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Elements of Fraud Hexagon and Financial Statement Fraud: The Moderating Effect of Tone at the Top

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Abstract

This study investigates the moderating effect of Tone at the Top on the relationship between the elements of fraud hexagon and financial statement fraud (FSF). Adopting an ex-post facto, longitudinal research design, and secondary data were collected from financial sector companies listed on the Nigerian Exchange (NGX) over a twelve-year period. FSF was measured using the Beneish M-Score model, while pressure, opportunity, rationalization, capability, ego and collusion were operationalized using relevant financial ratios and governance indicators. Tone at the Top was measured through text analysis of the Chairman's Statement. The study further controlled for Return on Assets (ROA), Market Capitalization (MCAP), and Firm Size (FSIZ) to ensure accuracy and validity of the analysis. Panel regression analysis was conducted with the Hausman's test result justifying the use of the Random Effects Model. Results show that pressure, opportunity, rationalization, ego, and collusion significantly influence FSF, while capability does not. Furthermore, Tone at the Top significantly moderates the relationship between pressure, opportunity, ego, collusion and FSF. These findings contribute to existing fraud literature by extending empirical validation of the Fraud Hexagon model and highlight the critical role of leadership communication in fraud prevention. Recommendations for policy, practice, and further research are also provided.

Keywords: Financial Statement Fraud, Fraud Hexagon Theory, Tone at the Top, Beneish M-Score.

1. Introduction

Fraud can be referred to as an act of deliberate deception, which can either be carried out by an individual or a group with the aim of generating gains for the perpetrator, while the victim suffers loss. It includes asset misappropriation, financial statement manipulation, and corruption, often damaging company reputation and concealing prior misappropriation (Sari & Nugroho, 2021; Sari & Khoiriah, 2021).

The financial position, financial performance, and cash flows of a company in an accounting period are revealed with the help of financial statements, but a corporation's desire to present its financial position in a favourable light encourage fraud (Ghaisani et al., 2022). Major scandals, including those involving Enron Corporation and Bernie Madoff, question management integrity and reporting reliability.

Association of Certified Fraud Examiners [ACFE], (2022) as revealed in (Sihombing & Panggulu, 2022) says that financial statement fraud accounts for only 5% of occupational fraud cases but results in the highest losses. The Enron Corporation scandal exemplifies tone-

at-the-top ethical drift, where management promotes arrogance, self-interest, and practices that threaten corporate survival.

Tone at the Top is directly related to ethical climate, ethical behavior and ethical leadership (Reed et al., 2011; Shin, 2012). It is a reflection of top management corporate conducts, and it has potential to make the internal control system strong or weak as an integral element of corporate governance system. Tone at the Top as the leadership's attitude and behavior that influence the organizational culture, and ultimately, the behavior of the employees (Indriyati, 2017). Abeki and Sadiq (2023) reveal that management sets the Tone at the Top, and employees are more likely to uphold the same values if management sets a good example of honesty, integrity, and ethics, or a bad one. It therefore appears that factors that suggest fraud may be rendered impotent where an ethical tone at the top resides. Tone at the Top can be positive or negative (Kohlbeck & Mayhew, 2016).

The fraud hexagon theory of Vousinas (2019), known as S.C.C.O.R.E, identifies six factors contributing to fraud risk: stimulus (pressure), capability, collusion, opportunity, rationalization, ego/ arrogance. This theory expands on the earlier fraud pentagon of Crowe (2011) model by introducing an extra element-collusion. Vousinas (2019) argued that fraud occurs once all these factors are present. These factors or characteristics would incite fraud in financial statements, according to Achmad et al. (2022), but it appears that these six elements can only help fraud thrive in financial statements where Tone at the Top is predisposed to fraud and fraudulent tendencies (negative tone). The survey by PriceWaterhouseCooper (2012) reveals that 90% of the respondents agreed that Tone at the Top is effective in reducing fraud, and no study has gone against this till date to the best of my knowledge. Integrity on the part of top managers contributes to a sound internal control system for fraud prevention (Mangoensentono, 2012). Integrity of top management could help minimize incidences of fraud by rendering the risk factors impotent. The ingredients of Tone at the Top such as integrity of top leadership, effective managerial controls, fair reward systems, conducive working conditions, and consistent enforcement of disciplinary measures, when shaped by a strong ethical climate and organizational culture, can significantly reduce opportunity for fraud. In doing so, they also diminish the influence of key fraud drivers such as collusion, arrogance, rationalisation, pressure and capability (Murphy et al., 2011). The Tone at the Top can be perceived from Chief Executive Officer's Letter in a company's audited accounts. Not all companies include CEO Letter in her audited accounts, but companies in the financial sector, including banks, insurance firms and securities companies, are more likely to issue a CEO Letter compared to non-finance companies as revealed in Costa et al. (2013). However in Nigerian financial statements, the CEO letter can not be found. The nearest to CEO Letter is the Chairman's Statement.

Ghaisani et al. (2023) examine the moderating role of audit committee within the fraud hexagon framework; finding stimulus and rationalization significantly influence financial statement fraud, while capability, opportunity, and collusion do not. The Audit committee moderate capability, rationalization, and arrogance. Similar to audit committees, tone at the top, a part of the Committee on Sponsoring Organisation (COSO) Internal Control-Integrated Framework, may mitigate fraud drivers COSO (2013).

However, to the best of my knowledge, limited empirical studies assess its moderating role within fraud hexagon theory. COSO emphasizes strong tone at the top enhances internal controls and reduces fraud opportunities. Existing research largely prioritizes structural governance mechanisms such as board independence, audit quality; audit committee effectiveness (in governance literature), and rarely considered the behavioural and ethical dimensions, like tone at the top which is often seen in management and psychology literature

(Mayer et al., 2009; Trevino et al., 2003; Bandura, 1999; Moore et al., 2012; Kaptein, 2011; Soltani, 2014; Bazerman & Tenbrunsel, 2011) rather than financial fraud research. In the light of this, this study examines the moderating effect of the tone at the top on the elements of fraud hexagon and financial statement fraud.

Novelty of this research is the measurement of Tone at the top, the moderating variable, using text analysis of chairman's statement (the nearest to CEO letter) in the Nigerian financial statements with the help of Modified Loughram and McDonald Worldlist (2011).

