

Determinants of Earnings Manipulation amongst Lusaka Securities Exchange Listed Firms: Application of the Beneish M-Score Model

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Abstract:- Corporations have incentive to manipulate their financial performance with reported earnings or net after tax income being a common target resulting in concerns such as misallocation of funds in capital markets and in the extreme, firms concealing possible impending cases of corporate failure. This study was conducted to evaluate prevalence and determinants of earnings management amongst firms listed on the Lusaka Securities Exchange (LuSE) using the Beneish (1999) M-score model and establish factors that may have contributed to the likelihood of such practices amongst the firms for the period 2010-2019. Data for the study was collected from annual reports of 12 out of the 17 non-service-related firms listed on the LuSE over the period 2010-2019. Results of the study were that there was high prevalence of earnings manipulation with 30.27% of the M-Scores calculated in the manipulator range amongst the firms. However, of the variables adopted as possible explanatory factors for the practice, the study found that only the coefficients of “years listed”, and “financial gearing” for the listed firm were statistically significant in the empirical Probit regression models estimated. Based on these findings, the study recommends that LuSE and the Securities and Exchange Commission create guidelines for the use of Generally Accepted Accounting Practices and application of accounting standards that minimize the likelihood of earnings manipulation amongst listed firms. They should also closely monitor IPOs and financial statements of recently listed firms to curtail their tendency to manipulate earnings.

Keywords:- Earnings Manipulation, Beneish M-Score Model, Lusaka Securities Exchange, Probit Regression

I. INTRODUCTION

Financial statement manipulation, used to mislead investors about financial performance/health is a problem that corporate boards must be diligent in curbing to ensure integrity of financial statements as well as investor confidence (Koutoupis & Pappa, 2018). Many accounting rules and principles require that a company's management make judgments in following accounting principles but without systematic or deliberate attempts to mislead users of financial statements. Earnings management takes advantage

of how accounting rules are, applied and creates financial statements that inflate or "smooth" earnings (Ronen & Yaari, 2008). Earnings manipulation has been, identified as one of the most likely cases of accounting fraud or financial statement fraud. According to Beneish (2001), earnings management is widespread, at least among public companies, as they face pressure to meet analysts' expectations. It also tends to be widespread if investors rely on analytical indicators to make decisions. Scholars have devised models for detecting the manipulation of earnings based on comparisons of reported items in financial statements and in particular examination of changes in “discretionary accruals”.

The Beneish M-Score Model, was developed by Professor M. Daniel Beneish of the Kelley School of Business at Indiana University (Herawati, 2015). Beneish(1999) proposed a mathematical model that uses financial ratios and eight variables to identify whether a company has manipulated its earnings. It is applied for detection of financial statement fraud. The model has inspired much empirical research to test its reliability and ability to predict outcomes related to earnings management and even the event of corporate failure (MacCarthy, 2017; Kamal, et al., 2016; Beneish, et al., 2013; Anh & Linh, 2016; Repousis, 2016; Talab, et al., 2017; Beneish, 1999; Lotfi & Aghaei Chadegani, 2018; Ofori, 2016; Bhavani & Amponsah, 2017). Scholars have considered different aspects of the applications of the model and in different sector as well as country contexts. Notably however, studies have been predominantly based on listed companies from different countries, a feature of the literature that points to the need for availability of published financial data for purposes of detecting earnings manipulation practices (Anh & Linh, 2016; Petrik, 2016; Talab, et al., 2017). Beyond the work of Beneish in this area, other scholars have made contributions to the area of detection of possible earnings manipulation, most notably the recent use of machine learning models by scholars such as Dbouk & Zaarour (2017). Grammatikos & Papanikolaou, (2021) have proposed use of computer algorithms based on Benford's Law to detect possible manipulation of earnings. The detailed discussion of these recent approaches was however beyond the scope of this study.

