

KEEPING TABS ON THE INTEGRITY OF FINANCIAL STATEMENTS: A BENEISH MODEL APPROACH

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Abstract

The integrity of financial statements is crucial for stakeholders in assessing the financial health and performance of a company. However, financial statement manipulation remains a concern, leading to the necessity of tools and models to detect potential fraud. This study explores the application of the Beneish M-Score model as an effective approach to evaluate the accuracy and integrity of corporate financial statements. The Beneish model, which uses various financial ratios and metrics, serves as an analytical tool to detect signs of earnings manipulation and financial statement irregularities. By examining a sample of companies over a defined period, this study aims to identify potential discrepancies in financial reporting, providing insights into the reliability of financial disclosures.

Keywords: Financial Statement Integrity, Beneish Model, Earnings Manipulation, Financial Analysis, Corporate Fraud Detection, Financial Ratios, Financial Reporting.

Introduction

The integrity of financial statements is a fundamental issue for companies, investors, and regulators. Accurate financial reporting provides transparency and accountability, enabling stakeholders to make informed decisions about a company's financial health. However, financial reporting can be susceptible to errors, omissions, and even fraud, which can undermine financial statement integrity and can have negative impacts on investors, stakeholders, and the economy as a whole. Therefore, identifying indicators of financial statement integrity has been a topic of significant interest in accounting and finance research.

The need to maintain the integrity of financial statements has continuously increased by the day in recent years. The Enron and WorldCom scandals in the early 2000s were a wake-up call for the need to improve corporate governance and transparency. More recently, the Wirecard scandal in Germany (Beard, 2020), and the Luckin Coffee scandal in China (Reuters, 2020) have further highlighted the need for improved financial reporting standards and better detection methods for financial statement fraud.

The Beneish model developed by Messod Beneish, is a statistical tool used in forensic audits and fraud detection. It is based on eight financial ratios that can be distorted by companies engaging in the manipulation of earnings such as abnormal accruals, sales growth, and asset quality, and analyzes financial ratios that are derived from a company's accounting data to determine the probability that the

company's reported earnings have been manipulated. (Karami & Powdel, 2021). The model is considered to be a highly effective tool for detecting earnings manipulation and financial statement fraud. This approach is grounded on the assumption that companies engaging in earnings manipulation may attempt to distort certain financial ratios in their financial statements to present a false picture of their financial performance. The model has been extensively used in previous research to identify financial statement fraud (Kim and Shin, 2018)

Numerous studies have utilized the Beneish model to investigate financial statement integrity. Chen et al. (2020) used the Beneish model to detect earnings management in the Chinese manufacturing sector. The study found that higher Beneish scores are associated with a greater likelihood of earnings management, suggesting that the Beneish model is a valuable tool for detecting potential financial statement fraud. Similarly, Bhatia and Jain (2017) employed the Beneish model to detect financial statement fraud in Indian companies. The study found that the model was a powerful tool for identifying companies with financial statement fraud.

By comparing a company's financial ratios to the model's thresholds, the model generates a score that indicates the likelihood of earnings manipulation. The analysis of the financial statement required at least two periods of financial reporting to detect the unusual event. However, to identify the trend of the company's financial statement reporting, it is

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suggested to analyze the data for five reporting periods.

The Beneish model can be used to detect potential earnings manipulation by analyzing a company's financial ratios and identifying any significant deviations from the expected values (Shamsuddin & Sulaiman, 2020).

The present study aimed to apply the Beneish model approach to assess the integrity of financial statements of selected publicly-held companies from the industrial and services industries. It likewise aimed to identify potential cases of earnings manipulation and financial statement fraud and to contribute to the development of effective methods for detecting and preventing financial statement fraud.

The study is expected to make a significant contribution to the existing literature on financial statement fraud and the application of the Beneish model approach particularly in the context of industrial and services markets. The paper makes a theoretical contribution by bringing attention to advancements in the field of earnings management detection. On a practical level, it introduces the application of the Beneish model as a method for identifying earnings manipulation through the analysis of the financial statements of enterprises. The results of this study would prove beneficial to investors, regulators, and other stakeholders who are interested in assessing the financial performance and stability of companies. The study also probed insights into the effectiveness of the Beneish model approach in detecting possible manipulation of earnings and contributed to the ongoing development of more effective methods for detecting and preventing the same, by identifying which financial ratios are significant determinants of the likelihood of earnings management.

Theoretical Framework

The study has its theoretical underpinnings on the agency theory which suggests that conflicts of interest may arise between principals (such as shareholders) and agents (such as management) in

the corporate setting (Jensen, 2020). The theory proposes that principals and agents have different goals and objectives, and may act in their self-interest rather than in the interest of the other party. In the context of financial reporting, agency theory suggests that management may have incentives to manipulate financial statements to present a more favorable view of the company's financial performance, which may not necessarily align with the best interests of shareholders (Karami & Poudel, 2019).

Thus, the theoretical framework of agency theory has provided a basis for understanding the underlying incentives and potential conflicts of interest that may drive earnings manipulation and financial statement fraud (Hasan, Islam, & Alam, 2021). The Beneish model can then be used as a tool for identifying these manipulations and providing a more accurate assessment of a company's financial performance (He, Liu, & Guo, 2021).

Conceptual Framework

The conceptual framework for this study was based on the Beneish Model, a statistical tool used to detect potential earnings manipulation in financial statements. The IPO (input-process-output) Model in Figure 1 represents the research paradigm of the study. The inputs came from secondary data gathered from audited consolidated financial statements of selected publicly-held companies. These data were processed using the Beneish M-score approach using eight financial ratios, namely: (1) Days sales in the receivable index (DSRI), (2) gross margin index (GMI), (3) asset quality index (AQI), (4) sales growth index (SGI), (5) depreciation index (DEPI), (6) sales, general and administrative index (SGAI), Leverage Index (LevI), and (8). Total accruals to total assets (TATA). Findings revealed which companies are likely manipulators and non-manipulators.

The study hoped to determine if the evaluation of the aforementioned financial ratios would ensure the integrity of financial statements and provide an accurate representation of the financial performance of the company.

