# Board Characteristics and Big Data Optimization: Prevailing Pythonic Accounting in Fraudulent Financial Reports in Indonesia

1<sup>st</sup> Kiki Khoifin School of Management Mae Fah Luang University Chiang Rai, Thailand Kiki.kho@mfu.ac.th 2<sup>nd</sup> Dzakiyy Hadiyan Achyar<sup>\*</sup> School of Management Mae Fah Luang University Chiang Rai, Thailand Dzakiyy.ach@mfu.ac.th 3<sup>rd</sup> Dej-anan Bungkilo School of Management Mae Fah Luang University Chiang Rai, Thailand Dej-anan@mfu.ac.th

Abstract—There are two-fold purposes of this study. First, we explore the association between board characteristics proxied by CEO duality, board independence, and board remuneration and fraudulent financial reporting measured by *F\_Score*. Second, we examine fraudulent financial reporting by using Python Sentiment Analysis. Our findings show that CEO duality and board remuneration significantly lead to fraudulent financial reporting. In contrast, board independence is not able to affect fraudulent financial reporting. By utilizing Pythonic Sentiment Analysis, we find that all observed samples have -1 (negative 1), noting that the article contains many negative meaning vocabularies (negative sentiment). This result confirms the significant measurement of F\_Score in examining fraudulent financial reporting. This study provides insights for regulators in developing a strong ground of corporate governance structure in preventing fraudulent financial reporting and sustain confidence in the Indonesian stock market and economy.

# Keywords—board characteristics, fraudulent financial reporting, pythonic accounting, big data optimization

#### I. INTRODUCTION

A main objective of governance reform has been to make public companies' boards more effective in reducing agency problem between managers and shareholders [1]. The agency costs that often stemmed from agency problems, notably captured in the literature, are well known as an opportunistic "earnings management", in which the financial performance is manipulated by company's managers for personal gains [2]. In preventing opportunistic earnings management, the corporate governance code across the world has advocated the procedures in enhancing the quality of financial reporting, in which earnings show the true information about firm's operations [3]. Prior empirical studies, mostly carried out in the United Kingdom (UK) and the United States (US) present the effect of company's boards on earnings management and the financial reporting quality [1]. It is worth mentioning that fraudulent financial reporting, as it much explored in empirical research cannot be separated with earnings management. As [4] contends that fraud is an excessive point on the earnings management scale provided by some earnings management standard measurements. The fraudulent financial reporting has posed devastating damages of the accountable business climate [1]. Consequently, fraudulent financial

reporting has been an emerging research avenue for business practitioners and academicians. There have been rekindled much attention to explore the research on fraudulent financial reporting and its association with corporate governance [4]. For example, [5] who incorporate corporate governance proxies, finds that companies with higher composition of outside directors and stock ownership by outside directors, longer tenure of outside directors, and smaller composition of board of directors less likely commit fraud. In addition, companies with audit committees that are completely independent, smaller composition of directorships, and longer audit committee tenure tend to have less fraudulent financial reporting [6]. A study from [7] shows that companies with weak corporate governance structures (e.g., higher percentage of management possessed by board of directors and no audit committees) are susceptible to fraudulent financial reporting. Another work from [8] which exploit 11 years data from public companies finds that fraudulent financial reporting is influenced by weak board of directors, audit committees, and top management.

Considering the above-mentioned phenomenon, thus, there are two-fold purposes of this study. First, we aim to explore the association between attributes of corporate governance (focus on board characteristics: CEO duality, board independence, and board remuneration) and fraudulent financial reporting in Indonesia. Examining board characteristics is motivated by appealing reasons. Since Indonesia has been promoting on good corporate governance to public companies, nevertheless, the application of good corporate governance has not been optimal [9], therefore, we incorporate CEO duality as one of the long-standing challenges in Indonesia's corporate governance mechanism. According to [10], CEO duality cripples overall accountability which makes companies less transparent for all stakeholders. CEOs with dual control in the boardroom might be less active in monitoring board activities [11]. Prior research has revealed that independent boards decrease earnings management and have association with better financial reporting quality ([5], [7], [2]). Hence, it will be relevant to add board independence to this study. Turning into board remuneration, scholars such as [12] and [13] contend that executive compensation tied to accounting numbers is one of the most cited features of why companies engage in

Corresponding Author

earnings management. Interesting findings from [14] shows that the rise of directors' remuneration is aligned with the rise of corporate profits. This result is questionable, as it can convey the trend in managerial remuneration and its association with manipulation of accounts which aimed at generating inflated earnings [15]. These previous studies, as stated by [4], indicate the potential association between corporate governance and fraudulent financial reporting.

