



A comparative earnings manipulation analysis using beneish m score and dechow f score: The case of a ZSE selected firm

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ABSTRACT

Background: The study seeks to compare Beneish M Score and Dechow F score proficiency in financial statement fraud detection utilizing a selected Zimbabwe Stock Exchange listed manufacturing firm. **Methods:** A quantitative research approach was adopted for the study. The Dechow F Score model and Beneish M Score were utilised in the analysis of secondary data of the selected firm from 2011 to 2015 and during the hyperinflation period relevant financial information from 2021 to 2023. The findings were cross validated with Independent external auditor reports. **Finding:** There exists no fraudulent financial reporting utilising the F Score model from 2011 to 2015 as the F Score was less than 1. The M score attests to non-manipulation from 2011 to 2014, with 2015 -2.009 reveals manipulation of financials but relatively low risk. The year 2023 has an F Score of 1.151 which falls within the above normal risk category. The Independent Auditor Report (IAR) reveals unqualified audit opinion for the years 2021 and 2023. In the year 2022, IAR exposes a qualified audit opinion. The M Score reveals non manipulation in 2021 and 2023 but manipulation detected in 2022. The findings reveal the Beneish M Score has 87.5% accuracy with Dechow F Score 62.5% accuracy. **Conclusion:** The period under study from 2011 to 2015 and 2021 to 2023 were selected for the study due constant changes to local currency adoption for which relevant financial information was available. **Novelty/Originality of this article:** The study provides insight into earnings manipulation models (Beneish M Score and Dechow F Score) in normal economic environment as well as hyperinflation. During periods of hyperinflation, the Dechow F score signified financial statements were high risk validating false positives when compared to the Beneish M Score findings that were in line with IAR opinions.

KEYWORDS: beneish m score; dechow f score; fraudulent financial reporting; manufacturing firms.

1. Introduction

ICAEW (2020) states fraudulent financial reporting as premeditated misstatements or understatements of totals within financial statements. According to the International Standard on Auditing (ISA) 240 (IAASB, 2013), fraudulent financial reporting is tantamount to deceptive disclosures within financial statements. ISA 240 (2009) articulates that fraud can be committed by those charged with governance in the following ways; (i) by recording fabricated journals, ignoring, advancing, or postponing recognition of transactions that would have been incurred by the entity during the accounting year; (ii) varying records and

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terms associated with significant and infrequent transactions, inappropriately altering assumptions and modifying judgments utilized in estimating account balances; (iii) disbursements to fabricated vendors as well as a significant increase in prices relating to goods and services that have been provided as well as sold. The Association of Certified Fraud Examiners (ACFE, 2022) classifies occupation fraud as encompassing three categories, which are asset misappropriation, corruption, and financial statement fraud. The focus of the study is financial statement fraud. ACFE (2022) identifies financial statement fraud as net income exaggeration or understatement, timing differences and fabricated revenues, concealed liabilities and expenses, inappropriate financial statement disclosures, and asset valuation. ACFE (2022) states financial statement fraud is costly with a USD 593,000 median loss. The next section discusses Zimbabwe's financial reporting environment.

1.1 Zimbabwe financial reporting environment

Zimbabwe has been classified as under hyperinflation since July 2019 as it met the requirements under IAS 29. Hyperinflation is indicated by characteristics of the economic environment of a country which include, but are not limited to, the following; (i) the general population prefers to keep its wealth in non-monetary assets or in a relatively stable foreign currency. Amounts of local currency held are immediately invested to maintain purchasing power, (ii) the general population regards monetary amounts not in terms of the local currency but in terms of a relatively stable foreign currency. Prices may be quoted in that currency, (iii) sales and purchases on credit take place at prices that compensate for the expected loss of purchasing power during the credit period, even if the period is short, (iv) interest rates, wages and prices are linked to a price index, and (v) the cumulative inflation rate over three years is approaching, or exceeds, 100% (ICAZ, 2020).