This study contributes to fraud papers by extending the application of the Fraud Hexagon framework within a developing economy context, empirically validating the moderating effect of Tone at the Top in fraud research, using text analysis of chairman's statements which offers a replicable and content-sensitive proxy for leadership ethics.

2. Literature Review and Hypothesis Development

2.1 Conceptualising Financial Statement Fraud

The misrepresentation of financial statements also considered as financial statement fraud can be performed through misstatements, namely the calculation of a number of values in financial statements in order to deceive users of financial statements (Rezaee, 2005). According to the ACFE survey, financial statement fraud schemes happen when perpetrators intentionally cause misstatements or material errors in the organization's financial statements (Ghaisani et al., 2022).

Financial statement fraud is generally perpetrated by individuals higher up in the organization which involves the Chief Executive Officer (CEO) or Chief Financial Officer (CFO) and is deemed to be the most costly to organization (ACFE, 2014). Financial statement fraud involves the intentional misstatement of an organisation's financial results or economic position (Vikas et al., 2015). It is the least common and most costly form of corporate fraud (Olivia, 2018), yet, it is the damaging. It involves falsification of an organisation's financial statements such as the creation of fictitious revenue, understating liabilities, and improper assets valuation (KPMG, 2014).

Financial statement fraud can be a deliberate omission of certain information in the financial statement, misapplication of accounting rules, overstatement of revenue, which involves recording uncertain sales or through fictitious sales by including revenue that has not been earned completely and are not ready to be recognized. It can also involve understating liabilities like improperly recording liabilities as equity or moving them between short and long term or understatement of expenses, which involves holding expenses incurred during the current period over to the next financial period and terms it understatement of expenses (Ryan et al., 2018). Financial statement fraud is a social threat which has created stimulus for negative tone at the top setting. It is hence, systemic as posited by Nenyiaba and Okoye (2015).

Timing difference which is another form of financial statements fraud occurs when revenue or expenses are recorded in improper periods and is also known as income smoothening. Real activity manipulation which is another form of financial statement fraud occurs when management deliberately manipulate the real operational activities and this include giving out a discount to customers to improve sales, timing of profitable investment and reduction of expenditure to increase the profit level (Abdullahi et al., 2020).

Inflating networth of assets due to deliberate failure to apply a proper depreciation schedule is another form of financial statement fraud. This occurs when a particular company overstates

assets by failing to apply an appropriate depreciation schedule or valuation reserve like inventory reserves, which results in overstated net income and retained earnings, which inflates shareholder's equity (Kedia & Shukla, 2022). Depreciation method and estimate of asset's useful life that does not correspond to those of the overall industry can affect the net worth of the company's assets. Assets account is influenced to boost a company's statement of financial position, especially to positively impact important ratios involving assets. At higher risk of overstatements are current asset such as account receivables and this can affect the net worth of assets.

2.2 Elements of Fraud Hexagon

The fraud hexagon theory was introduced by Vouras in 2019. It is an improvement of the previous fraud theory (Fraud Pentagon) by adding collusion. The elements in detecting fraud according to the fraud hexagon theory are stimulus, capability, collusion, opportunity, rationalization and ego/ arrogance.

Pressure which is stimulus is an impulse that causes someone to commit fraud (Ghaisani et al., 2022). Vouras (2019) reveals that stimulus is the pressure to commit fraud financially and non-financially. Management's pressure to meet their personal financial needs can be a trigger for fraud by increasing company profits. Organizational pressure is one of the primary drivers of financial statement fraud. Pressure can originate from various sources, such as unrealistic performance expectations, competitive market forces, or the desire to meet shareholder demands (Merchant & Van der Stede, 2007). These pressures can lead individuals, especially those in senior financial positions, to manipulate financial data to meet targets. Ghaisani et al. (2022) likely used AGROW to measure financial stability as a proxy for pressure because AGROW provides a holistic view of a company's financial performance, covering growth, profitability, leverage, and shareholder's value. Each component of AGROW can signal financial stress or instability such as asset growth that outpaces revenue growth, declining returns on assets or equity, increasing debt or liability obligations and decreasing shareholder's value. This study will use this as proxy to measure pressure.

Even in the presence of pressure, there must be opportunity before fraud can be committed. From the work of Vouras (2019), opportunity has been described as that which enhances the perpetration of fraud and those who commit the fraud will not be detected. The work reveals that if supervision is not effectively done, can create opportunity for fraud to thrive. An opportunity is such that must exist in order for someone to conduct fraudulent financial reporting actions. According to the Committee of Sponsoring Organisations of the Treadway Commission (COSO), a lack of proper internal controls and oversight creates an environment conducive to fraudulent behavior (COSO, 2013). In many cases, the opportunity for financial statements fraud is enabled by ineffective controls (Dechow et al, 2010), poor supervision, or lenient corporate culture that tolerates unethical behavior. Organizations with weak internal control environments provide opportunities for employees to exploit the system. A low accounts receivables turnover ratio can create opportunities for fraud due to inadequate internal controls and lack of oversight (Cohen et al, 2017; Dechow et al., 2011; Kothari et al., 2016).

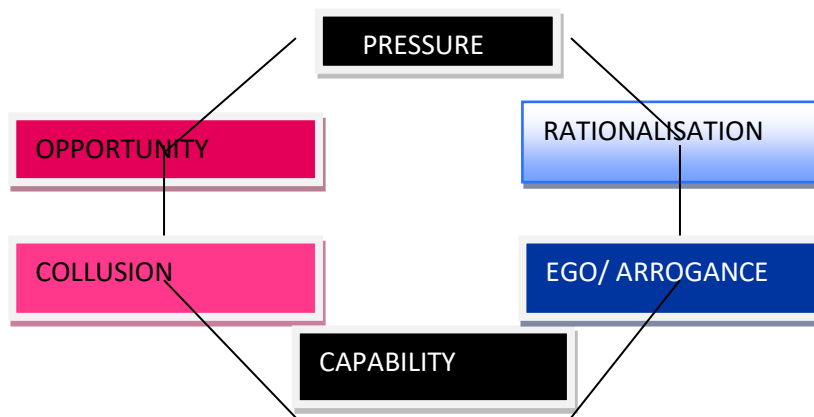
Rationalization is an action taken by a person to find justification because he has felt trapped in a bad situation, where the crime or his actions have been known by others (Vouras, 2019). Generally speaking, perpetrators would usually seek justifications for their conduct in order to be accepted by other parties. It helps employees to manipulate financial statements without perceiving it as unethical, making it one of the most critical psychological drivers of

fraud (Kranacher et al., 2011). Some studies have used the ratio of total accruals to total assets (TATA) as proxy for measuring rationalization such as Situngkir and Triyanto (2020). TATA was probably used because it enables managers to rationalize accruals-based fraud.

