Keunis
Vol. 14, No. 1, Jan 2026, Page. 61-71

P-ISSN: 2302-9315
E-ISSN: 2714-7274
https://jurnal.polines.ac.id/index.php/keunis

FRAUD DIAMOND ANALYSIS IN REVEALING ASSET MISAPPROPRIATION WITH FRAUD RISK ASSESSMENT AS A MODERATING VARIABLE: A PERSPECTIVE OF THE FRAUD DIAMOND THEORY

ZATI RIZKA FADHILA*
ANIS CHARIRI
RR SRI HANDAYANI

Accounting Department, Faculty of Economics and Business, Universitas Diponegoro
Jl. Hayam Wuruk SH No. 5 Semarang 50241, Semarang, Central Java, Indonesia

Article History:
Received : 2025-08-12
Revised : 2025-10-12
Accepted : 2025-11-27
Published : 2026-01-02

Corresponding author:
zatirizkafadhila6@gmail.com

Cite this article:
Fadhila, Z. R., Chariri, A., & Handayani, R. S. (2026). Fraud Diamond Analysis in Revealing Asset Misappropriation with Fraud Risk Assessment as a Moderating Variable: a Perspective of the Fraud Diamond Theory. *Keunis*, 14(1), 61-71.

DOI:
10.32497/keunis.v14i1.6832

***Abstract*:**
Asset misappropriation is one of the most frequent and financially destructive types of occupational fraud, particularly in the public sector. Nevertheless, the behavioral and governance mechanisms contributing to this fraud have not received much attention in existing studies. Therefore, this study aims to evaluate the determinants of asset misappropriation by employing the Fraud Diamond Theory, which comprises elements of pressure, opportunity, rationalization, and capability. Furthermore, the analyses also explore the moderating role of Fraud Risk Assessment (FRA) as a detection-oriented governance mechanism, where its positive correlation with misappropriation is hypothesized to indicate increased detection capacity rather than control failure. Data obtained from 312 respondents from public organizations in Indonesia were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that opportunity and capability significantly influence asset misappropriation, while pressure and rationalization show no significant effect. Meanwhile, FRA serves a dual role: 1) it positively affects asset misappropriation through improved detection; and 2) it negatively moderates the relationship between opportunity and asset misappropriation. This reflects the effectiveness of FRA in limiting the exploitation of weak controls. By elucidating FRA's dual role in governance and detection, this study contributes to the fraud theory and carries practical implications for the enhancement of fraud management through integrated surveillance, audit coordination, and real-time risk analytics.

Keywords: Asset Misappropriation, Fraud Diamond Theory, Fraud Risk Assessment

INTRODUCTION

Currently, public organizations remain highly susceptible to fraud as a major challenge, notably in the form of asset misappropriation, which is the most prevalent and tangible type of occupational fraud (ACFE, 2024). In contrast to financial statement fraud, which manipulates data for external users, asset misappropriation directly depletes organizational resources and undermines governance integrity. According to the Association of Certified Fraud Examiners (2024), asset misappropriation occurs in 86% of occupational fraud cases, with a median loss reaching USD 120,000. These occurrences are common in both the public and private sectors, and are frequently driven by lax internal controls, inadequate supervision, and ineffective accountability mechanisms (Jiménez Serrano et al., 2025). Therefore, understanding the behavioral and structural factors that contribute to asset misappropriation has emerged as a crucial area of study in accounting and governance (Apriliana & Agustina, 2017). However, empirical studies still primarily concentrate on financial statement fraud, while asset misappropriation—which stems from operational access and internal control weaknesses—remains underexplored.

Wolfe and Hermanson (2004) have developed the Fraud Diamond Theory to advance the Fraud Triangle Theory (Cressey, 1953) by introducing the capability factor in addition to pressure, opportunity, and rationalization,

thus providing a more comprehensive behavioral explanation for the occurrence of fraud. Therefore, it is essential to examine the predictive relevance of the Fraud Diamond Theory in explaining asset-level fraud (Abdullahi & Mansor, 2018; Budiandru & Nur, 2024). Furthermore, the significance of Fraud Risk Assessment (FRA) as a strategic process for identifying, detecting, and mitigating fraud has been highlighted in recent developments of fraud governance (Taherdoost, 2021). Nevertheless, the conceptual function of FRA—whether serving as a preventive mechanism or a detection-oriented governance tool—is still under debate. Existing evidence has demonstrated a positive correlation between FRA and detected fraud cases, implying that effective FRA may increase detection rather than prevent fraud occurrence. This paradox suggests that FRA-intensive organizations may simply be more efficient in identifying fraud. Accordingly, this study conceptualizes FRA as a detection-oriented governance mechanism and examines its moderating role in mitigating opportunity-driven asset misappropriation.