The insistent high inflation has undermined the usefulness of inflation adjusted financial statement as they do not reflect the economic reality as well as market values. The Zimbabwean economy embraced multi-currency in 2009 following the 2006 to 2008 hyperinflationary years due to demonetization of the local currency. Daka (2023) posits inflation adjusted financial statements as not beneficial from 2018 to date. With the functional currency changing, though not official, the RTGS became the official currency which was pegged at 1:1 with the US dollar. On the 22nd February 2019, the government of Zimbabwe issued statutory instrument (SI) 33 of 2019 which introduced a new currency terms RTGS dollar. The challenge is entities reported in USD using the exchange rate 1:1 which didn't reflect economic substance of financial performance and position. There arose significant misstatements in financial statements resulting from the conversion process at opening rate of USD \$1:2.5 RTGS\$. Accountants legally complied and prepared financial statements in USD. Auditors consequently issued adverse or modified opinions in relation to the substance of the matter due to IAS 21 The Effects of Changes in Foreign Exchange Rates noncompliance. The change in functional currency has had an unintended effect on implementation of accounting standards (IFRS 9, IFRS 15, IFRS 16, and IFRS 17). The adoption of a new currency affects the outcomes in hyperinflationary environments like Zimbabwe.

Ndala (2021) articulates compliance with SI 33 of 2019 resulted in IAS 21 noncompliance. This arose as due to the functional currency change in February 2019 though indications implied October 2018, USD was no longer the functional currency hence RTGS dollar as new currency. The results were catastrophic as historic figures utilised to derive inflation adjusted values per IAS 29 were not in compliance with IAS 21, and non-compliance with IAS 8 due to lack of prior period adjustment in relation to 2018 brought forward balances. IAS 29 gave rise to challenges in relation to General Price Index (GPI) which was out of touch with prevailing economic environment. The Consumer Price Index (CPI) was used as the GPI (Daka, 2023). Thus the CPI does not reflect the transactions undertaken by business thus leading to compromised financial statements lacking fair

representation. In March 2023, the authorities stopped publishing normal CPI index and produced a blended US\$ and ZWL \$ a consequence of the rise in usage of US\$.

1.2 IFRS 1: General non-compliance with IFRS in Zimbabwe

Financial statements in Zimbabwe revealed compliance with International Financial Reporting Standards (IFRS) except for IAS 21 The Effects of Changes in Foreign Exchange Rates as a consequence of conflicting local laws. In relation to IAS 21, a few organizations received unqualified audit opinions on the basis that historical non-compliance is insignificant over time if the current financial statements are prepared according to IFRS. Zimbabwe's current volatile economic environment has generated new challenges in relation to IAS 21. Entities were mandated to adopt USD\$1:1 RTGS which did not reflect economic substance of the transactions undertaken. Currently there exists lack of exchangeability between ZWL replaced by ZiG and USD. As a consequence, this complicates full IFRS compliance efforts. To this effect, the International Accounting Standards Board issued "lack of exchangeability" document on the 15th August 2023 amending IAS 21 effective 1 January 2025. The accounting challenges that arose from lack of exchangeability are addressed thus paving way for greater IFRS compliance. The next section will discuss financial statement fraud in Zimbabwe.

1.3 Financial statement fraud in Zimbabwe

According to Hosho et al. (2013), fraud perpetration and massive creative accounting practices exist in the Zimbabwean Cotton industry. According to Chigudu (2014), forensic accounting unearthed public sector fraud whereby procurement processes were manipulated for personal advantage. Makichi (2015) states fraudulent transactions were uncovered by an internal audit at a manufacturing firm in their 2013 accounts. The forensic approaches inclusive of internal audit are crucial in detecting as well as preventions of financial statement fraud. Newswire (2019) advances senior management of a renowned sugar manufacturer as having exaggerated sugar sales in order to meet set performance targets so as to earn incentives. Nkomo (2019) posits the occurrence of underreported revenue and funds unaccounted for in state owned entities. Madziva et al (2022) articulates executives in the public sector as exploiting weak controls to manipulate accounts and commit procurement fraud. The fraud committed involved a scheme of structuring financing agreements as representing sales therefore overly inflating sugars sales. The massaging of financial statements presents challenges for investment as capital flows out to safer havens due to unreliable published financial information.

There is dearth of studies validating Dechow F score and Beneish M Score models in economic environments such as Zimbabwe plagued with hyperinflation and local currency instability. Thus there exists literature on the applicability of these models as well as their comparability in developed economies but is limited in developing economies hence creating a gap in the verification of predictive accuracy in financial statement fraud investigative studies. Therefore, this creates challenges in the recommendation of the best practice for fraud detection. To this effect, this study assesses the proficiency of the Dechow F Score and Beneish M score model in detecting earnings manipulation in the Zimbabwe market where there is limited research on fraud detection models that could assist investors with a sound decision making tools to prevent loss of capital due to financial statement fraud.

