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DETECTING FINANCIAL STATEMENT FRAUD USING THE BENEISH M-SCORE MODEL IN STATE-OWNED COMPANIES INVOLVED IN CRIMINAL ACTS OF CORRUPTION

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Abstract

This research is motivated by the increasing case corruption in state-owned companies and existence indication manipulation report frequent financial become part from practice corrupt. The main goal this research is test whether there is indication manipulation report finance using the Beneish M-Score model on the state-owned companies involved corruption during period 2010-2023. This study uses approach quantitative descriptive with purposive sampling technique, with sample of 9 state-owned companies involved action criminal corruption and applying method analysis ratio Beneish M-Score based on report data finance annual. From 124 observation data study show that a total of 51 data were categorized as a manipulator with 26 data showing indication manipulation report finance during period corruption and 25 data shows indication manipulation report outside finance period corruption, while the remaining 73 data categorized as non-manipulators. These finding indicate that financial statement manipulation was identified in several years that coincided with periods of corruption cases.

Keywords: Analysis Financial Statements; Beneish M-Score; BUMN; Corruption; Financial Statement Fraud

INTRODUCTION

Financial reports are the primary instrument companies use to convey information about their financial condition, performance, and cash flow to external stakeholders such as investors, creditors, regulators, and the public. However, the rise in cases of financial statement fraud, both nationally and internationally, has raised doubts about the credibility of the information presented in these reports (Rachmi et al., 2020). This situation indicates that financial reports do not always reflect the true state of affairs, potentially misleading decision-making.

According to the Association of Certified Fraud Examiners (Association of Certified Fraud Examiners, 2024), organizational fraud, or occupational fraud, is divided into three main categories: corruption, asset misappropriation, and financial statement fraud. According to the Report *to the Nations* published by the ACFE (2024), 1,921 fraud cases from 138 countries were comprehensively analyzed. The report's findings indicate that although financial statement

fraud is the least common type of fraud, it has the greatest financial impact, with an average loss of $766,000 per case. This confirms that financial statement fraud has significant consequences for organizational sustainability.

One sector with a high risk of fraud is State-Owned Enterprises (SOEs). As strategic entities that manage significant public resources and play a vital role in the national economy, SOEs are required to consistently implement Good Corporate Governance (GCG) principles. According to a 2023 report by the Ministry of SOEs, total assets of Indonesian SOEs reached more than IDR 9,800 trillion, contributing IDR 303 trillion to the state budget in 2022. However, SOEs frequently come under scrutiny due to various cases of corruption and abuse of authority. The complexity of organizational structures, political intervention, weak internal oversight, and the low integrity of some officials are factors that increase the opportunity for fraud. This situation not only harms state finances but also undermines public trust in the management of state resources.

Data from the Corruption Eradication Commission (KPK) (2025) shows that during the 2004–2024 period, there was a significant increase in corruption cases in state-owned enterprises (BUMN) and regionally-owned enterprises (BUMD), with 38 cases recorded in 2024 alone. This trend indicates that corruption has become a systemic problem that has not been effectively controlled. Furthermore, various corruption cases in state-owned enterprises (BUMN) also show a close link to financial statement manipulation. For example, the case of PT Garuda Indonesia (2018), which recorded fictitious revenue to display false profits (Nazarah & Saleh, 2021), and PT Waskita Karya and PT Wijaya Karya (2023), which presented false positive cash flows by concealing vendor debts (Kompas, 2023). The case of PT Jiwasraya (2017) also showed financial statements that appeared reasonable but concealed problematic investments (Kumparan, 2020). This phenomenon shows that financial statement manipulation is often part of broader and more organized corruption practices.

Theoretically, (Mauro, 1995) stated that corruption can undermine institutional integrity, including the quality of financial reporting. This is reinforced by (Everett et al., 2007), who stated that accounting is often used as a tool to conceal corrupt practices. In the context of state-owned enterprises (SOEs), Haniffa and Cooke (2005) also found that state-owned enterprises tend to have lower levels of transparency than private companies due to conflicts of interest and political interference.

To detect indications of financial statement manipulation, one method that can be used is the Beneish M-Score (Beneish, 1999). This model uses eight financial ratios—DSRI, GMI, AQI, SGI, DEPI, SGAI, LVGI, and TATA—to identify potential earnings manipulation. Research by (Marfuah & Ardiami, 2018) shows that this model is effective in detecting financial statement fraud in various sectors.

However, previous research still shows inconsistencies. (Fitriani et al., 2021) found that most SOEs were classified as non-manipulative, while (Husein dkk., 2023) stated that all SOEs engaged in manipulation, although not consistently every year. These discrepancies were also found in other sectors, such as research by (Widowati & Oktoriza, 2021) and (Raharja & Pamungkas, 2025). This uncertainty highlights the need for further research, particularly on SOEs suspected of corruption.

Based on this phenomenon, this study was conducted to analyze whether state-owned enterprises involved in corruption are also indicated to have committed financial statement fraud through an analysis of financial reports for the period 2010–2023. This research is expected to provide empirical evidence and strengthen the urgency of monitoring and improving financial governance within state-owned enterprises.

Research Purposes

This study aims to analyze and test the indications of financial report manipulation using the Beneish M-Score model in state-owned companies involved in criminal acts of corruption.

