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Efficacy of Intelligent Knowledge Management Algorithms on Financial Reporting Quality in Nigerian Listed Companies

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Abstract. Due to the importance of corporate governance, many countries all over the world are obliged to improve on their financial reporting practices and Nigeria is not an exception. As part of its effort to strengthen corporate governance practices, this paper focuses on the adoption of International Financial Reporting Standards enhance financial reporting quality through efficient Intelligent Knowledge Management Algorithms. Thus, the fundamental theoretical justification is that the fear of reputational injury and litigation risk that might arise from financial statement failure due to regulatory reform will cause the board of directors to be more thorough in their process and demand for high quality financial statement. This paper presents an extensive review on input-output-based earnings management and earnings quality measures that are considered as useful proxies for audit quality according to the International Financial Reporting Standards. Virtually, all studies on earnings management have sought to find a simple statistical method to measure it. The efficacy of various earnings management models was investigated in a comparative manner for Nigerian listed companies. Hence recommendations were made in order to proffer a way forward for enhancement of the national economy and global competitiveness.

Keywords: Information Management, Knowledge Management, Corporate Governance, Financial Reporting Quality.

1 Introduction

1.1 Background

The financial report has in recent time received increased attention from regulators, stakeholders, and policymakers following various accounting scandals recorded all over the world [1]. Thus, to address the issue of financial reporting, the debate has focused on Knowledge Management mechanisms that might enhance financial reporting quality [2]. Effective corporate governance involves a series of mechanisms which guarantee an effective financial reporting process, accountability, and respon-

sibility [3,4]. These emphases are indicative of an association between corporate governance and financial reporting quality that an effective AC will improve upon. Accounting scandals have led to the collapse of high-profile businesses across the globe which raised serious concerns on the effectiveness of corporate governance mechanisms and monitoring strategies hitherto employed by firms to protect the interest of investors [5]. In Nigeria, these scandals have prompted the release of the 2011 revised Code for Corporate Governance, and the establishment of Financial Reporting Council of Nigeria (FRCN) in 2010 and 2011, respectively, to regulate the activities of Nigerian listed firms [6]. In addition, the International Financial Reporting Standards (IFRS) were also adopted to strengthen the reliability and credibility of the financial reporting process [7]. Hence, investigating financial reporting quality is a good way of assessing Audit Committee's effectiveness. Thus, study examines a number of attributes regarding financial reporting quality based on the agency theory and related literature.

1.2 Statement of the Problem

Financial reporting process and the auditing framework for Nigerian listed companies were generally deficient, and auditor's independence is often compromised. As a result of the impairment of auditor's independence mostly due to weak Audit Committee, several issues, like earnings misstatement, financial fraud, and losses, have been reported. It involved a number of audit firms which further led to professional misconduct among accountants and auditors in corporate Nigeria. These various gravities of professional misconduct among accountants and auditors in corporate Nigeria that has been glaring such that some accountants and auditors are determined on taking advantage of the ambiguities which characterise the accounting systems to continue to create escape routes to justify their misdeeds. Hence, it is glaring that the market was unable to attract sustainable investment following the loss of investor confidence. These ugly situations have focused attention on regulatory reforms in financial reporting seeking for ways to enhance the integrity of the financial reporting across firm levels. Hence, the urgent need to circumvent this problem through the adoption and digital deployment of intelligent knowledge management algorithms based on leading learning models.

2 Earnings Management

2.1 Definition of Earning Management

EM is a term used to refer to a purposeful intervention in the process of external financial reporting with the intention of getting private gains. Although other scholars have argued that this purposive intervention is to make the financial reporting have adequate information for its users, others believe that it is used for misleading stakeholders. Different phrases or names have been used to describe the activities of EM, including accounting alchemy, income smoothing, window dressing, banking income for the future, financial shenanigans, borrowing income from the future, financial

reporting manipulations, creative accounting, accounting magic, juggling the books, reengineering the income statement, the numbers game, financial reporting management, accounting hocus-pocus and cooking-the-books.

