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Board Gender Diversity and Fraud in Indonesia's Regional Banks: A Fraud Hexagon Perspective

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ABSTRACT
This study investigates the determinants of financial reporting fraud using the Fraud Hexagon theory and examines the moderating role of women on the board of commissioners (WOC). This study employs a quantitative approach using Moderated Regression Analysis (MRA) with panel data from 27 Regional Development Banks during the period 2016–2023. The findings show that pressure, capability, opportunity, and arrogance significantly influence financial reporting fraud, while collusion is not significantly associated with fraud propensity. The results further indicate that the presence of women on the board of commissioners weakens the effect of pressure and capability on financial reporting fraud, highlighting their monitoring and governance-enhancing role. However, the effectiveness of WOC appears to be context-dependent, particularly influenced by the strength of corporate governance and internal control systems within banks. This study extends the empirical application of the Fraud Hexagon theory in explaining financial reporting fraud and provides evidence on the role of board gender diversity in fraud mitigation. By focusing on Indonesia's Regional Development Banks – an underexplored sector – the findings offer practical implications for promoting ethical conduct and strengthening integrity-based corporate governance.

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INTRODUCTION

Fraud in Regional Development Banks (*Bank Pembangunan Daerah* – BPD) in Indonesia remains a serious issue, with various cases highlighting weaknesses in supervision and internal control. Several regional banks, such as Bank Banten Tbk. (BEKS), BPD Bali, and Bank BJB, have recently come under media scrutiny due to issues involving alleged employee corruption, abuse of authority, and losses resulting from illegal transactions that harm customers (Natsir, 2024; Ridho & Susanti, 2024; Suyadnyana, 2023). These cases are typically uncovered only after causing significant impacts, including financial and reputational losses for the institutions, as well as a decline in customer trust.

Compared to national banks or state-owned enterprises (SOEs), BPDs face more complex governance challenges. Their majority ownership by local governments exposes them to political interference, weak board independence, and constrained resources (Akyuwen & Mangowal, 2019; Hartantiningsih, 2017). These characteristics amplify the risk of financial reporting fraud, especially in areas such as procurement, credit disbursement, and managerial oversight (Fasha et al., 2025). Therefore, this study focuses on BPDs not only because of their strategic regional development role,

but also because they represent a governance setting that is highly susceptible to fraud yet under-examined in scholarly research.

According to the ACFE (2024) report, Indonesia ranks third in the Asia-Pacific region for the highest number of fraud cases, following China and Australia, with nearly half of the cases involving corruption. This aligns with the ACFE (2025) Indonesia survey, which found that 47.6% of respondents considered corruption the most dangerous form of fraud. The ACFE also categorizes occupational fraud schemes into three main types: corruption (47.6% of cases), asset misappropriation (40.2% of cases), and financial statement fraud (12.2% of cases), with varying degrees of financial loss. Corruption cases have the largest losses, ranging from IDR 1 billion to IDR 50 billion per case. Asset misappropriation is also significant, with losses between IDR 100 million and IDR 500 million occurring in 19% of cases. Financial statement fraud tends to be less common, but when it does occur, the losses can be substantial, with losses ranging from IDR 1 billion to IDR 50 billion in 23.7% of cases. Although financial statement fraud represents the smallest proportion of cases, it is undeniable that financial reporting serves as the most effective communication channel between agent and principal.

According to ACFE (2025), 12% of fraud cases occurred in the banking and financial services sector, making it the third largest industry affected by occupational fraud. Then, according to the ACFE (2024), organizations across all industries experienced a median loss of USD 145.000 per fraud case. While the report does not disaggregate loss data by specific sectors such as banking, financial services remain the most frequently targeted industry, highlighting its vulnerability to occupational fraud. These findings further reinforce the urgent need to examine financial reporting fraud in institutions such as BPDs, which are characterized by limited oversight and heightened political influence. Currently, there are 27 Regional Development Banks (BPD) operating in Indonesia. Most BPDs face relatively complex governance challenges, primarily due to their ownership structure dominated by local governments. Majority ownership by provincial governments often involves local authorities in the process of appointing directors, opening up opportunities for political influence in corporate governance practices (Akyuwen & Mangowal, 2019). Several previous studies have also shown that BPDs often operate within the framework of local governments' political and economic agendas. This situation makes government intervention in operational decision-making more likely, ultimately increasing governance complexity compared to other banking institutions (Akyuwen & Mangowal, 2019; Hartantiningsih, 2017).

Various theories have been developed to understand the factors that drive fraud, one of which is the Fraud Hexagon Theory. This theory consists of six main elements: pressure, opportunity, rationalization, capability, arrogance, and collusion. Vousinas (2019) developed this theory from previous concepts, such as the Fraud Triangle Theory (Cressey, 1953), Fraud Diamond Theory (Wolfe & Hermanson, 2004), and Fraud Pentagon Theory, by adding collusion as a factor that reinforces fraudulent behavior. Vousinas (2019) argues that major fraud cases in recent decades have often involved multiple members of an organization. Therefore, collusion is considered a key element in various forms of complex, high-cost fraud, particularly those associated with high-level financial crimes (white-collar crime).

This study offers novelty by examining the Fraud Hexagon Theory in the context of Regional Development Banks (BPD) in Indonesia, a sector that plays a strategic role in regional economies but has been rarely explored in academic research on fraud. Most previous studies have focused on national banking or other industries, while fraud risks in BPDs, which have unique characteristics, have not been extensively investigated. Therefore, this study provides a unique contribution to understanding how fraud elements operate in an environment with governance challenges distinct from those faced by national or private banks.

This study investigates the impact of the six key elements in the Fraud Hexagon Theory on potential fraudulent financial reporting actions in Regional Development Banks (BPD) in

Indonesia. Several previous studies have identified the elements in the fraud theory as driving factors behind fraud occurrences. Naldo & Widuri (2023) found that pressure and capability influence fraudulent financial reporting. Similar findings were also reported by Alfarago et al. (2023), who indicated that pressure has a significant impact on fraudulent actions. Umar et al. (2020) revealed that pressure, rationalization, and opportunity contribute to financial reporting fraud, while the study by Suryandari et al. (2023) added that arrogance also plays a role in driving employee fraudulent actions. Furthermore, research by Utami et al. (2019) provides empirical evidence that pressure, opportunity, rationalization, and capability serve as factors that drive the intention to commit fraud.

Although various factors in the Fraud Theory have been identified as key drivers of fraudulent financial reporting actions, the effectiveness of internal control mechanisms and corporate governance remains a crucial aspect in mitigating fraud risks. In this context, the organizational leadership structure, particularly the role of the Board of Commissioners, plays a significant part in overseeing and controlling management behavior to ensure alignment with principles of transparency and accountability. The Financial Services Authority (OJK, 2023), as an independent institution in Indonesia responsible for regulating and supervising the financial services sector, emphasizes the importance of the Board of Commissioners' oversight function over the Board of Directors as part of the implementation of good banking governance.