In addition, due to the advancement of data analytics, investigating the textual content of company disclosures, news articles, and social media posts has resulted an increased popularity across accounting and finance scholars [16]. Therefore, the second purpose of this study, in serving empirically relevant shorthand on accounting and big data optimization as highlighted on the title of this paper is examining fraudulent financial reporting by using Python Sentiment Analysis. Among data analytical approaches, Python-has been constantly ranked in the most known programming languages as a general-purpose programming language in the globe [16]. The texts, unlike numbers (as a common result of accounting rules), bring with them an immense number of possibilities. It is very capable and intuitive in the domains of pattern matching and text analysis [16]. Pythonic accounting, as we prefer to call one of programming language tools, provides the sentiment analysis on the "news" related to the fraud.

Our findings show that CEO duality and board remuneration significantly lead to fraudulent financial reporting. In contrast, board independence is not able to affect the reporting fraudulence. However, all control variables (leverage, MTB, profit, and size) effect significantly on fraudulent financial reporting. In respect to Pythonic Sentiment Analysis, we find that all observed samples have - 1 (negative 1), noting that the article contains many negative meaning vocabularies such as decrease, decline, terrible, etc., (negative sentiment). This result confirms the significant measurement of  $F\_Score$  in examining the fraudulent financial reporting.

Our paper contributes to three ways. First, we extent to the literatures which focus on the board characteristics and fraudulent financial reporting in Indonesia. Second, given that an attempt to incorporate data analytics in accounting has attracted interest, we expect this study can extent the literature on the pertinent topic. Third, the contribution of this study is devoted to regulators in enhancing good corporate governance, despite the challenges, as the implementation has not been optimal. Indonesian regulators are encouraged to provide the sound basis for updating corporate governance regulations to particularly reduce fraudulent financial reporting. More importantly, developing a strong ground of corporate governance mechanism can prevent fraudulent financial reporting and sustain confidence in the stock market and economy. For investors are also suggested to put greater emphasis on corporate governance indicators before investing. This study proceeds as follows. Section II provides a discussion of literature review. We delineate research

methodology and result and discussion in Section III and IV. Lastly, Section V concludes.

#### II. LITERATURE REVIEW

#### A. Hypothesis Development

The fraud refers to a crime perpetrated by people, which is discovered in many sectors [17]. Financial reporting scandals such us Enron and Owest caused a tremendous downturn of public trust in the stock market [18]. It notes that fraudulent financial reporting has attracted extensive attention from the global society. Much research explores fraudulent financial reporting with corporate governance [9]. For example, using corporate governance proxies [1] find that CEO duality the boardroom increases earning management in Indian settings. This finding addresses the role of the board in relationship to earnings management in developing economy. CEO duality also has relationship with accounting conservatism which underlies financial reporting quality as stated by [19]. They show that firm with CEO duality has tendency to be less conservative in financial reporting. These prior studies nuance the interconnectedness between CEO duality and earnings management which has indication to fraud. We, thus, come with first hypothesis:

Hypothesis 1: There is positive relationship between CEO duality and fraudulent financial reporting.

Previous studies have stated that boards independence reduce earnings management and has relation to a better quality of financial reporting ([5], [7], [2]). In addition, with robust findings, [20] state that companies with an increase in independent directors reduce the probability of fraudulent financial reporting. This leads to our second hypothesis:

Hypothesis 2: There is negative relationship between board independence and fraudulent financial reporting.

Another relevant corporate governance feature is executive compensation or board remuneration. Executive compensation attached to accounting numbers is one of the most relevant reasons why firms engage in earnings management [12]. [14] finds that director remuneration is associated with the rise of corporate profits. This trend, as believed by [15], there is a tendency of manipulation of accounts which aimed at creating inflated profits. We assume that board remuneration effects fraudulent financial reporting as displayed in the third hypothesis below.

Hypothesis 3: There is negative relationship between board remuneration and fraudulent financial reporting.