LITERATURE REVIEW

Financial Statement Fraud

Financial statement fraud is a form of fraud committed through the manipulation of accounting information to mislead users of financial statements and create a misrepresentation of a company's performance. This practice can include the recognition of fictitious revenue, the manipulation of assets and liabilities, and the concealment of certain liabilities. Literature reviews have identified this fraud as a serious threat to the quality of financial reporting because it directly impacts economic decision-making by investors and creditors. (Mintara & Hapsari, 2021) state that financial statement fraud not only causes material losses but also damages the company's reputation and integrity as a whole. Furthermore, theoretical approaches such as the fraud triangle emphasize that pressure, opportunity, and rationalization are the primary factors driving fraud (Sari & Rofi, 2020).

Empirical research shows that financial statement fraud can be detected using quantitative approaches such as the Beneish M-Score. (Indriani & Rohman, 2022) found that companies with high levels of pressure tend to have higher M-Scores, indicating potential financial statement manipulation. This finding is supported by (Boermawan & Arfianti, 2022) and Rachmi et al. (2020), who demonstrated that the model is capable of identifying fraud in companies listed on the Indonesia Stock Exchange. Therefore, financial statement fraud is a complex phenomenon that requires reliable detection tools to minimize the risk of audit failure and increase the transparency of financial reporting.

State-Owned Enterprises (BUMN)

State-Owned Enterprises (SOEs) are business entities whose ownership is partially or entirely held by the state through separate capital participation. In the literature, SOEs are often categorized as *hybrid organizations* because they combine commercial and social functions (Indrawati, 2020). This makes SOEs not only profit-oriented but also responsible for public services and national economic development. This strategic role makes SOEs a crucial instrument in maintaining economic stability, particularly in vital sectors such as energy, finance, and infrastructure (Ferdiana & Sugiyarto, 2022).

However, these characteristics also pose challenges in terms of governance and transparency. SOEs often face political interference, conflicts of interest, and organizational complexity, which can increase the risk of fraud, including financial statement manipulation. Research by (Husein dkk., 2023) shows that SOEs listed on the capital market still have the potential to commit irregularities, as reflected in anomalous patterns in certain financial indicators. Therefore, strengthening the supervisory system and implementing Good Corporate Governance (GCG) principles is crucial to maintaining the accountability and integrity of SOE financial management.

Beneish M-Score

The Beneish M-Score is a statistical model developed by (Beneish, 1999) to detect potential financial statement manipulation through the analysis of eight financial ratios. This model is designed to distinguish between manipulating and non-manipulating companies based on patterns of changes in financial statement components such as sales, assets, and profits. Indriani & Rohman (2022) stated that the Beneish M-Score is effective in identifying potential fraud, especially in companies facing high performance pressure. This finding is supported by

(Boermawan & Arfianti, 2022), who found that changes in profit margins and increased leverage contribute to high M-Score values.

Over time, the Beneish M-Score has proven superior to other fraud detection methods. (Pertiwi et al., 2023) and Patmawati & Rahmawati (2023) demonstrated that this model has higher sensitivity than the Altman Z-Score and Springate. Furthermore, (Suheni & Arif, 2020) emphasized that the M-Score can be used as an early detection tool by investors, even in companies that receive an unqualified audit opinion. Therefore, the Beneish M-Score is a relevant and effective tool for systematically identifying indications of financial statement fraud.

RESEARCH METHODOLOGY

This study uses a descriptive quantitative approach with the aim of analyzing indications of financial report manipulation in State-Owned Enterprises (BUMN) involved in corruption. The data used are secondary data collected through documentation methods, in the form of annual financial reports obtained from the company's official website and other trusted sources. The study population includes all BUMN companies in Indonesia, while the sample was determined using a purposive sampling technique based on certain criteria, namely BUMN companies listed in the official report of the Supreme Audit Agency (BPK), proven to be involved in corruption cases based on data from the High Prosecutor's Office or the Corruption Eradication Commission (KPK) during the 2010–2023 period, and have complete annual financial reports containing the quantitative data required for the Beneish M-Score calculation. The 2010–2023 study period was chosen because it provides an adequate observation span to identify indications of financial statement manipulation before, during, and after the occurrence of corruption cases, while also taking into account the availability and comparability of the data required for the Beneish M-Score calculation. Based on the sample selection process, 9 companies were selected as the research sample, comprising a total of 126 observations. However, the annual financial statements for the 2010–2023 period were not fully complete for one of the companies. Consequently, two data observations could not be used in the analysis, resulting in a final sample size of 124 data observations for this study.

The identification of corruption cases in the sample companies during the study period is presented in Table 1. below.