One aspect that has gained increasing attention in corporate governance studies is gender diversity within the Board of Commissioners structure. The presence of women on the board is believed to enhance the effectiveness of oversight and reduce managerial tendencies to engage in opportunistic practices (Dwyer et al., 2002). Literature shows that women tend to have a lower tolerance for opportunistic behavior in decision-making and are more likely to avoid aggressive earnings management and excessive risk-taking (Dwyer et al., 2002). Additionally, women in organizational leadership are often associated with increased diligence in oversight, improved reporting transparency, and better governance quality (Malik et al., 2020; Post & Byron, 2014). Furthermore, female participation in organizational leadership structures is also linked to strengthening monitoring and oversight procedures, improving ethical behavior, and reducing opportunistic actions in earnings management practices (Adams & Ferreira, 2009). Lakhal et al. (2015) found that the presence of women on the board of directors contributes to the reduction of earnings management practices, as women tend to be more stringent in financial management compared to men.

This study contributes to the academic literature by expanding the application of the Fraud Hexagon Theory in the context of Regional Development Banks (BPD) in Indonesia, which have unique characteristics compared to other commercial banks. Furthermore, this research also provides practical implications for regulators and bank management in designing more inclusive and effective corporate governance policies to mitigate fraud risks, particularly by considering the role of women in financial oversight.

LITERATURE REVIEW

Fraud Hexagon Theory

The Fraud Hexagon Theory, proposed by Vousinas (2019), represents the most recent development in fraud theory, building upon prior models that aimed to explain why individuals commit fraud. The foundational Fraud Triangle Theory, introduced by Cressey (1953), identifies three key elements-pressure, opportunity, and rationalization-as drivers of fraudulent behavior. Recognizing that these three elements were not sufficient to explain all types of fraud, Wolfe & Hermanson (2004) introduced the Fraud Diamond Theory, which added capability as a fourth element, arguing that personal traits such as intelligence, position, confidence, and ego are necessary to commit and conceal fraud.

To address the growing complexity of white-collar crime, Marks (2012) proposed the Fraud Pentagon Theory, incorporating a fifth element: arrogance, referring to the perpetrator's sense of superiority or entitlement, which often leads them to ignore rules or ethical constraints. Expanding on these prior frameworks, Vousinas (2019) developed the Fraud Hexagon Theory by adding collusion as a sixth element. Collusion captures the coordinated nature of modern fraud, especially in organizational contexts where strict internal controls exist. Vousinas emphasized that collusion often arises when subordinates are pressured to meet targets "at any cost," leading to intentional or even unintentional collaboration with others. This theory reflects how modern fraud is frequently systemic, involving multiple actors who abuse trust and position for personal or collective gain.

According to Vousinas (2019), many financial reporting frauds occur because subordinates respond to pressure from superiors to "achieve targets at any cost." In the context of the Fraud Hexagon, collusion can occur either intentionally or unintentionally when fraudsters exploit the position and trust of others for personal gain, often by exploiting unsuspecting individuals. This approach highlights how the Collusion element plays a role in increasing the risk of fraud in complex organizational environments.

Women on the Board of Commissioners

According to Mishra & Jhunjhunwala (2013)there are behavioral differences between men and women in various aspects. Women tend to be more intuitive in decision-making, have better multitasking abilities, and excel in building relationships. Several studies provide empirical evidence that women are more ethical in decision-making (Doan & Iskandar-Datta, 2020; Pan & Sparks, 2012; Post & Byron, 2014). Furthermore, women's tendency to avoid risk, face challenges in building credibility, and struggle to influence others makes them more cautious and better prepared. This affects their contribution to improving monitoring effectiveness (Post & Byron, 2014).

In the context of the board of directors, women are considered more resilient in terms of oversight compared to men (Adams & Ferreira, 2009). This view aligns with the findings of Lakhal et al. (2015), who stated that women are more effective in performing the monitoring roles entrusted to them and play an essential part in corporate governance frameworks. This advantage is reflected in women's ability to maintain a balance between carrying out supervisory duties and taking a more careful and ethical approach. The conservative mindset often held by women, combined with leadership that emphasizes ethical principles, has the potential to make a significant contribution to strengthening the internal control environment within an organization. With a stronger emphasis on conservative and ethical financial reporting, women can help create greater transparency (Ho et al., 2015).

Fraud Hexagon Elements and Financial Reporting Fraud

The Influence of Pressure on Financial Reporting Fraud

The term pressure in the context of factors driving fraudulent behavior can be identified through several key indicators, namely financial stability, external pressure, and financial targets (Skousen et al., 2009). Financial stability is defined as the company's ability to manage financial risks and avoid crises that could negatively impact the company and its stakeholders (Allen & Wood, 2006). When this stability is disrupted, managers often face pressure that encourages them to manipulate financial reporting to maintain stakeholder trust (Umar et al., 2020). This pressure is exacerbated by stakeholder demands that ignore the company's limitations, thus increasing the complexity of maintaining the integrity of financial reports (Narsa et al., 2023).

External pressure can stem from the company's obligation to repay loans or fulfill debt agreements (Skousen et al., 2009). Companies with high leverage ratios, reflecting a large amount of debt compared to assets, face a greater risk of default (Naldo & Widuri, 2023). This situation

creates pressure on managers to maintain the company's financial image, even through unethical means, such as manipulating financial statements to show an appearance of better repayment capability.

In addition, financial targets serve as another significant source of pressure. These targets include achieving sales figures, profits, or other financial performance indicators linked to incentives or bonuses for managers (Umar et al., 2020). When the pressure to meet these targets becomes too high, managers may be tempted to take unethical actions, such as manipulating profit figures. Such actions can harm the company in the long run by creating a performance impression that does not reflect the actual condition. For example, profit manipulation to meet certain targets can undermine the integrity of financial statements and reduce stakeholder trust in the company.

The presence of women on the Board of Commissioners is considered to influence the behavior of company management. Eagly & Carli (2003) explain through traditional gender stereotypes that women tend to be more gentle, empathetic, nurturing, and collaborative. Their research highlights that feminine traits and transformational leadership styles are more effective in the context of modern leadership, potentially reducing fraudulent actions in financial reporting. Women are more ethical in decision-making, and this is related to the supervisory role of female Board of Commissioners members within the company (Doan & Iskandar-Datta, 2020). Based on the explanation of several studies above, the proposed research hypothesis is as follows:

H1a: Pressure has a positive effect on manipulative actions in financial reporting.

H1b: The presence of women on the board of commissioners can reduce the effect of pressure on manipulative actions in financial reporting.

The Influence of Capability on Financial Reporting Fraud

Several studies have shown that changes in directors are closely related to indications of fraud within a company. Referring to Alfarago et al. (2023), capability is often proxied through director turnover, which is frequently done to remove individuals with in-depth knowledge of fraudulent actions. If the director is seen as an obstacle or a potential "whistleblower," their replacement may be a strategic step to conceal the fraud that has occurred. This is consistent with the findings of Supri et al. (2018), which show that director turnover can be used to disguise fraudulent actions.

In addition, the study by Gao et al. (2017) reveals that changes in the board of directors often serve as a predictor of fraud. Director turnover may signal an effort to change management, which is typically associated with poor financial conditions or external pressure to improve performance. This pressure can motivate financial statement manipulation as a short-term response to the expectations of shareholders or regulators.