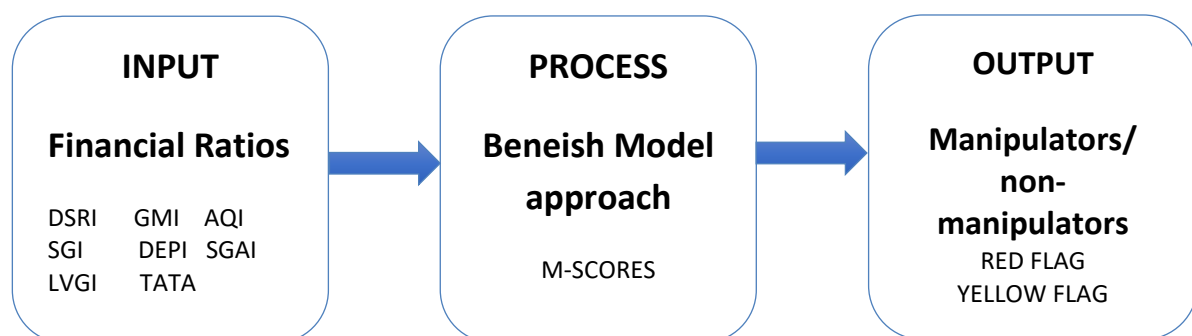


Figure 1: Research Paradigm of the Study

Statement of the Problem

The study sought to evaluate the integrity of financial statements by analyzing the financial ratios of selected publicly listed companies using the Beneish model approach.

Specifically, the research attempted to answer the following questions:

1. What are the resulting financial ratios of selected publicly-listed service companies in terms of:
 - 1.1 Days sales in receivables index (DSRI)
 - 1.2 Gross margin index (GMI)
 - 1.3 Asset Quality Index (AQI)
 - 1.4 Sales Growth Index (SGI)
 - 1.5 Depreciation Index (DEPI)
 - 1.6 Sales/general and administrative expenses index (SGAI)
 - 1.7 Leverage index (LVGI), and
 - 1.8 Total Accruals to Total Assets (TATA)?
2. What are the resulting M-scores for the selected companies?
3. Is there evidence of the likelihood of earnings manipulation and financial fraud in the selected publicly listed industrial and service companies?
4. Is there a significant correlation between the different financial ratios and the resulting M-scores?
5. Which of the different financial ratios most likely predict the resulting M-score?
6. What implications or insights could be derived from the findings of this study?

The study has the following null hypothesis set at alpha .05:

H01 There is no evidence of the likelihood of earnings manipulation and financial statement fraud in selected companies using the Beneish M-score approach

H02 There is no statistically significant correlation between financial ratios and M-scores

H03 Financial ratios do not statistically predict M-scores and the likelihood of manipulation of financial statements

Scope and Delimitation

Scope:

The study focused on the application of the Beneish model in detecting potential earnings manipulation and financial statement fraud. It primarily concentrated on the selected publicly-held companies operating in the Philippines, and only included the (1) Industrial Sector, particularly under Food, Beverage, and Tobacco, the (2) Services sector, including Telecommunications and Hotel and Leisure. The study did not include other subsectors outside of the aforementioned.

The data that were analyzed were financial data from the audited consolidated financial statements of the selected companies ending December 31, 2020-2021 and 2021-2022. Companies with these data are made available through the PSEedge (Philippine Stock Exchange Electronic Disclosure Generation) technology.

The study was conducted from February to September 2023.

Delimitations

The research did not aim to provide a comprehensive analysis of all the factors that can lead to financial statement fraud or earnings manipulation. It did not investigate the effectiveness of other statistical models for detecting financial statement fraud such as Altman Z-score, and Zmijewski score, among others. It likewise did not provide an assessment of the impact of the Beneish model on stock prices or company reputation. Since the Beneish model is a probabilistic approach, it can merely suggest that companies may be more likely to manipulate their profits, but it does not give a conclusive judgment of the existence of fraud.

Further, ratio analysis information is historic, meaning, it is not current and does not take into account external factors nor measure the human resources element of the selected publicly-listed companies under study.

Methodology

Research Design

The study made use of a quantitative research design where data on financial ratios and other relevant variables were collected and analyzed using statistical methods. The study was conducted on selected publicly-held companies operating in the industrial and services sectors.

Participants/Respondents of the Study

This study did not involve individuals. Instead, it examined secondary data extracted from the audited consolidated financial statements of selected publicly-held/listed companies from the (1) industrial sector, particularly under Food and Beverage, and the (2) services sectors, including Telecommunications and Hotel and Leisure ending December 31, 2020 -2021 and 2021-2022.

Instrument/s of the Study

This study did not rely on any survey instruments. Instead, it utilized secondary data obtained from the latest audited consolidated financial statements of chosen companies from different industrial and services industries. These financial statements were obtained from the PSEedge, *“a state-of-the-art, fully automated system that facilitates the efficient*

processing, validation, submission, distribution, and analysis of time-sensitive disclosure reports submitted to the Exchange” (<https://edge.pse.com.ph>)

Data Gathering Procedure

The researcher made use of secondary data, specifically the audited consolidated financial statements of the selected publicly-listed industrial and services companies, to apply the Beneish model and assess the integrity of financial statements. The use of secondary data has minimized the cost and time needed to conduct the study, while the accuracy and reliability of the financial statements obtained from the PSEedge have been ensured, to properly validate the results of the Beneish model analysis. The following was the detailed data-gathering procedure for the study:

- (1) Identified publicly-held companies from the industrial and services sectors with 2020 to 2021 and 2021 to 2022 audited financial statements made available to the public
- (2) Collected the published, audited consolidated financial statements of the selected companies from the following sources: (1) PSEedge database, (2) 17-A forms submitted to the Securities and Exchange Commission (SEC) and (3) the companies' webpages/sites.
- (3) Calculated the financial ratios required by the Beneish model using the financial data from the audited financial statements of these companies
- (4) Applied the Beneish model to detect any potential earnings manipulation on the financial statements by using the Beneish model calculator
- (5) Analyzed and compared the results of the Beneish model
- (6) Validated and interpreted the findings

Data Analysis and Statistical Treatment

The Beneish model was used to identify potential earnings manipulation by analyzing a company's financial ratios and identifying any significant deviations from expected values. The statistical treatment of the Beneish model involved calculating the scores for each of the model's variables and aggregating them into a single score, the Beneish M-Score. The M-Score was then compared to a predetermined threshold to determine if the company's financial statements indicate a potential risk of earnings manipulation.

To analyze the data using the Beneish model, the first step was to calculate the values for the variables that make up the model. The researcher made use of the Beneish calculator to facilitate the computation of variables. These variables include:

1. Days sales in receivables index (DSRI)
2. Gross margin index (GMI)
3. Asset quality index (AQI)

4. Sales growth index (SGI)
5. Depreciation index (DEPI)
6. Sales/general and administrative expenses index (SGAI)
7. Leverage index (LVGI)
8. Total Accruals to Total Assets (TATA)

Once the values for these variables have been calculated, they were used to calculate the Beneish M-Score. The manual computation uses the following formula:

$$\text{M-Score} = -4.84 + 0.92\text{DSRI} + 0.528\text{GMI} + 0.404\text{AQI} + 0.892\text{SGI} + 0.115\text{DEPI} - 0.172\text{SGAI} + 4.679\text{LVGI}$$

Three possible conclusions were made using the M score:

- M-Score > -1.78: RED FLAG; likely earnings manipulation; strong likelihood of a firm being a manipulator; serious manipulation.
- -2.22 < M-Score < -1.78: YELLOW FLAG; possible earnings manipulation; but the company has more reliable reports; then when M-score is higher than -1.78; slight manipulation.
- M-Score < -2.22: GREEN FLAG; unlikely profit manipulation; company is unlikely to be a manipulator (<https://apps.kelley.iu.edu/Beneish/MScore/MScoreInput>).