Table 1
Company Corruption Case

Company	Corruption Case	Period of Corruption	Basis/ Source
PT Aneka Tambang Tbk	Corruption cases involving the management of gold.	2010-2022	Kejaksaan
PT ASDP Indonesia Ferry	Corruption cases related to business partnerships and the acquisition of PT Jembatan Nusantara (JN).	2019–2022	KPK
PT Bukit Asam Tbk	Corruption cases related to the management of pension funds.	2013–2018	Kejaksaan
PT Garuda Indonesia Tbk	Corruption cases related to aircraft procurement.	2008–2013	KPK
PT Indofarma Tbk	Corruption cases related to corporate financial management.	2020-2023	Kejaksaan
PT Pertamina	Corruption cases related to the procurement of Liquefied Natural Gas (LNG) and the management of crude oil.	2011-2021 & 2018-2023	KPK & Kejaksaan,
PT Telkom Indonesia Tbk	Corruption cases related to fictitious projects.	2016–2018	Kejaksaaan
PT Timah Tbk	Corruption cases related to the management of the tin commodity trade.	2015-2022	Kejaksaan

PT Waskita Karya Tbk	Corruption cases related to the construction of Light Rail Transit (LRT) infrastructure in South Sumatra Province.	2016-2022	Kejaksaan

Source: Processed data, 2025

Data analysis was carried out using the Beneish M-Score model (Beneish, 1999). There are eight ratios used in calculating the Beneish (1999) M-Score. The formulas for these ratios are as follows:

a) DSRI (*Days Sales in Receivables Index*)

$$\text{DSRI} = \frac{Piutang\ Usaha(t)/penjualan(t)}{Piutang\ Usaha(t-1)/Penjualan(t-1)}$$

b) GMI (*Gross Margin Index*)

$$\text{GMI} = \frac{Laba\ Kotor(t-1)/penjualan(t-1)}{Laba\ Kotor(t)/Penjualan(t)}$$

c) AQI (*Asset Quality Index*)

$$\text{AQI} = \frac{1-((Aset\ Lancar(t) + Aset\ Tetap(t))/Total\ Aset(t))}{1-((Aset\ Lancar(t-1) + Aset\ Tetap(t-1))/Total\ Aset(t-1))}$$

d) SGI (*Sales growth index*)

$$\text{SGI} = \frac{Penjualan(t)}{Penjualan(t-1)}$$

e) DEPI (*Depreciation Index*)

$$\text{DEPI} = \frac{\frac{Depresiasi(t-1)}{Depresiasi(t-1) + Aset\ Tetap(t-1)}}{\frac{Depresiasi(t)}{Depresiasi(t) + Aset\ Tetap(t)}}$$

f) SGAI (*Sales, General and Administrative Expenses Index*)

$$\text{SGAI} = \frac{\frac{SGA(t)}{Penjualan(t)}}{\frac{SGA(t-1)}{Penjualan(t-1)}}$$

g) LVGI (*Leverage Index*)

$$\text{LVGI} = \frac{\frac{Total\ Liabilitas(t)}{Total\ Aset(t)}}{\frac{Total\ Liabilitas(t-1)}{Total\ Aset(t-1)}}$$

h) TATA (*Total Accruals to Total Assets*)

$$\text{TATA} = \frac{Laba\ Usaha(t) - Arus\ Kas\ dari\ Aktivitas\ Operasi(t)}{Total\ Aset(t)}$$

Information:
t = financial reporting year
t-1 = financial reporting year minus 1

Next, each ratio is analyzed by comparing it to relevant indicators, using the following index-based parameters:

Table 2
Index Ratios

Index	Manipulator	*Grey Company*	Non-Manipulator
DSRI	≥1.465	1.031<Indeks<1.465	≤ 1.031
GMI	≥1.193	1.014<Indeks<1.193	≤ 1.014
AQI	≥1.254	1.039<Indeks<1.254	≤ 1.039
SGI	≥1.607	1.034<Indeks<1.607	≤ 1.134
DEPI	≥1.077	1.001<Indeks<1.077	≤ 1.001
SGAI	≥1.041	1.001<Indeks<1.041	≤ 1.001
LVGI	≥1.111	1.037<Indeks<1.111	≤ 1.037
TATA	≥0.031	0.018<Indeks<0.031	≤ 0.018

The calculated values for each ratio are plugged into the Beneish M-Score formula or equation, as follows:

M-Score = -4.84 + (0.92 × DSRI) + (0.528 × GMI) + (0.404 × AQI) + (0.892 × SGI) + (0.115 × DEPI) + (-0.172 × SGAI) + (4.679 × TATA) + (-0.327 × LVGI)

Value:

a. If the M-Score is ≥ -2.22, the company is suspected of financial statement fraud or manipulation.
b. If the M-Score is -2.22, the company is in an ambiguous position, falling between a manipulator and a non-manipulator. This indicates a possibility of fraud, but it is not significant or remains within the grey area (grey company).
c. If the M-Score is ≤ -2.22, then the company shows no indication of financial statement fraud and is a non-manipulator.

RESULTS AND ANALYSIS

The data analysis in this study aims to obtain the Beneish M-Score as an early detection tool for indications of financial report manipulation in state-owned enterprises suspected of corruption. The analysis was conducted by calculating the value of each ratio that forms the Beneish M-Score model and then calculating it into the Beneish M-Score equation.

a. DSRI (*Days Sales in Receivables Index*)

