



Assessment of the nature and prevalence of real activity manipulation among Nigerian listed companies

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Abstract

The prevalence and nature of real activity manipulations (RAM) among 74 Nigerian listed companies are examined in this study for the years 2001–2014. The required data was found in the sampled firms' published annual reports. Three forms of RAM were examined in the study: production costs manipulation, discretionary expenses manipulation, and sales manipulation. Six estimating techniques were used to accomplish the study's objectives. The outcome demonstrates the frequency of each of the three manipulations studied among Nigerian listed companies, suggesting that during the research period, Nigerian listed companies participated in income-increasing manipulations. Consequently, among other things, it was suggested that corporate governance procedures be strengthened and that listing regulations and established corporate governance guidelines be followed. Additionally, it recommends that regulatory bodies and other regulatory agencies pay attention to RAM prevalence among listed firms in Nigeria. RAM practices are becoming more and more common among companies in emerging economies; therefore, this report is significant and appropriate. The nature and incidence of RAM in all sectors of Nigerian listed companies have not been examined in previous research conducted in the country.

Keywords: Corporate failures, whistle-blowing, income-increasing manipulations, corporate governance, Nigerian Stock Exchange, JEL Classification: G34; M41

Introduction

The prevalence and nature of real activities manipulations (RAM) among Nigerian listed companies were examined in this study. 74 publicly traded companies that remained listed continuously between 1999 and 2014 made up the sample size. To combat the various forms of dishonest manipulations that impact the business environment, the Federal Government of Nigeria (FGN) has implemented number of initiatives. One sign of poor and inadequate company governance is fraudulent financial reporting. According to Chima and Damagum (2013), corporate governance comprises the methods and procedures that businesses use to accomplish their justifiable goals in the best interests of all stakeholders. These manipulations, otherwise called RAM, have serious repercussions for a company's ability to operate. Roychowdhury (2006) asserts that manipulating real activities deceives investors as well as other stakeholders in order to reach a particular profitability threshold. Agency conflicts are the cause of managers' opportunistic behaviour.

The Securities and Exchange Commission (SEC) Corporate Governance Code (2003), which was reviewed and revised in 2011; the Investment and Securities Act (ISA) (2007); the Financial Reporting Council Act (2011); the Companies and Allied Matters Act (1990), which was reviewed and amended in 2004; the National Pension Commission (PENCOM) Corporate Governance Code for Pension Fund Administrators (2008);

the National Insurance Commission (NAICOM) Corporate Governance Code for Insurance Companies (2009); and the Central Bank of Nigeria (CBN) Corporate Governance Code for Nigerian Banks post-consolidation (2006), which was reassessed in 2014, are just a few of the numerous reforms, reviews, and enactments of corporate governance laws that have taken place in Nigeria over the past few decades in an effort to lower the prevalence of RAM among listed firms in the country.

Despite all of these steps, dishonest financial reporting and organizational failures caused by RAM continue to be common occurrences in Nigeria. For instance, the SEC expressed concern in June 2006 regarding "overstatements" in the financial statements of Cadbury (Nig.) Plc. The irregularity, which had occurred for many years, was found to be between ₦13 billion and ₦16 billion by the auditors who investigated the manipulations. From June 30, 2002, when the manipulations began, to December 14, 2006, Cadbury was fined ₦100,000.00 by the SEC in the first instance and ₦5,000.00 every day. Both Mr. Bunmi Oni, the managing director, and Mr. Akadiri Ayo, the finance director, were fired from the organization (Adeyemi, 2007; Uwuigbe, 2013). The corporate scandal of Afribank Nigeria Plc bears close ties with that of Cadbury (Nig) Plc. Its financial reports showed significant earnings despite accusations of monumental manipulations (Akomolafe & Mmadu, 2014).

Ile-Oluji cocoa products, Lever Brothers (Nig) Plc, Standard Printing and Publishing Company, African Petroleum Company, and Union Dicon Salt are among the other purported instances of corporate failures in Nigeria following the publication of the 2003 SEC corporate governance code (Bakre, 2007; Lauwo & Otusanya, 2010).

Due to the severity of the 2008 manipulations at Spring Bank Plc, 13 people were removed from the board with the CBN's approval. The liquidity challenges of the bank and the steadily declining wealth of its stockholders were made clear by this removal. According to the 2009 Nigerian "Capital Market Report," the ranking of the country's capital market was among the worst in 2008 because of reprehensible corporate governance (Adejogbe & Aina, 2015). 2009 saw a "Tsunami" of non-performing loan cases in Nigeria's banking sector, affecting institutions like Intercontinental Bank Plc, Afribank Plc, Oceanic Bank Plc, Bank PHB, and Fin Bank Plc (Sanusi, 2010).