Ethical Considerations

Since the study did not involve human subjects, informed consent was not necessary. The use of secondary data required that the researcher protect the confidentiality and privacy of the owners of the financial data obtained from the PSE edge, SEC, and company websites. The researcher likewise complied with data protection privacy laws and regulations.

It was ensured that the data used were reliable and accurate. Transparency in presenting the data source and how they were obtained was exercised. Appropriate acknowledgment of the sources was observed, and any form of academic misconduct including plagiarism and misrepresentation of data was avoided.

Results and Discussion

The succeeding paragraphs discuss the results of the study.

It could be gleaned from the data presented in Table 1 that per the Philippine Stock Exchange (PSE) portal, PSE edge, the total number of companies publicly listed under the Industrial sector, particularly the Food, Beverage, and Tobacco sub-sector is 28. For the Services sector, particularly

under the Telecommunications and Hotel and Leisure sub-sectors, the total number of publicly listed companies are three (3) and five (5), respectively.

Of the total 36 companies under the selected sectors, only 75 percent or 27 companies have published audited consolidated financial statements either for year/fiscal year ending 2020-2021, or 2021-2022; eight (8) from the Services sector, and 21 from the Industrial sector.

Table 1: Distribution of Selected Publicly Listed Companies with Audited Consolidated Financial Statements, ending 2020-2021, and 2021-2022

Sector	Subsector/s	N	n	% n to N
Industrial	Food, Beverage & Tobacco	28	21	75%
Services	Telecommunications	3	3	100%
	Hotel and Leisure	5	3	60%
Total		36	27	75%

On the whole, it could be said that the financial statements of companies under the Industrial sector (Food, Beverage and Tobacco) registered an overall mean M-score of -2.132, indicating a *Yellow flag*. It could be further inferred that generally, said companies could be possible earnings manipulators, but they have more reliable reports than unreliable ones.

A closer look at Table 2, brought forth the following deductions on individual results of financial ratio indices for the Industrial Sector (Food, Beverage, and Tobacco):

1. DSRI (Days Sales in Receivables): This ratio measures how long it takes for a company to sell its inventory. Higher values may indicate slower inventory turnover. Company R has the highest DSRI at 1.444, suggesting that it takes the longest to sell its inventory.

A DSRI > 1 may indicate the likelihood of overestimating earnings through accelerated recognition of revenue particularly for Companies A, B, D, E, H, I, M, R, and S. The resulting DSR indices for these companies may likewise suggest a change in credit policy to boost sales by providing additional deferred payment.

2. GMI (Gross Margin Index): GMI is a measure of a company's gross margin relative to its industry average. Values above 1 suggest higher-than-average gross margins. Company C has an exceptionally high GMI, indicating possible irregularities in the reporting of profits.

Since the gross profit margin should remain fairly stable from period to period, it is expected for the index to remain close to 1.0. When the index varies significantly from 1.0, as in the case of Company C, this may be an indication of either fraudulent reporting activity or an error in the prior or current period.

Noteworthy to mention that aside from Company C, other companies that registered a GMI above 1.0 are: B, D, E, F, H, I, L, M, N, O, P, Q, R, T, and U.

3. AQI (Asset Quality Index): This index can be used to determine if the company is shifting operating expenses to capital. Company E registered the lowest AQI at 0.0881 which provides us with information of the possibility that the company has changed its accounting practice and is shifting expense to capital in an attempt to improve perceived profits in the near term.

A low asset quality index (<0.8, or 80%) indicates the possible shifting of operating expenses to capital, as well as in the case of Companies H, and T.

4. SGI (Sales Growth Index): This refers to the ratio of sales in the current year in year t relative to year $t - 1$. The value higher than one for SGI indicates positive sales growth relative to the previous year. However, companies could be predisposed to manipulate earnings to manage perceptions of continuing growth and also to obtain the capital needed to support growth.

Per the data in Table 2, only two (2) companies have SGIs lesser than 1. These are: Companies H and R. The other 19 companies' SGI results proved otherwise. Therefore, with this ratio, one can assume that these companies are susceptible to earnings manipulation.

5. DEPI (Depreciation Index): This ratio is the proportion of depreciation rate in year $t - 1$ to the corresponding rate in year t . A DEPI greater than 1 suggests a slower depreciation rate of a company's assets which signals a potential manipulation of earnings.

Income increases due to adjusting depreciation methods; i.e., the company revises the estimates of assets' useful lives. In such a way, the

company may increase income by cutting expenses. Given the data in Table 2, only Companies A, D, G, Q and R have DEPI < 1.

Table 2: Computed Financial Ratios of The Industrial Sector, Food, Beverage, and Tobacco

Company	DSRI	GMI	AQI	SGI	DEPI	SGA1	LVG1	TATA	M score
1. Company A	1.060	.0922	.904	1.081	.959	1.068	.193	.195	-1.514
2. Company B	1.349	1.069	1.328	1.032	1.125	.795	.856	.209	-0.887
3. Company C	.846	7.673	.945	1.851	1.006	.789	1.179	-.042	1.420
4. Company D	1.198	1.016	.965	1.061	.986	.903	.552	-.227	-3.150
5. Company E	1.014	1.117	.0881	1.122	1.088	1.102	.962	.015	-2.270
6. Company F	.835	1.076	.993	1.158	1.016	.898	.996	-.005	-2.454
7. Company G	.270	.852	1.594	4.880	.360	1.615	.435	.166	1.253
8. Company H	1.725	1.311	.550	.848	1.478	.717	1.141	-.061	-2.194
9. Company I	1.072	1.045	2.212	1.113	1.104	.900	.170	-.131	-2.112
10. Company J	.723	.969	1.042	1.235	1.145	.856	1.290	-.078	-2.962
11. Company K	.899	.473	.871	1.069	1.156	.941	.991	-.014	-2.875
12. Company L	.949	1.056	.893	1.020	2.650	1.167	.720	-.102	-2.749
13. Company M	1.022	1.094	.658	1.282	1.161	.900	1.116	.018	-2.214
14. Company N	.829	1.038	.986	1.239	1.075	1.014	1.059	.038	-2.246
15. Company O	.874	1.168	1.006	1.149	1.081	.924	1.096	.007	-2.348
16. Company P	.580	1.038	1.215	1.386	1.122	.875	1.439	-.600	-4.963
17. Company Q	.921	1.011	1.077	1.019	.606	.938	.986	-.097	-2.982
18. Company R	1.444	1.252	1.051	.831	.979	1.664	.946	.033	-2.011
19. Company S	1.217	.648	1.025	1.049	1.191	1.052	.953	-.025	-2.504
20. Company T	.747	1.061	.100	1.409	1.185	1.066	1.130	.250	-2.197
21. Company U	.491	1.010	.985	1.561	1.213	.537	1.087	-.095	-2.817
Mean	.956	1.289	.976	1.352	1.128	.987	.919	-.026	-2.132