Several studies suggest that gender differences in organizational management can have varying impacts between men and women. Fernando et al. (2020) found that the more women are present in the Top Management Team (TMT), the better the managerial capabilities and company performance, especially during times of crisis. Al-Shammari & Al-Saidi (2014) also showed that the presence of women on the board of directors contributes to better financial performance compared to companies led solely by men. In the context of corporate governance, Terjesen et al. (2009) argued that gender diversity can enhance governance effectiveness through various mechanisms. The role of women on the board of directors is not only limited to leadership or mentoring but also has a symbolic impact, inspiring other women to contribute more and stay longer in the company. Based on the explanation above, the proposed research hypothesis is as follows:

H2a: Capability has a positive effect on financial reporting fraud.

H2b: The presence of women on the board of commissioners can reduce the effect of capability on financial reporting fraud.

The Influence of Collusion on Financial Reporting Fraud

High-profile fraud cases emphasize that collusion is a key element in many complex frauds and white-collar financial crimes (Vousinas, 2019). Collusion is defined as a fraudulent agreement or arrangement between two or more parties, where one party takes actions that harm the other party for malicious purposes, such as deceiving a third party regarding their rights.

Fraud in financial reporting can be carried out by subordinates based on instructions from superiors to take any action to achieve specific targets. Additionally, collusion can occur indirectly when perpetrators exploit the position of others and take advantage of unsuspecting parties (Vousinas, 2019). Research shows that the risk of fraud within companies increases with the level of collusion Naldo & Widuri (2023), where the higher the level of collusion, the greater the likelihood of fraud occurring (Achmad et al., 2023).

Women tend to be more careful in decision-making, more transparent in financial reporting, and more compliant with regulations, and they tend to avoid risks. These characteristics can reduce the likelihood of a company engaging in tax aggressiveness (Utaminingsih et al., 2022). Therefore, the presence of women in top management positions or supervisory boards can act as a moderating factor in the relationship between the fraud hexagon and financial reporting fraud. This aligns with the tendency of women to adhere more to rules and focus on transparency and ethics in decision-making. Based on the explanation above, the following research hypotheses are proposed:

H3a: Collusion has a positive effect on financial reporting fraud.

H3b: The presence of women on the board of commissioners can reduce the effect of collusion on financial reporting fraud.

The Influence of Opportunity on Financial Reporting Fraud

Opportunity can be understood as a gap in an organization's control system perceived as a weakness, allowing fraud perpetrators to evade legal consequences (Avortri & Agbanyo, 2021). As stated by Herbenita et al. (2022), opportunities for fraud can arise due to inadequate internal controls, lack of managerial oversight, and abuse of position and authority. In this case, high positions in a company provide individuals with power and the ability to exploit weaknesses in the system (Vousinas, 2019).

Several studies highlight that opportunity is a significant factor driving fraud within organizations (Avortri & Agbanyo, 2021; Said et al., 2017; Sawaka K. & Ramantha, 2020). When internal controls are weak, opportunities for financial manipulation are wide open, allowing individuals to exploit these weaknesses for personal gain (Suryandari et al., 2023).

In the context of financial reporting manipulation, opportunities can be identified through certain indicators, such as the nature of the industry reflected in changes in accounts receivable due to changes in sales, as well as the effectiveness of oversight by independent commissioners (Narsa et al., 2023). These two indicators reflect how weak controls, and insufficient supervision can create gaps for manipulative actions in financial reports.

According to Jouber (2022) women in organizations can play an important role in management oversight. They tend to support the implementation of broader managerial control systems, thus helping to improve the professionalism of the company. An increase in the percentage of women in top management enhances the supervision of the company's activities (Lim & Chung, 2021). Based on this explanation, the following hypothesis can be formulated:

H4a: Opportunities have a positive impact on fraudulent financial reporting actions.

H4b: The presence of women on the board of commissioners can reduce the impact of opportunities on fraudulent financial reporting actions.

The Influence of Rationalization on Financial Reporting Fraud

Rationalization is the process by which an individual convinces themselves that the fraudulent act is not a crime and justifies their behavior before carrying it out. This process allows individuals to view illegal behavior as acceptable, thus maintaining their self-image (Dorminey et al., 2010). In the context of financial reporting fraud, rationalization is often carried out by replacing independent auditors who can detect fraudulent behavior within the organization. This step gives management an opportunity to reduce the likelihood of fraud detection by influencing the new auditor not to disclose any fraud that occurred in previous periods (Apriliana & Agustina, 2017; Supri et al., 2018). Several empirical studies have also shown a positive influence of rationalization on fraudulent actions (Avortri & Agbanyo, 2021; Kazimean et al., 2019).

Research shows that women in supervisory and senior management positions play a positive role in promoting transparency within companies. García-Sánchez et al. (2019) found that boards with more women can reduce the risk of information manipulation in sustainability disclosures. Additionally, Mohy-ud-Din (2023) stated that the presence of women on the board supports CSR activities, while Chouaibi et al. (2022) emphasized that women contribute to the availability of higher-quality information. Based on the above explanation, the proposed research hypothesis is as follows:

H5a: Rationalization has a positive effect on financial reporting fraud.

H5b: The presence of women on the board of commissioners can reduce the impact of rationalization on financial reporting fraud.

The influence of arrogance on financial reporting fraud.

According to Geis in the study by Vousinas (2019), one of the main factors driving an individual to commit fraud is personality. Individuals with arrogant traits tend to have a greater potential to commit fraud compared to those who are more compliant. Vousinas (2019) emphasizes that a sense of entitlement and ego-driven motives, including the desire for power, are strong factors behind fraudulent behavior.

In this context, individuals with an arrogant attitude often feel exempt from procedures, regulations, and internal controls, and are unconcerned about potential sanctions they might face (Dorminey et al., 2010; Sahla & Ardianto, 2023). In the context of financial reporting manipulation, the power held by CEOs with arrogant traits encourages them to engage in fraudulent activities. Their excessive self-confidence makes them feel beyond the reach of law and internal control systems, allowing them to evade accountability (Bader et al., 2024).

Several previous studies have shown that arrogance can be measured through the number of photos of the CEO displayed in the company's annual report. The number of these photos is considered to reflect the level of arrogance of the CEO in question (Achmad et al., 2023; Alfarago et al., 2023; Bader et al., 2024). Therefore, the more photos of the CEO in the annual report, the higher the indicated level of arrogance, and the greater the potential for fraud in the financial statements.

Research shows that increasing the representation of women in top management directly impacts the improvement of managerial capabilities and company performance, both in stable conditions and during crises (Fernando et al., 2020). In addition, Orazalin (2020) found that companies with more women in the board of directors are more effective in controlling earnings management practices. Based on this explanation, the proposed research hypotheses are as follows:

H6a: Arrogance has a positive effect on financial reporting fraud.

H6b: The presence of women on the board of commissioners can reduce the impact of arrogance on financial reporting fraud.

RESEARCH METHOD

Sample and Sampling Techniques

This study sample includes all Regional Development Banks (BPD) in Indonesia from 2016 to 2023, consisting of 27 banks (OJK, 2025). Thus, this study involves 216 firm-year observations. The data used is secondary data obtained from the financial statements and annual reports of each Regional Development Bank in Indonesia.

Research model

Equation (1) is used to test the effect of the six key elements in the fraud hexagon theory on corporate financial reporting fraud actions.

$$M - Score_{it} = \beta 0 + \beta 1\, X1_{it} + \beta 2\, X2_{it} + \beta 3\, X3_{it} + \beta 4\, X4_{it} + \beta 5\, X5_{it} + \beta 6\, X6_{it} + \varepsilon_{it}$$

where M-Score represents financial reporting fraud, X1 to X6 represent the six key elements in the fraud hexagon theory, i refers to the company, t is the year, and ϵ is the error term.

