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ẢNH HƯỞNG CỦA YẾU TỐ ÁP LỰC ĐẾN GIAN LẬN BÁO CÁO TÀI CHÍNH: NGHIÊN CỨU THỰC NGHIỆM TRÊN CÁC DOANH NGHIỆP NIÊM YẾT VIỆT NAM

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Tóm tắt

Gian lận báo cáo tài chính là một thách thức nghiêm trọng của thị trường chứng khoán Việt Nam, ảnh hưởng đến các quyết định quan trọng của các bên liên quan. Nghiên cứu này nhằm cung cấp bằng chứng thực nghiệm về mối quan hệ giữa các yếu tố áp lực và gian lận báo cáo tài chính. Bằng việc phân tích hồi quy logistics với mẫu dữ liệu gồm 4,984 doanh nghiệp niêm yết trên cả hai Sở Giao dịch Chứng khoán Hà Nội (HNX) và Sở Giao dịch Chứng khoán Thành phố Hồ Chí Minh (HOSE) từ năm 2010 tới năm 2022, nghiên cứu chỉ ra có chín biến có ý nghĩa thống kê. Trong đó, các yếu tố áp lực tài chính làm tăng nguy cơ gian lận. Tuy nhiên, một số biến đại diện cho áp lực từ bên ngoài làm giảm nguy cơ gian lận do sự tăng cường giám sát từ các bên. Đặc biệt, cả bốn

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biến trong nhóm áp lực chủ sở hữu đều có ý nghĩa giải thích gian lận báo cáo tài chính, ngụ ý rằng các công ty nên tối ưu hóa cấu trúc sở hữu để giảm các hành vi gian lận.
Từ khóa: báo cáo tài chính, gian lận, áp lực, Việt Nam.

THE IMPACTS OF PRESSURE ON FINANCIAL STATEMENT FRAUD: AN EMPIRICAL STUDY ON VIETNAM PUBLIC LISTED COMPANIES

Abstract

Financial statement fraud poses a significant challenge within the Vietnam stock market, influencing critical decisions of stakeholders. However, the literature still needs to be completed. This study aims to bridge that gap by presenting empirical findings illuminating the relationship between pressure and financial statement fraud. Using a robust sample of 4,984 listed companies on the Ho Chi Minh City Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX) from 2010 to 2022 with binary logistic regression, we found nine variables within the pressure factors are statistically significant. Specifically, financial stability pressure can increase with fraud. However, some external pressure factors can enhance supervision and reduce fraud risk. All four variables associated with ownership pressure contribute to explaining financial statement fraud, suggesting the company should utilise its ownership structure to avoid unethical behaviours.

Keywords: financial statement, fraud, pressure, Vietnam.

1. Introduction

Internal and external stakeholders rely on financial statements to make informed decisions (Jackson, 2022). In the context of developing countries like Vietnam, the imperative to establish a transparent financial market—one where the financial statements of listed companies accurately reflect their financial position—has garnered significant attention from scholars and practitioners alike. Financial statement fraud carries consequences. First, misrepresentation of financial health may mask underlying problems, causing the firm to operate while insolvent (Ratley, 2016). Moreover, stock prices plummet rapidly following the disclosure of fraudulent practices (Albrecht et al., 2008). Notable cases, including Adelphia, Enron, Tyco, and WorldCom, resulted in losses exceeding 500 billion dollars (Ugrin & Odom, 2010). The consequences extend beyond financial losses. Employees, auditors, and executives face reputation damage due to their association with fraudulent practices (Strischek, 2010). Recent instances of fraudulent financial reporting in Vietnam's stock market underscore the need for vigilance. From an academic perspective, the manager who acts as an agent within the widely cited Agency Theory (Jensen & Meckling, 1976) faces pressures from business activities and personal financial stakes. Unfortunately, some managers may resort to misbehaviour, manipulating financial information within their statements to serve their stakes rather than those of the principles they represent. It poses a difficulty since regulations may be less effective in timely responses to such cases in developing countries like Vietnam.

While researchers around the world have explored financial statement fraud, i.e. Beasley (1996), Abbott et al. (2004) and Nindito (2018), the current literature in Vietnam remains incomplete. Furthermore, as the country embraces globalisation, it becomes imperative to accelerate forensic practices and enhance market integrity to attract foreign investors. Pressure, a component within the Fraud Triangle Theory (Cressey, 1953), represents a critical factor that managers regularly encounter in their business roles. Surprisingly, few studies in Vietnam have explored the relationship between pressure and financial statement fraud. Our research aims to address this gap by providing empirical evidence of the relationship between pressure and financial statement fraud. First, while most existing research treats pressure as a single factor in the Triangle Fraud Model, our study divides the pressure factor into financial stability pressure, pressure from external stakeholders, and pressure from ownership to further the relationship between pressure and fraud. Second, we address the weakness of the current literature in Vietnam with a robust dataset. Our research draws from a comprehensive and generalised dataset spanning two Vietnamese stock exchanges. The data covers the period from 2010 to 2022. This extensive dataset ensures that our findings accurately capture the influence of pressure factors on financial statement fraud. We collect and analyse secondary data from the FiinPro platform and Vietstock with 4,984 listed companies from 2010 to 2022. By bridging the research gap and providing relevant recommendations, this study aims to inform regulatory bodies, managers, and investors with practical implications to make informed decisions.