Any nation's economy is severely impacted by false financial reporting, and its consequences on prospective investors and society at large should raise serious concerns. Investors lose a substantial amount of money every year due to corporate mismanagement and eventual failure (Okaro *et al.*, 2013). Bakre (2007) claims that deliberate account manipulation and prevarication by business entities cost Nigerian investors billions of naira.

Do management of quoted companies in Nigeria influence performance through real activities? In case they do, what is the nature? As such, this research work concentrates on investigating the nature and prevalence of RAM that is specific to the Nigerian listed companies.

Literature review

Earnings manipulation is a crucial and important topic in the scholarly literature (Rath & Sun, 2010; Mortazavi & Vakilifard, 2016). This desire is solely motivated by the fact that earnings are used for a variety of purposes. Binding corporate contracts, such as financial covenants (Mortazavi & Vakilifard, 2016), executive bonus plans, assets' valuation, and compensation, such as executive equity compensation (Viviers & Mans-Kemp, 2018; Gao & Shrieves, 2002), all requires it. Thus, according to Ge (2009), accounting data offered information that is crucial and utilized by a variety of stakeholders. For instance, creditors utilize the stated figures to evaluate a company's viability, legitimacy, and financial health (Ge, 2009; Mortazavi & Vakilifard, 2016). In a similar vein, shareholders evaluate earnings to assess the performance of the company. However, if they refuse to acknowledge and account for the earnings manipulations' impact present in the publicly available financial accounts, their assessments of a company's success might not be accurate (Mortazavi & Vakilifard, 2016). When the firm's performance does not match its observed estimates, the embedded manipulations will be visible in the results that follow.

Cupertino *et al.* (2016) define earnings manipulation as a management choice to use accounting rules and procedures or to slant operational choices or activities in order to achieve particular profits targets with reference to the financial statements that have been made public. The empirical literature has found two types of earnings manipulation: real activities and accruals (Cohen *et al.*, 2008; Enomoto *et al.*, 2014; Chan *et al.*, 2015). In order to attain the targeted earnings level, the manipulation through accruals involves selecting the proper accounting techniques (also known as accounting-based management of earnings). The manipulation through real activities, also known as real earnings management (REM), makes use of the timing and size of operating decisions to achieve desired results. Most previous studies, concentrated on manipulating earnings through accruals, which auditors can easily spot (Chen, 2009; Zarowin & Cohen, 2010). However, with managers using RAM methods more frequently lately, this practice has changed significantly (Saona & Mellado, 2019).

According to Ibrahim and Hassan (2014), manipulating earnings is not limited to accruals; it may also be sustained by changing operational measures that move earnings in the intended direction. RAM is the term for the later. Roychowdhury (2006) asserts that there is a plausible indication that the management team continues to manipulate earnings. This can be accomplished by manipulating accruals in ways that have no direct impact on cash flow, like under-provision of bad debt or

delay of asset write-offs. In order to reach a specific earnings threshold, executives are also motivated to manage actual operations throughout the year. Cash flows in the current time are impacted by manipulation of real actual activity (Roychowdhury, 2006).

These are all signs that RAM can take many various forms, which makes it challenging to determine and address the type of RAM present in a given organization. Without giving enough consideration to the prevalence and nature, which are crucial for combating the threat, many previous research have focused more on the impact of RAM and the potential solutions (Kothari *et al.*, 2012; Venkatachalam & Rajgopal, 2011; Lu & Zhu, 2013; Chen, 2009). In the realm of accounting research, RAM has gained more and more interest (Inaam *et al.*, 2012). Ahmed and Hassan (2012), Samuel (2012), Fodio *et al.* (2013), Obeten *et al.* (2014), Elijah and Ayemere (2015), Kibyaa *et al.* (2016), and Moses (2019) are only a few of the many research works that focused on accruals manipulation in Nigeria. Research on the incidence of RAM in Nigeria has been scant or nonexistent, with only a few studies concentrating on manufacturing firms, including Ibrahim and Hassan (2014), Okolie (2014), and Bello *et al.* (2015), to date

Data and Methodology

This study examines the frequency and type of real activity manipulations using a fourteen-year period (2001–2014). This study used a secondary data methodology

and the correlational research method. Due to the availability of the necessary data, the study is restricted to Nigerian listed firms.