Despite the growing interest in fraud theories, studies that integrate the Agency Theory, the Fraud Diamond Model, and FRA into a unified analytical framework—particularly in the context of the public sector—remain very limited. Previous studies often overlook how fraud dynamics are shaped by public governance structures, such as internal audits, segregation of duties, and whistleblowing systems. Therefore, this study attempts to address these gaps by investigating how behavioral factors (pressure, opportunity, rationalization, and capability) influence asset misappropriation and how FRA moderates these relationships. By positioning FRA as both a monitoring and prevention mechanism, this study aims to contribute to the existing fraud theories while offering practical insights into how internal control and governance in public sector asset management can be improved.

THEORETICAL FRAMEWORK AND HYPOTHESES

Theoretical Background

Fraud behavior in organizations can be explained using the Agency Theory (Jensen & Meckling, 1976), which highlights how conflicts may arise when agents prioritize personal interests over those of principals. This is compounded by information asymmetry, weak monitoring, and inadequate governance mechanisms. Within this framework, asset misappropriation represents a classic agency problem, where employees exploit control weaknesses for self-benefit. Therefore, to reduce agency costs, organizations should establish governance structures that enhance transparency, oversight, and accountability, such as Fraud Risk Assessment (FRA).

Complementing this governance perspective, the Fraud Diamond Theory (Wolfe & Hermanson, 2004) refines the Fraud Triangle Theory (Cressey, 1953) by introducing capability as a fourth dimension—alongside pressure, opportunity, and rationalization. This view holds that fraud occurs from the interplay of motivational, situational, cognitive, and personal factors. In this regard, pressure reflects incentives or financial stress; opportunity denotes weaknesses in internal control; rationalization captures moral justification; and capability represents traits and authority that enable exploitation of these weaknesses. Collectively, these elements constitute the settings conducive to fraud and underline the need for robust governance and behavioral monitoring (Simmons et al., 2025).

While the Fraud Triangle Theory explains why individuals commit fraud, the Fraud Diamond Theory clarifies who has the capacity to do so. Thus, applying this framework to the analysis of asset misappropriation enhances its explanatory relevance in operational and control-driven contexts.

Fraud Risk Assessment (FRA) as a Detection-Oriented Governance Mechanism

Fraud Risk Assessment (FRA) is an institutionalized governance process designed to identify, evaluate, and respond to fraud risks. However, its theoretical function—whether acting primarily as a preventive (deterrence) or detection (surveillance) tool—is still up for debate. Within the governance framework, FRA performs a dual strategic role encompassing both dimensions. FRA works as a deterrence mechanism by proactively mapping potential fraud risks, tightening internal controls, and creating ethical environments that reduce opportunities and motivations for fraud. It deters fraudulent intent before it occurs by increasing the perceived likelihood of detection and potential sanctions.

On the other hand, FRA serves as a surveillance mechanism by enhancing transaction transparency, auditability, and data analytics integration, thus improving organizational capability to identify existing irregularities. Consequently, higher FRA activity may result in increased detection of fraud cases—not because fraud occurs more frequently, but rather because monitoring systems work more effectively.

Empirical studies have reported a positive association between FRA and detected fraud, supporting the notion that FRA strengthens detection rather than prevention (Kazemian et al., 2019; Tarjo et al., 2024). Therefore, this study conceptualizes FRA as a detection-oriented governance mechanism, acknowledging possible reverse

causation in which organizations facing higher fraud risks institutionalize FRA more intensively to enhance control effectiveness.

Theoretical Integration and Research Framework

This study integrates the Agency Theory, the Fraud Diamond Theory, and the Fraud Governance Perspective into a unified framework. According to the model, pressure, opportunity, rationalization, and capability are the antecedents of asset misappropriation, and Fraud Risk Assessment—as a detection-oriented mechanism—moderates these associations. This framework distinguishes between deterrence (preventive) and detection (diagnostic) pathways of control and explains how governance practices interact with behavioral risk factors to influence the occurrence of fraud.

Hyphotheses

Direct Effects of the Elements of the Fraud Diamond Theory on Asset Misappropriation

1. Pressure and Asset Misappropriation

The Fraud Diamond Theory holds that pressure reflects the element of motivation that drives individuals to engage in fraudulent activities. According to Holderness Jr et al. (2018), economic strain, target pressure, or debt obligations can motivate individuals to make unethical decisions. However, prior studies have shown that the influence of pressure on asset misappropriation is context-dependent, as not everyone under stress turns to fraud (Mohd et al., 2023; Roffia & Poffo, 2025). In organizations with strong ethical cultures and internal control, the impacts of pressure may be lessened. Therefore, the first hypothesis is proposed as follows:

H1: Pressure has a positive effect on asset misappropriation.