Table 1. Proxies for Measuring M-Score

No.	Description and Symbol	Operationalization
1.	Gross Margin Index (GMI)	$\frac{(Gross\ Profit \div Sales)_{t-1}}{(Gross\ Profit \div Sales)_t}$
2.	Sales Growth Index (SGI)	$\frac{Sales_t}{Sales_{t-1}}$
3.	Total Accrual to Total Asset (TATA)	$\frac{(Operating\ Income - Cash\ Flow\ From\ Operation)_t}{Total\ Assets_t}$
4.	Depreciation Index (DEPI)	$\frac{[Depreciation\ /\ (PPE + Depreciation]_{t-1}}{[Depreciation\ /\ (PPE + Depreciation]_t}$
5.	Days' Sales in Receivables Index (DSRI)	$\frac{(Receivables - Sales)_t}{(Receivables - Sales_{t-1}}$
6.	Leverage Index (LVGI)	$\frac{(Total\ Liabilities \div Total\ Asset)_t}{(Total\ Liabilities \div Total\ Asset)_{t-1}}$
7.	Sales, general and administrative expenses index (SGAI)	$\frac{(Sales, General\ \&\ Administrative\ Expense \div Sales)_t}{(Sales, General\ \&\ Administrative\ Expense \div Sales)_{t-1}}$
8.	Asset Quality Index (AQI)	$\frac{\left(1 - \frac{Current\ Asset + Property, Plant\ \&\ Equipment}{Total\ Asset}\right)_t}{\left(1 - \frac{Current\ Asset + Property, Plant\ \&\ Equipment}{Total\ Asset}\right)_{t-1}}$

Source: Khatun et al. (2022), Lu & Zhao, (2021), Narsa et al. (2023)

We also investigate how the presence of women on the board of commissioners (WOC) moderates the relationship between the six key elements in the fraud hexagon theory and financial reporting fraud. The following Equation 2 tests the interaction effect of the moderator variable, women on the board of commissioners, and the six key elements in the fraud hexagon theory on financial reporting fraud.

$$M - Score_{it} = \beta 0 + \beta 1\, X1_{it}{}^{*}\, WOC_{it} + \beta 2\, X2_{it}{}^{*}\, WOC_{it} + \beta 3\, X3_{it}{}^{*}\, WOC_{it} + \beta 4\, X4_{it}{}^{*}\, WOC_{it} + \beta 5\, X5_{it}{}^{*}\, WOC_{it} + \beta 6\, X6_{it}{}^{*}\, WOC_{it} + \varepsilon_{it}$$

Panel Data Estimation Technique

This study employs panel data regression analysis. The Chow test indicates that the fixed effects model is more appropriate than pooled OLS. Additionally, the Breusch–Pagan Lagrange Multiplier test confirms the presence of panel effects. Although the Hausman test produced an invalid result, the fixed effects model was selected as the most appropriate approach, considering the heterogeneity across banks. Furthermore, robust standard errors were applied to address potential heteroskedasticity and autocorrelation issues.

Variable Measurement

Financial reporting fraud in this study is the dependent variable, defined as the intentional actions of an entity to manipulate financial information in its financial statements to mislead users of financial reports (Christensen et al., 2023). To measure fraudulent financial reporting, this study employs the Beneish M-Score model, as applied by Lu & Zhao (2021) and Khatun et al. (2022), which consists of eight variables detailed in Table 1.

Although the Beneish M-Score was originally developed for manufacturing firms, prior studies have shown its applicability across various industries, including financial institutions (Khatun et al., 2022; Nyakarimi, 2022). Since the model detects earnings manipulation based on financial statement relationships, which are also relevant for accrual-based banking reports, this study adopts the Beneish M-Score to measure fraudulent financial reporting in Indonesia's regional banks.

The independent variables in this study consist of six key elements that may drive an individual to engage in fraudulent actions, including pressure, capability, collusion, opportunity, rationalization, and arrogance (Vousinas, 2019). Each of these elements is measured using the indicators listed in Table 2. This study also involves the presence of women on the board of commissioners as a moderator variable, which is assessed by assigning a score of 1 if there is at least one female member in the Board of Commissioners structure, and 0 if there is none (Sadaa et al., 2023).

$$M - score = -4.840 + (0.920 * DSRI) + (0.528 * GMI) + (0.404 * AQI) + (0.892 * SGI) + (0.115 * DEPI) - (0.172 * SGAI) - (0.327 * LVGI) + (4.697 * TATA)$$

RESULT AND DISCUSSION

Data Summary

This study focuses on examining the influence of the Fraud Hexagon elements on financial reporting fraud at Regional Development Banks (BPD) in Indonesia, while also examining whether women on the board of commissioners (WOC) act as a moderating variable. Fraud indications are proxied using the Beneish M-Score. The study sample consisted of 27 BPDs during the 2016–2023 period, resulting in 216 observations. Empirical findings show that the influence of each Fraud Hexagon element on fraud is not uniform. Furthermore, the presence of women on the board of commissioners is not always effective but is only relevant in certain situations. These conditions

indicate that fraudulent behavior in the regional banking sector is formed through the interaction between financial pressures, governance mechanisms, and the characteristics of organizational leaders. Table 3 presents the results of the descriptive statistical tests.

Table 2. Elements of the Fraud Hexagon

No.	Fraud Hexagon Elements	Variables	Symbol	Measurement	Source
Independent Variables					
1.	Pressure (X1)	Financial Stability	AGR	$\frac{Total\ Asset_t - Total\ Asset_{t-1}}{Total\ Asset_{t-1}}$	Skousen et al. (2009)
		External Pressure	LEV	$\frac{Total\ Debt}{Total\ Asset}$	Skousen et al. (2009)
		Financial Target	ROA	$\frac{Net\ Income}{Total\ Asset}$	Skousen et al. (2009)
2.	Capability (X2)	Change of Director	BOD	Coded 1 if there is a change in the company's board of directors and coded 0 otherwise.	Achmad et al. (2023)
3.	Collusion (X3)	An agreement or cooperation between two or more parties that have the potential to commit fraud	BOC	Total number of commissioners who have concurrent positions.	Achmad et al. (2023)
4.	Opportunity (X4)	Nature of Industry	RGW	$\frac{Receivables_t - Receivables_{t-1}}{Sales_t - Sales_{t-1}}$	Narsa et al. (2023)
		Effectiveness of Supervision	IND	Number of Independent Commissioners / Total of Board commissioners	Narsa et al. (2023)
5.	Rationalization (X5)	Change in Auditor	AUD	Coded 1 if there is a change in the company's auditor and coded 0 otherwise.	Skousen et al. (2009)
6.	Arrogance (X6)	A person's selfish attitude in showing his power	PIC	Number of Chief Executive Officer photos shown in annual financial statements.	Achmad et al. (2023)

Source: Authors own work, 2026

Table 3. Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
M-Score	216	- 2.3051	.5489	-3.9968	1.9013
AGR	216	.0978	.1056	-.3409	.6581
LEV	216	.7932	.1943	.0541	.9321
ROA	216	.0160	.0126	-.0972	.0497
BOD	216	.5926	.4925	0	1
BOC	216	.8194	1.0520	0	4
RGW	216	5.3405	24.3122	-89.8414	91.1416
IND	216	.6242	.1735	.25	1
AUD	216	.3148	.4655	0	1
PIC	216	2.8333	.8840	1	7
WOC	216	.2454	.4313	0	1

Source: Authors own work, 2026

Table 3 presents descriptive statistics of the research variables to provide an overview of the data distribution in this study. M-Score has a mean value of -2.3051 with a standard deviation of 0.5489. The range of values from -3.9968 to 1.9013 shows that most companies in the sample have a low risk of fraud, although there are a few companies with higher potential for fraudulent practices.