1.4 Financial statement fraud models

Dechow et al. (2011) created the F-model. The Dechow f-score was developed to evaluate the financial statements' distortion. It is a generic method for assessing fraud risk and produces F-score, which represents likelihood of fraudulent financial reporting. According to Dechow et al. (2011), the F Score seeks to reveal major accounting

misstatements and is similar to Beneish (1997, 1999). The f-score model is represented by the following equation.

$$\text{Predicted value} = -7.893 + (0.790 * \text{RSST}) + (2.518 * \Delta\text{REC}) + (1.191 * \Delta\text{INV}) + (1.979 * \text{SOFT ASSETS}) + (0.171 * \Delta\text{CASH SALES}) - (0.932 * \Delta\text{ROA}) + (1.029 * \text{ISSUE}) \quad (\text{Eq. 1})$$

$$\text{Predicted Value} = -8.252 + 0.665\text{Rsst} - \text{acc} + 2.457\text{Chrec} + 1.393\text{Chinv} + 2.011\text{Softassets} + 0.159\text{Chcs} - 1.029\text{Chroa} + 0.983\text{Issue} - 0.15\text{Chaemp} + 0.419\text{Leasedum} + \varepsilon. \quad (\text{Eq. 2})$$

$$\text{Predicted value} = -7.966 + 0.909\text{Rsstacc} + 1.731\text{Chrec} + 1.447\text{Chinv} + 2.265\text{Softassets} + 0.160\text{Chcs} - 1.455\text{Chroa} + 0.653\text{Issue} - 0.121\text{Chaemp} + 0.345\text{Leasedum} + 0.082\text{Rett} + 0.098\text{Rett} - 1 + \varepsilon. \quad (\text{Eq. 3})$$

$$\begin{aligned} \text{Probability} &= \frac{e^{\text{predicted value}}}{1 + e^{\text{predicted value}}} \\ (e) &= 2.71828183 \\ &= 0.0037 \\ \text{F score} &= \frac{\text{Probability}}{0.0037} \end{aligned} \quad (\text{Eq. 4})$$

The variables utilised by the Dechow F Score model above are explained; a) RSST accruals, depreciation and changes in current liabilities (apart from short-term debt) are subtracted from changes in current assets (cash excluded) to determine how much has changed overall. Changes in long-term operating assets and long-term operating liabilities are taken into consideration as well, b) change in receivables, scaled by average total assets is the change in receivables from previous year to current year. Large adjustments in the accounts receivable balance are seen to be a sign of manipulated revenue and profits. False cash flows from operating operations, significant changes in accounts receivable, and false revenue recognition are all examples of manipulation, c) change in inventory, the average total assets are used to scale the change in inventories from the previous year to the current year. Large fluctuations in inventory might be a sign of liquidation, obsolescence, shortages, or surpluses, d) soft Assets This metric is calculated as total assets scaled by total assets less PP&E and, C&CE. It is hypothesised that managers have greater flexibility to modify assumptions and affect short-term profitability when soft assets are represented by a large portion of the statement of financial position, e) change in cash sales, the percentage difference between last year's and this year's cash sales constitutes this metric. Simply monitoring changes in cash sales is an essential signal to keep an eye on when evaluating the probability of revenue manipulation, f) change in return on assets, evidence of profits manipulation may be volatile earnings, which are defined as earnings divided by total assets of the current year subtracting the same metric previous year, and g) actual issuance of stock, this measurement is 1 in the event extra securities have been issued in the year of manipulation and 0 otherwise. Such issuances may signal operating cash flow issues that require further funding.

The Dechow F Score model has lately been studied and analysed by a number of academics, and the results are confirmed by empirical evidence (Cecchini et al., 2010; Lennox & Pittman, 2010). Najera (2021) suggests the F Score though utilized identifying fraudulent financial reporting, suffers from high false positive (Type 1 error). According to Dechow (2011), there is a correlation between a company's profitability and its level of exploitation; as a result, management is more likely to disregard financial figures when the organization's financial performance is subpar. Aghghaleh et al. (2016) posits the F score as having successfully detected fraud with a precision of 73.17% with non-fraud firms 76.22%. The chance of unearthing fraudulent financial reporting of Ho Chi Minh Stock exchange listed companies was examined by Tran et al. (2017) using the F-score. Their research found a substantial and positive correlation between Rsstacc, Chrec, and Soft Assets with the chance of fraud. A matched sample of 82 false observations from 2001 to 2014 was employed by Aghghaleh, Mohamed and Rahmat (2016). Aghghaleh et al. (2016) advance the