6. SGAI (Sales, general and administrative expenses): measures the change in the Selling, general and administrative costs (SGA) as a percentage of sales of the year t compared with the prior year t-1. A SGAI > 1 is interpreted as a negative sign concerning the company's future prospects: management is not successful in controlling expenses, which suggests a decrease in administrative and marketing efficiency.

The company is becoming less efficient in generating sales. Company R has the highest obtained SGAI at 1.664. This was followed by Companies A, E, G, L, N, R, S, and T.

7. LVGI (Leverage Index): Also known as gearing, leverage measures the amount of debt a company has issued relative to other capital such as equity.

Based on the data shown in Table 2, Company P has the highest LVI at 1.439. A LVI > 1 could be inferred as having a high risk of financial statement manipulation. It suggests an increase in financial leverage, with a corresponding growth in interest expense that is reflected in the company's net profit. Further, this situation could encourage incentives for earnings manipulations in order to meet debt covenants.

There is a higher probability, though, that the company will breach a debt covenant.

Companies with LVI > than 1 are: C, H, J, M, N, O, P, T, and U.

8. TATA (Total Accruals to Total Assets): The use of this index could detect if a company is changing an accounting practice to hide a solvency issue or bolster earnings.

An increase in a historical trend may indicate an attempt to cover up a financially-stressed business.

Based on the data presented in Table 2, it could be inferred that companies with positive TATA such as Companies A, B, G, M, R, and T are likely to manipulate their financial information on accruals.

The study of Khan and Akter (2017) supports the above findings. After conducting the tests through Beneish model, it was found that overall, the Food & Agriculture (F&A) industry have a tendency to get into earnings manipulation except two among the 14 companies because of significant lower M-scores. As far as the continuity is concerned, it is concluded that majority of the companies are

likely to manipulate the earnings for more than one year. A noteworthy to mention issue for the results is that M-score is a probabilistic approach to find manipulators, so the end result does not guarantee that the company is what the M-score suggests.

Overall, the financial statements of companies in the Services Sector (Telecommunications) reported a mean M-score of -2.257, indicating a *Yellow flag*. It might also be deduced that, in general, said companies could be potential profits manipulators, although they have more reputable reports than untrustworthy ones.

An examination of Table 3 revealed the following deductions on individual outcomes of financial ratio indices for the Services Sector (Telecommunications):

1. DSRI stands for Days Sales in Receivables: This ratio calculates how long it takes a business to sell its inventory. Higher values may imply a slower turnover of goods. Telco C has the greatest DSRI of 1.896, indicating that their inventory sells the slowest. A DSRI greater than one may suggest the possibility of overestimation of earnings due to accelerated revenue recognition, notably for Telco C whose DSR index may also indicate a shift in credit policy to enhance sales by providing extra deferred payment.

2. GMI stands for Gross Margin Index: The gross margin index (GMI) compares a company's gross margin to the industry average. Values greater than one (1) indicate higher-than-average gross margins.

The index is projected to remain close to 1.0 because the gross profit margin should remain reasonably stable from period to period. When the index deviates significantly from 1.0, it may indicate either false reporting activities or a mistake in the previous or current period. Telcos A and B have GMI which are a little more than 1.0 which could imply that there could be evidence of very slight manipulation of earnings.

3. Asset Quality Index (AQI): This index can be used to measure whether a company's operational expenses are being shifted to capital.

Telco B had the lowest AQI at 1.009, indicating that the company may have modified its accounting method and may have been moving expense to capital in an attempt to boost perceived earnings in the short term.

4. SGI stands for Sales Growth Index: This is the ratio of current-year sales in year t to sales in year $t - 1$. SGI values greater than one imply good sales growth over the previous year. Companies, on the other hand, may be predisposed to manipulate results in order to control expectations of continued growth and to secure the cash required to fund expansion.

According to the statistics in Table 3, all three Telcos have $SGI > 1$, with Telco C obtaining the highest result of 1.334, followed by Telco B with SGI of 1.068 and Telco A with SGI of 1.045. The results may demonstrate that these companies are vulnerable to earnings manipulation.

5. DEPI stands for Depreciation Index: This ratio is the ratio of the depreciation rate in year $t - 1$ to the rate in year t . A DEPI larger than 1.0 indicates a slower depreciation rate of a company's assets, indicating potential earnings manipulation.

Income rises as a result of modifying depreciation techniques; that is, the corporation revises its estimations of its assets' useful lives. In this manner, the corporation may grow profits while decreasing expenses. According to the statistics in Table 3, only Telco C has a $DEPI < 1$.

6. SGAI stands for sales, general, and administrative expenditures: The change in selling, general, and administrative costs (SGA) as a percentage of sales in year t compared to year $t-1$. A SGAI greater than 1.0 is considered as a poor indicator for the company's future prospects: management is unsuccessful in reducing expenses, implying a loss in administrative and marketing efficiency.

The ratio also implies that the company's sales generation efficiency is deteriorating. The highest SGAI obtained by Telco A at 1.030.

7. Leverage Index (LVGI): Leverage, also known as gearing, compares the amount of debt issued by a corporation to other forms of capital such as equity.

According to the results presented in Table 3, Telco B has the highest LVI at 1.005. A LVI greater than one indicates a high risk of financial statement manipulation. It indicates an increase in financial leverage, which is represented in the company's net profit as an increase in interest expense. Furthermore, this position may provide incentives to manipulate earnings in order to meet debt contracts.

However, there is a greater chance that the corporation may violate a debt agreement.

8. TATA stands for Total Accruals to Total Assets: This index could be used to detect if a corporation is modifying an accounting procedure to conceal a solvency concern or boost earnings. An escalation in a previous pattern could indicate an attempt to conceal a financially troubled company.

Based on the facts in Table 3, it is not possible to conclude that Telcos A, B, and C are likely to alter their financial statistics on accruals with their resulting negative TATA.