2. Theoretical framework and hypotheses development

Section 240 of Generally Accepted Auditing Standards (GAAS) defines fraud as an intentional misstatement in legal concepts. Specifically, financial statement fraud is the deliberate misrepresentation of financial information by management, employees, or external parties to deceive users (AICPA, 2002). Managers may resort to such fraudulent practices to serve their self-interests, which can manifest in various forms, including timing manipulation, concealment of liabilities and expenses, or improper asset valuation. Existing literature posits many theories to explain the causes and motivations behind fraudulent behaviour. The asymmetric information theory highlights the potential for exploitation when one party (e.g., management) possesses superior knowledge compared to another (e.g., Board of Directors (BoD)). This information asymmetry can create an opportunity and incentive for managers to manipulate financial statements to their advantage. Since the management ideally possesses a more comprehensive understanding of the finance and operations than its owners, asymmetric information can exacerbate the agency problem, where the goals of managers and the board diverge. To fulfil their objectives, such as securing bonuses or avoiding termination, managers might need more data to meet the expectations of investors and the board, regardless of their financial standing. The Fraud Triangle Model (Cressey, 1953), which mentions three components of fraudulence including

pressure, opportunity and rationalisation, is one model that is used in many fields to understand fraudulent behaviour. It also sheds light on understanding the causes of financial statement fraud.

The prevalence of financial statement fraud within the business landscape necessitates further investigation into the pressure faced by management as a potential driver of such misconduct, particularly within the context of Vietnamese-listed companies. The Oxford Dictionary defines pressures as difficulties and worries caused by the need to achieve or behave in a particular way. Prior authors have defined pressure as something that arises from events in the personal life of a fraudster, leading to a stressful necessity (Cressey, 1953; Singleton & Singleton, 2010). In the context of this research, pressure translates to the burdens placed upon management, compelling them to behave in specific ways. Building upon the framework of Manurung & Hadian (2013), this study further subdivides pressure in the context of fraud into three distinct components: financial stability pressure, external pressure, and ownership pressure.

Firstly, the need to achieve financial stability can influence management teams. According to Saleh et al. (2021), metrics such as return on assets (ROA) reflect the effectiveness of business operations and the managerial capacity of corporate leadership. Additionally, shareholders may expect their invested companies to operate efficiently and yield financial benefits, such as stock price differentials or dividend distributions. Consequently, shareholders can exert pressure, compelling the management board to maintain stable profit indicators (Summers & Sweeney, 1998). In Vietnam, several studies have reached similar conclusions. Tran et al. (2014) assert that profit indicators and total asset turnover are critical metrics for evaluating business performance. Drawing from the agency theory, prior research by Kassem (2018) and Seifzadeh et al. (2022) suggests that some companies adopt profit-based compensation policies. As a result, managers may manipulate financial data to maximise their interests. From the relevant empirical literature, we hypothesise the following hypotheses on the relationship between financial stability pressure and fraud:

H1: Profitability is negatively associated with financial statement fraud.

H2: The proportion of inventories and receivables of total assets is positively associated with financial statement fraud.

H3: The proportion of profit from operating activities in gross profit is negatively associated with financial statement fraud.

H4: Altman's Z-Score is negatively associated with financial statement fraud.

H5: Revenue growth rate is positively associated with financial statement fraud.

Secondly, beyond internal pressures, companies also face significant external pressure from various stakeholders. Existing literature has elevated the likelihood of financial statement fraud using external pressure. For instance, creditors who utilise financial statements for loan decisions are identified as external stakeholders exerting pressure (Skousen et al., 2009; Diansari & Wijaya,

2019). Additionally, auditors are responsible for detecting fraudulent behaviour (Lennox & Pittman, 2010). Large audit firms, such as the Big Four, possess the expertise and knowledge to prevent or pressure companies to avoid fraudulent activities before their occurrence (Smaili & Labelle, 2009). Notably, Vietnamese Securities Law 54/2019/QH14 mandates two years of profitability for public offerings, creating pressure to avoid losses (Nguyen, 2020). This further underlines the pressure from investors of listed companies, expecting no losses within the preceding two years for continued listing on the stock exchange. From the relevant empirical literature, we hypothesise the following hypotheses:

H6: Financial leverage is negatively associated with financial statement fraud.

H7: A company audited by the Big Four is negatively associated with financial statement fraud.

H8: A company recording losses in the last two years is positively associated with financial statement fraud.