Capacity plays a critical role in enabling fraudulent activities, particularly when individuals possess the skills, knowledge, and access to manipulate financial information. It refers to the skills, knowledge, and authority of employees to manipulate financial data (Kranacher, et al., 2011). Capability perhaps is the ability of individuals to control their organizations. It also refers to the personal nature and skills possessed by someone who plays a vital role in the achievement of an action (Vousinas, 2019). Employees with high levels of financial expertise, experience in accounting, or access to key systems are more likely to exploit their capacity to commit fraud (Zhang et al., 2014). For example, accounting professionals or senior financial managers may have the knowledge and authority to bypass internal controls, alter accounting records, or create fictitious transactions (Kranacher et al., 2011). Capability is an important factor, however, it is not sufficient by itself; the organisation's culture and leadership can either enable or constrain its use for fraudulent purposes.

Arrogance or ego, characterized by overconfidence and a sense of superiority, is a significant predictor of unethical behavior in organizational contexts (Schrand & Zechman, 2012). Arrogance or ego is an attitude where one feels superiority over others. They ignore and apply internal control personally. Those with this attitude believe that internal regulations and controls do not really apply to them and that they will not be detected if they conduct fraud. Leaders with high level of arrogance often dismiss external advice, overestimate their abilities, and prioritise personal gain over organizational well-being (Tang et al., 2020). Ego refers to a leader's self-importance, self-esteem, and self-interest which can manifest as arrogance, narcissism, or self-aggrandizement, and can lead to prioritizing personal interests over organizational goals, poor decision-making, micromanaging, and stifling innovation (Maccoby, 2007; Hogan & Kaiser, 2005; Chatterjee & Hambrick, 2007).

Collusion, defined as covert cooperation between two or more parties to deceive others, is a key enabler of financial statement fraud (Beasley et al., 2010). By circumventing internal controls, collusion amplifies the difficulty of detecting fraudulent activities. Unlike individual fraudulent acts, collusion involves multiple parties working together, complicating detection and enforcement (Morales et al., 2014). It is possible for auditors and management to conspire to falsify financial statements to achieve performance targets or conceal financial instability (Albrecht et al., 2012).



Fraud Hexagon Model (Vousinas, 2019)

2.3 Concept of Tone at the Top

Tone at the top refers to the ethical climate or atmosphere established in a company (IFAC, 2007; Lail et al., 2015). Tone at the top is the degree of commitment by management and those charged with governance of the entity (board of directors) to having an open, direct, honest, and ethically correct corporate culture (Law, 2011). The tone set by the company's leadership has a trickle-down effect on employees (Cheng et al., 2019; Payne and Raiborn, 2018). As such, a company's tone at the top entails the governing body and management conducting themselves ethically (ethical leadership) and the implementation and promotion of an ethical organisational culture (Jaffer, Odendaal & Theron, 2021). Tone at the top can be positive or negative.

A positive tone prevents fraud and unethical practices. It reflects and encompasses integrity, objectivity, independence, competence and leadership by implementing right ethical code of conduct within an organization with intent to prevent fraud and its related activities (Norwani, Mohamad & Chek, 2011). Negative tone at the top is reflected in weak corporate governance mechanisms that increases incidences of fraud. This perhaps, has been built up in opportunity for fraud unlike the positive tone at the top. Globally companies collapse because of the unethical conduct of their top management (Cronje, 2018; Schwartz et al., 2005), bearing truth to the proverb: 'Trees die from the top' (Druker, 1974 in Staicu et al., 2013). Tone at the top set by CEOs can be measured via content analysis of CEO statements.

3. Hypotheses Development

3.1 Pressure and Financial Statements Fraud

Fathmaningrum and Budgeti (2021), Achmad and Pamungkas (2022), and Sari et al. (2020) show that financial stability affects financial statements fraud. Tania et al. (2020) and Zulfa and Tanusdjaja (2022) reveal that financial stability has no effect on fraudulent financial statements. However, Aviantra (2021), and Riyanti and Trisanti (2021) have revealed that financial stability is a form of pressure that causes managers to do anything possible to keep the company's finances standing including fraudulent means. Research on fraudulent financial statements identified several pressure factors that can influence their occurrence such as external pressure, often measured by leverage ratios, which has been found to have a significant negative effect on financial statement fraud (Iskander et al., 2022; Mardiana & Jantong, 2020). Financial stability and targets represented by profitability metrics like ROA, show mixed results across studies (Yuniasih et al., 2020; Suyanto, 2009). Ghaisani et al. (2022) also revealed that organizations that focus more on asset growth are likely going to be pressurized to commit fraud. Okafor et al. (2024) examined the effect of pressure as a fraud

risk factor in Nigerian commercial banks and found a non-significant positive effect, suggesting that while pressure exists, its impact may vary across different contexts.

3.2 Opportunity and Financial Statements Fraud

Fathmaningrum and Budgeti (2022) and Tarjo et al. (2021) reveal that the quality of external auditors has no effect on fraudulent financial statements. Aviantara (2021), Riyanti and Trisanti (2021), and Larum et al., (2021) have revealed that opportunity has a significant impact on fraudulent financial statements, thus, if internal supervision by the independent board of commissioners of the company is low, the situation becomes an opportunity to carry out fraudulent financial statements. Opportunity factors such as the nature of industry and ineffective monitoring have been found to significantly influence fraudulent reporting (Fitriana, 2017; Suyanto, 2009).

Smaili and Labelle (2016) has revealed that the more the supervision the lower the financial statement fraud tendencies. This is also in line with the findings of Khoyumi et al. (2024), that supervising ineffectiveness and nature of industry influence financial statement fraud. The work of Wicaksono and Suryandari (2022) reveals also that opportunity to commit financial statement fraud is created when companies often change their auditors. By doing this, the management removes important information that is unknown to the principal. If the company maintains the statutory tenure, it is likely that, information that poses risk would have been identified by the current auditor.