Discretionary accruals are also strongly and favorably impacted by leverage, or the company's debt ratio. This finding of Cudia and dela Cruz (2018) supports the present study. Enterprises with a high degree of leverage and greater exposure to debt are more inclined to manipulate their profitability. Different contractual limitations, debt covenants, and other arrangements may become applicable to the company as its debt load rises. In order to prevent potential expenses and disputes resulting from non-compliance with debt-related agreements and arrangements, it is therefore expected that managers would use their discretion in reporting earnings in these situations.

Table 3: Computed Financial Ratios of the Services Sector, Telecommunications

Company	DSRI	GMI	AQI	SGI	DEPI	SGA1	LVG1	TATA	M-score
1. Telco A	.793	1.006	1.040	1.045	1.190	1.030	.992	-.090	-3.014
2. Telco B	.925	1.001	1.009	1.068	1.048	.975	1.005	-.108	-2.980
3. Telco C	1.896	.947	1.060	1.334	.831	.777	.984	-.049	-1.586
Mean	1.205	.985	1.036	1.149	1.023	.927	.994	-.082	-2.257

Table 4 demonstrates the overall mean M-score of -15.758 for companies under the Services sector (Hotel and Leisure) implying a *Yellow flag*. There is a possibility that the companies applied slight manipulation of their earnings, and that generally, majority of their reports are reliable.

Further detailed analysis gives the following results:

1. DSRI (Days Sales in Receivables): This ratio measures how long it takes for a company to sell its inventory. Higher values may indicate slower inventory turnover. H & L (B) has the highest DSRI at 3.120, implying that it takes the said company to sell its inventory the longest, followed by H & L (A) with 1.428 DSRI, and H & L (C) with only .824 DSRI.

A DSRI > 1 may indicate the likelihood of overestimating earnings through accelerated recognition of revenue particularly for H & L (B). The resulting DSR index may likewise suggest a change in credit policy to boost sales by providing additional deferred payment.

2. GMI (Gross Margin Index): GMI is a measure of a company's gross margin relative to its industry average. Values above 1 suggest higher-than-average gross margins. H & L (A) and H & L (C). have very slightly higher than 1 GMI, which gives a very faint indication of possible irregularities in the reporting of profits.

Since the gross profit margin should remain fairly constant from period to period, it is expected for the index to remain close to 1.0. When the index varies significantly this may be

an indication of either fraudulent reporting activity or an error in the prior or current period. Noteworthy to mention that H & L (B) has a very significant negative GMI which could mean that the company's cost of production exceeds its sales significantly and of the company's inability to control costs, which indicates a non-sustainable business model..

3. AQI (Asset Quality Index): This index can be used to determine if the company is shifting operating expenses to capital. The resulting AQI of H & L (A) is > 1 A low asset quality index (<0.8, or 80%) indicates the possible shifting of operating expenses to capital, as in the case of H & L (B) which could be inferred that there is a possibility that the companies have changed their accounting practices or have been shifting expense to capital in an attempt to improve perceived profits in the near term.
4. SGI (Sales Growth Index): This refers to the ratio of sales in the current year in year t relative to year $t - 1$. The value higher than one (1) for SGI indicates positive sales growth relative to the previous year, as in the cases of H & L (B) and (C). However, companies could be predisposed to manipulate earnings to manage perceptions of continuing growth and also to obtain the capital needed to support growth.

Per the data in Table 4, H & L (B) and (C) have SGIs greater than one, which could be assumed that these companies are somehow susceptible to manipulate their earnings.

5. DEPI (Depreciation Index): This ratio is the proportion of depreciation rate in year $t - 1$ to the corresponding rate in year t . A DEPI greater than 1 suggests a slower depreciation rate of a company's assets which signals a potential manipulation of earnings.

Income increases due to adjusting depreciation methods; i.e., the company revises the estimates of assets' useful lives. In such a way, the company may increase income by cutting expenses. Given the data in Table 4, only H & L (A) has DEPI > 1.

6. SGAI (Sales, general and administrative expenses): Measures the change in the Selling, general and administrative costs (SGA) as a percentage of sales of the year t compared with the prior year $t-1$. A SGAI > 1 is interpreted as a negative sign concerning the company's future prospects: management is not successful in controlling expenses, which suggests a decrease in administrative and marketing efficiency.

The company is becoming less efficient in generating sales. H & L (A)'s SGAI is a little above the rule of thumb of 1.

7. LVGI (Leverage Index): Also known as gearing, leverage measures the amount of debt a company has issued relative to other capital such as equity.

Based on the data shown in Table 4, H & L (B) has a LVI a little above 1, at 1.133. A LVI > 1 could be inferred as having a high risk of financial statement manipulation. It suggests an increase in financial leverage, with a corresponding growth in interest expense that is reflected in the company's net profit. Further, this situation could encourage incentives for earnings manipulations in order to meet debt covenants. There is a higher probability, though, that the company will breach a debt covenant.

Hotel and Leisure Companies do not suggest high risk of financial statement manipulation.

8. TATA (Total Accruals to Total Assets): The use of this index could detect if a company is changing an accounting practice to hide a solvency issue or bolster earnings.

An increase in a historical trend may indicate an attempt to cover up a financially-stressed business.

Table 4: Computed Financial Ratios of the Services Sector, Hotel and Leisure

Company	DSRI	GMI	AQI	SGI	DEPI	SGA1	TATA	LVGI	M-score
1. H & L (A)	1.428	.904	1.233	.946	1.292	1.120	.029	.818	-1.882
2. H & L (B)	3.120	-86.729	.534	4.880	.916	.370	.250	1.133	-42.353
3. H & L (C)	.824	.947	.913	1.015	.953	.985	-.074	.989	-3.038
Mean	1.791	-28.293	.893	2.280	1.054	.825	.068	.980	-15.758

Based on the data presented in Table 4, it could be inferred that H & L (C) with a negative TATA of -.074 is unlikely to manipulate their financial information on accruals. On the other hand, H & L (A) and (B) companies' TATA suggest that these two companies may possibly hide a solvency issue, but not to a very likely extent.

Table 5 presents the resulting M-scores, and Odds ratio for the Industrial Sector under the Food, Beverage and Tobacco sub-sector. It could be gleaned from the data shown in Table 5 that:

- For **Company A**, the odds ratio is 9.43 to 1. This means that, in the context of whatever is being measured, in this case the likelihood of earnings manipulation and fraudulent financial

statements, Company A is 9.43 times more likely to exhibit this behavior compared to other companies in the group. The interpretation suggests that Company A has a "Red flag" and is "Likely a manipulator." This implies that they may have a high likelihood of engaging in some sort of manipulation.

- The odds ratio for **Company B** is 27.18 to 1, which is even higher than Company A. The interpretation is similar, indicating that Company B is likely a manipulator as well.
- **Company C** has an extremely high odds ratio of 133.65 to 1, suggesting a very high likelihood of manipulation. In contrast, Company D has an odds ratio of 0.12 to 1, which is very low. The interpretation is a "Green flag," indicating that there's little to no manipulation likely to happen in this company.