Finally, ownership pressure emanates from internal stakeholders wielding the power to set goals, establish visions, and appoint management teams. While state-owned enterprises may prioritise other goals beyond profitability (Wang et al., 2012; Liu Xiang et al., 2014), pressure from stockholders, such as institutional and foreign investors, can create an effective governance mechanism to avoid fraud risks (Dechow et al., 1996). A study conducted in China revealed that state-owned enterprises and banks enjoy preferential interest rates compared to private companies (Haß, 2019). The capital burden and credit access barriers are lower for companies with a higher state ownership ratio, giving them a competitive advantage over other firms. Previous studies by Cornett (2008) and Nguyen (2020) indicate that shareholder ownership has an inverse relationship with the risk of financial statement fraud. Large organisational shareholders can also help monitor operational activities (Cornett et al., 2008). Organisational shareholders have a vested interest in the business performance of the invested company, motivating them to oversee and evaluate the operations to safeguard their rights. Therefore, managers are less likely to conduct fraudulent behaviour for personal gain. Prior research by Chen (2006) also reveals an inverse relationship between foreign shareholder ownership and the risk of financial statement fraud. It also reduces financial pressure on businesses and mitigates the risk of fraudulent reporting. For the management, delegating ownership to an individual who holds a stake in the company can naturally minimise agency issues, as the interests of management align with those of the shareholders. Thus, managers also face less pressure to manipulate information on financial statements to appease shareholders. From the relevant empirical literature, we hypothesise the following hypotheses:

H9: The percentage of shares held by the state is negatively associated with financial statement fraud.

H10: The percentage of shares held by institutional stockholders is negatively associated with financial statement fraud.

H11: The percentage of shares held by foreign stockholders is negatively associated with financial statement fraud.

H12: The percentage of shares held by management is negatively associated with financial statement fraud.

3. Research design

3.1. Methodology

To investigate the association between pressure and financial statement fraud, we employ the following baseline model:

$$\mathbf{FRAUD_{i,t} = \beta_0 + \beta_1 FINANCIAL\_PRESSURE_{i,t} + \beta_2 EXTERNAL\_PRESSURE_{i,t} + \beta_3 OWNERSHIP\_PRESSURE_{i,t} + \beta_4 CONTROL_{i,t} + \varepsilon_{i,t}}$$

Where: $FRAUD_{i,t}$ represents the dependent variable,

$FINANCIAL\_PRESSURE_{i,t}$ denotes the financial stability pressure, $EXTERNAL\_PRESSURE_{i,t}$ denotes the external pressure, $OWNERSHIP\_PRESSURE_{i,t}$ denotes the pressure from ownership, $CONTROL_{i,t}$ refers to the control variables, β_0 represents the intercept, β_1, β_2, β_3 and β_4 are the coefficients, $\varepsilon_{i,t}$ represents the error term.

Consistent with previous research by Nguyen (2020), Skousen et al. (2009), Persons (2005), and Beasley (1996), we employ the logit regression model. The dependent variable in our model is binary, taking the value of 1 if a company is categorised as fraudulent and 0 otherwise. Recognising that unobserved factors specific to years or industries could influence our findings, we include dummy variables for each year and industry in the data to control for unobserved factors. It allows us to isolate the relationship between pressure and financial statement fraud. Additionally, we employ average marginal effects to facilitate the interpretation of coefficients. Since the Breusch-Pagan test shows heteroskedasticity is present in the sample data, we address the issue using robust standard errors for more accurate calculations.

3.2. Measurement of variables

3.2.1. Dependent variable

Financial statement fraud often manifests as abnormalities within financial statements. While prior research in countries like the United States can rely on fraud databases published by authorities such as the Securities and Exchange Commission (SEC) to identify fraudulent observations, the situation in Vietnam is different. Here, no such comprehensive database exists for identifying fraudulent companies.

To address this challenge, we propose an alternative approach. We examine the delta in profit before tax between audited and unaudited financial statements. Manipulations of financial statements can significantly impact this account. In line with Nguyen (2020), we set materiality thresholds at 5% and 10%. These thresholds help us identify the significance of misstatements. Our procedure for creating the dependent variables involves three steps. First, we calculate the absolute percentage difference in profit before tax between audited and unaudited statements. Next, we determine the materiality thresholds: We adopt the 5% threshold recommended by Nguyen et al. (2018) and Kinney (1994). In line with Decision No. 01/2019/QĐ-KTNN issued by the State Audit Office of Vietnam, which specifies materiality for gross profit before tax in the range of 3% to 10%, we also employ the 10% threshold. Finally, we assign values 1 and 0 to the dependent variables. If the difference in profit before tax before and after auditing exceeds or equals 5%, we assign a value of "1" to the dependent variable FRAUD_5P. If the difference exceeds or equals 10%, we assign a value of "1" to the dependent variable FRAUD_10P. Otherwise, a value of "0" is assigned. This approach allows us to identify potential instances of financial statement fraud in Vietnam despite the absence of a dedicated fraud database.

3.2.2. Independent variables

Our study utilises a combination of financial ratios and other measurements to capture various pressure factors potentially influencing financial statement fraud.