Dechow, et al [8] defined EM as an accrual system of accounting; it is a system where revenues are recorded in the book as and when received and expenses recognised when they are paid. The accrual system also recognises some items even before the actual cash is received or paid, for example, credit purchase and sales. The EM process is divided into three different categories. First, fraudulent accounting-managers choose accounting practices that are contrary to the accounting standards [9]. Second, accrual management - in this category, managers use the accounting standards as contained in the GAAP, but shroud the true economic performance of the firm when reporting earnings; and third, the real earnings management – here, management practices and manipulates accounting numbers to report higher earnings.

2.2 Financial Reporting Quality and Earnings Management

Several nations, both developed and emerging, reacted to the challenges of poor corporate governance, even before the 2001 Enron collapse, by releasing various corporate governance codes and best practices. The Enron embarrassment and other financial-reporting fraud in the US led to the passage of the SOX of 2002 [10], which is a federal law with full corporate governance significance. The growing disappointment with AC performance in Nigeria has necessitated the need for an initiative for identifying the determinants of an effective AC to suit the Nigerian business climate. Consequently, the Nigerian regulators introduced a unique AC composition by including shareholders in the committee. The AC in Nigeria now comprises an equal number of three non-executive directors and three shareholders [6, 11]. This is more interesting as the shareholders will be in the know about their investment and that will stimulate their voting power during the AGM should anything go awry in the committee, especially when there is inadequate disclosure [12]. In Nigeria, regulators have enforced that AC members have accounting or financial knowledge [6]. The AC, should therefore, be composed of at least three independent directors (IND) and at least one with financial knowledge and three shareholders as representatives of other shareholders. These regulations indicate clearly that effectiveness of governance mechanisms depends to a large extent. The involvement of shareholders in the AC in Nigeria represents one of the most unique and recent regulatory enforcements that is expected to improve the effectiveness of AC compared to the guidelines for most developed countries, such as the US, the UK and Australia, as well as other emerging economies of Africa and Asia.

Hence, the way in which the shares are distributed among various shareholders determines each shareholder's voting power, especially the largest shareholder, although a large but minority shareholder has the power to control if the balance of the shares is distributed widely among various small shareholders that are likely to influence the outcome of a vote. In general, however, small shareholders' votes are very likely to cancel each other, and the large shareholders get the decision power. But when the second largest blockholders have the power, such power is denied [12]. This process

is the primary aim of this review in the context of AC composition and the shareholders' power in the committee's activities.

2.3 Measurement of Earnings Management

EM is considered as successful if it is not discovered. Virtually, all studies on EM have sought to find a simple statistical method to measure it. Consequently, several methods have been used by different scholars to measure EM. The common method to measure discretionary accruals is aggregate accruals which is the starting point or approach found in the accounting literature for measuring EM. The total accruals are made up of DA representing EM and non-discretionary accruals which are also determined economically. However, managers usually find ways of utilizing their discretion over accounting options to smooth earnings [13]. DA may either be increasing (positive) or decreasing (negative), based on the inherent motivations in each firm. Positive EM reflects various motivational factors, such as seasonal equity offers, raising price of stock or trying to meet earnings forecast. On the other hand, negative EM connotes other motivational factors, such as averting cost of regulations. In Nigeria, depending on the inherent motivation of individual firms, the discretionary accruals may be either negative or positive.

To calculate DA, total accruals are collected. There are two methods for calculating total accruals according to some prior studies. First, is the use of the balance sheet approach [14]. The balance sheet is estimated as follows:

$$TAC_t = \Delta CA_t - \Delta Cash_t - \Delta CL_t + \Delta DCL_t - DEP_t \quad (1)$$

Where:

ΔCA_t = Change in current assets in year t

$\Delta Cash_t$ = Change in cash and cash equivalents in year t

ΔCL_t = Change in current liabilities in year t

ΔDCL_t = Change in debt included in current liabilities in year t.

DEP_t = Depreciation and amortisation expense in year t

The second method is estimated using the cash flow approach as used by other scholars [15, 16, 17, 18].

The approach is stated below:

$$TAC_t = Income_t - Cash Flow_t \quad (2)$$

Where:

$Income_t$ = Earnings before extraordinary and abnormal items in year t

$Cash Flow_t$ = Operating cash flow in year t

In a bid to distinguish between the two approaches, [19] examined the approaches and reported that the cash flow method is much better than the balance sheet method when firms undergo mergers or acquisitions. However, [20] argued that non-articulation events, especially mergers or acquisitions, may separate the relationship between balance sheet working capital changes and revenue and expenses accrued in the in-

come statement. Further, the balance sheet method is biased when calculating accruals for items that may be considered discretionary for companies which have ceased operations. Consequently, this present study employs the modified Jones approach to estimate total accruals (TA).