Several proxies for the Pressure variable show that the average AGR is 0.0978, indicating relatively stable financial conditions, although there is variation with a minimum value of -0.3409 and a maximum of 0.6581. LEV, with an average of 0.7932, indicates that most companies have a high debt level, which could create external pressure in financial management. Meanwhile, ROA has a mean of 0.0160, reflecting relatively low achievement of financial targets with considerable variation between companies experiencing losses and those making profits.

In the Capability aspect, the average BOD of 0.5926 indicates that more than half of the companies experienced changes in their board of directors. For Collusion, the average BOC is 0.8194, with some companies having a high number of commissioners holding multiple positions, suggesting potential conflicts of interest in company oversight.

In the Opportunity aspect, RGW has a mean of 5.3405 with a large standard deviation, indicating high variation in the observed industry. Meanwhile, the average IND of 0.6242 shows that most companies have more than half of their commissioners as independents, which should enhance the effectiveness of supervision.

For Rationalization, the average AUD of 0.3148 shows that 31.5% of the sample companies had changes in their auditors, which could indicate the potential for financial statement manipulation. In the Arrogance aspect, the average number of CEO photos in the annual report (PIC) is 2.8333, with some reports including up to 7 photos, suggesting varying levels of exposure and potential dominance by company leaders.

Table 4. Results of Moderated Regression Analysis

Variables	Model 1	Model 2
Pressure (AGR)	0.425**	1.080***
Pressure (LEV)	0.022	.183
Pressure (ROA)	0.268**	7.904**
Capability (BOD)	0.019*	.159*
Collusion (BOC)	0.016	.062
Opportunity (RGW)	0.126**	.003**
Opportunity (IND)	-0.027	.231
Rationalization (AUD)	0.027	.106
Arrogance (PIC)	0.040**	.097**
WOC		.310
AGR_WOC		-2.245**
LEV_WOC		0.250
ROA_WOC		6.321
BOD_WOC		-.316*
BOC_WOC		-.077
RGW_WOC		.003
IND_WOC		.382
AUD_WOC		.182
PIC_WOC		.102

Note: ***, **, and * denote significance at the 1%, 5%, and the 10% levels, respectively.
Source: Authors own work, 2026

The average WOC of 0.2454 shows that only about 24.54% of companies in the sample have women on the board of commissioners. When WOC is moderated with the main variables, there are changes in the distribution, such as with AGR*WOC and ROA*WOC, which have lower

averages compared to the main variables, indicating that the presence of women on the board of commissioners may affect financial stability and financial target achievement. Additionally, PIC*WOC, which measures CEO arrogance tendencies in companies with women on the board of commissioners, has a range from -1.3835 to 3.1443, suggesting that in some cases, CEO exposure could either increase or decrease significantly when women are present in the company's oversight structure.

Overall, these descriptive statistics show that the elements in the Fraud Hexagon exhibit significant variation across companies and indicate that the presence of women on the board of commissioners may act as a moderating factor in the relationship between fraud risk factors and financial reporting fraud practices.

To ensure that multicollinearity does not affect the regression results, this study conducted a multicollinearity test using the Variance Inflation Factor (VIF). The results indicate that all VIF values are below the threshold of 10, suggesting that multicollinearity is not a significant concern.

Table 5. Summary of Hypothesis Testing Results

Variable	Proxies	Coefficient	Conclusion
Pressure	AGR → M-Score	0.425**	H1a partially supported (only AGR and ROA are significant proxies of pressure)
	LEV → M-Score	0.002	
	ROA → M-Score	0.268**	
	AGR*WOC → M-Score	-2.245**	H1b is partially supported, as only the interaction between AGR and WOC is statistically significant
	LEV*WOC → M-Score	0.250	
	ROA*WOC → M-Score	6.321	
Capability	BOD → M-Score	0.019*	H2a supported
	BOD*WOC → M-Score	-0.316*	H2b supported
Collusion	BOC → M-Score	0.016	H3a not supported
	BOC*WOC → M-Score	-0.077	H3b not supported
Opportunity	RGW → M-Score	0.126**	H4a partially supported (only RGW are significant proxies of opportunity)
	IND → M-Score	-0.027	
	RGW*WOC → M-Score	0.003	H4b not supported
	IND*WOC → M-Score	0.382	
Rationalization	AUD → M-Score	0.027	H5a not supported
	AUD*WOC → M-Score	0.182	H5b not supported
Arrogance	PIC → M-Score	0.040**	H6a supported
	PIC*WOC → M-Score	0.102	H6b not supported

Source: Authors own work, 2026

Hypothesis Testing

Hypothesis testing in this study was conducted using Moderated Regression Analysis (MRA) with panel data, employing the Stata statistical software. The regression results are presented in Table 4, while Table 5 summarizes the hypothesis testing. The Adjusted R-squared (R^2) value is of 0.1229 indicates that the six elements of the Fraud Hexagon theory, used as independent variables, explain only 12.29% of the variation in organizational financial reporting fraud.

Regression estimates show that the pressure variable, proxied by the Asset Growth Ratio (AGR) and Return on Assets (ROA), has a positive and significant effect on fraud. Conversely, leverage does not show a significant effect. This finding aligns with the Fraud Hexagon Theory, which positions economic pressure as a key driver of fraudulent behavior.

Conceptually, management faced with demands to demonstrate asset growth, and a certain level of profit tends to embellish financial reports when actual performance falls short of targets.

In the case of regional development banks (BPD), this pressure can originate from the local government, as a shareholder, expecting improved performance and dividend contributions.

This empirical finding is consistent with Alfarago et al. (2023), Naldo & Widuri (2023), and Umar et al. (2020), which state that financial pressure increases the likelihood of fraud. Meanwhile, the insignificant leverage indicates that the debt structure in the banking industry does not always reflect financial pressure, given that third-party funds are a normal operational characteristic for banks.

The AGR*WOC interaction term proved to have a negative and significant effect. This indicates that the presence of women on the board of commissioners can weaken the influence of pressure on fraud. This finding supports the gender ethics theory, which explains that women tend to be more cautious, risk averse, and have a stronger compliance orientation.

The involvement of women on the board of commissioners has the potential to strengthen oversight quality, particularly when management faces pressure to drive asset growth. This finding aligns with Adams & Ferreira (2009) and recent research by Mohy-ud-Din et al. (2025), which confirms that board gender diversity can improve monitoring effectiveness.

On the other hand, the interaction term for LEV and ROA did not show statistical significance. This indicates that women's effectiveness in the oversight function does not necessarily apply to all forms of pressure but tends to be stronger when pressure is related to asset growth.