reliability of the F Score in the prediction fraudulent reporting to the extent of 73.17% with type 11 error of 26.83% and therefore champion its adoption in Malaysia. According to Zhou et al. (2022), the F score cannot be adopted for detecting fraudulent financial reporting. Thai (2017) posits Rstacc, Chrec, Soft assets and ROA as variables that impact fraud and error detection in the context of financial reporting. Marais et al. (2023) suggest the F score as inappropriate for utilization as a tool to detect financial statements manipulation in South Africa and its usage in the specialization should be with circumspection. Burca et al. (2022) posit a negative relationship between F score and real earnings management. The Beneish M Score model has been utilized to detect earnings manipulation. There are two models which are stated in Equation 5 below.

$$M = -6.065 + 0.823 * DRSI + 0.906 * GMI + 0.593 * AQI + 0.717 * SGI + 0.107 * DEPI \quad (\text{Eq. 5})$$

The analysis incorporates several key indicators derived from the Beneish model, which is adopted in this study; therefore, these variables are included as they contribute to the calculation of the M-score. The Days Sales in Receivables Index (DSRI) reflects potential revenue inflation when receivables increase disproportionately compared to sales. The Gross Margin Index (GMI) indicates susceptibility to manipulation, particularly when gross margins are weak, as reflected by a value equal to or close to one. The Asset Quality Index (AQI) signals possible earnings manipulation when its value exceeds one, implying an increase in intangible assets or deferred costs. Furthermore, the Sales Growth Index (SGI) compares current-year sales with those of prior years to assess growth trends. Finally, the Depreciation Index (DEPI) suggests that when the value is greater than one, the rate of asset depreciation has declined, which may indicate a revision in the asset's useful life or the adoption of income-increasing accounting techniques by the organization.

Aghghaleh et al. (2016) posit the Beneish M Score as being utilized in the detection of financial statement fraud with 73.17% entities identified as manipulators in Malaysia. According to Kamal et al. (2016), the M Score identified 14 of 17 companies as manipulators of financial statements and hence advance its effectiveness as a forensic tool in unearthing fraudulent financial reporting. Ofori (2016) postulates the M score and Altman Z score as having discovered fraudulent financial reporting at Enron for the years 1998, 2000, and 2001. In Ghana, manufacturing companies were deemed to have manipulated financial statements using the Beneish M Score (Anning & Adusei, 2020). The Beneish M score is effective in determining financial statement fraud (Akra & Chaya, 2020). Nyakarimi (2022) attests the Beneish M score effectiveness in identifying earnings management in Kenya, Tanzania and Uganda. According to Durana et al. (2022), the five model Beneish M Score correctly predicts of financial statement fraud.

1.5 Comparative analysis of beneish m score and dechow f score

The Dechow F score is superior to the Beneish M score in financial statement fraud (Aghghaleh et al., 2016; Nurcahyono et al., 2021; Omeiret al., 2023; Chakrabarty et al., 2024). The Beneish M score outperforms the Dechow F Score in the detection of financial statement fraud (Deniswara et al., 2022; Husnurrosyidah & Fatihah, 2022; Hou et al., 2023; Marais et al., 2023; Shu et al., 2022). Accordingly, the Beneish M Score and Dechow F Score output reveals the same level of accuracy (Wisdianti et al., 2022; Xu et al., (2023).

2. Methods

The study adopts a quantitative approach focused on a selected manufacturing firm listed on the Zimbabwe Stock Exchange from 2011 to 2015, for which secondary data was utilized for analysis. The period 2011 to 2015 was selected as the USD\$ was adopted the functional currency following the demonetization of the local currency due to hyperinflation. In 2016, a new currency was introduced to supplement the USD\$ termed "bond notes" by the Reserve Bank of Zimbabwe (RBZ). In 2019, the RBZ introduced RTGS\$

that was pegged at 1:1 with the USD\$. In 2020, the RBZ introduced the ZWL\$ as the new currency. In February 2023, the RBZ. In April 2024, the RBZ introduced the ZiG\$ that is backed by gold. Therefore, the currency instability necessitated the selection of the hyperinflation period for analysis as 2021 to 2023 to ensure consistency of presentation for which relevant financial information is available.