Detecting fraudulent financial reporting can be conducted manually by either internal or external independent parties [16], through auditing internal corporate data and quantitative analysis such as liquidity and profitability assessment based on historical financial data or comparison with other company within the industry [17]. Another relevant technique could be the use of financial and process red flags to help auditor to identify the focus areas of their audit procedure [18]. This notes that investors and the public have to depend on available

## **GTBMC 2022** Global Technology and Business Management Conference

external corporate information. The new method of fraud detection is considered crucial, especially for investors and public who can only rely on publicly available corporate data, such as the corporate financial statement or accessible news articles. Emerging computer technology which improves the performance and accessibility of powerful computing power and algorithm has been developed. This new kind of method, according to several researchers, defined as machine-learning method [19; 20]. In the process, the detection of fraudulent financial report using the machine learning techniques involves the analysis of big data. For example, [20] conduct the research exploring the language in corporate disclosures for a purpose of fraud detection and find that fraud companies have more negative sentiments compared to non-fraud companies. This study motivated us to present a novel approach for fraud detection by analyzing the qualitative content of news articles related to the fraud firms. Using Python Sentiment Analysis technique, we determine if fraud firms have negative sentiment (negative meaning vocabularies) expressed from the news articles. This leads to our fourth hypothesis:

Hypothesis 4: There is negative sentiment on fraud firms.

#### III. RESEARCH METHODOLOGY

#### A. Data Set

This study demonstrates the effect of board characteristics (CEO duality, board independence, and board remuneration) on fraudulent financial reporting among Indonesian manufacturing companies listed on Indonesia Stock Exchange (IDX) from 2018 to 2021. We also exploit the Python Sentiment Analysis to assess fraudulent financial reporting from the news articles.

In detecting the likelihood of fraudulent financial reporting, we used the fraud score model ( $F\_Score$ ) developed by [21]. The measurement of  $F\_Score$  is as follows:

Predicted value =  $-7.893 + 0.790 \text{ x} (rsst_acc) + 2.518 \text{ x}$ (ch\_rec) + 1.191 x (ch\_inv) + 1.979 x (soft\_assets) + 0.171 x (ch\_cs) + (-0.932) x (ch\_roa) + 1.029 x (issue)

Where:

RSST accrual = $(\Delta WC + \Delta NCO + \Delta FIN)$			
In which:	Average Total Assets		
WC	= (Current Assets – Current Liability)		
NCO	= (Total Assets – Current Assets – Investment and Advances) – (Total Liabilities – Current Liabilities – Long Term Debt)		
FIN	= (Total Investment – Total Liabilities)		
Average Total Assets	= (Beginning Total Assets + End Total Assets) / 2		

Change in receivables	= $\Delta Receivables / Average Total Assets$		
Change in inventories	= $\Delta$ Inventories / Average Total Assets		
Soft assets	= [Total Assets – PPE – Cash and cash equivalent] / Total assets		
Change in cash sales	= Percentage change in cash sales $[\Delta Sales - \Delta Receivables]$		
Change in ROA	= [Earningst /Average Total Assets] - [Earningst-1 / Average Total Assetst-1]		
Issue	= An indicator variable coded 1 if the firm issued securities during year t.		

Then, probability is measured by Probability = e <sup>(Predicted value)</sup> / (1 + e <sup>(Predicted value)</sup>). The score of unconditional probability is 0.0037. After calculating probability, then we input it into *F\_Score* that is shown in the formulation below and resulting the score of each company. The result concludes if *F\_Score* < 1 is non misstatement, whereas *F\_Score* > 1 is misstatement.

#### *F\_Score* = Probability / Unconditional probability

This study tests four years data of 138 manufacturing companies (552 data observations). The sample is deployed by purposive sampling method by selecting the companies that disclose information needed in the analysis.

#### B. Definition and Measurenment of Variables

Table I below describes the instrumental variables used in the study, including the definition and measurement technique.

TABLE I. INSTRUMENTAL VARIABLES

Variable	Definition	Measurement			
Dependent vario	Dependent variable				
F_Score	This variable is to detect the likelihood of fraudulent financial reporting employing the fraud score model developed by [21].	Measured by using <i>F-Score</i> developed by [21].			
Independent va	riables	•			
CEO Duality	CEO who also occupies the chair position of the board of directors [34].	Dummy variable that is equal to one if the firm's CEO also occupies the chair position on the board, or zero otherwise.			
Board Independence	Percentage of independent board.	Number of independent boards over total			

Global Technology and Business Management Conference

		number of board of directors.
Board Remuneration	The amount of Board of Directors' salary	Natural logarithm (Ln) of total of board of directors' salary.
Control variable	S	-
Leverage	Degree to which a company is financing its operations through debt versus wholly owned funds.	Total liabilities/ Shareholder's equity.
MTB	Market to Book Ratio.	Market capitalization/ Book value.
Profit	Profit of the firm.	Natural logarithm (Ln) of total profit.
Size	Size of the firm.	Natural logarithm (Ln) of total assets.