II. LITERATURE REVIEW

Earnings manipulation is a subject of great interest in accounting research as it can impact financial reporting quality and influence investors' decisions (Badertscher, Phillips, Pincus, & Rego, 2009). Researchers have utilized several theoretical frameworks to comprehend why firms engage in earnings management and how they do it (Gibson, 2013). Four frameworks, namely agency theory, signal theory, positive accounting theory, and entrenchment theory, have been used to explain the drivers of earnings manipulation (Beneish M. D., 1999). According to agency theory, managers act as agents of shareholders, and their interests may not always align with those of the shareholders (Ronen & Yaari, 2008). This misalignment can lead managers to manipulate earnings to meet their personal goals, such as achieving higher bonuses or job security. Scholars have identified executive compensation as one of the significant drivers of earnings manipulation. Signal theory posits that managers manipulate earnings to send signals to investors, lenders, and other stakeholders that the company is performing better than it actually is. Scholars have identified corporate debt as a driver of earnings manipulation in this context (Al-Mohareb & Alkhalailah, 2019).

Positive accounting theory suggests that managers are motivated by their self-interest and will engage in earnings management to maintain their power and control over the firm. According to this theory, managers manipulate earnings to increase their own wealth or the firm's share price (Ronen & Yaari, 2008). The need to use financial statements to increase the sense of indispensability is identified as a driver of earnings manipulation in this context. Entrenchment theory posits that managers may manipulate earnings to maintain their power and control over the firm, even if it is not in the best interest of shareholders. This theory suggests that managers may manipulate earnings to signal their ability to generate profits or to keep their jobs (Badertscher, Phillips, Pincus, & Rego, 2009).

Studies have also investigated the impact of regional practices and macroeconomic conditions on earnings manipulation. Firms in regions with a weak institutional environment are more likely to manipulate earnings, while firms in countries with weaker legal systems are more likely to engage in earnings management (Beneish, 1999). Furthermore, studies have shown that firms are more likely to manipulate earnings during times of economic prosperity, while economic crises have also been found to increase the likelihood of manipulative practices of financial reporting (Al-Mohareb & Alkhalailah, 2019).

III. RESEARCH METHODOLOGY

The study adopted a descriptive quantitative research approach to meet the research objectives. The population was, defined in terms of the financial statements of all non-service-related firms listed on the LuSE over the period 2010-2019. Based on an estimated of 17 such firms, the total

annual reports that were therefore available for analysis were in the range 170-190. Given the panel characteristics of the dataset that was, required, the sampling procedure considered the purposive selection of qualifying listed firms. Twelve out of the 17 qualifying firms to yield a balanced panel data set for the period 2010-2019 were, selected. This represented 70.58% of the possible population for the study and was arguably sufficiently large to capture all required information. Secondary data in the form of financial numbers was, obtained from the annual reports of the LuSE listed firms. The annual reports were, downloaded from various websites include the corporate sites of the listed firms as well as links provided from the LuSE website. Other major sources for the financial data included the African Financials website. Other relevant publications containing macroeconomic data such GDP growth rates and exchange rates were those from Bank of Zambia and World Bank databases. The financial and other data was, analysed in four phases:

Phase 1: Calculation of M-Scores for each year and each listed firm over the period 2010-2019. The Beneish model's with eight variables are shown in the expanded model in the Appendix.

Phase 2: Classified the M-Scores based on the threshold of -2.22 to establish the possible prevalence of earnings management.

Phase 3: Used Probit regression model to regress M-Scores analysed as either positive or negative in relation to earnings management (a binary variable), against variables representing economic subsector, number of listed competitors, and years listed on the exchange. The purpose of the model was to estimate the probability that an observation with named characteristics will fall into a specific one of the categories; moreover, classifying observations based on their predicted probabilities is a type of binary classification model (Bryman, 2012).

Phase 4: Used the Probit regression model to regress M-Scores analysed as either positive or negative in relation to earnings management (a binary variable), against variables representing the external macroeconomic environment i.e., interest rates, GDP growth, exchange rates. All hypothesis tests were, conducted at the 5% level of significance. Data was, analysed using Stata version 14 software.