3. Results and Discussion

3.1 Dechow F score

According to Table 3, there exists no financial statement fraud as the F scores are less than 1 (F score < 1) as the results lies in the normal or low risk category. The results are validated by the Independent external auditor report that reveals unqualified opinions for the years 2011 to 2015. Therefore, stakeholders can utilize these financial statements with confidence to make strategic investment decisions as they are free from material misstatements. The results for the F Score from 2011 to 2015 are as per Table 1 below.

Table 1. F score (2011 to 2015) US\$

	2011	2012	2013	2014	2015
Constant	-7.893	-7.893	-7.893	-7.893	-7.893
Rsst	0.514	0.005	0.029	0.759	0.024
Λrec	0.000	0.026	0.076	-0.015	0.045
Λniv	0.019	0.019	0.019	0.025	0.020
SoftAssets	0.692	0.761	0.818	0.768	1.423
ΔCashsales	0.101	0.242	0.005	-0.026	0.002
Λroa	-0.056	0.033	-0.019	-0.014	-0.005
Issue	0.000	0.000	0.000	0.000	0.000
Predicted value	-6.511	-6.874	-6.928	-6.368	-6.374
Probability	0.002	0.001	0.001	0.002	0.002
Fscore	0.41	0.27	0.26	0.46	0.46

The F score for the year 2021 is 3.189 which falls within the above 2.45 category implying high risk. The F score for 2022 is 0.649 which falls within the normal or low risk category. The year 2023 has an F Score of 1.151 which falls within the above normal risk category.

Table 2. Hyperinflation F Score (2021 to 2023)

	2021	2022	2023
Constant	-7.893	-7.893	-7.893
Rsst	0.730	0.118	0.070
Λrec	0.570	0.180	0.230
Λniv	0.130	0.80	0.090
SoftAssets	1.172	1.416	1.549
ΔCashsales	0.968	0.022	0.050
Λroa	-0.025	-0.062	-0.450
Issue	0.000	0.000	0.000
Predicted value	-4.298	-6.015	-5.454
Probability	0.012	0.002	0.004
Fscore	3.189	0.649	1.151

The descriptive statistics premised on the hyperinflationary period reveals SoftAssets, Change in cash sales, change in receivables, and Rsst as the most significant variables impacting 2021 to 2023 ZWL\$ period. This is in tandem with findings by Thai (2017) who posits Rstacc, Chrec, Soft assets as variables that impact fraud and error detection in the context of financial reporting. Tran et al. (2017) postulate a substantial and positive correlation between Rstacc, Chrec, and Soft Assets with the chance of fraud. The results suggest that there are challenges in relation to revenue recognition under periods of

hyperinflation. There also exists moderate manipulation of receivables and accruals as they reflect moderate means. Soft assets and cash sales have increased manipulation risk as these are subject to managerial discretion.

Table 3. F Score hyperinflation 2021 to 2023 descriptive statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
SoftAssets	3	1.172	1.549	4.137	1.37893	0.191156
ΔCashsales	3	0.022	0.968	1.040	0.34667	0.538273
Δrec	3	0.180	0.570	0.000	0.32667	0.212211
Rsst	3	0.070	0.730	0.000	0.30603	0.367953
Δinv	3	0.080	0.130	0.000	0.10000	0.026458
Issue	3	0.000	0.000	0.000	0.00000	0.000000
Δroa	3	-0.450	-0.025	0.000	-0.17913	0.235322
Valid N (listwise)	3					

3.2 Beneish M score

According to Table 6, there exists financial statement manipulation in 2015 as the M score is greater than -2.22 (M score > 2.22), though low risk. The years 2011 to 2014 reveal non manipulation.

Table 4. M score (2011 to 2015) US\$

Year	Constant	Drssi	Gmi	Aqi	Sgi	Depi	M Score
2011	-6.065	0.604	-0.261	0.750	0.977	0.214	-3.781
2012	-6.065	0.734	0.834	0.649	1.045	0.077	-2.726
2013	-6.065	1.058	1.039	0.583	0.969	0.072	-2.344
2014	-6.065	0.954	0.769	0.483	0.560	0.115	-3.185
2015	-6.065	1.011	1.479	0.681	0.773	0.111	-2.009

The M score for the year 2021 is -3.128, which is above the -2.22 category implying no manipulation. The F score for 2022 is -0.755 which is greater than -2.22 implying manipulation of financial statements. The year 2023 has an M Score of -3.055, which is below the -2.22 threshold hence no manipulation.