Table 3
DSRI Ratio Values

No.	Company	DSRI													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	PT Aneka Tambang Tbk	1.924	0.667	1.367	0.619	1.111	0.375	2.153	0.838	0.477	0.837	1.603	0.767	1.060	0.668
2	PT ASDP Indonesia Ferry	-	-	1.692	0.476	0.888	0.737	2.119	1.009	1.671	1.199	0.833	0.654	0.791	0.972
3	PT Bukit Asama Tbk	0.756	0.885	1.195	0.955	0.864	1.056	1.399	1.689	0.479	0.867	0.800	1.162	0.777	1.199
4	PT Garuda Indonesia Tbk	1.075	0.913	0.637	1.010	0.814	1.039	1.554	1.108	1.725	0.577	1.360	0.954	0.691	0.960
5	PT Indofarma Tbk	0.792	1.048	1.624	0.989	0.696	0.851	1.061	0.862	0.967	1.514	2.012	0.401	1.157	0.788
6	PT Pertamina	0.643	1.173	0.998	1.039	0.851	1.245	1.159	0.782	1.028	1.132	1.353	0.845	0.640	1.185
7	PT Telkom Indonesia Tbk	1.130	1.080	0.991	1.073	0.992	1.018	0.863	1.136	1.214	0.997	0.955	0.715	0.986	1.220
8	PT Timah Tbk	1.702	0.556	1.042	2.997	1.094	0.328	1.820	1.361	1.114	0.470	0.938	1.627	0.615	1.214
9	PT Waskita Karya Tbk	1.072	1.315	1.244	1.062	1.270	1.466	0.286	0.440	1.866	1.467	2.412	0.870	0.513	1.235

Source: Processed data, 2025

Based on Table 3. and the classification criteria, 20 data observations have DSRI values ≥ 1.465 and are classified as manipulators. The highest DSRI value is observed at PT Timah Tbk in 2013, reaching 2.997. This value indicates a substantial increase in receivables relative to sales compared with the previous period and therefore represents a potential signal of revenue manipulation. In addition, 40 data observations have DSRI values between 1.032-1.464 and are classified as grey companies, indicating a relatively increased proportion of receivables to sales but not exceeding the manipulation threshold. The remaining 64 data observations have DSRI values ≤ 1.031 and are classified as non-manipulators, suggesting relatively normal movements in receivables compared with sales.

b. GMI (*Gross Margin Index*)

Table 4
GMI Ratio Value

No.	Company	GMI													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	PT Aneka Tambang Tbk	0.409	1.183	1.467	1.353	1.735	4.448	0.198	0.720	0.943	1.013	0.831	0.989	0.925	1.162
2	PT ASDP Indonesia Ferry	-	-	1.055	1.116	1.035	1.028	1.036	0.962	0.953	0.936	1.157	0.826	0.844	0.980
3	PT Bukit Asama Tbk	1.173	0.925	1.137	1.420	1.005	1.020	0.963	0.717	1.082	1.156	1.325	0.572	1.094	1.771
4	PT Garuda Indonesia Tbk	-14.955	-0.092	0.769	3.186	-0.150	-2.295	1.725	-1.406	-0.791	0.717	-0.022	0.498	-1.433	8.910
5	PT Indofarma Tbk	0.891	0.923	1.034	1.261	1.116	1.111	1.012	1.160	0.972	0.969	0.789	1.500	-1.617	0.320
6	PT Pertamina	1.318	0.964	1.103	0.993	1.024	0.672	0.611	1.339	1.099	1.076	0.883	1.211	0.869	0.971
7	PT Telkom Indonesia Tbk	1.027	1.074	0.916	0.993	1.025	1.035	0.939	0.984	1.153	0.950	0.981	0.960	1.236	0.903
8	PT Timah Tbk	0.648	1.023	1.332	0.686	1.138	2.173	0.635	0.949	1.090	2.581	0.799	0.313	1.164	3.638
9	PT Waskita Karya Tbk	1.074	1.058	1.009	0.896	0.823	0.930	0.819	0.797	1.152	1.017	-1.462	-0.787	1.640	1.218

Source: Processed data, 2025

Based on Table 4. and the classification criteria, 23 data observations have GMI values ≥ 1.193, indicating a decrease in gross profit margin compared with the previous period and therefore a potential signal of financial statement manipulation. The highest GMI value is recorded by PT Aneka Tambang Tbk in 2015 at 4.448, followed by PT Timah Tbk in 2023 at 3.638 and PT Garuda Indonesia Tbk in 2013 at 3.186, indicating substantial deterioration in gross profit margin relative to the preceding period. Furthermore, 34 data observations fall within the grey category, with GMI values ranging from 1.015-1.192, indicating a moderate increase in the GMI that does not reach the manipulation threshold but may still warrant further attention. Meanwhile, 67 data observations have GMI values ≤ 1.014 and are classified as non-manipulators, indicating that the gross profit margin did not experience an increase in the GMI beyond the specified threshold.

c. AQI (*Asset Quality Index*)