2. Opportunity and Asset Misappropriation

Opportunity is a key enabler of fraud, representing the ease with which individuals can exploit system weaknesses (Rae & Subramaniam, 2008). In this regard, asset misappropriation is made possible by weak segregation of duties, inadequate supervision, or override of controls. Existing studies have consistently demonstrated that opportunity is the strongest determinant of asset-level fraud (Abdullahi & Mansor, 2018; Utami et al., 2021). Opportunity-driven fraud is more prevalent in the public sector, whose oversight mechanism is often complex. Therefore, the second hypothesis is proposed as follows:

H2: Opportunity has a positive effect on asset misappropriation.

3. Rationalization and Asset Misappropriation

Rationalization involves psychological justification that allows individuals to view fraudulent actions as (Koomson et al., 2020). While its relationship with fraud is conceptually significant, empirical results are conflicting; several studies indicate rationalization as significant only when it is combined with strong opportunity or capability factors (Yusrianti et al., 2020). This suggests that rationalization may operate indirectly through moral disengagement mechanisms. Therefore, the third hypothesis is proposed as follows:

H3: Rationalization has a positive effect on asset misappropriation.

4. Capability and Asset Misappropriation

Capability determines an individual's ability to commit and conceal fraud (Said et al., 2018). With technical knowledge and confidence, individuals in positions of authority can override controls and obscure evidence. Several studies have confirmed that capability—within the framework of the Fraud Diamond Theory—is the most influential predictor of asset misappropriation (Heinzova et al., 2024; Putra et al., 2025). Therefore, the fourth hypothesis is proposed as follows:

H4: Capability has a positive effect on asset misappropriation.

Moderating Role of Fraud Risk Assessment (FRA)

5. FRA Moderates the Relationship between Pressure and Asset Misappropriation

Through regular evaluations and red flag indicators, an effective FRA can assist organizations in identifying employees or departments under financial or operational pressure. However, FRA may not effectively mitigate individual psychological pressures as it operates mainly at a systemic or procedural level. Consequently, its moderating influence on the relationship between pressure and asset misappropriation is expected to be limited or weak. Therefore, the fifth hypothesis is proposed as follows:

H5: Fraud Risk Assessment weakens the positive relationship between pressure and asset misappropriation, although the effect is expected to be weak.

6. FRA Moderates the Relationship between Opportunity and Asset Misappropriation

Since FRA specifically assesses weaknesses in internal control systems, it is most effective in minimizing opportunity-driven fraud. FRA reduces the likelihood that fraud may go unnoticed by identifying vulnerabilities such as poor segregation of duties or inadequate supervision. Empirical findings indicate that structured FRA that is

supported by technology (e.g., GAS, whistleblowing mechanisms) significantly reduces undetected fraud cases (Nadirsyah et al., 2024; Yanuarisa et al., 2025). Therefore, the sixth hypothesis is proposed as follows:

H6: Fraud Risk Assessment weakens the positive relationship between opportunity and asset misappropriation.

7. FRA Moderates the Relationship between Rationalization and Asset Misappropriation

FRA can indirectly influence rationalization by enhancing ethical awareness and accountability mechanisms. When organizations integrate ethical audits and employee integrity programs into FRA, employees are less likely to justify unethical behavior as they are more aware of the consequences of fraud. However, as rationalization is deeply personal and moral in nature, the moderating effect of FRA may vary and sometimes be weak (Dorminey et al., 2010). Therefore, the seventh hypothesis is proposed as follows:

H7: Fraud Risk Assessment weakens the positive relationship between rationalization and asset misappropriation.

8. FRA Moderates the Relationship between Capability and Asset Misappropriation

As capability reflects the personal competence, authority, and access that enable exploitation of control weaknesses, FRA can moderate its association with asset misappropriation by introducing layered oversight and analytical tools that limit the autonomy of individuals who are highly capable of committing fraud. When FRA integrates data analytics and continuous monitoring, capability-driven fraud can be detected earlier (Colombo & Piva, 2019). Therefore, the eighth hypothesis is proposed as follows:

H8: Fraud Risk Assessment weakens the positive relationship between capability and asset misappropriation.

RESEARCH METHODS

Research Design

Within the framework of the Fraud Diamond Theory and Fraud Risk Assessment (FRA), this study adopted a quantitative explanatory design to examine the causal relationships between behavioral and governance factors contributing to asset misappropriation. The analysis evaluates whether pressure, opportunity, rationalization, and capability affect asset misappropriation, and whether FRA—which is conceptualized as a detection-oriented governance mechanism—moderates these effects. Partial Least Squares Structural Equation Modeling (PLS-SEM), which is suitable for complex, theory-driven models that involve latent constructs, was used to analyze relevant data (Hair et al., 2021).

Population and Sampling Techniques

The research population comprises employees and managers of public sector organizations in Indonesia, covering ministries, regional government agencies, state-owned enterprises, and financial management offices. A purposive sampling technique was employed to select respondents based on the inclusion criteria as follows: (1) having a minimum of one year of experience in finance, accounting, or asset management; (2) being directly involved in asset control or supervision; and (3) working in organizations that implement internal control or FRA mechanisms.