For the pressure from financial stability, we use the following variables and measurements: Return on Assets (ROA) equals Net Profit After Tax / Total Assets. According to Skousen et al. (2009), companies with high ROA are less likely to commit fraud. Accounts Receivable and Inventory Turnover (ACOM) equals (Accounts Receivable + Inventory) / Total Assets. According to Zainudin & Hashim (2016), companies with high ACOM have lower liquidity and are more likely to experience financial distress. Therefore, high ACOM increases the likelihood of fraud. Net Operating Profit Margin (NOP) equals Net Operating Profit / Total Revenue. According to Minh et al. (2019), companies with a high NOP have lower risk and are less likely to commit fraud. Altman's Z-Score (ZSCORE) quantifies the financial distress with the calculation shown in the Table below. According to Persons (2005), companies with financial distress are more likely to commit fraud. Revenue growth rate equals (Revenue Year t - Revenue Year t-1) / Revenue Year t-1. According to Nguyen et al. (2018), companies with high revenue growth rates have less motivation and pressure to commit fraud.

For the external pressure variables, we use the LEV for pressure from creditors, BIG for pressure from auditors and LOSS for pressure from investors. Financial Leverage (LEV) equals Total Liabilities / Total Assets. According to Jensen (1986), companies with high debt ratios are less likely to commit fraud due to the need for transparency to access capital from lenders. Big Four Audit (BIG) equals 1 if the company is audited by a Big Four firm, 0 otherwise. According to Farber (2005), companies audited by a Big Four firm are less likely to commit fraud. Losses in

two consecutive years (LOSS) equals 1 if the company had losses in the previous two years and 0 otherwise. According to Nguyen (2020), companies with losses in two consecutive years are more likely to commit fraud.

For the pressure from ownership variables, we use the percentage of shares held by the state, institutional investors, foreign investors and management. State ownership ratio (STATE) is the percentage of ownership by state-owned shareholders. According to Liu Xiang et al. (2014), companies with higher state ownership are less likely to commit fraud. Institutional ownership ratio (INST) is the percentage of ownership by institutional shareholders (excluding state-owned). According to Farber (2005), companies with higher institutional ownership are less likely to commit fraud. Foreign ownership ratio (FRN) is the percentage of ownership by foreign shareholders. According to Chen et al. (2006), companies with higher foreign ownership are less likely to commit fraud. Management ownership ratio (MNG) is the percentage of shares management holds. According to Beasley (1996), companies with higher management ownership are less likely to commit fraud.

3.2.3. Control variables

We also incorporate three control variables into their model, i.e. board tenure (TENURE), board independence (BIND), and firm size (SIZE). Board tenure (TENURE) represents the average age of board members. According to Kim & Yang (2014), companies with longer board tenure reduce fraudulent behaviour. Board independence (BIND) is the ratio of independent board members to the total number of members. Beasley (1996) asserts that companies with more independent board members are less likely to engage in fraudulent activities. Firm size (SIZE) is the natural logarithm of total assets representing the firm size. Dalnial et al. (2014) find that larger firms have a diminished likelihood of fraud. We use logarithms to ensure that the data distribution adheres more closely to normality, considering that total assets can assume substantial values compared to other variables.

3.2. Data sample

We collect financial data from the FiinPro platform and non-financial data from Vietstock. This dataset comprises financial statements from listed companies on the HOSE and HNX securities exchanges from 2010 to 2022. We exclude financial institutions such as banks and insurance companies since these institutions adhere to different financial reporting standards, which can significantly diverge from those applicable to non-financial companies. The data is cleaned and used to calculate relevant variables in our model with Python. To ensure the robustness of our analysis, we employ winsorisation techniques to replace outliers at the 1% and 99% levels. This step aligns with the assumptions of the logit model. After eliminating missing and duplicate values, our final dataset comprises 4,984 observations.

Table 1. Variable definitions

Variable	Definition	Expected sign	Sources
	Dependent variables		
FRAUD_5P	Dummy variable, assigned "1" if the absolute difference in profit before tax between unaudited and audited financial statements is 5% otherwise "0".		Nguyen et al. (2018) and Kinney (1994)
FRAUD_10P	Dummy variable, assigned "1" if the absolute difference in profit before tax between unaudited and audited financial statements is 10% otherwise "0".		
	Independent variables		
ROA	Profit after tax/Total assets	-	Skousen et al. (2009)
ACOM	(Receivables + Inventories)/Total assets	+	Zainudin & Hashim (2016)
NOP	Net profit from operating activities/Gross profit	-	Minh et al. (2019)
ZSCORE	Alman's Z-Score	-	Persons (2005)
GROWTH	$(Revenue_{year\ t} - Revenue_{year\ t-1})/Revenue_{year\ t-1}$	+	Nguyen et al. (2018)
LEV	Total liabilities/Total assets	-	Jensen (1986)
BIG	Dummy variable, assigned "1" if audited by Big Four, otherwise "0"	-	Farber (2005)
LOSS	Dummy variable, assigned "1" if records loss	+	Nguyen (2020)

Variable	Definition	Expected sign	Sources
	in the last two years, otherwise "0"		
STATE	Percentage of shares held by the state	-	Liu Xiang et al. (2014)
INST	Percentage of shares held by institutional investors (excluding state)	-	Farber (2005)
FRN	Percentage of shares held by foreign investors	-	Chen et al. (2006)
MNG	Percentage of shares held by management	-	Beasley (1996)
	Control variables		
TENURE	Average tenure of BOD	-	Kim & Yang (2014)
SIZE	Natural logarithm of company's total assets	-	Dalnial et al. (2014)
BIND	Percentage of independent members in BOD	-	Beasley (1996)