Table 5: Resulting M-Scores and Odds Ration Industrial Sector – Food Beverage and Tobacco

Company	M-score	Odds ratio	Interpretation
1. Company A	-1.514	9.43 to 1	Red flag; Likely manipulator
2. Company B	-0.887	27.18 to 1	Red flag; Likely manipulator
3. Company C	1.420	133.65 to 1	Red flag; Likely manipulator
4. Company D	-3.150	.12 to 1	Green flag; No manipulation
5. Company E	-2.270	1.68 to 1	Green flag; No manipulation
6. Company F	-2.454	1.02 to 1	Green flag; No manipulation
7. Company G	1.253	129.70 to 1	Red flag; Likely manipulator
8. Company H	-2.194	2.05 to 1	Yellow flag; Possible manipulator
9. Company I	-2.112	2.52 to 1	Yellow flag; Possible manipulator
10. Company J	-2.962	.22 to 1	Green flag; No manipulation
11. Company K	-2.875	.29 to 1	Green flag; No manipulation
12. Company L	-2.749	.43 to 1	Green flag; No manipulation
13. Company M	-2.214	1.95 to 1	Yellow flag; Possible manipulator
14. Company N	-2.246	1.79 to 1	Green flag; No manipulation
15. Company O	-2.348	12.37 to 1	Green flag; No manipulation
16. Company P	-4.963	.00 to 1	Green flag; No manipulation
17. Company Q	-2.982	.21 to 1	Green flag; No manipulation
18. Company R	-2.011	3.21 to 1	Yellow flag; Possible manipulator
19. Company S	-2.504	.89 to 1	Green flag; No manipulation
20. Company T	-2.197	2.03 to 1	Yellow flag; Possible manipulator
21. Company U	-2.817	.35 to 1	Green flag; No manipulation

- **Company E, F, J, K, L, N, O, P, Q, S, and U** also have low odds ratios of 1.68 to 1, 1.02 to 1, 2.52 to 1, 0.22 to 1, 0.29 to 1, 0.43 to 1, 1.79 to 1, 12.37 to 1, .00 to 1, 0.21 to 1, 0.89 to 1, 0.35 to 1, respectively. These figures indicate a low likelihood of manipulation or are unlikely to be a manipulator. They are given "Green flags."
- **Company H, I, M, R, T** have moderate odds ratios, suggesting a moderate likelihood of manipulation. They are given "Yellow flags," indicating possible manipulation.
- Company O has a relatively high odds ratio of 12.37 to 1, suggesting a moderate likelihood of manipulation. However, it is still categorized as a "Green flag," which may depend on the threshold used for flagging.
- Company P has an odds ratio of 0.00 to 1, which is extremely low. It's categorized as a "Green flag," indicating no manipulation of company earnings

It could be said that the data presented in Table 6 give the resulting M-scores, and Odds ratio for the

Services Sector under the Telecommunications sub-sector.

It could be gleaned from the data shown in Table 6 that:

- For **Telco A**, the odds ratio is .19 to 1. This means that, in the context of whatever is being measured, in this case, the likelihood of earnings manipulation and fraudulent financial statements, is less likely to occur for Telco A, or has a low likelihood of manipulation. The interpretation suggests that Company A has a "green flag".
- The odds ratio for Telco B of .21 to 1 suggests that in the context of the likelihood of earnings manipulation and fraudulent financial statements, Telco B is a less likely manipulator.
- The odds ratio of 8.50 to 1 for Telco C implies an increased likelihood of manipulation as compared with that of a low odds ratio. An odds ratio of 8.50 to 1 indicates that, statistically speaking, the event is more probable to happening than not.

Table 6: Resulting M-scores, and Odds Ratio Services Sector - Telecommunications

Company	M-score	Odds ratio	Interpretation
1. Telco A	-3.014	.19 to 1	Green flag; No manipulation
2. Telco B	-2.980	.21 to 1	Green flag; No manipulation
3. Telco C	-1.586	8.50 to 1	Red flag; Likely manipulator

Data in Table 7 show the resulting M-scores together with the Odds ratios for the Hotel and Leisure sub-sector under the Services Sector. Results could be deduced as follows:

- (1) For H & L (A), the odds ratio is 4.34 to 1 which means that the company is 4.34 times more likely to exhibit this behavior compared to other companies in the group. The interpretation

suggests that H & L (A), has a "yellow flag" and is a "possible manipulator." This implies that they have a somewhat high likelihood of engaging in some sort of manipulation.

- (2) H & L (B) has an odds ratio of .00 to 1 which is extremely low. It's categorized as a "Green

flag," indicating no manipulation of company earnings

- (3) The odds ratio for H & L (C) of .17 to 1 suggests that in the context of the likelihood of earnings manipulation and fraudulent financial statements, H & L (C) is a less likely manipulator.

Table 7: Resulting M-scores, Estimated Probability, and Odds Ratio Services Sector - Hotel and Leisure

Company	M-score	Odds ratio	Interpretation
1. H & L (A)	-1.882	4.34 to 1	Yellow flag; Possible manipulator
2. H & L (B)	-42.353	.00 to 1	Green flag; No manipulation
3. H & L (C)	-3.038	.17 to 1	Green flag; No manipulation

Table 8 presents the correlation between financial ratios and M-scores of selected publicly-held/listed companies under study.

From the data shown in Table 8, it could be culled that DSRI, TATA, and LVGI are negatively correlated with M-scores obtaining Pearson r correlation coefficients of -.745, -.229, and -.184 respectively. On the other hand, GMI, AQI, SGI, DEPI, and SGAI are positively correlated with the resulting r of .991, .231, .597, .055, and .486 accordingly.

It should be noted that LVGI shows a little to no relationship with M-scores at r equal to -.184. This finding is in contrary to Fung and Goodwin (as cited by Cudia and dela Cruz, 2018) wherein a positive association between debt and earnings management was observed. Meanwhile, TATA demonstrated a weak, negative correlation at r equal to -.229, and DSRI obtained a r equal to -.745 denoting a very strong negative correlation.

Conversely, DEPI with r equal to .055 denotes a little to no correlation with resulting M-scores. AQI implies a weak, positive relationship with M-scores at r equal to .239, while SGI and SGAI presents strong positive correlation with correlation coefficients of .597 and .486, respectively. GMI exhibits a very strong positive relationship with r equal to .991.