Table 5
AQI Ratio Values

No.	Company	SGI													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	PT Aneka Tambang Tbk	0.884	1.428	1.833	0.985	0.859	0.709	0.947	1.081	0.609	0.864	1.125	0.962	1.238	0.947
2	PT ASDP Indonesia Ferry	-	-	236.604	2.058	1.008	0.464	1.125	0.851	0.013	19.306	7.435	0.930	1.067	1.926
3	PT Bukit Asama Tbk	1.159	0.989	1.294	1.210	1.122	0.956	1.013	0.953	1.146	1.124	1.189	0.816	1.039	1.407
4	PT Garuda Indonesia Tbk	1.071	1.126	1.254	1.001	1.024	0.983	1.016	1.132	0.950	1.032	0.163	1.798	0.971	0.973
5	PT Indofarma Tbk	1.177	0.792	1.030	0.994	0.945	0.771	1.694	0.984	0.742	1.144	1.146	1.005	2.026	1.480
6	PT Pertamina	0.952	0.976	0.977	1.219	1.213	1.172	0.948	1.035	0.979	1.030	1.000	0.940	0.884	0.997
7	PT Telkom Indonesia Tbk	0.978	1.285	0.852	1.113	1.379	1.002	1.106	1.078	0.913	1.066	1.572	1.147	0.927	1.038
8	PT Timah Tbk	0.821	0.923	1.142	1.094	1.509	1.431	1.260	0.930	0.919	1.169	1.425	0.834	1.154	1.082
9	PT Waskita Karya Tbk	0.680	1.438	0.644	1.673	1.654	3.056	1.018	1.202	0.972	1.309	1.167	0.869	1.113	1.189

Source: Processed data, 2025

Based on Table 5. and the classification criteria, 25 data observations have AQI values ≥ 1.254 and are classified as manipulators. The highest AQI value is observed at PT ASDP Indonesia Ferry in 2012 at 236.6, 2019 at 19.306 and 2020 at 7.432, indicating that the company capitalizes operating expenses into fixed assets to make profits appear higher. Furthermore, 36 data observations fall within the grey category, with a DSRI value of 1.040-1.253 are in the category of being prone to manipulation because they indicate changes in assets that need to be watched out for. Meanwhile, the other 63 data observations have an AQI value ≤ 1.039,

indicating an increase in productive assets that are used efficiently to support operational activities, indicating good asset performance and governance.

d. SGI (*Sales growth index*)

Table 6
SGI Ratio Value

No.	Company	SGI													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	PT Aneka Tambang Tbk	1.004	1.183	1.010	1.081	0.834	1.118	0.865	1.390	1.995	1.296	0.837	1.405	1.195	0.894
2	PT ASDP Indonesia Ferry	-	-	1.208	1.193	1.149	1.211	0.992	1.129	1.073	1.116	0.974	1.146	1.239	0.981
3	PT Bukit Asama Tbk	0.884	1.338	1.096	0.967	1.167	1.050	1.024	1.385	1.087	1.029	0.795	1.689	1.458	0.902
4	PT Garuda Indonesia Tbk	1.094	1.391	1.278	1.070	1.059	0.970	1.013	1.081	1.515	0.913	0.364	0.906	1.734	1.368
5	PT Indofarma Tbk	0.931	1.148	0.961	1.157	1.033	1.174	1.033	0.974	0.976	0.853	1.262	1.692	0.394	0.458
6	PT Pertamina	1.158	1.346	1.203	1.253	0.994	0.676	0.874	1.177	1.349	0.942	0.760	1.387	1.722	0.893
7	PT Telkom Indonesia Tbk	1.014	1.048	1.073	1.075	1.081	1.142	1.135	1.102	1.020	1.037	1.007	1.049	1.029	1.013
8	PT Timah Tbk	1.082	1.049	0.894	0.748	1.260	0.933	1.014	1.323	1.199	1.747	0.788	0.960	0.856	0.671
9	PT Waskita Karya Tbk	1.303	1.243	1.211	1.100	1.062	1.376	1.681	1.901	1.079	0.643	0.516	0.755	1.252	0.716

Source: Processed data, 2025

Based on Table 6. and the classification criteria, 8 data observations have SGI values ≥ 1.607 and are classified as manipulators. The highest SGI value is observed at PT Aneka Tambang Tbk in 2018 at 1.995, which indicates an increase in sales, but growth that is too fast or inconsistent can actually put pressure on management to maintain this trend, which in turn can increase the risk of manipulation practices. Furthermore, 40 data observations fall within the grey category, with a SGI value of 1.135-1.606 are in the category prone to manipulation because they describe a growth pattern that needs to be watched out for. Meanwhile, 76 other data observations have SGI values ≤ 1.134, indicating a decrease in sales compared to the previous year.

e. DEPI (*Depreciation Index*)

Table 7
DEPI Ratio Value

No.	Company	DEPI													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	PT Aneka Tambang Tbk	0.938	0.891	1.226	1.156	1.076	1.160	0.976	0.986	1.177	0.893	0.914	0.909	0.962	0.931
2	PT ASDP Indonesia Ferry	-	-	1.098	0.895	0.921	1.162	1.048	0.957	1.054	0.943	0.892	0.926	1.019	0.821
3	PT Bukit Asama Tbk	1.365	1.087	1.298	1.287	1.145	1.067	0.943	0.849	0.917	0.948	0.913	0.936	0.894	0.925
4	PT Garuda Indonesia Tbk	0.965	2.022	1.035	1.061	0.931	0.991	1.950	0.936	1.037	0.936	0.920	0.588	0.868	0.966
5	PT Indofarma Tbk	0.946	2.725	0.910	0.991	0.975	0.975	0.988	1.032	0.939	0.759	0.945	0.959	0.957	0.859
6	PT Pertamina	0.983	0.964	0.913	1.026	0.993	1.018	0.911	0.961	0.945	0.964	1.023	1.050	0.989	1.002
7	PT Telkom Indonesia Tbk	0.929	0.967	0.972	1.036	0.983	0.988	1.029	1.050	1.048	0.994	0.987	0.967	0.986	0.998
8	PT Timah Tbk	0.975	0.994	0.995	1.008	0.972	0.986	0.959	1.020	1.042	1.011	0.941	0.970	1.046	0.927
9	PT Waskita Karya Tbk	0.994	1.044	1.113	1.186	1.181	1.702	1.107	0.800	0.963	0.926	0.757	0.769	0.888	0.837