This study followed the “10-times rule” by Hair (2014), with the minimum sample requirement being 40 observations. However, from the 400 questionnaires distributed, 312 valid responses were received (78% response rate). Non-response bias testing showed no significant differences between early and late respondents. To ensure voluntary participation, anonymity, and confidentiality, ethical approval was obtained. The individual employee, representing perceptions of behavioral and control factors related to asset misappropriation, serves as the unit of analysis.

Variable Operationalization and Indicators

All constructs were measured using reflective indicators based on established literature. A five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) was used to measure the level of agreement with each statement. The measurement items were adapted from previous validated scales, slightly adjusted for the context of the public sector. Variable operationalization and indicators are as seen in Table 1.

Table 1. Variable Operationalization and Indicators

Construct	Dimension / Indicator Examples	Sources
Pressure	Financial stress, performance target pressure, lifestyle demands, personal debt	(Albrecht et al., 2022; Mohd et al., 2023)
Opportunity	Weak internal control, lack of segregation of duties, ineffective supervision, access to assets	(Rae & Subramaniam, 2008; Utami et al., 2021)
Rationalization	Justifying unethical behavior, minimizing wrongdoing, loyalty excuses, denial of responsibility	(Jackson, 2025; Yusrianti et al., 2020)
Capability	Technical skill, authority level, system access, ability to conceal actions	(Putra et al., 2025; Said et al., 2018)
Fraud Risk Assessment (FRA)	Frequency of risk assessment, risk documentation, fraud detection systems, integration with internal audit	(AlMansour et al., 2020; Kazemian et al., 2019)
Asset Misappropriation	Misuse of cash, inventory, procurement fraud, and manipulation of asset records	(ACFE, 2024; Putra et al., 2025)

Because the indicators manifest the underlying latent variable rather than forming it, each construct is treated as reflective. The reflective specification is consistent with the theoretical reasoning as well as prior studies that examined fraud behavior using PLS-SEM.

Procedures to Minimize Common Method Variance (CMV)

Since all variables were self-reported, procedural and statistical remedies were used to address potential Common Method Variance (CMV). Procedural Remedies ensured anonymity and voluntary participation. To reduce respondent pattern bias, items were counterbalanced and separated by construct. Furthermore, Statistical Remedies involved performing a full collinearity VIF test, with all VIF values below 3.3, indicating no serious collinearity (Roffia & Poffo, 2025). Additionally, an unmeasured latent method factor test was carried out, confirming that no single factor dominated variance across indicators.

Data Analysis Techniques

This study followed procedures by Hair (2014) to analyze the data using **SmartPLS 4** software. This involves two stages, i.e., measurement model and structural model evaluations, whose key metrics and criteria are explained as follows:

1. Measurement Model (Outer Model) Evaluation
   a. Indicator Reliability: item loadings > 0.70
   b. Internal Consistency Reliability: Cronbach's α and Composite Reliability (ρc) > 0.70
   c. Convergent Validity: Average Variance Extracted (AVE) > 0.50
   d. Discriminant Validity: evaluated using the HTMT ratio (< 0.90) and cross-loadings
   e. Construct Multicollinearity: indicator VIFs reported to ensure no redundancy or common method bias
2. Structural Model (Inner Model) Evaluation
   a. Path Coefficients (β), Standard Errors (SE), and p-values obtained through bootstrapping (5,000 subsamples, bias-corrected 95% CI)
   b. Model Fit Indices: SRMR, d_ULS, d_G reported to verify global model fit
   c. Explained Variance: R^2 and Adjusted R^2 values to evaluate predictive power
   d. Effect Size (f^2): the local impact of each exogenous variable
   e. Predictive Relevance (Q^2): assessed via blindfolding to test out-of-sample prediction
   f. Moderation Analysis: tested using the two-stage approach with mean-centered interaction terms to avoid multicollinearity
   g. Robustness Tests: (i) split-sample by FRA intensity; (ii) control variables, such as firm size, internal audit presence, and whistleblowing system, included to test endogeneity risk

All significance levels were set at α = 0.05, and path significance was interpreted based on t-statistics (>1.96) and p-values (<0.05).

Summary of Research Model

To explain asset misappropriation, the overall model integrates behavioral determinants of fraud (pressure, opportunity, rationalization, and capability) with a governance mechanism—i.e., FRA—as moderator. This approach emphasizes both psychological drivers and systemic controls, consistent with the Fraud Diamond Theory, the Agency Theory, and the Fraud Governance Perspective. The use of PLS-SEM allows simultaneous testing of direct and moderating effects, providing comprehensive insights into the surveillance (detection) and deterrence (preventive) mechanisms of fraud.

RESULTS AND DISCUSSION

Respondent Profile

A total of 312 valid responses of the distributed questionnaires were received from employees in accounting, finance, and internal audit divisions across public sector organizations in Indonesia, covering ministries, regional government agencies, and state-owned enterprises (*Badan Usaha Milik Negara*/BUMN). Table 2 presents the demographic characteristics of respondents.