The study's population consists of all Nigerian quoted firms between 1st January, 1999, and 31st December, 2014. In order to eliminate companies that are not necessary until the requisite sample size is chosen, this study employs a non-probability sampling technique called "filtering." The necessary sampled firms are those that have the pertinent data of interest for the study and have been regularly listed on the Nigerian Stock Exchange from 1999 to 2014. It is pertinent to note that companies that were not listed on the NSE during this time will likewise not be included in the sample chosen because they will not have the adequate data needed for this research. All sampled organizations must have data spanning 16 years (1999-2014) in order to be considered relevant.

The companies that were listed on the NSE between 1999 and 2014 comprise the sample for this study. The nonfinancial industries are the focus of the investigation. Financial institutions are excluded because of their unique characteristics, operating in a highly regulated sector with distinct accounting policies, corporate governance codes, standards, and regulatory bodies, as well as adapting the criteria of previous research of this kind (Badertscher, 2011; Gunny, 2010). Firms that don't have all the data needed for this study throughout the appropriate time frame are eliminated. Firm-year observations are used for regression analysis; each firm-year must

have at least 14 years of records (2001–2014). Notably, a lot of companies do not have the necessary research and development (R&D) data. When sales, general, and administration (SG&A) expenditures are accessible and R&D expenses are not, R&D expenses equal ₦0.00 (Roychowdhury, 2006).

2001 serves as the base year for this evaluation as the SEC's corporate governance code for publicly traded corporations was implemented in 2003. 2014 was selected as the upper limit (ending period) because, at the time data collection began, the most current annual reports of every company listed on the NSE, that is, the year 2014 were readily available. Since no recognized database contains all of the necessary data, the researcher gathers all of the data by hand. The Independent Shareholders' Association of Nigeria (ISAN) archive, the NSE and SEC libraries, and the headquarters of the selected companies were all excellent sources of the secondary data that were needed. The NSE FACTBOOK, the INET BFA online database also provided certain required financial data, particularly financial data from 2006 in certain instances. Certain data categories needed for this study, such as inventory values, cost of sales, cash-flow statements, and operating expenses, are not included in the NSE Factbook. As of mid-2016, the NSE FACTBOOK publications for 2013 and 2014 are still pending.

In line with earlier research on RAM, such as that conducted by Roychowdhury (2006), Sanjaya *et al.* (2012), and Sun *et al.* (2014), this study looked at three different kinds of manipulation: manufacturing cost manipulation, sales manipulation, and manipulation of discretionary spending. In the literature, discretionary expenses manipulation involves managers reducing discretionary costs such as SG&A expenses, advertisements, and R&D expenses; production cost manipulation involves managers choosing to increase profits by producing more units than is necessary to decrease fixed costs per unit and, consequently, the cost of goods sold; and sales manipulation is defined as managers trying to temporarily boost current year sales by granting credit terms that are more lenient or price rebates.

Price reductions are used in sales manipulation to increase sales, which lowers margins. The cash inflow per sale also decreases when margins do. In a similar vein, providing more accommodating credit conditions, such as zero-percent financing or lower interest rates, results in less cash inflow. Because of the sales level, sales manipulation operations are therefore linked to lower current-period operational cash-flows. We use the following model to predict sales manipulations caused by anomalous cash-flows from operations (ab_cfo_{it}), which is our first measure of RAM:

$$CFO_{i,t}/TA_{i,t-1} = \alpha (1/TA_{i,t-1}) + \beta_1(SL_{i,t}/TA_{i,t-1}) + \beta_2(\Delta SL_{i,t}/TA_{i,t-1}) + \varepsilon_{i,t} \dots (1)$$

Where:

$CFO_{i,t}$ = operating cash-flows for firm i at period t .

$TA_{i,t-1}$ = the total assets of firm i at the end of the previous year.

$SL_{i,t}$ = sales of firm i at year t .

$\Delta SL_{i,t}$ = the change in sales of firm i in year t .

Following the parameters' estimation in equation (1), the value of residual in equation (1) is the abnormal cash flow (ab_cfo_{it}). A positive value of ab_cfo_{it} indicates income-decreasing RAM because sales manipulation reduces the signed value of anomalous operating cash flows. On the other hand, a negative score indicates an income-increasing RAM (Roychowdhury, 2006).

