

Internal Control Systems

The findings confirm that internal control systems ($\beta = 0.184$) significantly influence fraud detection capability, supporting H4. This result is consistent with the fraud-oriented

systems audit perspective, which emphasizes the importance of structural safeguards in preventing and detecting fraud (Bonrath & Eulerich, 2024).

However, qualitative insights indicate that many BUMN still operate with fragmented or inconsistently implemented control systems. Weak segregation of duties, inadequate documentation, and limited audit trails create systemic vulnerabilities that hinder effective fraud detection. This finding reinforces the argument that internal control systems are not only technical mechanisms but also reflections of broader governance quality.

Organizational Culture and Institutional Pressure

Organizational culture also demonstrates a significant positive effect ($\beta = 0.165$), supporting H5 and aligning with prior research on ethical climate and fraud prevention (Rifai & Mardijuwono, 2020). A strong culture of integrity promotes transparency and encourages auditors to report irregularities without fear (Yusnaini et al., 2025).

Nevertheless, the findings reveal that hierarchical structures and cultural norms within BUMN may inhibit whistleblowing and suppress ethical dissent. This confirms that cultural factors can either strengthen or weaken audit effectiveness depending on the prevailing organizational values. The study therefore contributes to the literature by emphasizing the dual role of organizational culture as both a facilitator and a barrier to fraud detection.

Audit Technology and Digital Capability

Audit technology, while significant ($\beta = 0.152$), exhibits the weakest effect among the determinants, supporting H6. This finding is consistent with prior studies indicating that the adoption of audit technology enhances fraud detection but remains underutilized in many organizations (Almagrashi et al., 2023; Ikhsan et al., 2022; Samagaio & Diogo, 2022).

The relatively low impact suggests that technological capability in BUMN is still at an early stage of development. Qualitative findings highlight challenges such as limited access to audit tools, insufficient training, and restricted data availability. This study extends existing literature by demonstrating that technological adoption alone is insufficient; it must be supported by organizational readiness, data accessibility, and auditor competence.

A key contribution of this study lies in its demonstration that fraud detection capability is inherently multidimensional. The six determinants do not operate independently but interact in a complex and interdependent manner. This finding is visually

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reinforced through the mind mapping framework (Figure 2), which illustrates how weaknesses in one dimension can amplify vulnerabilities in others.

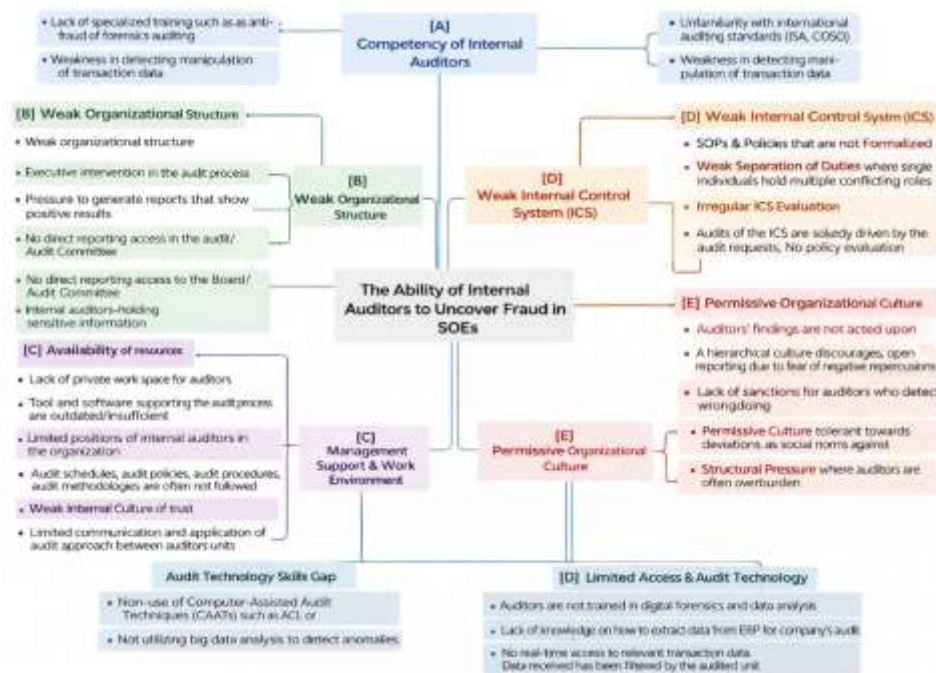


Figure 2. Mind Map of Determinants of Fraud Detection Capability in BUMN

For example, limited auditor competence combined with inadequate technology and restricted data access creates compounded barriers to effective fraud detection. Similarly, weak management support and compromised independence reinforce organizational cultures that discourage transparency. This integrated perspective advances prior research by moving beyond isolated factor analysis toward a systemic understanding of audit effectiveness. The findings of this study make several important contributions to the literature. Theoretical Contribution, this study advances the internal audit literature by shifting from a role-based perspective to a determinant-based framework, integrating fraud hexagon theory and systems audit approach into a unified model. Empirical Contribution, the study provides robust empirical evidence ($R^2 = 0.709$) supporting the influence of six key determinants, thereby validating the conceptual model proposed in Section 2. Methodological Contribution, by combining qualitative insights (interviews and FGDs) with quantitative regression analysis, this study offers a more comprehensive approach to analyzing fraud detection capability.