The capability variable, proxied by changes in the board of directors (BOD), has been shown to have a positive and significant effect on fraud. According to the Fraud Hexagon Theory, individuals with capability, access, and strategic positions tend to have a greater opportunity to commit fraud.

Changes in the board of directors have the potential to create a transition period characterized by weakened internal controls and opportunities to cover up previous management errors. Furthermore, new directors may engage in income smoothing to create a more positive initial image. This finding aligns with Supri et al. (2018) and Gao et al. (2017), which state that leadership changes are often associated with an increased risk of financial statement manipulation.

The negative and significant BOD*WOC interaction term indicates that the presence of women on the board of commissioners effectively mitigates the impact of changes in the board of commissioners on fraud. Thus, women can be seen as playing a balancing role in governance during periods of management transition.

The collusion variable, proxied by concurrent commissioner positions (BOC), did not show a significant effect. This indicates that concurrent positions are not always synonymous with collusion or fraud. In the context of Regional Development Banks (BPD), commissioners holding dual positions often come from local government or professional backgrounds, bringing additional networks and experience. As long as these practices comply with regulations and are under the supervision of the Financial Services Authority (OJK), concurrent positions do not automatically increase fraud. This finding differs from the assumptions of the Fraud Hexagon Theory but also confirms that collusion indicators need to be adjusted to the characteristics of the public sector and the regional banking industry.

The opportunity variable, measured by receivables growth (RGW), showed a positive and significant effect on fraud, while the proportion of independent commissioners (IND) had no significant effect. This finding indicates that the complexity of operational activities is more influential than the formal supervisory structure.

The increase in receivables, or accounts related to credit distribution, creates significant room for subjectivity in determining reserves, asset classification, and revenue recognition. In the banking industry, the credit sector is known as one of the segments most vulnerable to potential manipulation due to the involvement of managerial estimates and judgment. These results align

with Avortri & Agbanyo (2021) and Herbenita et al. (2022), who assert that weaknesses in internal control can create loopholes that allow fraud to occur. On the other hand, the insignificance of independent commissioners indicates that their quantitative presence is insufficient to guarantee effective supervision without adequate competence, strong oversight intensity, and substantive independence.

The rationalization variable, proxied by auditor change (AUD), did not significantly impact fraud. This indicates that auditor changes in regional development banks (BPD) are more influenced by regulatory compliance, audit rotation mechanisms, and audit procurement policies, rather than by attempts to cover up fraudulent practices. This finding differs from some studies in the private sector, which view auditor switching as an indicator of potential financial statement manipulation. In the highly regulated banking industry, auditor change decisions tend to be formal, structured, and more transparent.

The arrogance variable, proxied by the number of CEO (PIC) photos, has a positive and significant effect on fraud. The more prominent the CEO's visual exposure in the annual report, the higher the likelihood of fraud. This finding supports the Fraud Hexagon Theory, which states that leaders with high levels of self-superiority tend to ignore control mechanisms and are more easily influenced by opportunistic decisions.

The dominance of the CEO figure in an organization has the potential to create a centralized work culture, reduce the space for dissenting opinions, and weaken the internal oversight function. These results align with Dorminey et al. (2010), Vousinas (2019), and Sahla & Ardianto (2023). However, the PIC*WOC interaction did not show a significant effect. This indicates that the presence of women on the board of commissioners is not strong enough to directly buffer the effect of CEO dominance on the potential for fraud.

Overall, fraudulent behavior at Regional Development Banks in Indonesia is largely influenced by financial pressure, the dynamics of board turnover, opportunities arising in operational processes, and the characteristics of leadership arrogance. At the same time, the presence of women on boards of commissioners has been shown to mitigate some of these risks, particularly those related to pressure and capability. These findings confirm that fraud prevention requires a combination of strengthening governance mechanisms and increasing diversity within board structures.

CONCLUSIONS, LIMITATIONS, AND SUGGESTIONS

The conclusion of this study shows that hypothesis testing using Moderated Regression Analysis (MRA) successfully provides valuable insights into the factors influencing financial reporting fraud using the Fraud Hexagon theory, which introduces a new aspect, namely Collusion. The research findings reveal that pressure from the AGR and ROA variables positively affects financial reporting fraud, and the presence of women on the board of commissioners helps mitigate these negative impacts.

Additionally, the Capability variable, proxied by board of director changes, also has a positive effect on fraud, while women on the board of commissioners serve as a moderating factor that reduces this tendency. The Opportunity and Arrogance variables show a significant positive effect on financial reporting fraud, where the opportunity to commit fraud arises from weaknesses in internal control and an arrogant attitude that allows individuals to ignore oversight. However, the Collusion aspect, which is a new addition to the Fraud Hexagon theory, did not show a significant effect on fraud, possibly since commissioners holding multiple positions can still function independently. Furthermore, the Rationalization variable, proxied by auditor changes, did not have a significant effect on fraud, as it is more influenced by regulatory obligations rather than an indication of fraud rationalization.

The testing results for interaction variables involving women on the board of commissioners also did not show significant moderating effects, indicating that the impact of gender diversity is not universal and is influenced by other factors, such as governance structure and internal oversight policies. Overall, although the Fraud Hexagon theory introduces Collusion as an important aspect in understanding fraud, other factors such as capability, opportunity, and arrogance are more dominant in influencing the tendency for financial reporting fraud.

Some limitations of this study include the limited data, which only covers 27 Regional Banks within a relatively short period, resulting in 216 firm-years. This may be the reason why the regression model is only able to explain 12.29% of the variation in financial reporting fraud. Several elements of the fraud hexagon theory, particularly collusion, did not show significant effects, which may be attributed to the misalignment of the proxies used. Based on these findings, future research could consider extending the period to enhance the power of the regression model and explore new approaches in selecting proxies used to measure each element of the fraud hexagon theory.

REFERENCES

ACFE. (2024). Occupational Fraud 2024: A Report To The Nations. *Association of Certified Fraud Examiners*, 1–96. https://www.acfe.com/-/media/files/acfe/pdfs/rttn/2024/2024-report-to-the-nations

ACFE. (2025). *Survei Fraud Indonesia 2025* (Issue 111). https://acfe-indonesia.or.id/survey-fraud-indonesia-2025/

Achmad, T., Ghozali, I., Helmina, M. R. A., Hapsari, D. I., & Pamungkas, I. D. (2023). Detecting Fraudulent Financial Reporting Using the Fraud Hexagon Model: Evidence from the Banking Sector in Indonesia. *Economies*, *11*(1). https://doi.org/10.3390/economies11010005

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, *94*(2), 291–309. https://doi.org/10.1016/j.jfineco.2008.10.007

Akyuwen, R., & Mangowal, C. (2019). Leadership Challenges of Regional Banks in Indonesia. *Kinerja*, *23*(1), 76–86. https://doi.org/10.24002/kinerja.v23i1.2131

Al-Shammari, B., & Al-Saidi, M. (2014). Kuwaiti Women and Firm Performance. *International Journal of Business and Management*, *9*(8), 51–60. https://doi.org/10.5539/ijbm.v9n8p51

Alfarago, D., Syukur, M., & Mabrur, A. (2023). The Likelihood of Fraud From the Fraud Hexagon Perspective: Evidence From Indonesia. *ABAC Journal*, *43*(1), 34–51. https://doi.org/https://doi.org/10.14456/abacj.2023.3