3 Earnings Management Models

Various models for detecting accrual-based EM have been developed by [14]. Until now, the Jones model and the modified Jones model [13] have drawn the attention of scholars in EM research. These models are considered as the best and most powerful for testing EM. Although [21] model has become a focused on in accounting research. This model seeks to measure EM by using aggregate mean accruals in the estimating period as non-DA measure. This measurement model was the first to evaluate the extent of managers' manipulation. Hence, accruals are recognised as the difference between operating cash flows and earnings reported. The DA is measured as follows:

$$EDA_{it} = TA_{it} / A_{it-1} \quad (3)$$

Where:

EDA_{it} = Measured discretionary accruals for the period;

TA_{it} = Aggregate accruals for the period;

A_{it-1} = Overall assets at the beginning of the period

3.1 The DeAngelo (1986) Model

Consequent upon the observed shortcomings associated with the Healy Model of previous year's benchmark for expected accruals, [22] attempted to provide a new model, where DA are measured by estimating the difference between current year's total accruals and previous year's total accruals. The model is as below:

$$EDA_{it} = TA_{it} / A_{it-1} \quad (4)$$

Where:

EDA_{it} = Measured discretionary accruals for the period;

TA_{it} = Aggregate accruals for the period;

A_{it-1} = Overall assets at the beginning of the period

Consequently, this model was criticized as a result of misclassifying non-DA to be used as discretionary. Again, the previous year could have been used as a benchmark for expected accruals but comprise manipulated earnings [23].

3.2 The Jones (1995) Model

A more powerful model was established by [14]. Her model includes plant, property and equipment (PPE) as measures of non-DA to ensure that changes in the DA accruals that stem from depreciation and firm business activities are controlled. The model is shown below:

$$TAC_{it} = \alpha (1 / TA_{it-1}) + \beta_1 (\Delta REV_{it} / TA_{it-1}) + \beta_2 (PPE_{it} / TA_{it-1}) + \epsilon_{it} \quad (5)$$

Where:

TAC_{it} = aggregate accruals.

TA_{it-1} = the book value of total assets of firm i at the end of year t -1,

$\Delta REV_{it} / TA_{it-1}$ = sales revenues of firm i in year t less revenues in year t-1 scaled by TA_{it-1},

PPE_{it} / TA_{it-1} = gross property, plant and equipment of firm i at the end of year t scaled by TA_{it-1},

α , β_1 , β_2 = estimated parameters,

ϵ_{it} = the residual.

Many studies have considered the [14] model as the best and most powerful [24] over Healy's and DeAngelo's models due to their DA which are inclined to opportunistic behaviour and the performance hypothesis. The [14] model has also been found to be more effective when run with cross-section analysis, thus providing additional control than when run with time-series.

3.3 The Modified Jones (1995) Model

Dechow et al. [13] criticised [14] model and argued that managerial decision on credits should not be disregarded by the model. Hence, the Jones model was slightly modified to recognise accounting variations in income receivables in the event period. So, managers reverted to manipulating earnings on credit sales rather than cash sales. The modified Jones model (MJM) allows credit sales variations during the period of the event because of EM [25]. The model is as follows:

$$TAC_{it}/TA_{(it-1)} = \alpha_0 + \alpha_1 ((1/TA)_{(it-1)}) + \alpha_2 (((\Delta REV)_{it} - (\Delta REC)_{it})/TA_{(it-1)}) + \alpha_3 (PPE_{it}/TA_{(it-1)}) + \epsilon_{it} \quad (6)$$

Where:

TAC_{it} = Aggregate accruals.

TA_{it-1} = the book value of total assets of firm i at the end of year t -1,

$\Delta REV_{it} / TA_{it-1}$ = sales revenues of firm i in year t less revenues in year t - 1 scaled by TA_{it-1},

ΔREC_{it} = the change in accounts receivables.