Source: Processed data, 2025

Based on Table 7. and the classification criteria, 19 data observations have DEPI values ≥ 1. 077 and are classified as manipulators. The highest DEPI value is observed at PT Indofarma Tbk in 2011 at 2.725 and PT Garuda Indonesia Tbk 2011 at 2.022, indicating that the depreciation rate has decreased compared to the previous year, which could be an indication of efforts to extend the economic life of assets or change the depreciation method to reduce

depreciation expenses and beautify net income. Furthermore, 24 data observations fall within the grey category, with a DEPI value of 1.135-1.606 are in the category prone to manipulation because they reflect changes in depreciation that need to be watched out for. Meanwhile, 81 other data observations have a DEPI value ≤1.001, indicating an increase in depreciation expenses that tend to reflect more conservative and transparent accounting practices.

f. SGAI (*Sales, General and Administrative Expenses Index*)

Table 8
SGAI Ratio Value

No.	Company	SGAI													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	PT Aneka Tambang Tbk	1.571	0.900	1.118	0.994	1.029	0.839	1.088	0.890	0.780	1.659	0.837	1.055	0.987	0.969
2	PT ASDP Indonesia Ferry	-	-	0.884	0.991	1.005	0.985	1.022	0.963	1.174	1.063	1.010	0.910	1.000	1.321
3	PT Bukit Asama Tbk	1.175	0.895	0.973	0.984	0.901	0.972	1.024	0.897	1.064	1.033	0.970	0.998	0.638	0.859
4	PT Garuda Indonesia Tbk	0.991	0.937	1.021	0.976	1.024	0.917	0.992	1.015	0.884	1.039	2.479	0.668	0.764	0.657
5	PT Indofarma Tbk	1.087	1.011	0.956	1.090	0.744	0.842	1.054	0.958	1.045	0.964	0.928	0.667	2.298	1.799
6	PT Pertamina	0.629	0.646	1.168	0.992	1.005	1.608	1.311	0.994	0.802	1.135	1.181	0.758	0.903	1.131
7	PT Telkom Indonesia Tbk	0.981	1.216	0.920	1.092	0.906	0.928	1.030	1.092	0.964	0.971	0.953	0.825	1.100	0.972
8	PT Timah Tbk	1.228	0.996	1.123	1.282	0.870	0.963	0.974	1.006	0.977	0.745	0.945	1.380	1.097	1.317
9	PT Waskita Karya Tbk	0.886	0.949	0.987	1.086	1.192	0.874	0.906	1.404	0.735	1.278	2.406	1.794	0.851	1.056

Source: Processed data, 2025

Based on Table 8. and the classification criteria, 40 data observations have SGAI values ≥ 1.041 and are classified as manipulators. The highest DEPI value is observed at PT Garuda Indonesia Tbk in 2020 at 2.479, followed by PT Waskita Karya Tbk in 2020 at 2.406 and PT Indofarma Tbk in 2022 at 2.298, which indicates an increase in the proportion of operating expenses to sales, which may indicate a decrease in operational efficiency or pressure on company performance. Furthermore, 14 data observations fall within the grey category, with a SGAI value of 1.002-1.040 are in the category prone to manipulation because they reflect an increase in SGA expenses that need to be watched out for. Meanwhile, the other 70 data observations have an SGAI value ≤ 1.001, indicating an increase in operational efficiency.

g. LVGI (*Leverage Index*)

Table 9
LVGI Ratio Value

No.	Company	SGAI													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	PT Aneka Tambang Tbk	1.252	1.324	1.197	1.189	1.106	0.864	0.973	0.995	1.061	0.981	1.001	0.918	0.804	0.924
2	PT ASDP Indonesia Ferry	-	-	1.519	1.179	0.902	0.594	1.075	1.019	1.754	0.989	1.068	1.012	1.589	0.611
3	PT Bukit Asama Tbk	0.922	1.110	1.143	1.065	1.174	1.086	0.959	0.862	0.878	0.900	1.006	1.111	1.103	1.224
4	PT Garuda Indonesia Tbk	0.954	0.779	0.959	1.116	1.133	1.012	1.024	1.029	1.054	1.059	1.408	1.567	0.674	0.955
5	PT Indofarma Tbk	0.977	0.788	0.999	1.200	0.967	1.167	0.951	1.125	1.000	0.969	1.179	0.998	1.263	2.181
6	PT Pertamina	1.116	1.024	1.012	1.034	0.988	0.892	0.931	1.004	1.014	0.986	1.025	1.046	1.006	0.946
7	PT Telkom Indonesia Tbk	0.881	0.940	0.976	0.991	0.984	1.126	0.942	1.055	0.991	1.090	1.086	0.931	0.962	0.993
8	PT Timah Tbk	0.972	1.052	0.842	1.500	1.120	0.991	0.968	1.200	1.161	1.305	0.889	0.865	0.808	1.115
9	PT Waskita Karya Tbk	0.999	0.988	0.865	0.959	1.060	0.880	1.069	1.056	1.000	0.993	1.106	1.009	1.005	1.028