Since discretionary expenses are often period costs that are recorded at the time of its occurrence, managers may manipulate them by cutting them in order to boost earnings. Discretionary expenses will be abnormally lower for companies who opportunistically reduce them. According to Roychowdhury (2006), the total of advertising, R&D, SG&A costs is what is referred to as discretionary expenditure. We perform this regression in order to separate the anomalous component of discretionary expenses:

$$DISX_{i,t}/TA_{i,t-1} = \alpha (1/TA_{i,t-1}) + \beta_1(SL_{i,t-1}/TA_{i,t-1}) + \varepsilon_{i,t} \dots (2)$$

Where:

$DISX_{i,t}$ = discretionary expenses of firm i in year t .

$SL_{i,t-1}$ = lagged sales.

Using the value of the residual in equation (2), the second way to assess RAM is by manipulating discretionary expenses, which is measured by anomalous discretionary expenses ($ab_disx_{i,t}$).

A positive value of $ab_disx_{i,t}$ indicates a low prevalence of RAM since a decrease in discretionary expenses results in a decrease in abnormal discretionary spending.

We adopt Roychowdhury (2006)' definition of production costs as the total of the cost of products sold plus inventory change. The regression model is estimated below to determine abnormal production costs (ab_prod_{it}). Because such actions can lower the cost of goods sold, production cost manipulations take place when businesses manufacture excess goods than are required in order to boost profits. The fixed overhead expenses are spread over all of the overproduced units which results in a reduced cost of goods sold as a consequence of the overproduction. The regression model is given by:

$$PROD_{i,t}/TA_{i,t-1} = \alpha (1/TA_{i,t-1}) + \beta_1(SL_{i,t}/TA_{i,t-1}) + \beta_2(\Delta SL_{i,t}/TA_{i,t-1}) + \beta_3(\Delta SL_{i,t-1}/TA_{i,t-1}) + \varepsilon_{i,t} \dots (3)$$

Where:

$PROD_{i,t}$ = production costs of firm i at year t.

$\Delta SL_{i,t-1}$ = the lagged change in sales.

Production cost manipulations, as determined by a typical production cost which are the value of the residual in equation (3), constitute our third measure of RAM. Since overproduction raises the quantity of anomalous production expenses, a positive value of ab_prod_{it}

suggests a high prevalence of RAM. The aforementioned models forecast average earnings, which, when deducted from the reported actual results, yield the residuals the amount of manipulated earnings.

Six estimating methodologies were used to accomplish the study's goal. Three variance-covariance estimate (vce) models with specification on standard error reported: the type that are robust to certain kinds of misspecification (robust); the models that allow intragroup correlation (cluster clustvar); the ordinary least square (OLS) model (assuming homoscedasticity); and the models that use bootstrap. Other models include the feasible generalized least squares (FGLS) and the panel-corrected standard errors (PCSE).

The choice of the three vce-type models is to obtain consistent, asymptotically unbiased results while not assuming homoscedasticity and normality of random error terms (Hamilton, 2013; Simons, 2019). It is recommended not to assume homoscedasticity but to rather adjust the model to resolve heteroscedasticity (Torres-Reyna, 2007; Watson & Stock, 2003). According to Maddala (1999), and Schmidheiny (2016), a vce-type model has a better prediction tendency and capable of producing estimates that are not spurious. In other words, the residuals from such model are more efficient and consistent (Hoechle, 2007). The residuals generated from these models are the crux of this study, which defines the RAM prevalence of the firms listed in NSE. The inclusion of FGLS and PCSE models is to afford

comparison of the standard errors and other statistics generated with all the other models. It will reveal similarity or otherwise as a form of robustness check of the residuals generated from these other vce-type models especially.

When autocorrelation, heteroscedasticity, and cross-sectional dependency become problematic, Trivedi and Cameron (2013) and Moundigbaye *et al.* (2018) suggested using alternative estimators that will yield reliable standard errors and a more effective estimation. Panel data frequently exhibit heteroscedasticity, autocorrelation, and cross-sectional dependency, among other non-spherical error behaviours (Ye & Reed, 2011).

According to Chen *et al.*, (2011), it employs an estimation approach that concurrently addresses time-invariant cross-sectional correlation, group-wise heteroscedasticity, and first-order [AR(1)] serial correlation, therefore, the FGLS (group-wise heteroscedasticity + autocorrelation) model is utilized in this investigation.

When the disturbances are not presumed to be independent and identically distributed (i.i.d), panel-corrected standard error (PCSE) can be used as an alternative to FGLS for fitting linear cross-sectional time-series models. Assuming that the disturbances are heteroskedastic and contemporaneously correlated across panels by default, it calculates the variance-covariance and standard errors estimates (Webb & Reed, 2010).