Source: The authors (2024)

4. Empirical results

4.1. Descriptive analysis

Table 2. Descriptive statistics

Panel A. Descriptive statistics

Variable	N	Mean	Standard deviation	Min	Max
FRAUD_5P	4,984	0.204	0.403	0.000	1.000

FRAUD_10P	4,984	0.140	0.347	0.000	1.000
ROA	4,984	0.057	0.072	-0.483	0.654
ACOM	4,984	0.462	0.236	0.000	0.999
NOP	4,984	0.438	0.766	-2.836	4.842
ZSCORE	4,984	2.977	3.098	-0.083	20.236
GROWTH	4,984	0.319	0.976	-0.753	6.771
BIG	4,984	0.244	0.430	0.000	1.000
LEV	4,984	0.486	0.219	0.001	1.294
LOSS	4,984	0.009	0.096	0.000	1.000
STATE	4,984	0.144	0.230	0.000	0.968
INST	4,984	0.199	0.249	0.000	0.997
MNG	4,984	0.057	0.103	0.000	0.854
FRN	4,984	0.031	0.094	0.000	0.941
TENURE	4,984	9.142	5.383	0.000	39.000
SIZE	4,984	11.896	0.650	10.180	14.761
BIND	4,984	0.617	0.218	0.000	1.000

Panel B. Percentage of fraud observation by year

Year	FRAUD_5P	FRAUD_10P	Year	FRAUD_5P	FRAUD_10P
2010	0.206	0.108	2017	0.171	0.126
2011	0.349	0.263	2018	0.147	0.107
2012	0.297	0.224	2019	0.188	0.121
2013	0.266	0.183	2020	0.172	0.114

2014	0.195	0.133	2021	0.159	0.102
2015	0.232	0.16	2022	0.209	0.139
2016	0.225	0.153			

Panel C. Percentage of fraud observation by industry

Industry	FRAUD_5P	FRAUD_10P	Industry	FRAUD_5P	FRAUD_10P
Industrials (I)	0.201	0.135	Consumer goods (CG)	0.185	0.114
Technology (TEC)	0.182	0.136	Basic materials (BM)	0.218	0.152
Health care (HC)	0.15	0.1	Utilities (UT)	0.164	0.118
Oil and gas (OG)	0.35	0.15	Financials (FIN)	0.284	0.209
Consumer services (CS)	0.172	0.127			

Source: The authors (2024)

Panel A reveals that the dependent variable FRAUD_5P has an average value of 0.204 and a standard deviation of 0.403. In contrast, the dependent variable FRAUD_10P exhibits a lower average value of 0.140 due to its variable definition. Specifically, observations with asset differences of less than 5% may also have asset differences of less than 10%, but the reverse is not necessarily true. Panel B focuses on the percentage of fraud observations by year. Notably, the statistics indicate a significant increase in fraud observations during 2011. This surge coincided with an economic downturn in Vietnam, characterised by an 18% inflation rate, which posed pressure for businesses to commit fraud. Subsequently, the fraud percentage remained stable in the subsequent years but experienced another notable rise in 2022, coinciding with the outbreak of the COVID-19 pandemic. This economic pressure may have contributed to companies resorting to fraudulent practices. Panel C shows the percentage of fraud by industry. The data highlights that the Oil and gas and Financials sectors exhibit the highest levels of fraud.

4.2. Correlation analysis

To ensure reliable coefficient estimates in regression analysis and uphold the robustness of the research model, the authors conducted hypothesis testing. For the chosen logistic regression method, the model assumes an absence of multicollinearity (Stoltzfus, 2011). This assumption necessitates that there is no high correlation among the independent variables within the model. We employed a correlation matrix using the Spearman method to evaluate this hypothesis. Given the inclusion of some non-continuous variables such as BIG or LOSS, the authors opted for the Spearman correlation matrix in Table 4.2 to precisely determine the degree of correlation between explanatory variables, surpassing the limitations of the Pearson correlation matrix. A range of 0.7 to 1 (or -0.7 to -1) is accepted to identify a strong correlation (Ratner, 2009). Importantly, all independent variables in the model fall below this threshold, indicating a lack of correlation among them. This observation underscores the absence of pronounced correlations between the independent variables.