Source: Processed data, 2025

Based on Table 9. and the classification criteria, 29 data observations have LVGI values ≥ 1. 111 and are classified as manipulators. The highest DEPI value is observed at PT Indofarma Tbk in 2023 at 2.181, indicating an increase in the debt-to-assets ratio. Furthermore, 20 data observations fall within the grey category, with a LVGI value of 1.010–1.038 were categorized

as vulnerable to manipulation. Meanwhile, the remaining 75 data observations had an LVGI value of ≤1.037, indicating a decrease in *leverage* or a reduction in reliance on debt-based financing.

h. TATA (*Total Accruals to Total Assets*)

Table 10
TATA Ratio Value

No.	Company	TATA													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	PT Aneka Tambang Tbk	-0.005	0.029	0.000	0.012	-0.026	-0.039	-0.034	-0.026	-0.001	-0.022	-0.006	-0.070	-0.005	-0.041
2	PT ASDP Indonesia Ferry	-	-	-0.039	-0.053	-0.064	-0.049	-0.059	-0.058	-0.061	-0.021	-0.020	-0.083	-0.009	-0.075
3	PT Bukit Asama Tbk	-0.021	0.006	0.108	0.009	0.023	0.031	0.032	0.158	-0.066	0.028	-0.041	-0.023	0.058	0.106
4	PT Garuda Indonesia Tbk	-0.122	-0.050	-0.078	-0.028	-0.111	-0.003	-0.002	-0.004	-0.039	-0.082	-0.214	-0.562	0.655	0.069
5	PT Indofarma Tbk	0.045	0.045	0.105	0.084	-0.082	-0.052	0.254	-0.099	0.067	0.021	0.007	-0.020	-0.239	-0.539
6	PT Pertamina	0.020	0.110	0.123	0.048	0.009	-0.077	-0.036	0.023	0.048	0.006	0.029	0.012	-0.010	-0.021
7	PT Telkom Indonesia Tbk	-0.064	-0.083	-0.020	-0.068	-0.059	-0.068	-0.045	-0.028	-0.033	-0.057	-0.088	-0.075	-0.123	-0.056
8	PT Timah Tbk	0.090	0.191	-0.126	0.202	0.161	-0.130	-0.062	0.074	0.143	0.098	-0.357	-0.123	-0.131	-0.094
9	PT Waskita Karya Tbk	0.062	0.067	0.042	0.033	0.063	0.016	0.178	0.136	0.033	-0.039	-0.039	-0.006	-0.009	-0.035

Source: Processed data, 2025

Based on Table 10. and the classification criteria, 32 data observations have TATA values ≥ 0.031 and are classified as manipulators. The highest TATA value is observed at PT Garuda Indonesia Tbk in 2022 at 0.655, which indicates the possibility of profit manipulation, because companies can use accrual policies to increase profits in a certain period. Furthermore, 8 data observations fall within the grey category, with a TATA value of 1.010-1.038 are in the category prone to manipulation because they show accrual patterns that need to be watched out for. Meanwhile, the other 84 data observations have a TATA value ≤0.018, indicating that profits come more from actual cash flow.

The following table presents the results of the Beneish M-Score calculation for the companies analyzed during the 2010–2023 period. The table summarizes the M-Score values obtained from the equation and provides the corresponding classification of each observation based on the established threshold.

Table 11
M-Score Values

No.	Company	M-Score													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	PT Aneka Tambang Tbk	-2.20	-2.32	-1.61	-2.56	-2.35	-1.34	-2.15	-2.50	-2.23	-2.64	-2.12	-2.68	-2.16	-2.98
2	PT ASDP Indonesia Ferry	-	-	93.24	-2.62	-2.70	-2.81	-1.69	-2.71	-2.78	5.06	-0.11	-3.17	-2.74	-2.46
3	PT Bukit Asama Tbk	-2.71	-2.31	-1.52	-2.19	-2.32	-2.26	-1.95	-0.89	-3.07	-2.29	-2.80	-2.17	-1.93	-1.38
4	PT Garuda Indonesia Tbk	-11.28	-2.77	-2.94	-1.41	-3.77	-4.22	-1.48	-3.56	-2.49	-3.50	-4.99	-5.36	-0.21	2.37
5	PT Indofarma Tbk	-2.73	-1.95	-1.71	-1.81	-2.24	-2.91	-2.34	-1.39	-3.13	-1.80	-1.32	-2.06	-4.25	-4.98
6	PT Pertamina	-2.40	-1.48	-1.72	-1.92	-2.48	-3.07	-2.88	-2.23	-1.85	-2.35	-2.33	-2.10	-2.32	-2.52
7	PT Telkom Indonesia Tbk	-2.61	-2.62	-2.60	-2.63	-2.51	-2.66	-2.67	-2.40	-2.36	-2.74	-2.73	-2.96	-2.95	-2.56
8	PT Timah Tbk	-1.63	-1.99	-2.87	-0.26	-1.15	-2.97	-2.08	-1.63	-1.56	-0.99	-4.29	-2.97	-3.38	-1.69
9	PT Waskita Karya Tbk	-1.92	-1.43	-1.95	-1.94	-1.74	-0.70	-1.78	-1.69	-1.35	-2.47	-3.33	-4.01	-2.35	-2.53