Insert Table 1(Panel 1) here

Insert Table 1(Panel 2) here

Insert Table 1(Panel 3) here

As stated earlier, the predicted residuals from the regression analysis is the main essence of this study. Table 1 above gives the results of estimating the three RAM models using different estimating techniques. The table is subdivided into three panels, that is A, B, and C, each of the panel account for the results of a particular RAM model. There is little dissimilarity from the results as evident in the three RAM models above, for example, none of the standard errors are exactly the same even in cases where the coefficients are similar. The significant levels of the various variables are similar between the vce-type models, FGLS and PCSE but slightly different from the ols asymptotical model in Panel C where all the variables are statistically significant. As a result of the inherent capabilities of the vce-type models, FGLS, and PCSE to handle a range of non-spherical error behaviours, such as autocorrelation, cross-sectional dependence, and heteroscedasticity, many of the post-estimation options that are available using the ols model are not available under these models (Ye & Reed, 2011).

As the results reveals, for these data analyses, there is no difference in the residuals predicted in all the vce-type models and the ols asymptotical model. The analyses results from the three RAM models reveals similarity in the residuals, Panel A shows results from sales manipulation model with **-0.0055** predicted residual; Panel B account for **-0.0046** predicted residual from discretionary expenses model; Panel C gives the results from production costs

manipulation model with **0.0154** predicted residual. The result from the VCE (bootstrap) is adopted for analysis in the next section, although all the coefficient and the significant levels of the VCE-type models are similar, one must be adopted for discussion. According to Moundigbaye *et al.* (2018), the bootstrap method produces more accurate inference results.

Results and Discussions

RAM is the result of adding the residuals from equations 1, 2, and 3, as such, each model has been evaluated, and its residuals have been extracted as their abnormal counterpart in Table 1, which represents the RAM in Nigerian listed firms. Below are the regression results for the RAM models shown in Table 2. The analysis of data and interpretation of the empirical results are presented in this section. The three types of RAM that were investigated are production cost manipulation, discretionary expense manipulation, and sales manipulation, as explained in the methodology section.

Insert Table 2 here

The computed coefficients are shown in Table 2. The significance is derived from the firm-year standard error of the mean, and the coefficients provided are the mean coefficients over firm-years. As mentioned, table 2 displays the pool regression results for each of the three models. Column 1 contains the model for sales manipulation, Column 2 contains the model for discretionary expenses manipulation, and Column 3 contains the model for production costs manipulation.

The Table present the estimated mean coefficient over firm-years with each having 14 observations for the three RAM models. The explanatory power that is, adjusted r-square is comparable with prior studies and well within acceptable bounds in earnings management research. The coefficient signs are also similar to previous research (Bjurman & Weihagen, 2013; Gunny, 2010; Roychowdhury, 2006). Most of the coefficients are significant except for the change in the current sales level in abnormal cash flow regression (sales manipulation) model. The outcome showed that there was little chance that the change in current sales will have an impact on operating cash flow. Similar consequences of the low significance for the mentioned coefficient have been found in other prior studies (Mokarami & Aflatooni, 2013; Cupertino *et al.*, 2016). To lessen the impact of observed outliers, the calculated firm-year coefficients are winsorized. The variable input is winsorised at the 99% level from ends. Winsorisation is common in studies of similar nature, 99% in Roychowdhury (2004), 99% in Zang (2012). A possible advantage of winsorisation is that it preserves the information that is entailed in a case among the highest (or lowest) values in the distribution while protecting against some harmful effects of outliers that could jeopardise regression results (Keyton & Reifman, 2010).

Table 3 provides descriptive statistics of the RAM models used in the empirical analysis above.

Insert Table 3

Manipulations through real activities generate one of, or a combination of, the following effects: abnormally low operational cash flow given by a negative mean value; unusually low discretionary expenses, also presented by negative mean value; or abnormally high production costs, provided by the positive mean value. All these depending on the direction of the manipulations, be it income-increasing or income-decreasing. The means of abnormal cash flow from the table is (-0.0055), for abnormal discretionary expenses is (-0.0046), and for abnormal production costs, it is (0.0154). The signed values of all these three models are indications of income-increasing real activities manipulations (Cohen *et al.*, 2008; Roychowdhury, 2006)

Table 2 demonstrates that a high level of sales manipulation among Nigerian listed companies is indicated by the residual's negative mean value. This result is in line with that of Bello *et al.* (2015), who examined 20 Nigerian listed manufacturing firms over a six-year spanning between 2008 and 2013. Okolie (2014) revealed that cash-based management of earnings, or RAM, was common within the sampled companies based on 342 firm-year observations of Nigerian listed companies between 2006 and 2011.