Table 3. Spearman correlation matrix

	FRAUD_5P	FRAUD_10P	ROA	ACOM	NOP	ZSCORE	GROWTH	LEV	BIG	LOSS	STATE	INST	FRN	MNG	TENURE	SIZE	BIND
FRAUD_5P	1.000																
FRAUD_10P	0.796*	1.000															
ROA	-0.363*	-0.362*	1.000														
ACOM	0.087*	0.077*	-0.277*	1.000													
NOP	-0.215*	-0.229*	0.599*	-0.266*	1.000												
ZSCORE	-0.274*	-0.254*	0.643*	-0.147*	0.232*	1.000											
GROWTH	-0.015	-0.027*	0.169*	0.022	0.073*	0.066*	1.000										
LEV	0.141*	0.105*	-0.437*	0.367*	-0.317*	-0.606*	0.092*	1.000									
BIG	-0.057*	-0.053*	0.093*	-0.073*	0.089*	0.021	-0.006	0.019	1.000								
LOSS	0.071*	0.082*	-0.077*	-0.009*	-0.058*	-0.057*	0.028*	0.005	0.023*	1.000							
STATE	-0.061*	-0.053*	0.119*	-0.090*	-0.057*	0.121*	0.017	0.004	-0.041*	-0.021	1.000						
INST	-0.056*	-0.061*	0.079*	-0.063*	0.058*	0.050*	-0.023	-0.009	0.239*	-0.009	-0.297*	1.000					
FRN	-0.032*	-0.031*	0.126*	-0.072*	0.071*	0.091*	0.026*	-0.092*	0.198*	0.022	0.003	0.150*	1.000				
MNG	0.039*	0.026*	-0.018	0.190*	-0.069*	-0.032*	0.081*	0.081*	-0.177*	-0.014	-0.205*	-0.254*	-0.005	1.000			

	FRAUD_5P	FRAUD_10P	ROA	ACOM	NOP	ZSCORE	GROWTH	LEV	BIG	LOSS	STATE	INST	FRN	MNG	TENURE	SIZE	BIND
TENURE	-0.073*	-0.080*	0.020	0.056*	-0.029*	0.080*	-0.079*	0.056*	-0.016	-0.008	-0.084*	-0.088*	-0.000	0.186*	1.000		
SIZE	0.014	0.000	-0.078*	-0.061*	0.172*	-0.338*	0.049*	0.335*	0.424*	-0.013	-0.070*	0.084*	0.168*	-0.147*	0.043*	1.000	
BIND	-0.004	-0.023	0.011	-0.104*	0.086*	0.137*	-0.028*	-0.078*	0.098*	0.028*	-0.083*	0.097*	0.034*	-0.224*	0.035*	0.080*	1.000

**: P_value < 0,1*

Source: The authors (2024)

4.3. Regression analysis

Based on findings from prior research studies (Seifzadeh et al., 2022; Nguyen, 2022; Shi et al., 2017) and the binary nature of financial statement fraud data, we employed a logistic regression model to estimate regression coefficients and provide empirical evidence for the research question. This model is well-suited for investigating which factors within the model influence the occurrence or absence of financial statement fraud and the direction of their impact. Additionally, the model assumes the absence of autocorrelation in the observed data. To address this issue, we used robust standard errors to ensure the reliability of research results. Furthermore, we interpreted the results using marginal effects. The logistic regression model informs us about the change in log odds of the dependent variable when an independent variable changes by one unit, ceteris paribus. Marginal effects facilitate straightforward interpretation, as they reveal the change in probabilities of the dependent variable when an independent variable changes by one unit, ceteris paribus (Norton et al., 2019). Table 5 below represents the result of the regression analysis.

Table 4. Regression analysis

Variable	**(1) FRAUD_10P**		**(2) FRAUD_5P**	
	-13.1011***	-1.3516***	-11.5904***	-1.6249***
ROA	(0.000)	(0.000)	(0.000)	(0.000)
	0.4968**	0.0513**	0.2845	0.0399
ACOM	(0.032)	(0.026)	(0.136)	(0.134)
	-0.0690	-0.0071	-0.0386	-0.0054
NOP	(0.261)	(0.186)	(0.481)	(0.423)
	-0.1471***	-0.0152***	-0.1341***	-0.0188***
ZSCORE	(0.008)	(0.000)	(0.001)	(0.000)
	-0.0122	-0.0013	0.0250	0.0035
GROWTH	(0.793)	(0.791)	(0.545)	(0.535)
	-0.3778	-0.0390	-0.0376	-0.0053
LEV	(0.229)	(0.191)	(0.888)	(0.881)
	-0.2055	-0.0212	-0.2295**	-0.0322**
BIG	(0.116)	(0.115)	(0.040)	(0.036)

Variable	(1) FRAUD_10P		(2) FRAUD_5P	
	1.3503***	0.1393***	1.0875***	0.1525***
LOSS	(0.000)	(0.000)	(0.001)	(0.001)
	-1.0014***	-0.1033***	-0.8446***	-0.1184***
STATE	(0.000)	(0.000)	(0.000)	(0.000)
	-0.8591***	-0.0886***	-0.5035**	-0.0706***
INST	(0.000)	(0.000)	(0.012)	(0.009)
	-0.9713*	-0.1002*	-0.5566	-0.0780
FRN	(0.067)	(0.096)	(0.252)	(0.236)
	-0.7854*	-0.0810*	-0.4169	-0.0585
MNG	(0.080)	(0.098)	(0.292)	(0.305)
	-0.0466***	-0.0048***	-0.0382***	-0.0054***
TENURE	(0.000)	(0.000)	(0.000)	(0.000)
	0.0190	0.0020	-0.0185	-0.0026
SIZE	(0.848)	(0.846)	(0.825)	(0.825)
	-0.5810**	-0.0599**	-0.2880	-0.0404
BIND	(0.029)	(0.026)	(0.206)	(0.202)
Observation	4,984	4,984	4,984	4,984
Pseudo-R-squared	0.1567		0.1353	
Log-Likelihood	-1700,8		-2180,6	
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Marginal effects	No	Yes	No	Yes