However, opportunity has also been found to negatively affect fraud (Sunardi et al., 2018). Rozi and Munari (2024) reveal that opportunity has no effect on financial statement fraud. Khoyumi et al. (2024) reveals that supervising ineffectiveness and nature of industry influence financial statement fraud.

3.3 Rationalisation and Financial Statement Fraud

Aviantara (2021), Sukmadilaga et al. (2022), and Suryander and Valetin (2021) have demonstrated that rationalization has a significant impact on fraudulent financial statements. Apriwenni et al. (2023) studied the relationship between financial statements fraud and fraud hexagon theory and results of the study indicate that total accruals have positively affected fraudulent financial statements.

Rozi and Munari (2024) consider fraud hexagon theory and fraudulent financial statements in basic industrial and chemical sectors companies listed on the IDX and it was found that rationalization has no influence on financial statements fraud. The mixed results from different studies suggest the need to examine what influence a moderating variable such as tone at the top may have on the existing relationships between rationalization and financial statement fraud.

Sari and Nugroho (2020) show that rationalization has no effect on financial statements fraud.

Khoyumi et al. (2024) in their study, considered detecting financial statements fraud using the hexagon fraud theory approach in financial sector companies. The study reveals that rationalization does not influence financial statement fraud. This is so probably when there is ethical tone at the top from the leadership.

3.4 Capability and Financial Statement Fraud

Sunardi et al. (2018) carried out study on fraud detection of financial statements from fraud diamond perspective and found that capacity has a positive relationship with financial statements fraud. Nugroho and Diyanty (2022) examine the effect of the fraud hexagon on fraudulent financial statements and the audit committee role in moderating this relation. This study shows that the probability of FFS is higher when the manager has the capability to commit the fraud.

In quest for what really causes fraudulent financial reporting came the study of Azizah (2024) which reveals that capability does not affect financial statements fraud.

3.5 Ego and Financial Statements Fraud

Rijsenbilt and Commandeur (2013) found that CEOs with high narcissistic tendencies were more likely to engage in earnings management, as their inflated sense of self and need for admiration pushed them to manipulate outcomes. Pamungkas and Faradiza (2022) reveal that narcissism as a measure of arrogance positively affects fraudulent financial reporting. Similarly, Triyani et al. (2024) demonstrated that arrogance influences financial statement fraud, with income tax rates moderating this relationship. Yovita & Suryani (2024) examines specific arrogance factors, finding that CEO Power and CEO Exposure negatively impact financial statement fraud.

Rozi and Munari (2024) consider fraud hexagon theory and fraudulent financial statements in basic industrial and chemical sectors companies listed on the IDX. A multiple linear analysis using purposive sampling technique was used to select sample of 19 from 2021-2022. It was found ego has no influence on financial statements fraud.

3.6 Collusion and Financial Statements Fraud

Octaviani et al. (2021) investigated fraudulent financial reporting using the fraud hexagon framework and revealed that collusion significantly influences the fraudulent financial statements. Indriaty and Thomas (2023) reveal that collusion does not have a significant effect on fraudulent financial report.

Rozi and Munari (2024) find that collusion influences financial statements fraud. When collusion is present, even well designed control systems can be bypassed, thereby increasing the risk and duration of fraudulent financial statement.

3.7 Moderating Role of Tone at the Top

The literature emphasizes the critical role of tone at the top in moderating the drivers of financial statement fraud. While organizational pressure is a major cause of fraud, its effect is significantly reduced when leadership promotes a strong ethical climate. Ethical leadership encourages sound decision-making and discourages manipulation, whereas weak leadership amplifies the negative impact of pressure (Trevino et al., 2000; Brown & Caylor, 2006). Similarly, firms with poor ethical tone are more vulnerable to fraud, especially under performance pressure (Kinney & Martin, 1994).

Regarding opportunity, studies show that although it enables fraud, a strong ethical tone limits its exploitation through improved internal controls and accountability (Kaplan, 2008; Zhang et al., 2014). In contrast, weak leadership may tolerate or even encourage unethical practices. Ethical leadership also reduces rationalization, as employees are less likely to justify misconduct in transparent and accountable environments (Trevino et al., 2000;

Schwartz & Holm, 2000). In terms of capability and ego, ethical leadership constrains individuals from misusing their skills or acting on narcissistic tendencies (Brown & Caylor, 2006; Agnew & Thaxton, 2019). However, weak tone may enable arrogant leaders to override controls and engage in fraud (Tang et al., 2020; Schrand & Zechman, 2012). Mixed findings on ego suggest its impact depends on organizational culture and governance (Tessa & Harto, 2016; Sagala & Siagian, 2021; Free et al., 2007).

Finally, collusion is less likely in organizations with strong ethical leadership, as it promotes transparency, whistle-blowing, and oversight (Taylor & Curtis, 2010; Morales et al., 2014). Although evidence on proxies like audit fees is mixed (Aviantara, 2021; Prasetya & Dewayanto, 2021), most studies agree that strong tone at the top significantly reduces collusion and fraud risk (Dewi et al., 2024; Deel & Purnamasari, 2021; Abeki & Aliyu, 2023).

4. Methodology

4.1 Research Design

This study adopts a positivist, ex-post facto design to examine the effect of fraud hexagon components on financial statement fraud in listed Nigerian financial firms. A census of 32 firms over 2012-2023 was employed, yielding balanced panel data suitable for longitudinal analysis.

4.2 Data and Data Collection

Annual reports of companies in the financial sector listed on the Nigeria Exchange Group (NGX) in 2012-2023 were obtained from the NGX and related company websites. The population gave 32 companies with total observation of 384. Since the population is small, the study used census of 32 companies. This method helped collect data from every member of the population or sample frame.