The summary reveals that the mean value of the residuals of the discretionary expenses manipulation model is negative. Table 3 shows that Nigerian listed companies engage in a significant degree of manipulation of discretionary expenses. A high level of RAM in terms of discretionary costs in the listed firms is shown by the results, which suggest that anomalous discretionary expenditure is high among the sampled companies. It implies that in order to boost profits, the sampled firms are using strategies that cut down on discretionary spending.

High anomalous production costs are equivalent to high real activity manipulations in terms of production costs, as indicated by the positive signed value of the residuals in the production cost manipulations model. It is implied that in order to increase profits, the sampled companies throughout the review period engaged in overproduction to increase earnings.

The analysis's findings indicate that the incidence of RAM in Nigeria leans toward manipulations aimed at boosting income. Sales manipulation, production costs manipulation, and discretionary expenses manipulation the three RAM metrics evaluated in this study seem to be most common among Nigerian listed companies. It is implied that the majority of listed companies do in fact push their results upward. Since financial reporting does not provide a true and impartial picture of their economic activities, its quality becomes doubtful.

According to Sun *et al.* (2014), Zarowin and Cohen (2010), and Roychowdhury (2006), the study produces an aggregate (composite) estimate of RAM with a mean value of 0.0259. As previously said, it is calculated by adding up the three RAM measures. There is a -1-multiplier applied to the residuals from both the sales manipulation model and the discretionary expenses manipulation model. Since high values of *ab_prod* already indicated large degrees of manipulation by real activities, the residuals from the estimated production cost manipulations model are not multiplied by negative one (-1).

The Pearson and Spearman correlation matrices for the three models are shown in Table 4. The correlations for the whole sample of 1036 firm-year observations from 2001 to 2014 are shown in these matrices.

Insert table 4

At the 5% significant level, the correlation is significant. The correlation coefficients in both matrices between abnormal discretionary expenses and abnormal production costs are negatively significant, which corroborates previous research. Whereas the Spearman correlation is -63%, the Pearson correlation is -56%. In order to declare high profitability, managers most often engage in actions that result in excessively high production costs while simultaneously cutting down on discretionary spending. It also supports the findings that listed companies in Nigeria indulge more likely in RAM to increase their income. Abnormal cash flow and

abnormal production costs have the same strong negative correlation. Spearman and Pearson correlation coefficients are -34% and -26%, respectively. It most likely exists because managers participate in irregular production costs and cash flow at the same time. Overproduction will result in more products on the market, which will force credit sales or the offering of sales discounts, both of which will inevitably lower cash flow in the current term. According to both matrices, there is a positive association between abnormal cash flow and abnormal discretionary expenses. Both the Spearman and Pearson correlation coefficients are 7% and 1%, respectively, with the Spearman correlation being significantly positive. It's probably because both models go in the same direction during an income-increasing manipulation. This result is comparable to Roychowdhury's (2006) findings.

The study has revealed not only the prevalence but also the nature of real activities manipulations in the Nigerian listed companies. This study seems to be the only research on the nature and prevalence of RAM in companies listed in Nigeria. There are studies on RAM in Nigeria of similar nature (Bello *et al.*, 2015; Ibrahim & Hassan, 2014; Okolie, 2014) but differs in scope and objectives of generating RAM. Most of the studies focus on manufacturing sectors, and the range is mostly a few years. None of the studies was able to identify the nature of the manipulations. However, this research will contribute to existing knowledge of RAM in Nigeria listed companies.

Conclusion

A sample of 1,036 firm-year observations of the Nigerian listed companies between 2001 and 2014 was used in this study. It has investigated and recorded evidence regarding the prevalence and nature of RAM in companies listed in Nigeria. The results have demonstrated that the incidence and nature of RAM in Nigeria lean toward manipulations aimed at boosting income. The three RAM metrics evaluated in this study seem to be common among Nigerian listed companies. The assumption is that Nigerian listed companies manipulate sales, discretionary expenses, and production costs to boost revenue.