Source: Processed data, 2025

Table 12
Indications of Financial Statement Fraud

No.	Company	Indications													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	PT Aneka Tambang Tbk	M	N	M	N	N	M	M	N	N	N	M	N	M	N
2	PT ASDP Indonesia Ferry	-	-	M	N	N	N	M	N	N	M	M	N	N	N
3	PT Bukit Asama Tbk	N	N	M	M	N	N	M	M	N	N	N	M	M	M
4	PT Garuda Indonesia Tbk	N	N	N	M	N	N	M	N	N	N	N	N	M	M
5	PT Indofarma Tbk	N	M	M	M	N	N	N	M	N	M	M	M	N	N
6	PT Pertamina	N	M	M	M	N	N	N	N	M	N	N	M	N	N
7	PT Telkom Indonesia Tbk	N	N	N	N	N	N	N	N	N	N	N	N	N	N
8	PT Timah Tbk	M	M	N	M	M	N	M	M	M	M	N	N	N	M
9	PT Waskita Karya Tbk	M	M	M	M	M	M	M	M	M	N	N	N	N	N

Source: Processed data, 2025

Information:
M = Manipulator
G = Grey Company
N = Non-Manipulator

Based on the M-Score calculations shown in Table 11. and the indications of financial statement manipulation in Table 12., out of 124 observational datasets, 51 data observations indicate financial statement manipulation or fall into the manipulator category, while the remaining 73 data observations show no indication of financial statement manipulation or fall into the non-manipulator category.

Discussion

An analysis of several State-Owned Enterprises (SOEs) during the 2010–2023 period indicates that financial statement manipulation was identified in several years that coincided with periods of corruption cases. At PT Aneka Tambang, 6 of the 13 financial statements analyzed during the 2010–2022 corruption case period were classified as manipulative based on the Beneish M-Score. Similar indications were found at PT Pertamina, where 5 out of 13 financial statements analyzed during the 2011–2023 corruption case period were classified as manipulated. At PT Bukit Asam, 3 out of 6 years of financial statements analyzed during the 2013–2018 corruption case period were classified as manipulative based on the Beneish M-Score. Additionally, indications of manipulation were also identified outside the corruption case period, specifically in 2012, 2021, 2022, and 2023.

A similar pattern was also observed at PT Indofarma, PT Waskita Karya, PT Garuda Indonesia, PT ASDP Indonesia Ferry, PT Timah and where indications of financial statement manipulation were identified not only during the periods of the corruption cases but also in the years before and after those periods. PT Indofarma and PT Waskita Karya showed indications of manipulation in several years preceding the corruption case period, while PT Garuda Indonesia showed indications of manipulation in several years following the corruption case period, with some M-Score values consistently exceeding the established threshold. A similar pattern was found at PT ASDP Indonesia Ferry and PT Timah, where indications of manipulation were present in the years before, during, and after the corruption case period. These findings indicate that financial statement manipulation is not limited to the period in which corruption cases were identified.

Unlike other companies, PT Telkom Indonesia showed no indication of financial statement manipulation during the study period, despite the presence of corruption cases. This suggests that not all corrupt practices can be detected through financial statement analysis, especially if the modus operandi is outside the formal reporting system. Overall, the results of this study confirm that there is a link between indications of financial statement fraud and

corruption cases in state-owned enterprises, although this is not absolute. These findings also reinforce the potential use of the Beneish M-Score as an early detection tool, but additional approaches are still needed to detect corrupt practices not directly reflected in financial statements.

A summary of the test results using the Beneish M-Score model to detect indications of financial report manipulation in state-owned companies involved in corruption in 2010-2023 is presented. Of the 124 observation data, 51 data were categorized as manipulators, with 26 data indicating indications of financial report manipulation during the corruption period and 25 data indicating indications of financial report manipulation outside the corruption period, while the remaining 73 data were categorized as non-manipulators. This finding provides an indicates that financial statement manipulation was identified in several years that coincided with periods of corruption cases.

Marfuah and Ardiami (2018) found that the Beneish M-Score can be used to identify indications of fraudulent financial reporting in banking companies. Their findings show that banking companies involved in fraud or corruption tended to have higher Beneish M-Score values than companies that were not involved in corrupt practices. This finding is consistent with the results of the present study, which show that increases in M-Score values were identified in several periods that coincided with corruption cases involving state-owned enterprises. The consistency between these findings suggests that financial statement manipulation may occur alongside other forms of irregularities. Therefore, the Beneish M-Score can serve as a supporting indicator for identifying potential financial reporting anomalies in companies involved in corruption cases.

CONCLUSION

Based on the analysis, it can be concluded that among the state-owned enterprises involved in corruption cases during the 2010–2023 period, 26 financial statements were classified as indicating financial statement fraud during the respective corruption case periods. This finding shows that indications of manipulation were identified in a number of financial statements issued during periods in which corruption cases occurred. However, the presence of manipulation indications does not necessarily imply that the corruption cases directly caused the manipulation, as the Beneish M-Score only identifies potential patterns of financial statement manipulation. Therefore, these findings highlight the relevance of using the Beneish M-Score as a supporting tool for identifying potential financial reporting anomalies in state-owned enterprises involved in corruption cases.

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