Table 5. M score hyperinflation (2021 to 2023)

Year	Constant	Drssi	Gmi	Aqi	Sgi	Depi	M Score
2021	-6.065	1.185	0.741	0.491	0.396	0.124	-3.128
2022	-6.065	1.262	1.283	0.164	2.525	0.076	-0.755
2023	-6.065	0.988	0.780	0.155	0.980	0.107	-3.055

The findings in Table 8 reveal DRSI and SGI as the most significant variables impacting the hyperinflationary period 2021 to 2023. SGI with a mean of 1.30 and standard deviation of 1.100 indicates substantial variability in sales growth implying aggressive sales growth may prevail in the entity. DRSI has a mean of 1.145 and standard deviation of 0.14 suggesting fluctuation in accounts receivable as being a consistent feature during this period. DEPI has a mean of 0.10 with a standard deviation of 0.024 symbolizing insignificant change in depreciation policy within the organization.

Table 6. M Score hyperinflation 2021 to 2023 descriptive statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Drssi	3	0.988	1.262	3.435	1.14507	0.140953
Gmi	3	0.741	1.283	2.804	0.93469	0.302184
Aqi	3	0.155	0.491	0.000	0.26999	0.191461
Sgi	3	0.396	2.525	3.901	1.30031	1.100383
Depi	3	0.076	0.124	0.000	0.10242	0.024110
Valid N (listwise)	3					

3.3 Independent external auditor opinion

The Beneish M Score in 2015 was -2,009 reflecting low risk though Independent external auditor issued an unqualified opinion. The Dechow F Score was 0.46 thus reflecting normal risk. In the years 2021 and 2023, the Independent auditor opinion was unqualified with the Dechow F score output 3.189 (2021) and 1.151 (2023) reflecting above normal risk. The Beneish M Score -3.128 (2021) and -3.055 (2023) revealing non manipulation of financial statements. In 2022, The Dechow F score was 0.649 thus reflecting normal risk with Beneish M Score at -0.755 reflecting manipulation. The auditor report reveals a qualified opinion as there exists non-compliance with IAS 21, IAS 8, and IAS 29. Thus the Beneish M score has 87.5% accuracy (7 /8 outcomes) with Dechow F Score 62.5% accuracy (5 /8 outcomes) when cross validated with the Independent External Auditor report as above. The qualified opinion in 2022 that cites non-compliance with IAS 29 suggesting SoftAssets are distorted by inflation than intentional manipulation.

Table 7. Independent auditor opinion (extract)

Year	Opinion
2011	Unqualified
2012	Unqualified
2013	Unqualified
2014	Unqualified
2015	Unqualified with emphasis of matter on land acquisition
2021	Unqualified
2022	Qualified. There is non-compliance with IAS 21, IAS 8 and IAS 29
2023	Unqualified

3.4 Agency theory implications

Agents may undertake actions that benefit their agendas at the expense of their principals. SGI and DRSI are significant as per the results obtained in table 8. The inference may be that managers may be allowing aggressive credit terms thus receivables policy changes translating to inflated sales. SGI has high variability as per table 8 hence advancing variable and aggressive growth strategies. The results signify and validate the agency theory behaviour of agents towards their principals as they seek managerial incentives in a highly unstable, hyperinflationary business environment that leads to financial statement manipulations. The findings in relation to the F Score means management persistently involved in discretionary reporting choices to smoot earnings. The low quality financial reporting will be an agency cost that will be borne by shareholders. M Score and F score findings force principals to spend more on monitoring costs in relation to agents. M Score and F Score findings reveal agents engage in opportunism for short term utility to meet their agenda for self-enrichment. Therefore 2021 to 2023 shows erratic behaviour due to the high standard deviation for SGI.

According to Ross (1973) agency theory, the manager serves as the agent and is expected to carry out the instructions given by the principle, who is presumed to be acting in his own best interest while delivering instructions. According to agency theory, directors and managers have a duty to make sure that true and fair view financial statements are presented to the current shareholders in order to notify them of the calibre of their corporate governance. According to Mahesarani & Chariri (2016), there needs to be an understanding to two key factors when dealing with fraud embedded in published financial statements. These are the impact of asymmetric information in which information availability is greater for management than for the owner and disparities in interests between management and owners that provide the impression of a conflict of interest.