IV. FINDINGS

Table 1 below shows the descriptive statistics for the M-Scores that were computed across the sample.

Table 1: Summary Statistics for Sample M-Scores

Mean estimation	Number of Obs	=	120

	Mean	Std. Err.	[95% Conf. Interval]

M Score	-2.791942	.0979494	-2.985891 -2.597992

Figure 1 below provides the diagrammatic view of the distribution of M-Scores.

Fig 1 Distribution Plot for Beneish M-Scores of Sampled

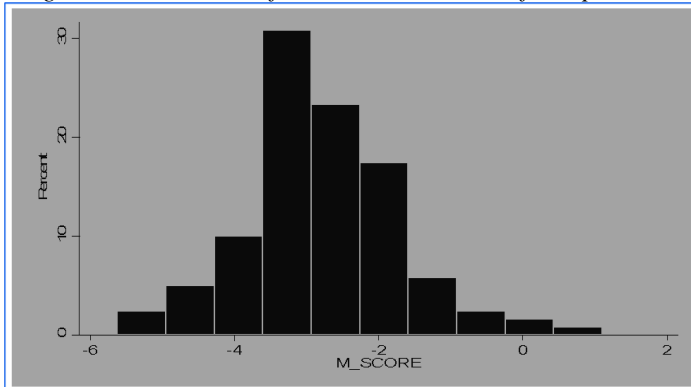


Figure 2 shows the proportions of M-Scores classified according to whether they were in the manipulator or no manipulator ranges across the financial statements of the sampled firms. The proportion of manipulated statements was 30.27% while those in the non-manipulator range were 69.73%.

Table 2 shows the Probit regression results for the binary earnings manipulation variable (Yes=1, No=0) against explanatory variables that were related to stock exchanges factors. The panel data Probit regression model estimated had a negative coefficient for the “listed rivals” factor of -0.0339271 with a p-value of 0.615. The 95% confidence interval for the true population coefficient of the factor was in the range -0.1661093 to 0.0982551. These results suggested that a higher value for listed rivals would reduce the probability of earnings manipulation and vice versa. However, results were statistically insignificant as seen from the p-value of the estimated coefficient.

In relation to the “years listed” on the LuSE factor, the empirical panel data Probit regression model gave a coefficient of -0.0382933 with a p-value of 0.008. The 95% confidence interval for the true population value of the coefficient was in the range -0.066622 to -0.0099646. The results obtained suggested that a higher value of the factor would lower the z-score probability of earnings manipulation by the estimated coefficient. A p-value of 0.008 denoted a statistically significant result at 1%, 5% and 10% levels of alpha. Interesting, the results suggested that newer entrants to the exchange would be more likely to engage in earnings manipulation.

Table 2 Empirical Probit Regression Model 1-Stock Exchange Factors

Random Effects			Groups	12
			Obs per group	10
			Wald Chi2	22.74
Log likelihood	=-		Prob>chi2	=0.000
Binary	Coeff.	SE	z	p>z

BMS				
Listed rivals	-0.0339	0.067	-0.50	0.615
Years listed	-0.0383	0.014	-2.65	0.008

Table 3 shows results of the empirical Probit regression model that was used to investigate possible factors for earnings manipulation patterns specifically related to the firms themselves, i.e., financial gearing ratios and dividend payout ratios. The results showed that the estimated coefficient for the financial gearing factor was -0.0106735 with a p-value of 0.005. The 95% confidence interval for the true population coefficient value for the factor was -0.018199 to -0.003148. These results were, interpreted as showing that higher levels of financial gearing reduced the probability of earnings manipulation while lower levels of financial gearing increased the probability of earnings manipulation. The results were notably statistically significant at standard levels of alpha given a p-value of 0.005.

The coefficient estimated for the dividend payout ratio as a possible factor for explaining the probability of earnings manipulation was -0.0070525 with a p-value of 0.343, which was statistically insignificant at all standard levels of alpha. The corresponding 95% confidence interval for the true population value of the coefficient was -0.0216406 to 0.0075355. In probability terms, the negative coefficient obtained suggested that higher payout ratios would lower the probability of earnings manipulation while lower payout ratios had the opposite effect. However, the results were statistically insignificant given the p-value of 0.343.