*P_value in parentheses, ***p<0.01, ** p<0.05, * p<0.1*

4.3.1. The effects of financial stability pressure on financial statement fraud

The statistical significance of the return on assets (ROA) variable at the 1% level, coupled with its negative regression coefficient, indicates an inverse relationship between ROA and the likelihood of financial statement fraud. It implies that companies with higher ROA are less prone to engaging in fraudulent reporting. This finding aligns with prior research conducted by Achmad et al. (2022), Maulidi (2023), and Hasan et al. (2022), all of which suggest that firms with elevated ROA exhibit lower fraud susceptibility. ROA serves as a metric to evaluate the efficiency of a company. Consequently, management in high-ROA firms experience less financial pressure and exhibit fewer fraudulent behaviours. Moreover, certain companies in Vietnam implement profit-sharing policies for employees based on business performance.

The variable ACOM exhibits statistical significance at the 5% level, with a positive regression coefficient indicating a positive correlation between the accounts receivable and inventory turnover ratio within the asset structure concerning financial statement fraud. This finding aligns with the research conducted by Khamainy and Setiawan (2022). Firms with a substantial inventory and accounts receivable ratio signal unstable liquidity. Consequently, this asset structure places financial stress on management, prompting executive boards to strategise inventory utilisation and recover outstanding receivables from customers. These results corroborate the findings of Sihombing and Rahardjo (2014) and Summers and Sweeney (1998).

The ZSCORE exhibits a statistically significant negative coefficient at the 1% level, implying an inverse relationship between high Altman's Z-Score and the likelihood of financial statement fraud. This finding aligns with prior research by Tarighi et al. (2022) and Tran et al. (2014). Companies with low Altman's Z-Score indicate financial distress and a decreasing Z-Score raises the risk of bankruptcy within the next two years. Consequently, companies facing financial distress encounter pressure from various stakeholders to improve their situation. Furthermore, for companies experiencing low Altman's Z-Score, the financial results reflected in their financial statements can be highly irregular, affecting the trust of business partners such as suppliers or banks.

4.3.2. The effects of pressure from external stakeholders on financial statement fraud

The variable BIG is statistically significant at the 5% level for model (2) but lacks statistical significance in model (1). In both models, the negative regression coefficient for BIG suggests that companies audited by the four largest audit firms face a lower risk of financial statement fraud. Hela et al. (2022) explain that the four largest audit firms possess specialised expertise and superior auditing capabilities not found in other audit firms. Therefore, companies audited by these Big Four firms are less likely to engage in fraudulent reporting. However, multiple studies also indicate that empirical evidence is insufficient to prove that Big Four audits effectively reduce fraud risk (Lennox & Pittman, 2010; Smaili et al., 2009; Baber et al., 2005).

The variable LOSS is statistically significant at the 1% level in both models. The positive regression coefficient indicates a direct relationship between consecutive years of financial losses and the likelihood of financial statement fraud. In Vietnam, Decree 155/2020/NĐ-CP states that companies reporting three years of losses based on their financial statements will be delisted. Consequently, this creates pressure for companies to engage in fraudulent practices to conceal their losses and avoid delisting. Additionally, recording losses in consecutive years highlights poor management and may subject the company to pressure when dealing with creditors and suppliers. These factors collectively contribute to the pressure that drives companies to manipulate their financial statements to avoid prolonged recognition of losses.

4.3.3. The effects of pressure from ownership on financial statement fraud

All four variables in the owner pressure group are statistically significant in at least one of the two models. Furthermore, the coefficients for all ownership variables are less than zero, suggesting that increasing the ownership proportion by state, organisations, management, or foreign shareholders reduces the likelihood of financial statement fraud.

Firstly, the negative regression coefficient is statistically significant at the 1% level, indicating that as the state holds a proportion of shares in a company, the likelihood of fraud decreases. The state-owned enterprises may have political objectives alongside typical financial goals. Additionally, companies with high state ownership have political resources and enjoy certain privileges compared to other firms, which reduces the pressure related to business performance indicators (Hou & Moore, 2010). State-owned companies also find it easier to access business funding through debt. Consequently, the manager is less likely to engage in fraudulent practices to meet conditions for bank credit access. Research by Tran et al. (2023) and Li et al. (2009) consistently shows that state ownership correlates positively with leverage. The ease of state-owned companies in accessing bank loans also alleviates the pressure on the management to manipulate financial statements to present safer financial indicators in the eyes of lenders and suppliers. From a governance perspective, in Vietnam, key management positions in state-owned enterprises are subject to scrutiny by agencies such as the State Capital Management Committee. State ownership also imposes strict requirements regarding management, auditing, public procurement, and conflict resolution. Therefore, managers in state-owned enterprises have fewer opportunities to engage in fraudulent behaviour when facing business pressures.