The computed r^2 suggests the approximate percentage of variance in M-scores that is accounted for by its association with the different financial ratios. This coefficient of determination quantifies the proportion of the variance in M-scores explained in a statistical sense (not a causal sense) by the financial ratios. Approximately 55.5 percent of the variance in M-scores is explained or accounted for by its association with DSRI. Conversely, 45.5 percent of the variance cannot be explained by DSRI. In the same manner, 98.2 percent, 5.7 percent, 35.6 percent, .3 percent, 23.6 percent, 5.2

percent, and 3.4 percent of the variances in M-scores are accounted for by its association with corresponding changes in GMI, AQI, SGI, DEPI, SGAI, TATA, and LVGI. On the contrary, 1.8 percent, 94.3 percent, 64.4 percent, 99.7 percent, 76.4 percent, 94.8 percent, and 96.6 percent of the variance in M-scores cannot be accounted for by its association with GMI, AQI, SGI, DEPI, SGAI, TATA, and LVGI, respectively.

The Table likewise reveals that the correlation is statistically significant between M-scores and DSRI, GMI, SGI, and SGAI with corresponding p-values equal to .000, .000, .001, and .010. These figures are less than the significance level set at 0.05. Therefore, the null hypothesis stating that *there is no statistically significant correlation between financial ratios and M-scores* is rejected.

In the study of Maniatis in 2021, it was found that "TATA and SGI variables have a significant relation with the M-score. A covariance analysis between the eight variables and M-score was calculated to examine the significant relationship between them. Thus, AQI and DSRI, SGAI and SGI variables seem to have a significant negative relationship, whereas DEPI and DSRI, LVGI and SGI seem to have a significant positive correlation."

Beneish (as cited in Halilbegovic et. al. (2020) hypothesized a positive correlation between DEPI and the likelihood of earnings management.

The study of Folagimi, et. al. (2023) provides evidence that leverage index, sales growth and sales and administrative expense exerted positive effects and channels for corporate fraud and earning management of the selected Nigerian-listed consumer goods manufacturing companies. It was found that while each of the day's sales trade receivables index, assets quality index, leverage index and sales growth quality index exerted positive effects, the gross margin index, depreciation index and total accruals to total index exhibited negative insignificant effects.

Table 8: Correlation Results of Ratios and M Scores for Selected Publicly Listed Companies

Variables	<i>r</i>	<i>r</i> ²	p-value	Interpretation	Decision
DSRI	-.745	.555	.000	Significant	Reject H02
GMI	.991	.982	.000	Significant	Reject H02
AQI	.239	.057	.230	Non-significant	Accept H02
SGI	.597	.356	.001	Significant	Reject H02
DEPI	.055	.003	.796	Non-significant	Accept H02
SGAI	.486	.236	.010	Significant	Reject H02
TATA	-.229	.052	.261	Non-significant	Accept H02
LVGI	-.184	.034	.359	Non-significant	Accept H02

To determine which of the Beneish Model ratios singly or in combination predict the likelihood of earnings manipulation through the resulting M-scores, data were likewise subjected to regression analyses. It was hypothesized that financial ratios do not significantly predict the likelihood of earnings manipulation. The results of the regression analyses are summarized in Table 9.

The analysis of the results reveals that the independent variable indicators (Beneish Model ratios) are correlated with earnings manipulation (as determined by M-scores) in varying extents. The B coefficients present the amount of change in M-scores that is associated with a change in one unit of the Beneish model ratios.

The beta value, which is measured in units of standard deviation, measures how strongly each predictor variable under Beneshish model ratios (dependent) influences M-scores. GMI, with a beta value of 1.142 followed by SGI with a beta value of .116, and TATA with a beta value of .085, imply that these aforecited ratios have the highest predictive capability on M-scores.

Results of the analysis of variance test revealed an F ratio equal to 6696.264, with an associated probability equal to .000, a value much lower than .05. The findings indicate that the null hypothesis which states that *Financial ratios do not significantly predict M-scores and the likelihood of manipulation of financial statements* is rejected.

Moreover, *DEPI* and *SGAI* may be considered singly as insignificant determinants of M-scores at alpha level .05. Based on the results of regression analysis, *DARI*, *GMI*, *AQI*, *SGI*, *TATA*, and *LVGI* are considered to be significant predictors of M-scores. The overall *r-squared* equal to 1.00 is a measure of the goodness of fit of a model. A *r squared* of 1 indicates that the regression predictions perfectly fit the data, and that the variations in M-scores are all accounted for by the Beneish model financial ratios.

The study of Halilbegovic, et. al. (2020), lends support to the above findings. The study posited that the most dominating ratios were DSRI, TATA, SGAI, LVGI & SGI, which means that the companies were prone to engage in financial statement fraud mostly within these variables. Also, the highest number of companies practiced fraud in DSRI. Thus, the forensic accountants and auditors should pay particular attention to those accounts.

Furthermore, Harsanti and Mulyani's (2021) study aimed to examine the effect of using the Beneish M-Score model against fraud reports of 69 manufacturing companies listed in the Indonesian Stock Exchange in 2016 -2018. The results showed that the Days Sales in Receivables Index (DSRI), Gross Margin Index (GMI) and Total Accrual to Total Asset (TATA) had a significant positive effect on financial statement fraud, while the Asset Quality Index (AQI), Sales Growth Index (SGI), Depreciation Index (DEPI), Sales General and Administrative Expenses Index (SGAI), and Leverage Index (LVGI) did not affect fraudulent financial statements.

The results of the present study is very much similar to the findings of Findik and ÖZTÜRK (2018), where it is determined that the variables of "days' sales in receivables index" (DSRI), "gross margin index" (GMI), "asset quality index" (AQI) and "total accruals to total assets" (TATA) have positive effects on the possibility of doing accounting manipulation for any company. In addition to this; it is also determined that total accruals to total assets (TATA) variable has highest impact compared to the other variables.

According to the study of Marinakis (n.d.) The coefficients on the leverage (LVGI), Depreciation Index (DEPI) and Sales General Administrative Expenses Index (SGAI) are not statistically significant. One possible explanation is that these variables are related more closely with earnings management rather with earnings manipulation.

Earnings management allows companies to achieve earnings targets without overriding accounting principles whereas earnings manipulation violates the true and fair view principle. Thus a company is more likely to apply all the means within GAAP to achieve an earnings threshold (earnings management) before engaging into earnings

manipulation, as it could lead to significant costs if it is publicly discovered.

Further, the study found that the Total Accruals to Total Assets (TATA) index has a significant positive coefficient which is consistent with the notion that manipulators have weaker operating cash-flows to comparing to the reported accounting profits.