4.3. Theoretical Framework and Model Specification

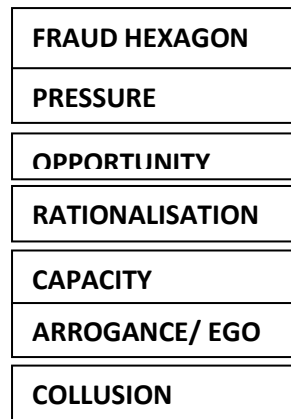
Theoretical Framework

Two suitable models were specified to achieve the objective of this study. The fraud hexagon which builds on earlier fraud models (e.g the fraud triangle, fraud diamond, and fraud pentagon) provides the framework to identify fraud factors. Agency theory addresses conflict in the area of interest of principals and agents, and the financial statement fraud often arises from agency problems, where managers manipulate statements to achieve personal or organizational goals at the expense of stakeholders. The stakeholder theory focuses on the responsibilities of organization to all stakeholders. The financial statements fraud affects a broad range of stakeholders. The agency and stakeholder theories explain how the tone at the top influences these fraud factors created by fraud hexagon, by addressing governance and ethical concerns.

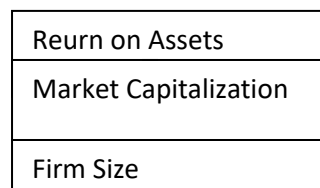
Agency theory predicts that managers, driven by self-interest, will exploit pressure, opportunity, and rationalization to commit fraud, especially if the tone at the top is weak. The fraud hexagon framework supports the idea that fraud occurs when multiple drivers such as pressure, opportunity, rationalization, capability, ego, and collusion interact. A strong tone at the top can counterbalance these risks. The stakeholder theory suggests that fraud damages long-term trust, and a strong tone at the top is key to ethical stakeholder management. The models integrate these theoretical insights to predict and analyse the incidence of financial statement fraud.

The Moderating Role of Tone at the Top

Independent Variables



Control variables



Moderating Variable

TONE AT THE TOP

Dependent Variable

Financial Statement
Fraud (FSF)

The study adapts the model of Ghaisani et al. (2022) on the analysis of financial statement fraud using the Vousinas fraud hexagon model approach.

However, against the Audit Committee employed in their studies, tone at the top is used as the moderating variable as this is more relevant and key to the achievement of the objective of this study. Following the established framework,

$$FFS_{it} = \beta_0 + \beta_1 PRE_{it} + \beta_2 OPP_{it} + \beta_3 RATZ_{it} + \beta_4 CAP_{it} + \beta_5 EGO_{it} + \beta_6 COL_{it} + \beta_7 ROA_{it} + \beta_8 MCA_{it} + \beta_9 FSIZ_{it} + e_{it} \quad (1)$$

Moderating the above equation (1) with tone at the top produces equation (2) stated below:

$$FFS_{it} = \beta_0 + \beta_1 PRE_{it} + \beta_2 OPP_{it} + \beta_3 RATZ_{it} + \beta_4 CAP_{it} + \beta_5 EGO_{it} + \beta_6 COL_{it} + \beta_7 TATT_{it} + \beta_8 APRE_{it} * TATT_{it} + \beta_9 OPP_{it} * TATT_{it} + \beta_{10} RATZ_{it} * TATT_{it} + \beta_{11} CAP_{it} * TATT_{it} + \beta_{12} EGO_{it} * TATT_{it} + \beta_{13} COL_{it} * TATT_{it} + \beta_{14} ROA_{it} + \beta_{15} MCA_{it} + \beta_{16} FSIZ_{it} + e_{it} \quad (2)$$

Where FSF = Financial statements fraud measured using Beneish M-Score score, β_0 = Constant Regression Coefficient (proportion of the change in financial statement fraud that is not explained by changes in the explanatory variables, β_1 to β_{12} = Coefficient of Determination (slope) PRE is Pressure, OPP is Opportunity, RATZ is Rationalization, CAP is Capability, EGO is Ego, COL is Collusion, TATT is Tone at the Top, ROA is Return on Asset, MCA is Market Capitalisation, FSIZ is Firm Size. I is firm 1 to 32 firms, while t is year 2012 to 2023 for each of the 32 sampled firms, and *e* is the error term

Based on theories and extant literature, it is presumptively expected that fraud risk factors positively impacted fraud, while TATT mitigated this effect. That is $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6 > 0$ (the fraud hexagon factors are expected to increase the likelihood of financial statement fraud), $\beta_7 < 0$ (A strong tone at the top is expected to reduce financial statement fraud risk

and $\beta_8, \beta_9, \beta_{10}, \beta_{11}, \beta_{12}, \beta_{13} < 0$ (if TATT is effective, it should weaken the positive relationship between the fraud hexagon factors and financial statement fraud).

The measurement of the financial statements fraud variable used the value of the Beneish M-Score. Beneish M-Score model which is composed of eight ratios. If the predictive M-Score is greater than -2.22, the companies have red flags indicating the possibility or likelihood of financial statement fraud and if less than -2.22, then the company is free from probability or likelihood of financial statement fraud. The eight ratios form an M-Score equation following Aviantara et al. (2021) and Kukreja et al. (2020)

$$\text{Beneish M-Score} = -4,840 + 0,920 \text{ DSRI} + 0,528 \text{ GMI} + 0,404 \text{ AQI} + 0,892 \text{ SGI} + 0,115 \text{ DEPI} - 0,172 \text{ SGAI} - 0,327 \text{ LVGI} + 4,697 \text{ TATA}$$

Although Beneish (1999) developed the M-Score using U.S. manufacturing firms, its core premise which is identifying unusual financial behavior via accrual distortion and rapid changes in financial ratios, applies across industries, including banking. These mechanisms exploit discretionary financial reporting, which is just as pertinent in financial institutions, albeit through different accounting metrics such as loan loss provisions, receivables, and leverage.

The M-Score's indices (such as DSRI, AQI, LVGI, and TATA) are still informative in banking contexts where revenue recognition, asset quality, leverage, and accrual behaviours are manipulated for earnings management. There is no bespoke fraud detection model developed specifically for Nigerian banks, largely due to data limitations in emerging markets.

The model has been applied on commercial banks in Nepal (Gyawali, 2021). The Beneish M-Score has also been used to analyse fraud detection in the state owned insurance companies registered in Indonesia (Wisdianti & Arum, 2022). Kkatun, Gosh, and Kabir (2022) applied the Beneish M-Score to listed commercial banks in Bangladesh over the 2009-2018 periods and found widespread earnings manipulation, with DSRI and AQI serving as the most influential variables in differentiating manipulators from non-manipulators. Talab, Flayyih, and Ali (2022) reported that, using the Beneish M-Score in a sample of 16 banks listed on the Iraq Stock Exchange, 56.2% of the banks were flagged as likely earnings manipulators, highlighting the model's applicability in detecting manipulation in banking environments.