Table 2. Respondent Profile

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	172	55.1
	Female	140	44.9
Age	< 30 years	68	21.8
	30–40 years	134	42.9
	41–50 years	78	25.0
	> 50 years	32	10.3
Education	Bachelor's Degree (S1)	214	68.6
	Master's Degree (S2)	88	28.2
	Doctoral (S3)	10	3.2
Position	Staff	158	50.6
	Supervisor	92	29.5
	Manager	62	19.9
Years of Service	< 5 years	84	26.9
	5–10 years	128	41.0
	> 10 years	100	32.1

Source: Data Proceed (2025)

As shown in Table 2, the majority of respondents are mid-career employees with good educational backgrounds and professional experience, thus having profound knowledge of internal control systems and organizational governance practices. This enhances the credibility of the collected data to be used in the analyses of behavioral and control-related fraud dynamics.

Distribution of Respondent Answers

Descriptive statistical analyses were performed to evaluate respondents' perceptions of fraud-related variables, namely: pressure, opportunity, rationalization, capability, fraud risk assessment (FRA), and asset misappropriation. The results are summarized in Table 3.

Table 3. Distribution of Respondent Answers

Construct	Mean	Std. Deviation	Interpretation
Pressure	3.72	0.68	Moderate–High
Opportunity	3.45	0.71	Moderate
Rationalization	3.18	0.64	Moderate
Capability	3.80	0.59	High
Fraud Risk Assessment (FRA)	3.95	0.63	High
Asset Misappropriation	2.86	0.74	Low–Moderate

Source: Data Proceed (2025)

The results of the descriptive statistical analyses suggest that Fraud Risk Assessment is perceived as effectively implemented (Mean = 3.95), while respondents' perception of asset misappropriation remains relatively low (Mean = 2.86), implying that effective FRA implementation increases fraud visibility and detection. Meanwhile, opportunity and capability are viewed as the highest behavioral risk factors, emphasizing the necessity of enhancing internal control and monitoring systems.

Measurement Model Evaluation

The measurement (outer) model was assessed for reliability and validity using SmartPLS 4. The results are displayed in Table 4.

Table 4. Measurement Model Evaluation

Construct	Cronbach's Alpha	Composite Reliability	AVE	Status
Pressure	0.823	0.881	0.648	Reliable & Valid
Opportunity	0.854	0.903	0.682	Reliable & Valid
Rationalization	0.812	0.868	0.631	Reliable & Valid
Capability	0.879	0.918	0.701	Reliable & Valid
Fraud Risk Assessment (FRA)	0.891	0.927	0.756	Reliable & Valid
Asset Misappropriation	0.868	0.911	0.681	Reliable & Valid

Source: Data Proceed (2025)

As shown in Table 4, all constructs exhibit strong psychometric properties and are considered reliable and valid, as shown by item loadings exceeding 0.70, Cronbach's Alpha and Composite Reliability values of above 0.70, Average Variance Extracted (AVE) of more than 0.50, and HTMT ratios of below 0.90. Furthermore, VIF values of less than 3.3 indicate no multicollinearity or common method bias. Therefore, the measurement model is considered statistically sound for further analysis of the structural model.

Structural Model Evaluation

To examine the direct and moderating effects of the variables, the structural (inner) model was tested using bootstrapping (5,000 subsamples). The results are presented in Table 5.

Table 5. Structural Model Evaluation

Path	Original sample (O)	t-statistics (|O/STDEV|)	p-values	Information
Pressure -> Asset Misappropriation	-0.020	0.466	0.641	Rejected
Opportunities -> Asset Misappropriation	0.408	5.070	0.000	Accepted
Rationalization -> Asset Misappropriation	-0.110	1.706	0.088	Rejected
Capabilities -> Asset Misappropriation	0.226	4.418	0.000	Accepted
Fraud Risk Assessment -> Asset Misappropriation	0.298	7.381	0.000	Accepted
Fraud Risk Assessment x Capability -> Asset Misappropriation	0.046	0.978	0.328	Rejected
Fraud Risk Assessment x Opportunity -> Asset Misappropriation	-0.426	3.421	0.001	Accepted
Fraud Risk Assessment x Rationalization -> Asset Misappropriation	-0.081	0.831	0.406	Rejected
Fraud Risk Assessment x Pressure -> Asset Misappropriation	0.118	1.944	0.052	Rejected

Source: Data Proceed (2025)

DISCUSSIONS

Sample Size Determination

This study used a sample of 312 valid responses, thus meeting the analytical requirements of Partial Least Squares Structural Equation Modeling (PLS-SEM) and ensuring statistical robustness. The sample size exceeded the "10-times rule" (Sarstedt et al., 2021), supporting model stability and generalizability. Data reliability was confirmed by non-response bias testing, which revealed no significant differences.