#### C. Empirical Model

This study exploits panel data analysis. We converted board remuneration, profit, and size data to the form of natural logarithms to lower the sharpness of data and avoid the potential existence of autocorrelation and heteroscedasticity. To test the hypothesis I, II, and III, we provide first empirical model as shown on the first equation below.

 $F\_Score_{it} = \beta_0 + \beta_1 CEO\_Duality_{it} + \beta_2 Board\_Independence_{it} + \beta_3 Ln Board\_Remuneration_{it} + \varepsilon_{it}$ 

We also incorporate several control variables in the study to provide robustness model as depicted on the second equation as follows:

 $F\_Score_{it} = \beta_0 + \beta_1 CEO\_Duality_{it} + \beta_2 Board\_Independence_{it} + \beta_3 Ln Board\_Remuneration_{it} + \beta_4 Control variables_{it} + \mathcal{E}_{it}$ 

(2) IV. RESULT AND DISCUSSION

There are four subsections on the result and discussion. The first subsection delineate the descriptive statistics. The second subsection encompasses the heteroscedasticity test, followed by the results of the panel data analysis in the third subsection. The fourth subsection is the result of Python Sentiment Analysis.

#### A. Descriptive Statistics

Table II below tabulates the descriptive statistics for the variables that we used for  $F\_Score$ , independent variables, and control variables. The mean (median) for  $F\_Score$  is 6.062 (0.198), showing that 6% of the samples have tendency to fraud. Whereas the result of mean (median) for *CEO duality* is 0.115 (0.000), it indicates that only 11.5% samples have CEO who also occupies the chair position of the board of directors. 24.3% of independent boards found on the samples as indicated by the mean (median) result which are 0.243 (0.250). The mean (median) for LnBoard remuneration is 23.081(23.159), whereas the mean (median) for variables of financial information; *Leverage, MTB*, LnProfit, and LnSize are 0.010 (0.106), 3236.3 (1014.2), 18.198 (18.461), and 22.480 (21.541), respectively.

TABLE II.	DESCRIPTIVE STATISTICS

	Mean	Media	Maximu	Minimu	Std.
		n	т	m	dev
F_Score	6.062	0.198	269.712	4.600	31.35
					2
CEO Duality	0.115	0.000	1.000	0.000	0.320
Board					
Independenc	0.243	0.250	0.600	0.083	0.089
е					
LnBoard					
Remuneratio	23.08	23.159	25.692	20.334	1.275
п	1				
Leverage	0.010	0.106	107.277	-191.395	9.869
MTB	3236.	1014.2	82444.4	-60983.1	1264.
	3				4
LnProfit	18.19	18.461	23.223	11.004	2.424
	8				
LnSize	22.48	21.541	31.231	17.568	3.448
	0				

#### B. Heteroscedasticity Test

TA

We observe whether the variables used in the study have serial correlation.

BLE III.	BREUSCH-PAGAN	LM TEST
	BILLEOBOIL FIGURE	

Variable	LM Test		
	Statistics	p-value	
F_Score	0.118	0.905	**
CEO Duality	-0.673	0.500	**
Board Independence	3.021	0.509	**
LnBoard Remuneration	0.074	0.940	**
Leverage	0.118	0.905	**
MTB	-0.022	0.982	**
LnProfit	-0.132	0.894	**
LnSize	0.041	0.967	**

Note: \*\* denotes significance at the 5% level.

(1)

Breusch-Pagan LM is tested to examine the presence of heteroscedasticity in a regression model. In our study, the residuals are homoscedastic as indicated by the result of Breusch Godfrey test (*p*-value > 0.05) on Table III, that makes the model fit.