Pressure in this study used a financial stability measurement proxy, namely:

PRE which is due to asset growth

$$\text{AGROW} = \frac{\text{total asset}_{(t)} - \text{total asset}_{(t-1)}}{\text{Total asset}_{(t-1)}}$$

(2022)

Ghaisani, Triyono and Bawono

Opportunity was measured using Accounts receivable turnover (ART) which is calculated as

$$\text{OPP} = \frac{\text{Receivables}_{(t)} - \text{Receivables}_{(t-1)}}{\text{Sales}_{(t)} + \text{Sales}_{(t-1)}}$$

Skousen et al. (2009)

Capability was measured by directors' education using the finance background of those who served in the Board of each research year

Boyle et al. (2015)

Rationalization variable used the proxy TATA (total accrual to total assets). Calculation is as follows:

$$\text{TATA} = \frac{\text{Total Accruals}}{\text{Total Assets}} \quad (\text{Meidijati and Amin, 2022})$$

Capability is represented by finance background of Directors. Assigned (1) for its presence, and (0) for absence. Boyle et al. (2015)

The variable Ego in this study is proxied by the Natural Log of total remuneration paid to the Directors. Chatterje and Hambrick (2011)

This study represents collusion with availability of related party transactions in a dichotomous manner. Nugroho and Diyanty (2022)

Return on Assets used the proxy $\text{ROA} = \text{Net income} / \text{Total assets}$

Dechow et al. (1995); Skousen et al. (2009); Zhou et al. (2022)

Market Capitalisation used the proxy $\text{MCAP} = \text{Natural logarithm of market capitalization share price multiplied by number of shares outstanding}$ Cohen and Zarowin (2010); Al-Matari et al. (2021)

Firm size use the proxy $\text{FSIZ} = \text{Natural log of total assets}$ Beasley (1996); Chen et al. (2006); Ilaboya and Lodikero (2017)

Tone at the Top (TATT), conceptualized as the ethical climate and behavioural posture set by top corporate leaders, is a critical moderating variable in this study.

4.4 Measurement of Tone at the Top

The Loughran and McDonald (2011) wordlists were originally developed for sentiment analysis in U.S. financial disclosures, particularly CEO letters to shareholders. However, in the Nigerian corporate reporting environment, CEO letters are largely absent, especially within the financial sector. Instead, the Chairman's Statement serves as the primary narrative channel through which leadership communicates with stakeholders, making it a more suitable source for extracting managerial tone.

Due to significant contextual and linguistic differences between U.S. and Nigerian disclosures, applying the original wordlists without modification would be methodologically inappropriate. Nigerian Chairman's Statements often reflect local economic conditions, regulatory frameworks, and communication styles, which differ from those in the U.S. context. To address this, the study modified the Loughran and McDonald (2011) wordlists to ensure contextual relevance and semantic accuracy.

A corpus of 384 Chairman's Statements was constructed from annual reports of 32 financial sector firms listed on the Nigerian Exchange Group (2012–2023). These documents were digitized and processed using Python's Natural Language Toolkit (NLTK), involving data cleaning, tokenization, lowercasing, and stopword removal. A matching algorithm was then used to compare the text against the original wordlists. Context-specific Nigerian terms such as "CBN directive," "inflationary pressures," and "foreign exchange" were added, while irrelevant U.S.-centric terms like "Sarbanes-Oxley" and "subprime" were excluded.

To ensure validity, the adapted wordlists were reviewed by a panel of accounting scholars and linguists. The final version retained the six original tone categories while incorporating

localized adjustments. These validated lists were then used to compute normalized Tone at the Top (TATT) scores for subsequent empirical analysis.

For each firm-year observation, the TATT score was computed using the net tone formula adapted from prior studies:

$$\text{Net Tone Score} = \frac{\text{Positive words} - \text{Negative words}}{\text{Positive words} + \text{Negative words}} \quad \text{Davis and Tama-Sweet (2012)}$$

Net tone was applied as a continuous moderating variable to examine its effect on the relationship between Fraud Hexagon elements and financial statement fraud (measured using the Beneish M-Score). The tone measurement approach, combining corpus-based modification, expert validation, and algorithmic word frequency extraction enhances contextual relevance and reliability for Nigeria's financial reporting environment.

Diagnostic tests confirmed model validity: multicollinearity was absent ($VIF < 10$), while heteroskedasticity was detected ($\chi^2 = 262.70$, $p < 0.0000$) and corrected using robust standard errors. The Hausman test supported the Random Effects model ($p = 0.8213$). Although mild non-normality was observed, it was adjusted. Stationarity tests were not conducted, as panel methods remain valid for short time dimensions (Gujarati, 2004; Wooldridge, 2010).

5. Estimation Results and Discussion of Findings

Table 1 Results of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FSF	384	-2.030	6.991	-36.330	81.860
PRE	384	9.479	28.116	-147.660	117.640
OPP	384	2.643	8.072	0.000	92.730
RATZ	384	-0.004	0.110	-0.460	0.570
CAP	384	0.651	0.477	0.000	1.000
EGO	384	5.099	0.842	0.550	7.860
COL	384	0.081	0.273	0.000	1.000
TATT	384	0.258	0.193	0.000	0.990
ROA	384	1.719	7.045	-45.950	25.350
MCAP	384	7.163	0.822	5.950	9.060
FSIZ	384	8.009	1.034	6.540	10.330

Source: Researcher's Compilation (2026)

Table 1 presents the descriptive statistics of the dependent, independent, and control variables. The likelihood of financial statement fraud (FSF), measured using the Beneish M-Score, has a mean of -2.030, which is above the benchmark of -2.22, suggesting that, on average, firms in the sample are likely to engage in financial manipulation. However, the large standard deviation and wide range (from -36.330 to 81.860) indicate substantial variability across firms and time, including possible outliers and extreme manipulation cases.

Tone at the Top (TATT) records an average score of 25.8%, reflecting a moderate-to-low positive tone in financial reports. This may indicate cautious or neutral communication, potentially influenced by regulatory or economic factors. The standard deviation (0.193) shows notable variation across firms, supporting its use in further analysis. The minimum value of 0.000 suggests some disclosures were purely factual or evasive, while the maximum

of 0.990 reflects highly optimistic tone, which may signal overstatement or earnings management.