Next, concerning the variable INST, the regression coefficient holds statistical significance at the 1% level. The negative sign indicates an inverse relationship between the proportion of ownership by institutional shareholders and financial statement fraud. This result aligns with numerous prior studies on the direction of impact (Jiambalvo et al., 2008; Cornett et al., 2008). Institutional shareholders enjoy advantages in terms of scale and expertise. Consequently, they impose stringent requirements on corporate governance. Institutional shareholders tend to select

well-performing businesses and can provide financial resources for necessary expansions, reducing pressures on the management.

Thirdly, the variable FRN exhibits statistical significance at the 10% level in the model (1). The negative regression coefficient indicates an inverse relationship between foreign ownership and financial fraud. Although statistical evidence is not found for model (2), the sign of the regression coefficient remains consistent across both models. The research findings regarding the direction of impact between foreign ownership and fraud align with the prior study by Chen et al. (2006). Firstly, foreign shareholders impose rigorous requirements on transparent management systems and efficiency to safeguard their capital. These shareholders typically possess substantial financial resources and managerial expertise when investing abroad. Secondly, foreign ownership can easily access capital and modern, transparent management systems. Foreign-invested enterprises in Vietnam may also benefit from tax incentives due to open policies, attracting foreign capital. It contributes to alleviating financial pressure on managers in foreign-invested companies. Hence, companies with foreign shareholders are less motivated to engage in fraud.

Finally, the variable MNG demonstrates statistical significance at the 10% level in the model (1), with negative regression coefficients observed in both models. Sen (2007) explains that management ownership contributes to aligning the interests of managers and the firm, thereby reducing the likelihood of fraudulent financial statements. According to the agency theory proposed by Jensen & Meckling (1976), managers and owners have divergent objectives. Consequently, management may manipulate financial statements or fraud to serve their interests. Therefore, compensating managers with company shares fosters greater alignment between managerial and ownership interests. Additionally, when management holds share in the company, they wield influence over the decisions of BoD. Their voting rights and elevated position resulting from share ownership alleviate managerial pressures, thus minimising the risk of fraudulent behaviour due to undue stress from external shareholders.

4.3.4. The effects of control variables on financial statement fraud

Within control variables, the tenure of the BoD exhibits statistical significance at the 1% level in both models. Conversely, the variable representing the independence of the BoD holds statistical significance at the 5% level in the model (1), where the dependent variable is the profit differential at the 10% level. However, there is no statistically significant evidence regarding the impact of company size on financial statement fraud. The tenure of the BoD shows an inverse relationship with financial statement fraud. It implies that as the tenure of the BoD increases, the likelihood of financial statement fraud decreases, and vice versa. This finding aligns with research by Livnat (2021) on the relationship between tenure and fraud. When BoD members work in a company for an extended period, they gain insights and experience regarding operations. As a result, they can promptly detect and prevent accounting information manipulation by management when faced with fraudulent pressures. Companies with

experienced BoD tenure also have clear operational directions, well-defined directives, and resolutions from the BoD aimed at building and developing transparent businesses. The independence of the BoD holds statistical significance and demonstrates an inverse relationship with the likelihood of financial statement fraud. It implies that as the independence of the BoD increases, the probability of fraudulent behaviour decreases, and vice versa. Independent board members make objective decisions, which can reduce the likelihood of financial statement fraud. Empirical results support prior research on the relationship between the independence of the BoD and financial statement fraud by Yiu et al. (2018) and Neville et al. (2019). However, the authors have not found statistically significant evidence regarding the impact of company size on fraud. Additionally, the opposite signs of the coefficients in the two models using different dependent variables suggest further research to clarify these findings.

5. Conclusion

With quantitative methods and binary logit regression, this study provides evidence that pressures from financial stability, external stakeholders, and ownership structure influence the likelihood of financial statement fraud. Notably, three variables representing financial stability, two concerning external pressure, and four reflecting ownership pressure demonstrate statistically significant effects. These findings align with previous research grounded in the Fraud Triangle Model.

These results offer valuable insights for both researchers and practitioners. Companies should prioritise responsible and ethical management of their financial structures, particularly liquidity challenges. Additionally, addressing the concerns of external stakeholders and adopting healthy ownership structures are crucial considerations. Likewise, auditors should heighten their scrutiny of companies facing financial pressure due to the increased risk of fraudulent activity. Finally, investors and users of financial statements should incorporate these factors into their decision-making processes for more informed analysis.

This study acknowledges limitations. First, we use secondary data from FiinPro and Vietstock. Although these sources are dependable, they are not immune to errors, as they aggregate information from third parties rather than directly from the companies. Second, our research focused on detecting financial fraud using the discrepancies between unaudited and audited financial statements. We then established thresholds to classify values as “fraudulent” or “non-fraudulent.” However, it is essential to acknowledge that some discrepancies may not be intentional fraudulent acts. Future research may address these limitations by using alternative approaches to measuring fraud. Furthermore, future studies could concentrate on specific sectors. Researchers can provide more precise and accurate results by narrowing the focus to a particular industry.

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