Table 3 Empirical Probit Regression Model-Firm Specific Factors

Random Effects			Groups	12
			Obs per group	10
			Wald Chi2	22.24
Log likelihood	=-		Prob>chi2	=0.000
BIN BMS	Coeff.	SE	z	p>z
gearing	-0.0106	0.038	-2.78	0.005
Payout ratio	-0.0705	0.007	-0.95	0.343

Table 4 shows the results of the Probit regression analysis considering macroeconomic factors relating to the Zambian economy as regressors. The GDP growth rate factor retained an estimated coefficient of 0.0488698 with a p-value of 0.521 and 95% confidence interval for the true population value in the range -0.1003024 to 0.198042. In other words, higher GDP growth rates increased likelihood of earnings manipulation compared with periods of lower growth. Notably, the results were statistically insignificant. The estimated coefficient for the interest rate was -0.0585984 with a p-value of 0.158 and 95% confidence interval for the true coefficient lying in the range from -0.1398965 to 0.0226997. Higher rates of interest would

lower the probability of earnings manipulation and vice versa, although the results were statistically insignificant for all standard alpha value. The coefficient of the USD-LCU exchange rate was -0.004121 with a p-value of 0.907 and 95% confidence interval from -0.0735871 to 0.0653451.

Table 4-Empirical Probit Model Macroeconomic Regressors

Random Effects			Groups	12
			Obs per group	10
			Wald Chi2	23.46
			Prob>chi2	=0.000
Log likelihood	=-70.645			
BIN BMS	Coeff.	SE	z	p>z
gdpg	0.0489	0.076	0.64	0.521
Interest rate	-0.0586	0.041	-1.41	0.158
Usd_lcu	-0.0412	0.035	-0.12	0.907

For purposes of comparison and discussion, an overall empirical panel data Probit regression model with all regressors of interest in this study, was, estimated. The results are, presented in Table 4 below. The results obtained in the overall model generally confirmed those in the reduced models in relation to coefficient sign but not in relation to statistical significance of results. This could be, attributed to loss of efficiency of the overall model because of increasing the numbers of regressors without increasing observations to use in the analysis.

Table 5- Overall Empirical Probit Model

Random Effects			Groups	12
			Obs per group	10
			Wald Chi2	25.46
			Prob>chi2	=0.000
Log likelihood	=-71.036			
BIN BMS	Coeff.	SE	z	p>z
Listed rivals	-0.0393	0.075	-0.52	0.600
Years listed	-0.0308	0.027	-1.14	0.254
gearing	-0.0023	0.009	-0.24	0.807
Payout ratio	-0.0059	0.007	-0.83	0.406
gdpg	0.0738	0.079	0.93	0.352
Interest rate	-0.0512	0.044	-1.17	0.244
Usd_lcu	0.0519	0.053	0.98	0.325

Table 5 shows the summarised hypothesis test results across the analysis of the data. The results in the table show that the hypothesis of a high proportion of financial statements with earnings manipulation (above 10%) over the period 2010-2019 could not be, rejected by the evidence. However, for the other hypotheses, only coefficients of

years listed, and financial gearing for the listed firm were statistically significant for alpha=1%, 5% and 10%.

Table 5-Summary of Hypothesis Test Results

Hypothesis	Null	Alternate	Coefficient	p-value	Result
1-proportion of earnings manipulation amongst LuSE listed firms	$\pi \leq 0.1$	$\pi > 0.1$	z= 6.3901	p= 0.0000	Reject Ho for $\alpha=0.01, 0.05$ or 0.1
2-Listed rivals & years listed respectively	$\beta = 0$	$\beta \neq 0$	b=-0.0339271	p=0.615	Accept Ho
			b=-0.0382933	p=0.008	Reject Ho
3-financial gearing & dividend payouts respectively.	$\beta = 0$	$\beta \neq 0$	b=0.0106735	p=0.005	Reject Ho
			b=-0.0070525	p=0.343	Accept Ho
4-GDPG, Interest Rate & USD-LCU FX rate respectively	$\beta = 0$	$\beta \neq 0$	b=0.0488698	p=0.521	Accept Ho
			b=-0.0585984	p=0.158	Accept Ho
			b=-0.004121	p=0.907	Accept Ho