The findings suggest that improving fraud detection within BUMN requires a holistic and integrated strategy, including strengthening auditor competence through continuous professional development, enhancing independence via structural reforms and legal protection, increasing management commitment to audit functions, improving internal control systems through standardization and digitalization, promoting an ethical organizational culture, accelerating the adoption of audit technology and data analytics. These implications highlight that technical improvements alone are insufficient without corresponding organizational and cultural transformation.

The mind mapping framework developed in this study serves as an integrative tool that synthesizes the relationships among the six determinants. Unlike conventional linear models, this approach captures the dynamic interdependencies among variables and provides a visual representation of systemic vulnerabilities.

As illustrated in Figure 2, the framework demonstrates that fraud detection effectiveness depends on the alignment of multiple factors. This visualization not only enhances analytical clarity but also provides a practical reference for policymakers and practitioners in designing targeted interventions.

CONCLUSION

This study was conducted in response to the persistence of large-scale corruption cases within Indonesian State-Owned Enterprises (BUMN), despite the formal existence of internal audit mechanisms mandated by regulatory frameworks. Moving beyond a traditional role-based perspective, this research aimed to identify and empirically examine the key determinants influencing the ability of internal auditors to detect and disclose fraud.

By employing a mixed-methods approach, integrating qualitative insights with quantitative regression analysis, the study provides robust evidence that fraud detection capability is shaped by a multidimensional set of factors. The empirical results demonstrate that all six proposed determinants auditor competence, independence and objectivity, management support, internal control systems, organizational culture, and audit technology have a positive and statistically significant effect on fraud detection capability. The high explanatory power of the model ($R^2 = 0.709$) confirms that the determinant-based framework offers a strong and comprehensive explanation of internal audit effectiveness within BUMN. The findings imply that the Ministry of SOEs should mandate an independent reporting line for internal auditors directly to the Audit Committee, bypassing management to reduce 'collusion' risks. Strengthening the Whistleblowing System (WBS) is not merely a formality but a critical defense mechanism against the 'arrogance' dimension identified in the Fraud Hexagon.

Among these factors, auditor competence and independence emerge as the most influential determinants, highlighting the central role of professional capability and structural autonomy in enhancing fraud detection. At the same time, organizational and systemic factors including management support, internal control systems, and organizational culture serve as critical enabling conditions that either strengthen or constrain audit effectiveness. Although audit technology is also significant, its relatively weaker influence suggests that digital transformation within BUMN audit functions remains underdeveloped and requires further institutionalization.

The findings reinforce the argument that the persistence of undetected fraud in BUMN cannot be attributed solely to the absence of audit functions, but rather to the misalignment of human, organizational, and technological dimensions within the audit environment. In this regard, the mind mapping framework developed in this study provides an integrative representation of how these factors interact, demonstrating that weaknesses in one dimension can amplify vulnerabilities in others. This confirms that isolated interventions are insufficient and that a systemic, coordinated approach is required.

From a theoretical perspective, this study contributes to the literature by advancing a determinant-based model of internal audit effectiveness, integrating insights from fraud hexagon theory and the fraud-oriented systems audit approach into a unified empirical framework. From a methodological standpoint, the combination of qualitative and quantitative approaches enhances the robustness and explanatory depth of the analysis.

From a practical perspective, the findings suggest several strategic implications for strengthening fraud detection within BUMN. First, continuous and structured competency development programs are essential to enhance auditors' technical and analytical capabilities, particularly in forensic auditing and data-driven audit techniques. Second, institutional reforms are required to ensure auditor independence, including the establishment of direct reporting lines to audit committees and the provision of legal protection against retaliation. Third, strengthening internal control systems and fostering an ethical organizational culture are critical to creating an environment that supports transparency and accountability. Fourth, accelerating the adoption of audit technology, supported by adequate training and data access, is necessary to address increasingly complex fraud risks. Finally, sustained management commitment is indispensable in providing the resources, authority, and strategic support required for effective audit implementation.

In conclusion, this study demonstrates that enhancing fraud detection capability within BUMN requires a holistic and integrated reform strategy that simultaneously addresses human capital, governance structures, organizational culture, and technological

capacity. Such an approach is essential not only to improve the effectiveness of internal audit functions but also to strengthen institutional accountability and restore public trust in state-owned enterprises.

Limitations and suggestions for further study

A notable limitation is the potential for Social Desirability Bias, where SOE auditors might provide responses that align with formal regulations rather than actual field practices. Future studies should employ anonymized longitudinal data or 'mystery audit' simulations to mitigate this bias. Future research should explore the moderating role of 'Political Intervention' and 'Institutional Culture' on auditor independence, as these variables are highly significant in state-led economies but difficult to measure through quantitative surveys alone.

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