Table 9: Regression Run of Financial Ratios and M-Scores

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. error	Beta	t	
1. (<u>Constant</u>)	-4704	.461		-10.210	.000
DSRI	.962	.117	.066	8.236	.000
GMI	.527	.005	1.142	100.030	.000
AQI	.368	.115	.019	3.194	.006
SGI	.896	.069	.116	12.998	.000
DEPI	.053	.234	.001	.227	.824
SGAI	-.125	.176	.004	-.708	.489
TATA	4.001	.275	.085	14.544	.000
LVGI	-.476	.161	-.018	-2.956	.009

r -squared = 1.000

F = 66696.264

p = .000

alpha = .05

Conclusion

Based on the results of this study, the following conclusions could be drawn:

1)

- The resulting DSR indices which are > 1 for Companies A, B, D, E, H, I, M, and S, Telco C, and H & L (C) may suggest a change in credit policy to boost sales by providing additional deferred payment or a shift in credit policy to enhance sales by providing extra deferred payment. Thus, a likelihood of overestimating earnings through accelerated recognition of revenue.
- The GMI varies significantly from 1.0, as in the case of Companies B, C, D, E, F, H, I, L, M, N, O, P, Q, R, T, and U. and H & L (B) which may be an indication of either fraudulent reporting activity or an error in the prior or current period. Telcos A and B have GMI which are a little more than 1.0 that could imply that there could be evidence of slight manipulation of earnings.
- Company E registered the lowest AQI which provides us with information of the possibility that the company has changed its accounting practice and is shifting expense to capital in an attempt to improve perceived profits in the near term. The same goes with Telco B and H & L (B).
- Companies H and R could be predisposed to manipulate earnings to manage perceptions of continuing growth and also to obtain the capital needed to support

growth. Telco A, B, and C may demonstrate vulnerability to earnings manipulation, as well as H & L (B) and (C).

- Food, Beverage, and Tobacco companies B, C, E, F, H, I, J, K, L, M, N, O, P, S, T, and U, Telecommunications companies A and B, and Hotel and Leisure company A are likely to adjust depreciation methods i.e., the company revises the estimates of assets' useful lives.
 - Companies A, E, G, L, N, R, S, and T, Telco A, and H & L (A) are becoming less efficient in generating sales, and seem to be not successful in controlling expenses
 - Companies C, H, J, M, N, O, P, T, and U, Telco B are highly probable to breach a debt covenant. Hotel and Leisure companies do not suggest high risk of financial statement manipulation relevant to financial leverage.
 - Companies with positive TATA such as Companies A, B, G, M, R, and T are likely to manipulate their financial information on accruals. On the other hand, Telcos A, B, C, and H & L (A) and (B) are unlikely to alter their financial statistics on accruals with their resulting negative TATA.
- 2) Overall M-scores for the *Food, Beverage, and Tobacco* subsector is -2.132, -2.257 for *Telecommunications*, and -15.758 for *Hotel and Leisure* indicate *Yellow flags*. It could be inferred that generally, said companies could be

possible earnings manipulators, but they have more reliable reports than unreliable ones.

- 3) Of the 27 companies, there are three *red flags*, five *yellow flags*, and 13 *green flags* under the *Food, Beverage, and Tobacco* subsector; one *red flag*, no *yellow flag*, and two *green flags* under the *Telecommunications* subsector; no *red flags*, one *yellow flag*, and two *green flags* under the *Hotel and Leisure* subsector.
- 4) The Beneish Model ratios namely: DSRI, GMI, SGI, and SGAI demonstrate statistically significant correlations with the M-scores, while AQI, DEPI, TATA, and LVGI were found to have no significant correlation with the resulting M-scores.
- 5) Collectively, the Beneish Model financial ratios are significant predictors of the resulting M scores or the likelihood of earnings manipulation. Individually, however, DEPI and SGAI do not have any statistically significant predictive capability on M-scores or the likelihood of earnings manipulation.

The Beneish model can be a useful screening tool for earnings manipulation because of its ease of use. But it's crucial to remember that a high M score does not indicate fraud. Instead, it implies that further investigation is required, ideally by forensic accounting experts.

Recommendations

By aligning the recommendations with the identified conclusions, businesses can take targeted actions to address specific areas of concern and enhance their overall financial management practices.

Based on the conclusions drawn, the following recommendations are hereby presented:

1.
 - a. For businesses whose DSRI is > 1 , it would be helpful to examine changing the credit policy and enhance credit management, such as how to preserve accurate financial reporting while increasing sales. Use extra choices for deferred payments with caution to prevent overestimating revenues.
 - b. Telcos A and B, whose GMI is marginally above 1.0, and with variants departing noticeably from 1.0 need to exercise extra caution when it comes to minute manipulations of earnings to address any mistakes or possibly fraudulent reporting.
 - c. Businesses like Company E that have poor AQIs ought to closely examine their accounting procedures. Analyze the short-term effects of converting expenses to capital on perceived profits.
 - d. In order to control perceptions of growth, companies that are susceptible to manipulating results, like Companies H and
- R and Telcos A, B, and C, should prioritize open communication. Put plans in place to raise the funds required for long-term expansion.
- e. Industries that are likely to modify their depreciation procedures ought to be open about such modifications. When updating estimates of the useful life of assets, it has to be ensured that accounting standards are being followed.
- f. Businesses that are having trouble keeping costs under control and making sales should perform a thorough operational evaluation, in which case they should determine where there is room for process improvement, cost-cutting, and optimization.
- g. Businesses that have a high risk of breaking debt covenants ought to handle their financial leverage proactively such as renegotiating terms with creditors or looking into different financing options are two things to consider.
- h. Businesses with high TATA are probably going to falsify accruals-related financial data. It is recommended to put procedures in place to deal with possible manipulations.
2. Companies should periodically assess financial ratios, more understanding on the significance of these ratios in predicting M scores or the likelihood of earnings manipulation is of utmost necessity. A systematic and regular monitoring process for the Beneish Model financial ratios should be established by considering integrating automated tools or software solutions for efficient data analysis.
3. Companies identified with *red* and *yellow flags* should bolster their governance and internal control systems. Conduct an in-depth review of financial reporting procedures to make sure they adhere to accounting rules and improve transparency. Consider aligning the monitoring process with corporate governance best practices. Ensure transparency in the reporting of financial ratios and communicate any identified risks to stakeholders in a clear and timely manner.
4. Continue monitoring ratios. Implement corrective actions based on the insights provided by these ratios. Understand their predictive capability regarding M-scores and earnings manipulation.
5. Given that the Beneish Model financial ratios collectively serve as significant predictors of M-scores and potential earnings manipulation, it is crucial for the business to establish a robust monitoring and analysis framework that will enable the company to proactively assess and mitigate the risk of manipulation, ensuring the accuracy and reliability of financial reporting.

Foster collaboration with external auditors to gain additional insights and validation of the ratio analysis. External auditors can provide an independent perspective on the effectiveness of internal controls and the reliability of financial information.

Conflicts of Interest

The authors declare that there is no conflict of interest in this manuscript.

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