V. DISCUSSION

The question of the prevalence of earnings manipulation practices amongst firms, especially publicly traded entities, is of great concern to a variety of stakeholders including the investing public, accounting standard setters, relevant regulatory authorities and even the capital markets as a collective (Badertscher, et al., 2009; Beneish, et al., 2013; Bhavani & Amponsah, 2017). For the purposes of this study, a key specific objective was to assess the prevalence of earnings manipulation practices amongst LuSE listed firms for the period 2010-2019 using the Beneish M-Score Model. Results of the study suggested a high prevalence of earnings manipulation practices amongst the firms considering a base value of 10% of financial statements attributable to highly random factors such as errors in the preparation of financial statements. Precisely, the study found a proportion of 30.27% of the financial statements of the sampled LuSE listed firms falling above the -2.22-threshold used in interpreting Beneish M-Scores to detect the likelihood of earnings manipulation. Although the higher proportion of firms fell in the range where earnings manipulation would be, considered as having a low likelihood, the results were, still considered a source of concern as the proportion flagged for possible earnings manipulation was too high. The results were consistent with other studies conducted around the world and regionally involving tendencies for earnings manipulation tendencies amongst publicly traded corporations (Herawati, 2015; Kamal, et al., 2016; Li, et al., 2011; Ofori, 2016). The results in this regard support the significance of efforts to improve the quality of financial statements through adoption of accounting practices that reduce the possibilities for manipulation of discretionary accruals (Repousis, 2016).

The emergence of branches of economic theory such as behavioral economics has opened a variety of useful and plausible explanations for behaviors of economic agents in different spheres of economic interaction such as the capital markets (Gibson, 2013). For these reasons, this study adopted factors that could relate to the influence of the stock market on the behavior of listed companies on the LuSE vis-à-vis the management of earnings. The two factors

investigated could be, considered as aligned with the peer pressure hypothesis raised in recent studies such as Charles, et al (2017). Dimensions of this peer pressure such as competition for investor attention and the need to fit in informed the adoption of “years listed on the stock exchange” and “number of listed rivals on the exchange” as factors for investigation of the veracity of this emerging hypothesis in the relevant literature. Of the two factors stated, this study found that only years listed amongst the sampled LuSE listed firms significantly affected the probability of earnings manipulation.

The results showed that more years since being listed on the exchange at the time of publication of financial statements could be associated with a lower likelihood of earnings manipulation. In other words, financial statements of firms that recently had their Initial Public Offerings(IPO) could be more prone to having manipulated earnings. These results are consistent with past studies that have explored the relationship between IPOs and earnings management practices of firms such as Roosenboom et al (2003). In other words, the pressure to manipulate earnings could be greater for firms that have recently made their shares available to the investing public. In relation to the number of listed rivals as a form of competition for investor attention, this study found, despite statistically insignificant results, that higher value for listed rivals would reduce the probability of earnings manipulation and vice versa. In other words, the presence of rival firms whose financial results could be used in detailed comparative analyses may act as a deterrent for earnings manipulation. Thus, firms with less rivals may counterintuitively be more prone to manipulate their results.