PPE_{it} / TA_{it-1} = gross property, plant and equipment of firm i at the end of year t scaled by TA_{it-1},

$\alpha = \alpha_1 \alpha_2 \alpha_3$ = estimated parameters.
 ϵ_{it} = the residual

3.4 The Kasznik (1999) Cash Flow Model

In measuring EM, [17] extended [13] and [14] Models by specifically including the change in cash flows from operating activities as an explanatory variable due its negative correlation with total accruals. Hence, he estimated the following cross-sectional model:

$$TAC_{it}/TA_{(it-1)} = \alpha_0 + \alpha_1 \left(\frac{1}{TA} \right)_{(it-1)} + \alpha_2 \left(\frac{(\Delta REV)_{it} - (\Delta REC)_{it}}{TA_{(it-1)}} \right) + \alpha_3 \left(\frac{PPE_{it}}{TA_{(it-1)}} \right) + \alpha_4 \left(\frac{\Delta CF_{it}}{TA_{(it-1)}} \right) + \epsilon_{it} \quad (7)$$

Where,

TAC_{it} = Net income minus cash flows from operations

ΔCF_{it} = Change in cash flows from operations in year t

Therefore, the same calculations used by the Jones Model to estimate the non-DA and DA were used with the addition of change in cash from operations.

3.5 The Francis et al. (2005) Cash Flow Model

Francis et al. [15] suggested that quality of accruals is an alternative proxy for EM. Consequently, [26] argued that quality of earnings is more beneficial if accruals are better related, which can be realised by operating cash flows in the preceding, current and subsequent periods. The model is an extension to [26] model of accruals quality by adding two new variables, namely, revenue changes (ΔREV) and plant, property and equipment (PPE). The two added variables are scaled by average total assets [16]. However, [17] further argued that for extracting error in estimation, it is necessary to control the two additional variables. The model is depicted below:

$$TCA_{it} = \alpha_0 + \alpha_1 CFO_{(it-1)} + \alpha_2 CFO_{(it+1)} + \alpha_3 CFO_{(it+1)} + \alpha_4 \frac{\Delta REV_{(it)}}{TA_{(it-1)}} + \alpha_5 \frac{\Delta PPE_{(it)}}{TA_{(it-1)}} + \epsilon_{it} \quad (8)$$

Where:

TCA = Total current accruals

CFO = Cash from operations

ΔREV = Change in Revenue

PPE = Property, plant and equipment

ϵ_{it} = The residuals (a minimum three years' firm data residual is required).

4 Conclusion

This study focuses on descriptive relationship with the aim of examining moderating effects of some key determinants in the relationship between Audit Committee and

Earning Management on the Financial Reporting Quality in Nigerian listed firms. In Nigeria, however, following the accounting scandals surroundings collapses, several companies with poor AC performance, have called for the need to identify factors that can effectively enhance AC performance to suit the Nigerian business horizon. Consequently, the revised CCG and the CAMA provide a unique AC composition by including shareholders. The AC composition in Nigeria now is made up of three non-IND and three shareholders under section 359 (3 & 4) and Part E Article 30 [6, 11]. Contrary to what is obtainable in most of the developed countries, such as in the US and the UK, where ownership of shares is dispersed, share ownership in Nigeria and most emerging economies around the world is tilted towards concentration, where shares are owned by various and identifiable interest groups, such as individuals, foreigners and managers. Further, Nigeria's political history offers a clear view of how developing shareholder activism as corporate governance mechanism can succeed in a country with a political background, like Nigeria. The study has confirmed that the Modified-Jones accrual model by [13] is the most reliable and consistent model to detect manipulative financial report, using manager's discretionary right of accounting methods choice and estimates. Findings from this study (if supported) are expected to restore investors' confidence such that foreign and domestic investors' can invest in firms listed on the Nigerian capital market without any fear. Additionally, we also hope that the research will be of benefit to the regulators in taking the necessary actions to overcome matters related to scandals, failures, and improve financial reporting quality.