#### C. Panel Data Analysis

Table IV tabulates the panel data results. CEO duality and LnBoard remuneration significantly led to fraudulent reporting as indicated by the probability value less than 0.05. Firms with CEO duality, on average, exhibits 0.954 F\_Score in model 1 and 0.925 in model 2. This indicates that there is positive relationship between CEO duality and fraudulent financial reporting. This result is consistent with [22] supports the arguments in the empirical research in terms of the power and autonomy connected with CEO duality [23]. This result supports a study of [17]. CEO duality with board options resulted in the greatest likelihood of fraud. CEO duality has greater freedom to pursue course of actions for satisfying personal goals and produce a greater likelihood of fraudulent financial reporting. In addition, if board remuneration is increased by one percent, it expects F\_Score to reduce 0.002 as indicated by the panel data results in both model 1 and model 2, nothing a negative relationship between board remuneration and fraudulent financial reporting. Maximizing remuneration of board members both process and mechanism can likely reduce the fraud actions. However, Board independence is not able to affect the reporting fraudulence significantly since the probability value is more than 0.05, This result is inconsistent with [24]. Fraudulent financial reporting is not depended by the independent board, even though 24.3% of the samples have independent directors in the boardroom.

For control variables, *Leverage* has significant positive relationship with the fraudulent financial reporting. The result is consistent with [15], indicating that *Leverage* is sensitive financial information which is associated with regulatory investigations. In addition, *MTB*, Ln*Profit*, and Ln*Size* have significant impact on the fraudulent financial reporting. The result of Ln*Size* is consistent with [25].

Variable	Model 1		Model 2	
Dependent variable	F_Score		F_Score	
CEO Duality	0.000	*	0.000	*
	0.954		0.925	
Board Independence	0.689		0.695	
	-0.084		-0.087	
LnBoard Remuneration	0.000	*	0.000	*
	-0.221		-0.221	
Leverage			0.000	*
			0.399	

N
N

MTB		0.000	*	
		0.356		a de la compañía de la
Ln <i>Profit</i>		0.000	*	14 - 2 14 - 2
		-0.627		
LnSize		0.000	*	
		-0.735		
Period fixed	Yes	Yes		
Adjusted R-squared	0.003	0.005		
Prob. (F-statistics)	*	*	3	X

Note: \* denotes significance at the 1% level.

### D. Python Sentiment Analysis

Sentiment Analysis can be classified into two strands: First, Machine Learning based approach and second is Lexicon based approach. Lexicon based approach exploits sentiment dictionary with opinion words and match them with data to determine polarity. Sentiment values are designated to words that present the positive, negative, and neutral attitude of the speaker. The result would give output of 0 (zero) if the article content is neutral, -1 (negative 1) if the article contains many negative meaning vocabularies such as decrease, decline, terrible, et cetera (negative sentiment), and +1 (positive 1) if the article contains positive sentiment.

Figure 1 demonstrates the process of Python Sentiment Analysis diagram in this study, followed by Figure 2 which shows the process of applying classification of algorithm on Python.





Fig. 1. Python sentiment analysis process diagram.



sample have -1 (negative 1). The article contains many negative meaning vocabularies, such as decrease, decline, terrible, etc., (negative sentiment). This result confirms the significant measurement of F\_Score in examining fraudulent financial reporting. We describe the finding in table V below.

		Result
Company	Criteria	Python Sentiment Analysis
Company 1	Misstatement	-1 (Fraudulent)
Company 2	Misstatement	-1 (Fraudulent)
Company 3	Misstatement	-1 (Fraudulent)
Company 4	Misstatement	-1 (Fraudulent)
Company 5	Misstatement	-1 (Fraudulent)
Company 6	Misstatement	-1 (Fraudulent)
Company 7	Misstatement	-1 (Fraudulent)
Company 8	Misstatement	-1 (Fraudulent)
Company 9	Misstatement	-1 (Fraudulent)
Company 10	Misstatement	-1 (Fraudulent)
Company 11	Misstatement	-1 (Fraudulent)
Company 12	Misstatement	-1 (Fraudulent)
Company 13	Misstatement	-1 (Fraudulent)
Company 14	Misstatement	-1 (Fraudulent)
Company 15	Misstatement	-1 (Fraudulent)
Company 16	Misstatement	-1 (Fraudulent)
Company 17	Misstatement	-1 (Fraudulent)
Company 18	Misstatement	-1 (Fraudulent)
Company 19	Misstatement	-1 (Fraudulent)
Company 20	Misstatement	-1 (Fraudulent)
Company 21	Misstatement	-1 (Fraudulent)
Company 22	Misstatement	-1 (Fraudulent)
Company 23	Misstatement	-1 (Fraudulent)
Company 24	Misstatement	-1 (Fraudulent)
Company 25	Misstatement	-1 (Fraudulent)
Company 26	Misstatement	-1 (Fraudulent)
Company 27	Misstatement	-1 (Fraudulent)
Company 28	Misstatement	-1 (Fraudulent)
Company 29	Misstatement	-1 (Fraudulent)
Company 30	Misstatement	-1 (Fraudulent)
Company 31	Misstatement	-1 (Fraudulent)
Company 32	Misstatement	-1 (Fraudulent)

TABLE V. PYTHON SENTIMENT ANALYSIS RESULTS

Fig. 2. Classification of algorithm on Python.