Return on Assets (ROA), a control variable, has a mean of 1.72%, indicating relatively low profitability among Nigerian financial institutions. The high standard deviation (7.045) reveals significant performance differences, with a minimum of -45.95% (indicating severe losses) and a maximum of 25.35% (strong profitability). Such variation may create incentives for fraud through pressure or rationalization.

Market capitalization (MCAP) shows a mean log value of 7.163 (approximately ₦1.44 billion), indicating moderately large firms, with a reasonable spread across the sample. Similarly, Firm Size (FSIZ), also log-transformed, has a mean of 8.009 (about ₦3 billion in assets), with values ranging from ₦695 million to ₦30.5 billion. This variation ensures sufficient heterogeneity and supports robust analysis of firm-level characteristics.

Normality Test Result

Table .2. Shapiro-Wilk W test for normal data

Variable	Obs	W	V	Z	Prob>z
FSF	384	0.335	176.393	12.285	0.000
PRE	384	0.860	37.139	8.585	0.000
OPP	384	0.256	193.748	12.496	0.000
RATZ	384	0.950	13.292	6.144	0.000
CAP	384	0.998	0.559	-1.380	0.916
EGO	384	0.945	14.710	6.385	0.000
COL	384	0.944	14.837	6.406	0.000
TATT	384	0.826	46.099	9.098	0.000
ROA	384	0.742	68.578	10.041	0.000
MCAP	384	0.903	25.798	7.719	0.000
FSIZ	384	0.887	30.045	8.081	0.000

Source: Researcher's compilation (2025)

All variables except CAP (Capability) significantly deviate from normality ($P < 0.05$), confirming non-normal data distribution. This validates the use of non-parametric correlation (Spearman) and robust panel estimation techniques. It is important to state that data might not be perfectly normal, but residuals can still be normally distributed, meaning regression results are valid. Only the normality of residuals, not the data, affects the reliability of P-values and confidence interval in regression.

Table .3. **Spearman's rank correlation coefficients**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) FSF	1.000										
(2) PRE	0.073	1.000									
(3) OPP	0.408	0.098	1.000								
(4) RATZ	0.529	-0.141	0.022	1.000							
(5) CAP	-0.065	0.090	0.037	-0.098	1.000						
(6) EGO	-0.005	0.262	0.017	-0.076	-0.075	1.000					
(7) COL	-0.072	-0.087	0.002	0.028	0.099	-0.039	1.000				
(8) TATT	0.055	-0.177	0.116	0.060	-0.107	0.056	0.011	1.000			
(9) ROA	0.214	0.298	0.039	0.228	0.131	-0.008	-0.055	-0.308	1.000		
(10) MCAP	-0.062	0.169	-0.045	-0.126	0.068	0.577	-0.044	-0.072	-0.017	1.000	
(11) FSIZ	0.028	0.247	0.037	-0.128	-0.002	0.715	-0.095	-0.079	-0.064	0.821	1.000

Spearman rho = 0.821

Unmoderated Regression Results (Baseline Model)

Variables	(1) OLS	(2) FE	(3) RE
PRE	0.049*** (0.000)	0.049*** (0.000)	0.049*** (0.000)
OPP	0.561*** (0.000)	0.567*** (0.000)	0.561*** (0.000)
RATZ	7.115*** (0.009)	8.425*** (0.004)	7.900*** (0.004)
CAP	0.520 (0.362)	0.204 (0.749)	0.299 (0.612)
EGO	0.937** (0.033)	1.138** (0.028)	0.963** (0.039)
COL	-3.361*** (0.001)	-1.006 (0.365)	-2.405** (0.018)
ROA	0.153*** (0.001)	0.126*** (0.009)	0.138*** (0.002)
MCAP	-0.704 (0.351)	2.599** (0.026)	0.290 (0.742)
FSIZ	0.453 (0.481)	-0.227 (0.874)	-0.210 (0.785)
Intercept	-7.652*** (0.002)	-26.867** (0.017)	-9.506*** (0.004)
Observations	384	384	384
R ²	0.486	0.456	0.446
Adj R ²	0.473		

Hettest	1175.71{0.000}	
VIF	2.31	
Hausman		1.69{0.890}

Notes: *p-values are in parentheses. *** $p < .01$, ** $p < .05$*

The results indicate that pressure, proxied by abnormal asset growth (PRE), has a positive and significant relationship with financial statement fraud ($\beta = 0.049$, $p = 0.000$). This suggests that rapid growth and the need to meet performance expectations increase the likelihood of financial misreporting. The finding aligns with prior evidence that financial pressure is a key driver of fraud (Umar and Daniel, 2021).

Similarly, opportunity, measured by accounts receivable turnover, is positive and significant ($\beta = 0.561$, $p = 0.000$), indicating that weak internal controls and operational gaps create avenues for fraud. In financial institutions, high volumes of receivables and credit transactions may enable managers to manipulate earnings through misclassification or delayed loss recognition.

Rationalization, proxied by total accruals to total assets, also shows a strong positive and significant effect ($\beta = 7.900$, $p = 0.004$), implying that firms relying heavily on accruals are more likely to justify unethical accounting practices. In contrast, capability, measured by directors' education and financial background, is not significant ($p = 0.612$), suggesting that technical expertise alone does not determine fraudulent behavior. This supports findings that education does not necessarily translate into ethical conduct (Okwuosa and Okolie, 2018; Ogundana and Iredele, 2020; Mgbame and Mgbame, 2019).

The ego variable, proxied by excess directors' remuneration, is positive and significant ($\beta = 0.963$, $p = 0.039$), indicating that highly paid executives may manipulate financial reports to justify compensation, consistent with narcissism-driven fraud literature (Buchholz et al., 2022).

Interestingly, collusion, measured by related party transactions, is negative and significant ($\beta = 2.405$, $p = 0.018$), suggesting that transparent disclosure of such transactions may reduce fraud risk due to increased regulatory scrutiny. This reflects the strong oversight of institutions like the Central Bank of Nigeria (CBN), SEC, and FRCN.

Control variables (MCAP and FSIZ) are largely insignificant. The model shows moderate explanatory power ($R^2 = 0.486$), acceptable multicollinearity ($VIF = 2.31$), and robustness, with the Hausman test ($p = 0.890$) supporting the random effects model.