The findings portend obvious implications for regulatory authorities. Like the SEC; Standard setters (for example, the professional accounting bodies, the Financial Reporting Council of Nigeria, etc.); and other organised private bodies that are stakeholders in the governance of corporate entities in Nigeria (like shareholders' associations). All these organisations, either in their statutory or supervisory roles, should be able to hold the management of firms accountable to outright manipulations and fraudulent reporting.

The results are comparable to those of Okolie *et al.* (2014), who came to the conclusion that a substantial presence of RAM is indicated by the fact that the financial reports of many listed businesses do not accurately depict the cash flow analysis of the companies. The outcome shows that businesses, particularly those quoted on NSE, use shrewd tactics that

don't accurately represent the cash flow situation in their own companies.

It is, however, recommended that regulatory authorities must be alive to their responsibilities of protecting the investment interest of the general public in listed companies in Nigeria. Therefore, strengthening corporate governance mechanisms will go a long way in reducing the incidences of RAM in Nigeria. Prior literature has revealed that effective and efficient mechanism, e.g., independent audit committee, reputable audit firms are capable of reducing the desire to manipulate real activities in listed firms in Nigeria. According to Krishnamoorthy *et al.* (2002), ensuring sound financial reporting and quality accounting policies oversight are the essential functions of an audit committee. Talking about a reputable audit firm, Okolie *et al.* (2014) concludes that when audit quality is high, the prevalence of RAM decreases.

Regulatory bodies must ensure stiffer penalties to perpetrators of RAM if accosted. The kind of punishment in the Cadbury saga is too lenient, and it's capable of encouraging such acts. Stiffer penalties will give managers a rethink before indulging in RAM.

The federal government must ensure through its agencies that measures leading to compliance of policies and standards are in place. Also, a mechanism for whistle-blowing must be in place and encouraged, part of which should include guaranteeing the confidentiality of the whistle-blower.

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Table 1: Estimating RAM models using different estimators

Panel 1: Sales manipulation model regressions

Model	1 ols	2 vce- cluster	3 vce-robust	4 vce- bootstrap	5 FGLS	6 PCSE
Dep. var	ab_cfo	ab_cfo	ab_cfo	ab_cfo	ab_cfo	ab_cfo
sltat1	0.0243*** (0.0070)	0.0243** (0.0105)	0.0243*** (0.0073)	0.0243*** (0.0062)	0.0347*** (0.0068)	0.0252*** (0.0088)
chgsltat1	0.0044 (0.0161)	0.0044 (0.0231)	0.0044 (0.0215)	0.0044 (0.0193)	0.0070 (0.0150)	0.0093 (0.0188)
Constant	0.0835*** (0.0094)	0.0835*** (0.0134)	0.0835*** (0.0092)	0.0835*** (0.0077)	0.0713*** (0.0082)	0.0812*** (0.0113)
Obs	1036	1036	1036	1036	1036	1036
Residuals	-0.0055	-0.0055	-0.0055	-0.0055	NA	NA
<i>estat</i> <i>hettest</i>	Chi2(1)=73.03 P>chi2=0.000	NA	NA	NA	NA	NA
Mean vif	1.65	1.65	1.65	NA	NA	NA
xtserial	F(1, 73)=0.86 Prob>F=0.36	NA	NA	NA	NA	NA
F	11.09	3.621	7.565	NA	NA	NA
r2	0.0210	0.0210	0.0210	0.0210	NA	0.0222
r2_a	0.0191	0.0191	0.0191	0.0191	NA	NA
AIC	-770.50	-770.50	-770.50	-770.50	NA	NA
BIC	-755.70	-755.70	-755.70	-755.70	NA	NA
rho	NA	NA	NA	NA	0.2247	0.2247
rmse	0.167	0.167	0.167	0.167	NA	0.161