Financial statement fraud may be utilised in the context of the agency relationship between shareholders and directors to hide the directors of a company's breach of their fiduciary duty to the company's shareholders. The disclosures in the financial statements may be selective to portray then greater good to camouflage below par operational

performance and there will also exist manipulation of financial information. Depending on the pressure or purpose behind the financial statement fraud, the type of accounting fraud will vary. If the goal is to hide subpar or careless performance, the needed misrepresentation will comprise overstating revenue and assets and understating costs and liabilities in order to provide a falsely positive picture of performance.

3.5 Economic utility theory

The results in Table 8 reveal SGI and DRSI managers may be prioritising present utility by misstating sales and receivables values. The inference is such that increasing sales may exploit short term utility. AQI and DEPI have a lower impact thus less motivation to manipulate non-cash items. Financial reporting decisions were premised on sales and receivables thus consistent with agency driven objectives as well as short term utility maximization during this period of hyperinflation. The high DRSI and SGI inclusive of SoftAssets and change in cash sales eliminate the predictive value of the financial statements. The various users of financial statements cannot rely on reported sales growth. It will be difficult for investors to determine whether a firm is high quality or low quality based on the compromised information. The results validate the economic utility theory. There exists compromised stewardship as information lacks neutrality and is not error free thereby perpetuating the moral hazard problem.

Table 8. Influence of economic utility theory on financial statement fraud

No	Aspect	Explanation
1	Fraudulent intent	According to the economic utility hypothesis, people are compelled to commit fraud if they think it would maximise their benefit or satisfaction. In order to get financial advantages through fraud, such as higher bonuses or stock prices, people would often falsify financial accounts to make them look better.
2	Earnings management	According to the economic utility theory, people may manipulate financial accounts to their advantage by engaging in earnings management. People can create a false impression of better profitability by adjusting expenditures or inflating revenues fraudulently, which increases the benefit they obtain from their position. For a variety of reasons, including bonus seeking, job security, or to also benefit shareholders, management may opportunistically manipulate results at the detriment of shareholders' interests (Sun & Liu, 2016).
3	Risk-taking behaviour	According to economic utility theory, people may take risks if they perceive the benefits outweigh the risks. When it comes to financial statement fraud, people could take chances by providing false financial information in the hopes that they won't be discovered or that the advantages of the fraud will exceed any possible negative consequences. Murphy and Dacin (2011) argued that managers defraud when they have the desire and opportunity and believe they won't be discovered. They also claim this if they have a fraud propensity.
4	Rationalisations	According to the economic utility hypothesis, people may explain away their deceptive behaviour by claiming that it is better for themselves. They could persuade themselves that what they're doing is important to retain their standing within the company or to reach their financial objectives. Individuals may use rationalisations to lessen cognitive dissonance and to defend their dishonest behaviour.

The theory is premised on work by Daniel Bernoulli in 1738. According to economic utility theory, people base decision making according to what provides the greatest fulfilment. Financial statement fraud may be affected by this theory in a number of ways in Table 8. In general, economic utility theory may shed light on the causes of financial statement fraud and aid in illuminating the thought processes of those who engage in

fraudulent behaviour. The next paragraph focuses on Dechow F Score as the financial statement fraud model adopted by the study.

3.6 Qualitative characteristics of financial information implications

In order for financial information to be useful, it must be relevant and must faithfully represent what it purports to represent. The information is useful to stakeholders for decision making purposes, therefore it is enhanced by being comparable, verifiability, understandability and timeliness.

Table 9. Fundamental qualitative characteristics

No	Characteristic	Explanation
1	Relevance	Financial information is relevant and can be utilised for decision making purposes if it has predictive value, confirmatory or both as they are interrelated.
2	Faithful representation	Economic phenomena in financial reports in represented in numbers as well as words. The economic phenomena must therefore be faithfully by what is purports to represent. Faithful representation thus entails representation of the substance of economic phenomena in place of its legal form. Faithful representation maximizes characteristics of completeness, neutrality as well as free from error. In order for information to be useful, it must be relevant and faithfully represented.

Enhancing qualitative characteristics consist of comparability, verifiability, timeliness, and understandability, all of which serve to improve the usefulness of financial information that is already relevant and faithfully represented. Comparability refers to the ability of users to evaluate financial information across different periods or between entities, enabling them to identify similarities and differences in performance over time. Verifiability ensures that financial information faithfully represents the economic phenomena it is intended to depict, thereby increasing stakeholders' confidence in its reliability. Timeliness emphasizes that information must be made available promptly to support effective decision-making, as delays can result in missed opportunities, additional costs, or potential losses for investors. Lastly, understandability highlights the importance of presenting financial information in a clear and concise manner so that users, particularly market participants, can easily comprehend the entity's financial position and performance.