5 References

1. Ghafran, C., & Yasmin, S. (2018). Audit committee chair and financial reporting timeliness: A focus on financial, experiential and monitoring expertise. *International Journal of Auditing*, 22(1), 13–24.
2. Al-Shaer, H., Salama, A., & Toms, S. (2017). Audit committees and financial reporting quality: evidence from UK environmental accounting disclosures. *Journal of Applied Accounting Research*, 18(1), 1–38.
3. Haq, I. (2015). Role of the Audit Committee Chair in the Financial Reporting Process. FIU Electronic Theses and Dissertation. 2212. <https://doi.org/10.25148/etd.FIDC000101>
4. Li, J., Mangena, M., & Pike, R. (2012). The effect of audit committee characteristics on intellectual capital disclosure. *British Accounting Review*, 44(2), 98–110.
5. Khalil, M., & Ozkan, A. (2016). Board Independence, Audit Quality and Earnings Management: Evidence from Egypt. *Journal of Emerging Market Finance*, 15(1), 1–35.
6. SEC. (2011). Code of corporate governance for public companies in Nigeria.
7. Herbert, W. E., Anyahara, I. O., Okoroafor, E. N., & Onyilo, F. (2016). Financial Reporting Council of Nigeria and the Future of Accounting Profession in Nigeria. *International Journal of Finance and Accounting*, 5(3), 146-157.
8. Dechow, Patricia M., Hutton, A. P., Kim, J. H., & Sloan, R. G. (2012). Detecting Earnings Management: A New Approach. *Journal of Accounting Research*, 50(2), 275–334.
9. Jamkarani, R.G. & Hozhi, T. (2016). Relationship Between the Accrual-Based Earnings Management and Future Financial Performance. *International Business Management*, 10(6), 1013–1019.

10. Sarbanes, P. (2002). Sarbanes-oxley act of 2002. In *The Public Company Accounting Reform and Investor Protection Act*.
11. CAMA. Laws of the Federation of Nigeria, CAP 59, Vol. III. (2004).
12. Leech, D. (2013). Shareholder Voting Power and Ownership Control of Companies. In *Power, Voting, and Voting Power: 30 Years After* (pp. 475–498). Berlin, Heidelberg: Springer Berlin Heidelberg.
13. Dechow, P.M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting Earnings Management. *The Accounting Review*, 70(2), 193–225.
14. Jones, J. J. (1995). Earnings Management During Import Relief Investigations. *Journal of Accounting Research*, 29(2), 193–228.
15. Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2005). The market pricing of accruals quality. *Journal of Accounting and Economics*, 39(2), 295–327.
16. Jaggi, B., Leung, S., & Gul, F. (2009). Family control, board independence and earnings management: Evidence based on Hong Kong firms. *Journal of Accounting and Public Policy*, 28(4), 281–300.
17. Kasznik, R., & McNichols, M. F. (2002). Does Meeting Earnings Expectations Matter? Evidence from Analyst Forecast Revisions and Share Prices. *Journal of Accounting Research*, 40(3), 727–759.
18. Xie, B., Davidson, W. N., Dadalt, P. J., Davidson Iii, W. N., & Dadalt, P. J. (2003). Earnings Management and Corporate Governance: The Role of the Board and the Audit Committee. *Journal of Corporate Finance*, 9(3), 295–316.
19. Cohen, D. A., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics*, 50(1), 2–19.
20. Habbash, M., & Alghamdi, S. (2015). The perception of earnings management motivations in Saudi public firms. *Journal of Accounting in Emerging Economies*, 5(1), 122–147.
21. Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics*, 39(1), 163–197.
22. DeAngelo, L. E. (1986). Accounting Numbers as Market Valuation Substitutes: A Study of Management Buyouts of Public Stockholders. *The Accounting Review*, 61(3), 400–420.
23. Aljifri, K. (2007). Measurement and Motivations of Earnings Management: A Critical Perspective. *Journal of Accounting, Business & Management*, 14(1), 75–95.
24. Guay, W. R., Kothari, S. P., & Watts, R. L. (1996). A Market-Based Evaluation of Discretionary Accrual Models. *Journal of Accounting Research*, 34, 83.
25. Evans, M. E., Houston, R. W., Peters, M. F., & Pratt, J. H. (2015). Reporting Regulatory Environments and Earnings Management: U.S. and Non-U.S. Firms Using U.S. GAAP or IFRS. *The Accounting Review*, 90(5), 1969–1994.
26. Dechow, P., & Dichev, I. D. (2002). The Quality of Accruals and Earnings: The Role of Accruals Estimation Errors. *The Accounting Review*, 77(2002), 35–59.
27. Kasznik, R. (1999). On the Association between Voluntary Disclosure and Earnings Management. *Journal of Accounting Research*, 37(1), 57.