How policies such as those relating to dividends and capital structure may influence patterns of earnings management has also been a feature of the relevant literature (Lemus, 2014). For this study, the role of capital structure as measured by the total debt to total assets ratio or financial gearing ratios and the dividend policies of firms as represented by their payout ratios were, used as firm specific factors that could help explain the likelihood of firms manipulating their earnings. Findings of the study showed that higher levels of financial gearing reduced the probability of earnings manipulation while lower levels of financial gearing increased the probability of earnings manipulation. The results were notably statistically significant at standard levels of alpha given a p-value of 0.005. However, the results were inconsistent with past studies such as Al-Mohareb & Alkhalileh (2019) who found that Jordanian Stock Exchange listed firms that found that higher levels of financial gearing measured by the total debt to total equity ratio increased the probability that firms would engage in manipulation of earnings. On the other hand, their results were inconclusive when they measured financial leverage, similar to the present study, using the total debt to total assets ratio.

The coefficient estimated for the dividend payout ratio as a possible factor for explaining the probability of earnings manipulation was -0.0070525 with a p-value of 0.343, which was statistically insignificant at all standard levels of alpha. The corresponding 95% confidence interval for the

true population value of the coefficient was -0.0216406 to 0.0075355. In probability terms, the negative coefficient obtained suggested that higher payout ratios would lower the probability of earnings manipulation while lower payout ratios had the opposite effect. However, the results were statistically insignificant given the p-value of 0.343. The results were nevertheless with international studies such as those conducted by, He et al(2017) who found from a sample of 23,429 firms from 29 different countries that those who paid dividends were less likely to manipulate their earnings than those that did not pay dividends. In other words, nonpayment of dividends may place firms under greater pressure to placate investors by earnings manipulation practices.

Beneish (1999) raised the observation that tendencies towards the manipulation of earnings may be, driven by overall factors in the macroeconomic environment that not only affect real firm performance, but also how such performance is, reported to the capital markets. This observation provided the justification for the investigation of the effects of three important macroeconomic variables in the context of the Zambian economy, on the likelihood of LuSE listed firms engaging in earnings manipulation. The performance of the overall economy was, measured by the nominal GDP growth rate, while financial market conditions were, measured by average lending interest rates per annum and the USD-Local Currency Unit, Zambia being an important dependent economy whose health is, closely tied to exchange rates for major convertible currencies such as the USD. Findings of the study were that all the three factors did not affect likelihood of earnings manipulation by LuSE listed firms over the period 2010-2019. These results were inconsistent with the findings of past studies that found that stressful macroeconomic situations coincided with high proclivity for earnings manipulation but consistent with those that found the opposite to be the case (Badertscher, et al., 2009; Herawati, 2015). For example, periods of high growth could compel firms to manipulate their earnings to meet the expectations of analysts and investors.

VI. CONCLUSION AND RECOMMENDATIONS

Financial statements of corporations provide a basis for various decisions by users of the statements. The responsibility of corporate boards to ensure such financial statements do not paint a materially different picture than the actual economic realities of the reporting entities was stressed by large scale corporate accounting scandals such as that preceding the collapse of Enron in the United States of America at the turn of the new millennium and the subsequent legislative response in the form of the Sarbanes-Oxley Act of 2002, amongst other important corporate governance recommendations. However, that senior managers of corporate entities have ability to manipulate reported performance through practices such as earnings management is a fact that has been of significant scholarly interest.

The question of the drivers of such behaviour continues to be of interest as much as the methods that can be used to detect the presence of manipulated earnings. This study was, inspired by the Beneish M-Score Model to investigate such factors based on data obtained for listed firms on the Lusaka Securities Exchange (LuSE) over the period 2010 to 2019. The study led to the conclusion that earnings manipulation over the period had been high while the main drivers of the practice appeared to be related to “years listed”, and “financial gearing” of the firms in the sample.

The main recommendations of this study were that the stock exchange should create guidelines for the use of Generally Accepted Accounting Practices and application of accounting standards that minimize the likelihood of earnings manipulation amongst listed firms. For example, changes in accounting policies as well as the use of discretionary accruals in preparation of financial statements by the listed firms should be, guided to reduce the likelihood of earnings manipulation by the firms. This should include clear policies against earnings management practices. They should also closely monitor IPOs and financial statements of recently listed firms to curtail their tendency to manipulate earnings. Such guidelines should be, provided as part of listing requirements with potential penalties for violation of the guidance to protect investors.

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