Moderated Regression Results (Tone at the Top as the Moderator)

Variables	(1) OLS	(2) FE	(3) RE
PRE	0.093*** (0.000)	0.094*** (0.000)	0.093*** (0.000)
OPP	0.772*** (0.000)	0.748*** (0.000)	0.772*** (0.000)
RATZ	10.501*** (0.005)	10.737*** (0.006)	10.501*** (0.005)
CAP	0.384 (0.662)	1.061 (0.270)	0.384 (0.662)
EGO	1.505*** (0.005)	1.506** (0.011)	1.505*** (0.005)
COL	2.234	1.508	2.234

	(0.163)	(0.355)	(0.163)
TATT	36.539***	38.621***	36.539***
	(0.000)	(0.000)	(0.000)
TATT × PRE	-0.237***	-0.215***	-0.237***
	(0.000)	(0.000)	(0.000)
TATT × OPP	-1.329***	-1.249***	-1.329***
	(0.000)	(0.000)	(0.000)
TATT × RATZ	-18.040	-14.722	-18.040
	(0.219)	(0.333)	(0.219)
CAP × TATT	-1.738	-4.320	-1.738
	(0.554)	(0.186)	(0.554)
TATT × EGO	-5.932***	-5.777***	-5.932***
	(0.000)	(0.001)	(0.000)
COL × TATT	-21.631***	-12.392	-21.631***
	(0.000)	(0.062)	(0.000)
ROA	0.127***	0.114**	0.127***
	(0.002)	(0.012)	(0.002)
MCAP	-0.458	2.356**	-0.458
	(0.483)	(0.025)	(0.483)
FSIZ	0.610	1.029	0.610
	(0.287)	(0.423)	(0.287)
Intercept	-14.312***	-38.814***	-14.312***
	(0.000)	(0.000)	(0.000)
Observations	384	384	384
R ²	0.636	0.588	0.569
Adj R ²	0.620		
Hetest	262.70{0.000}		
VIF	9.13		
Hausman			1.36{0.821}

Notes: p-values are in parentheses. *** p<.01, ** p<.05

The study highlights the critical role of Tone at the Top (TATT) in reducing financial statement fraud within Nigerian financial institutions. The negative and significant coefficient for TATT indicates that organizations led by individuals who emphasize ethical values, such as transparency, accountability, and integrity, are less likely to engage in fraudulent financial reporting. This finding reinforces the importance of leadership in shaping organizational culture, particularly in a sector often challenged by reputational risks and low public trust.

The moderated regression results show that TATT significantly weakens the relationship between pressure and financial statement fraud ($\beta = -0.237$, $p = 0.000$). This suggests that when leadership demonstrates strong ethical commitment, the pressure to meet growth targets or performance expectations is less likely to result in fraudulent behavior. Ethical leadership helps create an environment where employees resist engaging in misconduct despite performance demands. This finding aligns with prior studies that emphasize the role of governance in mitigating fraud pressure (Umar and Daniel, 2021; Owolabi and Ogundajo, 2019).

Similarly, TATT significantly reduces the effect of opportunity on fraud. Opportunity, often arising from weak internal controls, is less likely to be exploited in organizations with strong ethical leadership. This supports existing literature that identifies opportunity as a controllable element of fraud and highlights the importance of internal controls and oversight (Okoye and Akenbor, 2018; Olaoye and Bello, 2020). Ethical leaders promote accountability

and transparency, thereby strengthening control mechanisms and reducing opportunistic behavior.

The findings also reveal a strong negative interaction between TATT and ego, indicating that ethical leadership reduces the likelihood that high executive compensation drives fraudulent reporting. Even when financial incentives are high, leaders who model ethical behavior discourage executives from manipulating financial outcomes for personal gain. This is particularly relevant in the Nigerian context, where executive compensation often attracts scrutiny.

Furthermore, TATT has a substantial negative moderating effect on collusion ($\beta = -21.631$, $p = 0.000$). This suggests that in organizations with strong ethical leadership, related party transactions are less likely to be used for fraudulent purposes. Ethical leadership ensures such transactions are transparent and properly monitored, thereby acting as a safeguard against insider abuse.

However, TATT does not significantly moderate rationalization ($\beta = -18.040$, $p = 0.219$), implying that ethical leadership alone may not prevent individuals from justifying fraudulent actions. This finding is consistent with prior research (Olabisi and Olufunmilayo, 2020; Eze and Okoye, 2019; Ibrahim and Saheed, 2021; Chukwuma and Okoye, 2019; Uchenna and Enofe, 2017). Similarly, TATT shows no significant effect on capability ($\beta = -1.738$, $p = 0.554$), suggesting that highly skilled individuals may still engage in fraud despite an ethical tone (Okwuosa and Okolie, 2018; Ogundana and Iredele, 2020).

Overall, while TATT effectively mitigates several fraud drivers, it should be complemented with strong control systems and oversight mechanisms to address more complex factors like rationalization and capability.

6. Conclusion and Recommendations

This study provides robust empirical support for the fraud hexagon model in explaining financial statement fraud in the Nigerian financial sector. The study concludes that five elements of the fraud hexagon- pressure, opportunity, rationalization, ego, and collusion, are significant predictors of financial statement fraud in Nigeria's financial sector. Capability, however, was not found to be a significant factor. Furthermore, tone at the top plays a crucial moderating role in curbing or amplifying the impact of fraud antecedents, with the exception of capability and rationalization.

The accrual based earnings has been a serious means through which fraud is committed. It is therefore recommended that regulatory bodies like the Financial Reporting Council of Nigeria and SEC should enforce stricter oversight on firms demonstrating abnormal growth or high levels of accrual-based earnings management.

The tone at the in this study made use of chairman's statement. Regulatory bodies such as FRCN, NGX, and SEC should consider the mandatory inclusion of a CEO letter or CEO statement as part of audited annual reports of publicly listed companies in Nigeria as this will greatly help in measurement of tones of Chief Executive Officers. Firms should not only be mandated to disclose related party transactions, but to do it more transparently, and auditors should be more vigilant in examining them for signs of collusion. Compensation structures should be linked not just to performance, but also to adherence to ethical and transparent reporting standard.

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