Allen, W. A., & Wood, G. (2006). Defining and achieving financial stability. *Journal of Financial Stability*, *2*(2), 152–172. https://doi.org/10.1016/j.jfs.2005.10.001

Apriliana, S., & Agustina, L. (2017). The Analysis of Fraudulent Financial Reporting Determinant through Fraud Pentagon Approach. *Jurnal Dinamika Akuntansi*, *9*(2), 154–165. https://doi.org/10.15294/jda.v7i1.4036

Avortri, C., & Agbanyo, R. (2021). Determinants of management fraud in the banking sector of Ghana: the perspective of the diamond fraud theory. *Journal of Financial Crime*, *28*(1), 142–155. https://doi.org/10.1108/JFC-06-2020-0102

Bader, A. A., Abu Hajar, Y. A., Weshah, S. R. S., & Almasri, B. K. (2024). Predicting Risk of and Motives behind Fraud in Financial Statements of Jordanian Industrial Firms Using Hexagon Theory. *Journal of Risk and Financial Management*, *17*(3). https://doi.org/10.3390/jrfm17030120

Chouaibi, J., Belhouchet, S., Almallah, R., & Chouaibi, Y. (2022). Do board directors and good corporate governance improve integrated reporting quality? The moderating effect of CSR: an empirical analysis. *EuroMed Journal of Business*, *17*(4), 593–618. https://doi.org/10.1108/EMJB-04-2021-0066

Christensen, T. E., Huffman, A., Lewis-Western, M. F., & Valentine, K. (2023). A Simple Approach to Better Distinguish Real Earnings Manipulation from Strategy Changes*. *Contemporary Accounting Research*, *40*(1), 406–450. https://doi.org/10.1111/1911-3846.12830

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

Doan, T., & Iskandar-Datta, M. (2020). Are female top executives more risk-averse or more ethical? Evidence from corporate cash holdings policy. *Journal of Empirical Finance*, *55*(November 2019), 161–176. https://doi.org/10.1016/j.jempfin.2019.11.005

Dorminey, J. W., Fleming, A. S., Kranacher, M.-J., & Riley, R. A. J. (2010). Beyond the Fraud Triangle Enhancing Deterrence of Economic Crimes. *The CPA Journal*, *80*(7), 17–23. www.acfe.com/rttn/rttn-2010.pdf%0Ahttps://www.proquest.com/scholarly-journals/beyond-fraud-triangle/docview/637276283/se-2?accountid=49069

Dwyer, P. D., Gilkeson, J. H., & List, J. A. (2002). Gender differences in revealed risk taking: Evidence from mutual fund investors. *Economics Letters*, *76*(2), 151–158. https://doi.org/10.1016/S0165-1765(02)00045-9

Eagly, A. H., & Carli, L. L. (2003). Finding gender advantage and disadvantage: Systematic research integration is the solution. *Leadership Quarterly*, *14*(6), 851–859. https://doi.org/10.1016/j.leaqua.2003.09.003

Fasha, M. A. I., Matoati, R., Purwanto, B., & Viana, E. D. (2025). Pengaruh Kualitas GCG, Ukuran Bank dan BOPO terhadap Fraud pada BPD di Sumatera Periode 2017-2024. *Jurnal Manajemen Dan Organisasi*, *16*(3), 344–353. https://doi.org/10.29244/jmo.v16i3.68989

Fernando, G. D., Jain, S. S., & Tripathy, A. (2020). This cloud has a silver lining: Gender diversity, managerial ability, and firm performance. *Journal of Business Research*, *117*(June), 484–496. https://doi.org/10.1016/j.jbusres.2020.05.042

Gao, Y., Kim, J. B., Tsang, D., & Wu, H. (2017). Go before the whistle blows: an empirical analysis of director turnover and financial fraud. In *Review of Accounting Studies* (Vol. 22, Issue 1). Review of Accounting Studies. https://doi.org/10.1007/s11142-016-9381-z

García-Sánchez, I. M., Suárez-Fernández, O., & Martínez-Ferrero, J. (2019). Female directors and impression management in sustainability reporting. *International Business Review*, *28*(2), 359–374. https://doi.org/10.1016/j.ibusrev.2018.10.007

Hartantiningsih, I. (2017). Corporate Governance of Indonesian Regional Development Banks. *International Business Management*, *11*(4), 831–840.

Herbenita, H., Rahmawati, A., & Surwanti, A. (2022). *Potential of Fraud Financial Statements: The Fraud Triangle*. Central Asian Journal of Innovations on Tourism Management and Finance. https://emitennews.com/news/kpk-usut-korupsi-bank-bjb-dana-markup-rp200-miliar-ngalir-ke-pejabat

Ho, S. S. M., Li, A. Y., Tam, K., & Zhang, F. (2015). CEO Gender, Ethical Leadership, and Accounting Conservatism. *Journal of Business Ethics*, *127*(2), 351–370. https://doi.org/10.1007/s10551-013-2044-0

Jouber, H. (2022). Women leaders and corporate social performance : do critical mass , CEO managerial ability and corporate governance matter ? *Management Decision*, *60*(5), 1185–1217. https://doi.org/10.1108/MD-07-2020-0953

Kazimean, S., Said, J., Nia, E. H., & Vakilifard, H. (2019). Examining Fraud Risk Factors on Asset Misappropriation : Evidence from the Iranian Banking Industry. *Journal of Financial Crime*, *10*(6), 24–62.

Khatun, A., Ghosh, R., & Kabir, S. (2022). Earnings manipulation behavior in the banking industry of Bangladesh: the strategical implication of Beneish M-score model. *Arab Gulf Journal of Scientific Research*, *40*(3), 302–328. https://doi.org/10.1108/AGJSR-03-2022-0001

Lakhal, F., Aguir, A., Lakhal, N., & Malek, A. (2015). Do women on boards and in top management

reduce earnings management? Evidence in France. *Journal of Applied Business Research*, *31*(3), 1107–1118. https://doi.org/10.19030/jabr.v31i3.9236

Lim, M. H., & Chung, J. Y. (2021). The effects of female chief executive officers on corporate social responsibility. *Managerial and Decision Economics*, *42*(5), 1235–1247. https://doi.org/10.1002/mde.3304

Lu, W., & Zhao, X. (2021). Research and improvement of fraud identification model of Chinese A-share listed companies based on M-score. *Journal of Financial Crime*, *28*(2), 566–579. https://doi.org/10.1108/JFC-12-2019-0164

Malik, M. F., Zaman, M., & Buckby, S. (2020). Enterprise risk management and firm performance: Role of the risk committee. *Journal of Contemporary Accounting and Economics*, *16*(1), 100178. https://doi.org/10.1016/j.jcae.2019.100178

Marks, J. (2012). The Mind Behind the Fraudsters Crime: Key Behavioral and Environmental Elements. *Crowe Horwath LLP*, 1–62. https://www.fraudconference.com/uploadedFiles/Fraud_Conference/Content/Course-Materials/presentations/23rd/ppt/10C-Jonathan-Marks.pdf (accessed on May 6, 2026).

Mishra, R. K., & Jhunjhunwala, S. (2013). *Diversity and the Effective Corporate Board*. Academic Press.