Pressure and Asset Misappropriation

The results of the analyses reveal that pressure exerts no significant influence on asset misappropriation. In the context of the public sector, because of procedural accountability and hierarchical oversight, financial or performance stress alone does not trigger fraudulent behavior. This finding supports those of previous studies by Mohd et al. (2023) and Roffia and Poffo (2025), who argue that pressure becomes relevant only when it is coupled with weak internal controls. Therefore, in structured bureaucracies, pressure remains a latent variable rather than an active determinant of fraud.

Opportunity and Asset Misappropriation

In contrast to pressure, opportunity emerges as the strongest predictor of asset misappropriation, affirming its dominance in the Fraud Diamond Theory. In this regard, fraud may occur undetected as a consequence of weak segregation of duties, inadequate supervision, and ineffective monitoring. This finding is consistent with prior studies (Abdullahi & Mansor, 2018; Utami et al., 2021). Within the Agency Theory, opportunity reflects monitoring failure and information asymmetry. Thus, to minimize opportunity-driven asset misappropriation, the enhancement of internal controls, real-time audits, and digital asset tracking is essential.

Rationalization and Asset Misappropriation

In this study, rationalization also shows no significant impact on asset misappropriation. Although it allows cognitive justification of unethical behavior, its influence appears subdued in public organizations due to enforced ethical codes, transparency norms, and collective decision structures. This finding supports a previous study by Yusrianti et al. (2020), suggesting that rationalization interacts with other variables—opportunity and capability, in particular—rather than operating independently. Therefore, ethical interventions must be combined with structural reforms to ensure their effectiveness.

Capability and Asset Misappropriation

This study reveals that capability significantly influences asset misappropriation. Employees with technical knowledge, access to the system, or decision-making authority are more capable of exploiting control weaknesses. This finding confirms those of other studies (Jaffar et al., 2011; Wolfe & Hermanson, 2004), emphasizing that capability turns intention into action. Thus, public organizations should implement job rotation, access control logs, and authority limitations to mitigate this risk.

Fraud Risk Assessment and Asset Misappropriation

This study also finds a positive direct relationship between Fraud Risk Assessment (FRA) and asset misappropriation, indicating that stronger FRA frameworks correlate with higher reported fraud cases. Rather than signaling control failure, this demonstrates enhanced detection capability. This is in line with previous studies (Kazemian et al., 2019; Tarjo et al., 2024), indicating that active FRA implementation exposes existing irregularities that might otherwise remain concealed. Higher detection rates, therefore, reflect vigilance and transparency.

Moderating Effect of FRA on Opportunity and Asset Misappropriation

The analysis of the moderating effect of FRA reveals that it significantly weakens the relationship between opportunity and asset misappropriation. This confirms the effectiveness of FRA in preventing exploitation of internal control weaknesses. FRA identifies high-risk areas through structured evaluations, analytics, and internal audit coordination, as reported in previous studies (Nadirsyah et al., 2024; Achmad et al., 2024). Therefore, FRA acts as a hybrid mechanism—preventive- and detection-oriented—that reduces the occurrence of opportunity-based fraud.

Moderating Effects on Other Fraud Drivers

The moderating effects of FRA on pressure, rationalization, and capability, however, are insignificant. This indicates that FRA primarily addresses systemic risks rather than individual motivations or technical skill exploitation. To enhance its scope, FRA should be integrated with behavioral governance initiatives, such as ethics training, digital surveillance, and continuous auditing.

Summary of Findings

Overall, this study reveals that opportunity and capability are dominant behavioral drivers of asset misappropriation, while FRA serves as a critical governance tool that enhances fraud detection and accountability. This study expands the Fraud Diamond Theory by empirically demonstrating the behavioral–governance interaction and underlining FRA's dual role as both a surveillance (detection) and deterrence (preventive) mechanism, strengthening the foundation for sound fraud risk management in the public sector.

CONCLUSIONS

This study employed the Fraud Diamond Theory to examine the behavioral and governance determinants of asset misappropriation, with Fraud Risk Assessment (FRA) as a moderating variable. The findings indicate that opportunity and capability significantly increase the likelihood of asset misappropriation, while the relationships between asset misappropriation and both pressure and rationalization are insignificant. Furthermore, FRA demonstrates a dual function: 1) a positive direct effect, indicating that organizations with active risk assessments detect more fraud cases; and 2) a negative moderating effect on the relationship between opportunity and asset misappropriation, signifying that effective FRA practices reduce the exploitation of weak controls.

Theoretical and Practical Implications

Theoretically, the study extends the application of the Fraud Diamond Theory to the domain of asset-level fraud and integrates FRA as a detection-oriented governance mechanism, bridging behavioral and institutional perspectives. FRA works as both a deterrence (preventive) and surveillance (detection) tool, emphasizing the importance of distinguishing between preventive and diagnostic governance strategies. In addition, the results of this study reinforce the Agency Theory by demonstrating how FRA mitigates information asymmetry and enhances transparency in asset management, thus providing more comprehensive insights into behavioral–structural fraud dynamics.