The interaction between qualitative characteristics and fraud highlights how financial statement fraud undermines the integrity and usefulness of financial information. Fraudulent practices distort relevance by introducing misleading or manipulated data, which in turn misguides stakeholders' decision-making processes. In terms of faithful representation, financial statements that contain misstatements or omissions fail to accurately reflect actual economic events, rendering them unreliable. Comparability is also compromised when financial information is manipulated or inconsistently reported, making it difficult for users to assess performance across different periods. Furthermore, verifiability is weakened because fraudulent records and falsified documentation prevent independent confirmation of the reported information. Lastly, timeliness may be adversely affected, as management may intentionally delay the disclosure of unfavorable information to gain short-term advantages, thereby reducing the overall usefulness of financial reports.

Understandability. Complex misrepresentations will impact and impair users 'comprehension. A DRSI mean M score 1.14507 signals accelerated revenue recognition which could imply manipulation as the value of 1.031. This suggests the reported profit as well as sales may not be free of error or neutral. A SGI mean score of 1.30031 is very high thus high sales growth could mean misstatements or manipulation of financial statements. This translate for violation of faithful representation. Therefore, high DRSI and SGI values imply heightened financial statement risk that they are not faithfully representing that

which they purport to represent. The entity's performance is not reflecting the economic phenomena that it represents due to misstatement, aggressive accounting or intentional fraud. DRSI and SGI are high thus impacting predictive value and confirmatory value due to inflated sales or misstatements. The M score findings suggest the financial information is not relevant for decision making.

In relation to the M score SGI (standard deviation 1.100383), there is extreme variation in sales growth. The F score change in cash sales findings are standard deviation of 0.538273 which. Due to high volatility of the standard deviations of these two variables from the F score and M score, comparability is hindered from 2021 to 2023 hyperinflationary period. This is so as a high standard deviation entails the volatile variable value year on year. The high standard deviation imply the financial information fails to attain comparability as well as verifiability that have a ripple effect on relevance and faithful representation.

In relation to the F score, the high mean value implies persistent deviating from financial reporting neutrality as F score is designed to detect poor accruals quality or income manipulation. SoftAssets mean 1.37893 informs financial statements as not neutral or faithful representation as well as not free from error. The underlying data may mean inflationary distortions. The high SoftAssets reflects rapidly increasing inflation impact on nominal value of non-monetary. The predictive value is then less relevant for decision making. The standard deviation for change on cash sales 0.538273 and Rsst 0.367953 reflect high volatility in relation to sales. Therefore, it limits comparability and verifiability as there is no consensus among independent stakeholders. The high standard deviation could mean inconsistent reporting practices. Financial statements lack consistency that is necessary for faithfully representation year on year. Faithful representation and relevance, as well as high standard deviations show instability hindering comparability and verifiability.

3.7 Implications for stakeholders

Financial statements are utilized by various stakeholders for decision making purposes hence these are on paramount significance and hence provide actionable insights and policy implications. There should be regular integration of earnings manipulation fraud detection models into financial reporting cycles. Beneish M score revealed SGI and DRSI as variable of significance during the hyperinflation period. Thus supplementary tests may need be conducted when these anomalies are detected. Entities should adhere to International Accounting Standards as non-compliance can nurture manipulation of financial statements hence undermines stakeholders' confidence in financial statements which impact their investment decisions.

4. Conclusions

The F Score and the M score are valuable in identifying financial statement fraud. The period 2011 to 2015 had normal or low risk of fraudulent financial reporting as the F Scores were less than 1. The period 2021 to 2023 had a mixed bag of results with 2021 and 2023 flagged for misstatements whilst the IAR contained an unqualified audit opinion. The results for 2022 revealed normal or low risk with the IAR containing a qualified audit opinion due to non-compliance to IAS 21, IAS 8, and IAS 29 which are in agreement with the M Score. Therefore, the M score has greater accuracy than the F Score in a hyperinflationary environment when the findings are cross validated with Independent External Auditor reports. The results affirm the Beneish M score and Dechow F score significance during periods of normal to hyperinflation providing signals corroborated with audit findings. In highly unstable economic environments, the M Score (87.5%) outperforms the F Score (62.5%). To this effect, investors must be conversant with forensic tools in order to assist in investments based on financial statements which are free from material misstatement and error or earnings manipulation.

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