As we detected fraudulent financial reporting using  $F\_Score$  model, we found that there are 33 companies (6% of overall samples) have  $F\_Score > 1$ . We then analyzed the sample using Python Sentiment Analysis. The results of sentiment analysis from news articles, show that all observed



# **GTBMC 2022**

Global Technology and Business Management Conference

Company	Result	
	Criteria	Python Sentiment Analysis
Company 33	Misstatement	-1 (Fraudulent)

#### V. CONCLUSION

The fraudulent financial reporting has posed devastating damages of the sustainable development of business organizations. As a result, fraudulent financial reporting has become an emerging topic for business practitioners and academic researchers. There has been much research on fraudulent financial reporting and the association with corporate governance. In this study, we examine the relationship between corporate governance attributes (focus on board characteristics: *CEO duality, Board independence*, and *Board remuneration*) and fraudulent financial reporting measured by  $F_Score$ . Due to the advancement of data analytics, we also examine fraudulent financial reporting by using Python Sentiment Analysis. Pythonic accounting provides the sentiment analysis on the "news" related to the fraud.

Our results show that *CEO duality* and *Board remuneration* significantly led to fraudulent reporting. In contrast, *Board independence* is not able to affect the reporting fraudulence. However, all control variables (*Leverage, MTB,* Ln*Profit, and* Ln*Size*) effect significantly on fraudulent financial reporting. In respect to Pythonic Sentiment Analysis, we find that all observed samples have -1 (negative 1), noting that the article contains many negative meaning vocabularies such as decrease, decline, terrible, etc., (negative sentiment). This result confirms the significant measurement of *F\_Score* in examining the fraudulent financial reporting.

This study is devoted to regulators in enhancing good corporate governance, despite the challenges, as the implementation has not been optimal. Indonesian regulators are encouraged to provide the sound basis of corporate governance regulations to particularly reduce fraudulent financial reporting. More importantly, developing a strong ground of corporate governance mechanism can prevent fraudulent financial reporting and sustain confidence in the stock market and economy. For investors are also suggested to put greater emphasis on corporate governance indicators before investing.

This study has limitation such as small size of samples, used only *CEO duality, Board independence,* and *Board remuneration* to articulate board characteristic,  $F\_Score$ , and Python Sentiment Analysis. The future research is expected to include other board characteristics such as board gender diversity, board directors' expertise, etc., and exploit other model to detect fraudulent financial reporting. Also, using other data analytical tools to measure fraud is suggested.

#### ACKNOWLEDGMENT

The authors acknowledge that School of Management supported rigorous and extensive research at Mae Fah Luang University.