Practically, this study recommends: (1) strengthening opportunity controls through FRA-driven audits and segregation of duties; (2) integrating FRA into continuous, data-driven monitoring systems; (3) enhancing the synergy among audit, whistleblowing, and IT-based controls; and (4) differentiating between surveillance and deterrence actions based on FRA findings. Collectively, these implications highlight the strategic value of FRA in embedding detection-oriented vigilance and ethical deterrence within the governance frameworks of the public sector.

Research Limitations

Despite its implications, this study has several limitations that should be acknowledged. **First**, despite the implementation of both procedural and statistical remedies, the use of self-reported survey data may introduce common method bias (CMB). **Second**, this study focuses exclusively on public sector organizations in Indonesia, which may limit the generalizability of the findings to other institutional settings. **Third**, FRA is modeled as a single construct; future studies can break down the FRA model into its components of risk identification, evaluation, response, and monitoring to better capture its multidimensional nature. **Fourth**, endogeneity and reverse causality are still feasible; organizations that are more vulnerable to fraud may implement stronger FRA systems, resulting in greater fraud detection rather than higher fraud occurrence.

Recommendations for Future Studies

To overcome the existing limitations and extend the research, further studies are recommended to:

1. Model FRA as a Mediator – Future studies can examine whether FRA mediates the link between governance structures and fraud outcomes (e.g., control environment → FRA → misappropriation detection).
2. Adopt Multi-Group or Longitudinal Approaches – Comparing organizations with different control strengths or tracking FRA implementation over time can uncover causal and temporal effects.
3. Incorporate Governance Variables – Other variables, such as internal audit quality, whistleblowing effectiveness, and IT control sophistication, can be included as control or moderating factors.
4. Expand to Cross-Sector and Cross-Country Contexts – Testing the model in diverse governance environments will help determine the universality of FRA's detection-oriented role.
5. Use Behavioral or Experimental Designs – Combining survey data with experimental or archival data can reduce bias and provide deeper behavioral insights into fraud decision-making processes.

Concluding Remark

In conclusion, this study advances the understanding of asset misappropriation by positioning Fraud Risk Assessment as a critical governance mechanism that connects behavioral drivers with institutional control systems. The findings confirm that opportunity and capability remain the dominant behavioral factors contributing to asset misappropriation, while effective FRA practices can mitigate these risks through improved detection, assessment, and control integration. The dual interpretation of FRA as both a governance tool and a risk detection tool provides a new perspective for policymakers and practitioners seeking to establish resilient, transparent, and evidence-based fraud governance frameworks in both public and private organizations.

REFERENCES

Abdullahi, R., & Mansor, N. (2018). Fraud prevention initiatives in the Nigerian public sector: understanding the relationship of fraud incidences and the elements of fraud triangle theory. *Journal of Financial Crime*, *25*(2), 527-544.

ACFE. (2024). *Association of Certified Fraud Examiners (ACFE). (2024). Report to the nations: 2024 global study on occupational fraud and abuse. ACFE.*

Achmad, T., Huang, C.-Y., Putra, M. A., & Pamungkas, I. D. (2024). Forensic Accounting and Risk Management: Exploring the Impact of Generalized Audit Software and Whistleblowing Systems on Fraud Detection in Indonesia. *Journal of Risk & Financial Management*, *17*(12).

Albrecht, A., Salmerón, J. F., Moreno-Cruz, F., Becherer, M., Lugli, P., Cheng, G., & Rivadeneyra, A. (2022). Screen-printed capacitive pressure sensors with high sensitivity and accuracy on flexible substrates. *Flexible and Printed Electronics*, *7*(3), 035005.

AlMansour, A. a. Z. A., Ahmia, A., & Popoolaa, O. M. J. (2020). The Moderation Effect of Neuroticism on Knowledge and Fraud Risk Assessment Performance: A Conceptual Study. 2nd ICAN Malaysia International Conference on Accounting and Finance,

Apriliana, S., & Agustina, L. (2017). The analysis of fraudulent financial reporting determinant through fraud pentagon approach. *Jurnal Dinamika Akuntansi*, *9*(2), 154-165.

Budiandru, B. N. Fraud Diamond Theory Detection on M-Score with Profitability as a Moderating Variable: A Case Study on Sharia Banking Companies.

Colombo, M. G., & Piva, E. (2019). Knowledge misappropriation risks and contractual complexity in entrepreneurial ventures' non-equity alliances. *Small Business Economics*, *53*(1), 107-127.

Cressey, D. R. (1953). Other people's money; a study of the social psychology of embezzlement.

Dorminey, J. W., Fleming, A. S., Kranacher, M.-J., & Riley Jr, R. A. (2010). Beyond the fraud triangle. *The CPA Journal*, *80*(7), 17.