Note: Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

NA = Not available

Panel 2: Discretionary expenses manipulation model regressions						
Model	1 ols	2 vce- cluster	3 vce-robust	4 vce- bootstrap	5 FGLS	6 PCSE
Dep. var	ab_disx	ab_disx	ab_disx	ab_disx	ab_disx	ab_disx
slt1tat1	0.0602*** (0.0062)	0.0602*** (0.0174)	0.0602*** (0.0072)	0.0602*** (0.0075)	0.0705*** (0.0056)	0.0714*** (0.0082)
Constant	0.172*** (0.0085)	0.172*** (0.0193)	0.172*** (0.0081)	0.172*** (0.0079)	0.124*** (0.0082)	0.157*** (0.0131)
Obs	1036	1036	1036	1036	1036	1036
Residuals	-0.0046	-0.0046	-0.0046	-0.0046	NA	NA
<i>estat</i>	Chi2(1)=75.98 P>chi2=0.000	NA	NA	NA	NA	NA
Mean vif	1.00 F(1, 73)=9.15 Prob>F=0.003	1.00	1.00	1.00	NA	NA
xtserial	NA	NA	NA	NA	NA	NA
F	95.35	12.01	69.17	NA	NA	NA
r ²	0.0844	0.0844	0.0844	0.0844	NA	0.175
r ² _a	0.0835	0.0835	0.0835	0.0835	NA	NA
AIC	-974.60	-974.60	-974.60	-974.60	NA	NA
BIC	-964.70	-964.70	-964.70	-964.70	NA	NA
rho	NA	NA	NA	NA	0.7780	0.7765
rmse	0.1510	0.1510	0.151	0.1510	NA	0.0860

Note: Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

NA = Not available

Panel 3: Production cost manipulation model regressions						
Model	1 ols	2 vce-cluster	3 vce-robust	4 vce- bootstrap	5 FGLS	6 PCSE
Dep. var	ab_prod	ab_prod	ab_prod	ab_prod	ab_prod	ab_prod
slt1tat1	0.852*** (0.0138)	0.852*** (0.0600)	0.852*** (0.0277)	0.852*** (0.0283)	0.869*** (0.0112)	0.838*** (0.0210)
chgslt1tat1	0.0598** (0.0290)	0.0598 (0.0716)	0.0598 (0.0528)	0.0598 (0.0466)	-0.0199 (0.0177)	0.0198 (0.0337)
chgslt1tat	0.0693**	0.0693	0.0693	0.0693	-0.0094	0.0293

1	(0.0319)	(0.0735)	(0.0609)	(0.0628)	(0.0166)	(0.0320)
Constant	-0.132*** (0.0167)	-0.132*** (0.0488)	-0.132*** (0.0222)	-0.132*** (0.0226)	-0.109*** (0.0115)	-0.0991*** (0.0235)
Obs	1036	1036	1036	1036	1036	1036
Residuals	0.0154	0.0154	0.0154	0.0154	NA	NA
	Chi2(1)=68					
<i>estat</i>	2.08	NA	NA	NA	NA	NA
	P>chi2=0.000					
Mean vif	1.70	1.70	1.70	1.70		
	F(1, 73)=4.05					
xtserial	Prob>F=0.048	NA	NA	NA	NA	NA
F	2836.9	435.5	1023.0	NA	NA	NA
r2	0.892	0.892	0.892	0.892	NA	0.870
r2_a	0.892	0.892	0.892	0.892	NA	NA
AIC	400.30	400.30	400.30	400.30	NA	NA
BIC	420.10	420.10	420.10	420.10	NA	NA
rho	NA	NA	NA	NA	0.5740	0.5735
rmse	0.293	0.293	0.293	0.293	NA	0.211

Note: Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

NA = Not available

Table 2. RAM measurement: Estimates of expected levels of real activities

	1 ab_cfo <i>CFO/TA_{t-1}</i>	2 ab_disx <i>DISX/TA_{t-1}</i>	3 ab_prod <i>PROD/TA_{t-1}</i>
Dependent Variables			
1/ <i>TA_{t-1}</i>	0.084***	0.172***	-0.132***
SL/ <i>TA_{t-1}</i>	0.024***		0.852
SL _{t-1} / <i>TA_{it-1}</i>		0.0602***	
Δ SL/ <i>TA_{t-1}</i>	0.004		0.060
Δ SL _{t-1} / <i>TA_{it-1}</i>			0.069**
N	1036	1036	1036
Wald chi2(3)	13.42	103.90	3985.04
P>chi2	0.001	0.000	0.000
RMSE	0.167	0.151	0.293
r2	0.02	0.08	0.89
r2_a	0.02	0.08	0.89

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3. RAM Measurement: Descriptive statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
RAM	1036	0.0259	0.4601	-3.6756	1.5184
ab_cfo	1036	-0.0055	0.1664	-0.6164	0.4897
ab_disx	1036	-0.0046	0.1510	-0.3299	0.6591
ab_prod	1036	0.0154	0.2925	-3.1478	1.3214

Table 4. RAM measurement: Pearson and Spearman Correlation Matrices

	ab_cfo	ab_disx	ab_prod
ab_cfo	1	0.0742*	-0.3413*
ab_disx	0.0136	1	-0.6262*
ab_prod	-0.2601*	-0.5616*	1