Mohy-ud-Din, K. (2023). Board diversity and corporate social responsibility versus sustainability development: Evidence from US and Australia. *Journal of Cleaner Production*, *417*(June), 138030. https://doi.org/10.1016/j.jclepro.2023.138030

Mohy-ud-Din, K., Shahbaz, M., Khamdamov, S. J., & Ahmad, S. (2025). Asymmetric role of board diversity on green growth mechanism: Evidence from COP27 framework. *Journal of Environmental Management*, *375*(January), 1–15. https://doi.org/10.1016/j.jenvman.2025.124113

Naldo, R. R., & Widuri, R. (2023). Fraudulent Financial Reporting and Fraud Hexagon: Evidence from Infrastructure Companies in ASEAN. *Economic Affairs (New Delhi)*, *68*(3), 1455–1468. https://doi.org/10.46852/0424-2513.3.2023.14

Narsa, N. P. D. R. H., Afifa, L. M. E., & Wardhaningrum, O. A. (2023). Fraud triangle and earnings management based on the modified M-score: A study on manufacturing company in Indonesia. *Heliyon*, *9*(2), e13649. https://doi.org/10.1016/j.heliyon.2023.e13649

Natsir, M. (2024, September). *KPK Usut Korupsi Bank BJB, Dana Markup Rp200 Miliar Ngalir ke Pejabat*. Emitennews.Com. https://emitennews.com/news/kpk-usut-korupsi-bank-bjb-dana-markup-rp200-miliar-ngalir-ke-pejabat (accessed on October 16, 2025).

Nyakarimi, S. (2022). Probable earning manipulation and fraud in banking sector. Empirical study from East Africa. *Cogent Economics and Finance*, *10*(1), 1–20. https://doi.org/10.1080/23322039.2022.2083477

OJK. (2023). Peraturan Otoritas Jasa Keuangan Republik Indonesia Nomor 17 Tahun 2023 Tentang Penerapan Tata Kelola Bagi Bank Umum. In *Otoritas Jasa Keuangan* (Issue July). https://www.ojk.go.id/id/regulasi/Documents/Pages/Penerapan-Tata-Kelola-Bagi-Bank-Umum/POJK 17 Tahun 2023. PENERAPAN TATA KELOLA BAGI BANK UMUM.pdf (accessed on October 15, 2025).

OJK. (2025). *Daftar Alamat Kantor Pusat Bank Umum dan Syariah*. https://www.ojk.go.id/id/kanal/perbankan/data-dan-statistik/Pages/Daftar-Alamat-Kantor-Pusat-Bank-Umum-Dan-Syariah.aspx (accessed on December 2025).

Orazalin, N. (2020). Board gender diversity, corporate governance, and earnings management: Evidence from an emerging market. *Gender in Management*, *35*(1), 37–60. https://doi.org/10.1108/GM-03-2018-0027

Pan, Y., & Sparks, J. R. (2012). Predictors, consequence, and measurement of ethical judgments: Review and meta-analysis. *Journal of Business Research*, *65*(1), 84–91. https://doi.org/10.1016/j.jbusres.2011.02.002

Post, C., & Byron, K. (2014). Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal*, *58*(5), 1–59. https://doi.org/https://doi.org/10.5465/amj.2013.0319

Ridho, R., & Susanti, R. (2024). Korupsi Kredit Fiktif, Eks Pejabat Bank Banten Divonis 2 Tahun Penjara. *Kompas*. https://regional.kompas.com/read/2024/08/21/182055278/korupsi-kredit-fiktif-eks-pejabat-bank-banten-divonis-2-tahun-penjara?page=all (accessed on October 15, 2025)

Sadaa, A. M., Ganesan, Y., & Ahmed, M. G. (2023). The effect of earnings quality and bank continuity: the moderating role of ownership structure and CSR. *Journal of Sustainable Finance and Investment*, *13*(1), 366–386. https://doi.org/10.1080/20430795.2020.1858690

Sahla, W. A., & Ardianto, A. (2023). Ethical values and auditors fraud tendency perception: testing of fraud pentagon theory. *Journal of Financial Crime*, *30*(4), 966–982. https://doi.org/10.1108/JFC-04-2022-0086

Said, J., Alam, M. M., Ramli, M., & Rafidi, M. (2017). Integrating ethical values into fraud triangle theory in assessing employee fraud: Evidence from the Malaysian banking industry. *Journal of International Studies*, *10*(2), 170–184. https://doi.org/10.14254/2071-8330.2017/10-2/13

Sawaka K., I. G. N. H., & Ramantha, I. W. (2020). Fraud pentagon theory in detecting financial perception of financial reporting with good corporate governance as moderator variable. *International Research Journal of Management, IT and Social Sciences*, *7*(1), 84–94. https://doi.org/10.21744/irjmis.v7n1.824

Skousen, C. J., Smith, K. R., & Wright, C. J. (2009). Detecting and predicting financial statement fraud: The effectiveness of the fraud triangle and SAS No. 99. *Advances in Financial Economics*, *13*(99), 53–81. https://doi.org/10.1108/S1569-3732(2009)0000013005

Supri, Z., Rura, Y., & Pontoh, G. T. (2018). Detection of Fraudulent Financial Statements with Fraud Diamond. *Quest Journals Journal of Research in Business and Management*, *6*(5), 2347–3002. www.questjournals.org

Suryandari, N. N. A., Yadnyana, I. K., Ariyanto, D., & Erawat, N. M. A. (2023). Determinant of fraudulent behavior in the Indonesian rural bank sector using the fraud hexagon perspective. *Banks and Bank Systems*, *18*(4), 181–194. https://doi.org/10.21511/BBS.18(4).2023.16

Suyadnyana, I. W. S. (2023, November). *Bank BPD Bali Dibobol Transaksi Ilegal, Dana Nasabah Rp 21,5 Miliar Lenyap*. https://www.detik.com/bali/hukum-dan-kriminal/d-7030469/bank-bpd-bali-dibobol-transaksi-ilegal-dana-nasabah-rp-21-5-miliar-lenyap (accessed on November 23, 2025).

Terjesen, S., Sealy, R., & Singh, V. (2009). Women directors on corporate boards: A review and research agenda. *Corporate Governance: An International Review*, *17*(3), 320–337. https://doi.org/10.1111/j.1467-8683.2009.00742.x

Umar, H., Partahi, D., & Purba, R. B. (2020). Fraud diamond analysis in detecting fraudulent financial report. *International Journal of Scientific and Technology Research*, *9*(3), 6638–6646.

Utami, I., Wijono, S., Noviyanti, S., & Mohamed, N. (2019). Fraud diamond, Machiavellianism and fraud intention. *International Journal of Ethics and Systems*, *35*(4), 531–544. https://doi.org/10.1108/IJOES-02-2019-0042

Utaminingsih, N. S., Kurniasih, D., Pramono Sari, M., & Rahardian Ary Helmina, M. (2022). The role of internal control in the relationship of board gender diversity, audit committee, and independent commissioner on tax aggressiveness. *Cogent Business and Management*, *9*(1). https://doi.org/10.1080/23311975.2022.2122333

Vousinas, G. L. (2019). Advancing theory of fraud: the S.C.O.R.E. model. *Journal of Financial Crime*, *26*(1), 372–381. https://doi.org/10.1108/JFC-12-2017-0128

Wolfe, D. T., & Hermanson, D. R. (2004). The Fraud Diamond: Considering the Four Elements of Fraud. *The CPA Journal*, *74*(12), 38–42.