Hair, J. F. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. sage.

Heinzova, R., Hoke, E., & Jánová, N. (2024). Lean management methods: Evidence from the manufacturing industry in the Czech Republic. *Problems and Perspectives in Management*.

Holderness Jr, D. K., Negangard, E. M., & Sultan, J. (2018). Are individuals more likely to misappropriate during economic recessions or expansions? An examination of the relative impact of pressure and opportunity. *Journal of Forensic and Investigative Accounting*, *10*(1), 14-24.

Jackson, M. (2025). *The Division of Rationalized Labor*. Harvard University Press.

Jaffar, N., Haron, H., Mohd Iskandar, T., & Salleh, A. (2011). Fraud Risk Assessment and Detection of Fraud: The Moderating Effect of Personality. *International Journal of Business and Management*, *6*(7). https://doi.org/10.5539/ijbm.v6n7p40

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. In *Corporate governance* (pp. 77-132). Gower.

Jiménez Serrano, J., Delgado Rodriguez, M. J., Rodriguez Iglesias, I., & López Pérez, R. M. (2025). Misappropriation of assets: a quantitative and qualitative analysis of occupational fraud management in organizations. *Journal of Financial Crime*, *32*(5), 994-1013. https://doi.org/10.1108/jfc-01-2025-0016

Kazemian, S., Said, J., Hady Nia, E., & Vakilifard, H. (2019). Examining fraud risk factors on asset misappropriation: evidence from the Iranian banking industry. *Journal of Financial Crime*, *26*(2), 447-463.

Koomson, T. A. A., Owusu, G. M. Y., Bekoe, R. A., & Oquaye, M. (2020). Determinants of asset misappropriation at the workplace: the moderating role of perceived strength of internal controls. *Journal of Financial Crime*, *27*(4), 1191-1211.

Mohd, N. A., Hasnan, S., Ali, M. M., & Harymawan, I. (2023). The effect of pressure, opportunity, and rationalisation on asset misappropriation in public organisations: Evidence from emerging markets. *Journal of Asian Scientific Research*, *13*(4), 178-194.

Nadirsyah, Indriani, M., & Mulyany, R. (2024). Enhancing fraud prevention and internal control: the key role of internal audit in public sector governance. *Cogent Business & Management*, *11*(1), 2382389.

Putra, R., Kusumaningtias, R., Yanthi, M. D., Hidayat, R. A., & Laksono, B. R. (2025). Detecting Asset Misappropriation to Create Peace, Justice and Strong Institutions in Achieving SDG 16. *Journal of Lifestyle and SDGs Review*, *5*(2), e03468-e03468.

Rae, K., & Subramaniam, N. (2008). Quality of internal control procedures: Antecedents and moderating effect on organisational justice and employee fraud. *Managerial Auditing Journal*, *23*(2), 104-124.

Roffia, P., & Poffo, M. (2025). Revisiting the Fraud Triangle in Corporate Frauds: Towards a Polygon of Elements. *Journal of Risk and Financial Management*, *18*(3), 156.

Said, J., Mohamad, N., & Kazimean, S. (2018). Empirical findings of mitigating asset misappropriation among bank employees: fraud diamond theory perspective. *International Journal of Management and Applied Science*, *4*(8), 94-98.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In *Handbook of market research* (pp. 587-632). Springer.

Simmons, V. C., Hermanson, D. R., & Popova, V. K. (2025). Non-GAAP Reporting Decisions and the Enhanced Fraud Triangle: The Role of Capability. *International Journal of Auditing*.

Taherdoost, H. (2021). A review on risk management in information systems: Risk policy, control and fraud detection. *Electronics*, *10*(24), 3065.

Tarjo, T., Anggono, A., Alim, M. N., Said, J., & Mohd-Sanusi, Z. (2024). Religiosity, ethical leadership and local wisdom in moderating the effect of fraud risk management on asset misappropriation: evidence from local government in Indonesia. *Journal of Islamic Accounting and Business Research*.

Utami, Y. L., Rakhmayani, A., Imtichana, D. O., & Hajar, N. (2021). Determinants of asset misappropriation by employee from new fraud triangle theory perspective (case study on holding company in central java). *International Journal of Economics, Business and Accounting Research (IJEBAR)*, *5*(2).

Wolfe, D. T., & Hermanson, D. R. (2004). The fraud diamond: Considering the four elements of fraud.

Yanuarisa, Y., Irianto, G., Djamhuri, A., & Rusydi, M. K. (2025). Exploring the internal audit of public procurement governance: a systematic literature review. *Cogent Business & Management*, *12*(1), 2485411.

Yusrianti, H., Ghozali, I., & Yuyetta, E. N. (2020). Asset misappropriation tendency: Rationalization, financial pressure, and the role of opportunity (study in Indonesian government sector). *Humanities & Social Sciences Reviews*, *8*(1), 373-382.