#### REFERENCES

- J. Sarkar, S. Sarkar, and K. Sen, "Board of directors and opportunistic earnings management: Evidence from India," J. Account. Audit. Finance, vol. 23, no. 4, pp. 517-551, Oct. 2008.
- [2] A. Klein, "Audit committee, board of director characteristics, and earnings management,' J. Account. Econ., vol. 33, No. 3, pp. 375-400, Aug. 2002.
- [3] S. Young, "The increasing use of non-executive directors: its impact on UK board structure and corporate arrangements," J. Bus. Finance Account., vol. 27, no. (9-10), pp. 1311-1342, Mar. 2003.
- [4] L. P. Kalbers, "Fraudulent financial reporting, corporate governance and ethics: 1987 - 2007," *Rev. Account. Finance*, vol. 8, no. 2, pp. 187-209, May 2009.
- [5] M. S. Beasley, "An empirical analysis of the relation between the board of director composition and financial statement fraud," *Account. Rev.*, vol. 71, no. 4, pp. 307-340, Oct. 1996.
- [6] O. S. Persons, "The relation between the new corporate governance rules and the likelihood of financial statement fraud," *Rev. Account. Finance*, vol. 4, no. 2, pp. 125-48, Feb. 2005.
- [7] P. M. Dechow, R. G. Sloan, and A. P. Sweeney, "Causes and consequences of earnings manipulation: an analysis of firms subject to enforcement actions by the SEC," Contemporary Accounting Research, vol. 13(1), pp. 1-36, 1996.
- [8] P. M. Dechow, R. G. Sloan, and A. P. Sweeney, "Causes and consequences of earnings manipulation: an analysis of firms subject to enforcement actions by the SEC," *Contemp. Account. Res.*, vol. 13, no. 1, pp. 1-36, 1996.
- [9] I. U. Widyaningsih, A. Gunardi, M. Rossi, and R. Rahmawati, R. (). Expropriation by the controlling shareholders on firm value in the context of Indonesia: corporate governance as moderating variable. International," Journal of Managerial and Financial Accounting, vol. 9(4), pp. 322–337, 2017.
- [10] F. A. Gul and S. Leung, "Board Leadership, outside directors' expertise and voluntary corporate disclosures," *J. Account. Public Policy*, vol. 23, no. 5, pp. 351–379, 2004.
- [11] J. P. Fan, T. J. Wong, and T. Zhang, "Politically connected CEOs, corporate governance, and post-IPO performance of China's newly partially privatized firms," *J. financ. econ.*, vol. 84, no. 2, pp. 330-357, May 2007.
- [12] R. M. Bushman and A. J. Smith, "Financial accounting information and corporate governance," J. Account. Econ., vol. 32, no. 1-3, pp. 237-333, Dec. 2001.
- [13] P. M. Healy and J. M. Wahlen, "A review of the earnings management literature and its implications for standard setting," *Account. Horiz.*, vol. 13, no. 4, pp. 365-383, Dec. 1999.
- [14] S. Fagernas, "How do family ties, boards and regulation affect pay at the top? evidence for Indian CEOs," Centre for Business Research, University of Cambridge, Working Paper, 2007.
- [15] C. P. Chandrasekhar, and J. Ghosh, "New features of the stock market surge," *The Hindu Business Line*, Dec. 20, 2005.
- [16] Z. Rezaee, "Causes, consequences, and deterence of financial statement fraud," *Crit. Perspect. Account.*, vol. 16, no. 3, pp. 277-298, Apr. 2005.
- [17] T. R. Robinson, H. Van Greuning, E. Henry, and M. A. Broihah, Financial analysis techniques, International Financial Statement Analysis (CFA Institute Investment Series), Hoboken, NJ: John Wiley and Sons, Inc., 2008.
- [18] R. Kassem, and M. Hegazy, "Fraudulent financial reporting: do red flags really helps?," J. Econ. Eng., vol. 4, pp. 69-79, Jun. 2010.

# **GTBMC 2022** Global Technology and Business Management Conference

- [19] B. Li, J. Yu, J. Zhang, and B. Ke, "Detecting accounting frauds in publicly traded U.S. flrms: a machine learning approach", in *Proc. of Machine Learning Research*, 2015, pp. 173-188.
- [20] S. Goel, J. Gangolly, S. R. Faerman, and O. Uzuner, "Can linguistic predictors detect fraudulent financial filings", *Emerg. Technol. Account.*, vol. 7, pp. 25-46, Jan. 2010.
- [21] P. M. Dechow, W. Ge, C. R. Larson, and R. G Sloan, "Predicting material accounting misstatements," *Contemp. Account. Res.*, vol. 28, no. 1, pp. 17-82, Jan. 2001.
- [22] G. Chen, M. Firth, D. N. Gao, and O. M. Rui, "Ownership structure, corporate governance, and fraud: evidence from China," *J. Corp. Finance*, vol.12, no. 3, pp. 424–448, Jun. 2006.
- [23] J. W. Coles and W. S. Hesterly, "Independence of the chairman and board composition: firm choices and shareholder value," *J. Manage.*, vol. 26, pp. 195–214, 2000.
- [24] V. Rostami and L. Rezaei, "Corporate governance and fraudulent financial reporting," J. Financ. Crime, May 2022.
- [25] E. S. S. Alzoubi and M. H. Selamat, "The effectiveness of corporate governance mechanisms on constraining earning management: literature review and proposed framework," *Int. J. Glob. Bus. Compet.*, vol. 5, no. 1, pp. 17-35, Jan. 2012.



