



AUDIT QUALITY AND EARNINGS MANAGEMENT OF LISTED NON-FINANCIAL COMPANIES IN NIGERIA

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ABSTRACT

This study determines the relationship between audit quality and earnings management of listed non-financial companies in Nigeria. Expost-facto research design was used and data were extracted from the annual reports and accounts of the non-financial companies for the period 2012 to 2018. The data were analysed using Arellano-Bond dynamic panel-data estimation technique. The findings revealed that the coefficient of the lagged Discretionary Accruals (DA_{t-1}) reveals a negative and statistically significant effect on current discretionary accruals (DA_t), audit firm size has a negative and significant relationship with earnings management, auditor firm independence, auditor tenure and audit firm leading partner rotation has positive but not significant effect on earnings management. However firm size, net cash flow to total assets and return on assets (ROA) exhibits a negative and significant relationship with earning management. The study concludes that audit quality reduces earning management of listed non-financial companies in Nigeria.

Keywords: Audit Quality, Earnings Management, Non-financial companies

Introduction

Opportunistic earnings management practice produces less reliable accounting earnings that do not reflect the reality of firm's financial performance, it is perceived to be a pervasive phenomenon, spread across companies and industries; it distorts earnings quality and its usefulness for investment decisions, thus reducing investor confidence in the financial reports. Similarly, the agency problems associated with the separation of ownership and control, along with information asymmetry between management and absentee owners create the demand for external audit. External auditors are responsible for verifying whether the financial statements

are fairly presented in conformity with GAAPs or not, and the statements reflect the 'true' economic condition and operating results of the entity. Thus, the external auditor's verification adds credibility to the company's financial statements. Also, the external auditors are required by auditing standards to discuss and communicate with the audit committee about the quality, not just the acceptability of accounting principles applied by the client company. Therefore, a quality audit will not only constrain opportunistic earnings management but will also reduce information risk that the financial report contains material misstatements or omissions (Lin & Hwang, 2010).

Empirical findings for example Koh, Rajgopal and Srinivasan (2013) find previous evidence that that there is a reward system for managers depending on whether the earnings meets target or not particularly when managers are paid based on performance, hence, an obvious intention for earnings management exists.

Aliyu, Musa and Zachariah (2015) conclude that high quality audit is capable of uncovering material errors and misstatements in the financial statements of listed banks in Nigeria, Ozkan (2018) empirical findings indicates that high-quality audit is one of the prominent factors that can mitigate earnings management practices on non-financial firms quoted on Borsa Istanbul, at the same time Lopes (2018) confirmed that in Portugal the level of earnings management is significantly lower among companies contracting a big 4 audit firm as compared to companies using a non-big 4 audit firm.

Joint audit increase audit quality however, according to ICAN (2018) it is likely to cost more to use two accountancy firms than to use one for audit purpose, but Joint audit may provide a higher level of technical expertise than either audit firm could provide individually. Improved geographical coverage may be obtained for the audit, where each of the joint auditors on its own does not have offices that cover all the geographical locations of the component companies in the group, It has been suggested that two medium-sized accountancy firms might "join forces" and tender for the audit of a company for which the auditors would normally be one of the "Big 4" accountancy firms. This is possibly a way in which medium-sized firms might try to break the monopoly of the Big 4 on large company audits. However, while Zerni, Ki, Rvine and Niemi (2012) findings support the view that voluntary joint audits are positively associated with audit quality in relatively low litigious settings both for public and private firms, Aliyu, Musa and

Zachariah (2015) recommended that listed deposit money banks in Nigeria should emphasize the use of joint audit services.

The present study determines the relationship between audit quality and earnings management of listed non-financial companies in Nigeria. The remainder of this paper is organized as follows; next section contained conceptual issues and the review of existing literature; section three contained methodology adopted. Section four presents discussion of results and the last section contained conclusion and recommendations based on the findings of the study.

2.0 Literature Review

2.1 Concept of Audit quality

Titman and Trueman (1986) defined a high-quality audit as an audit that improves the reliability of financial statement information and allows investors to make more precise estimate of the firm's value. However, according to Schauer (2002) a higher quality audit increases the probability that the financial statements more accurately reflect the financial position and results of operations of the entity being audited. A high-quality audit is one performed “in accordance with generally accepted auditing standards (GAASs) to provide reasonable assurance that the audited financial statements and related disclosures are (1) presented in accordance with generally accepted accounting principles (GAAPs) and (2) are not materially misstated whether due to errors or fraud” (Government Accountability Office, 2003). In the same vein, Carlin, Finch and Laili (2008) and Duff (2009) viewed audit quality as the level of assurance or probability that a financial statement contains no material omission or misstatement.

2.2 Concept of Earnings management

Earnings management is the deliberate alteration of financial information to either mislead investors on the underlying economic status of a firm or to gain some contractual benefits that depend largely on accounting numbers (Watts and Zimmerman, 1986; Shipper, 1989; and Healy & Wahlen, 1999). Smith (1993) defines earnings management as techniques that comprise financial reporting decisions, such as the selecting of accounting methods and timing of expenses

and revenue reporting. Similarly, Dechow and Skinner, (2000) sees earnings management as the use of aggressive or conservative accounting to manage reported earnings. Scott (2003) view earnings management as an act of selecting accounting policies from a set of accepted accounting rules to get favorable results. It is natural to expect that managers will choose policies that will maximize their own utility and or the market value of the firm ".

2.3 Review of existing literature

Perols and Lougee (2011) examine how previous earning management impacts the likelihood that a firm will commit financial statement fraud and find that fraud firms are more likely to have managed earnings in prior years and that earnings management in prior years is associated with a higher likelihood that firms that meet or beat analyst forecasts or that inflate revenue are committing fraud, and further revealed that fraud firms are more likely to meet or beat analyst forecasts and inflate revenue than non-fraud firms are even when there is no evidence of prior earnings management. However, Hsiao, Lin and Yang (2012) examined the relationship between audit quality and earnings management and finds no significant relationship between earning management (reporting fraud) and audit quality (fees paid to auditors for various services). In the same vein, Memis and Cetenak (2012) confirmed that efficiency of the legal system helps decrease earnings management incentives however, the big four auditors do not constrain the earnings management incentives in emerging country. Yasar (2013) confirmed this by uncovering that audit firm size as proxy for audit quality, does not have an impact on discretionary accruals. The results indicate that there is no difference in audit quality between big four and non-big four audit firms for restriction of earnings management in Turkey.

Similarly, Ching, Teh and San (2015)uncover that audit quality does not actually constrain earnings management practices in Industrial products and consumer products companies in Malaysia. In addition Lisar, Lisar and Zadeh (2016) findingsindicate that the audit quality has no effect on earnings management of companies listed on Tehran Stock Exchange. Contrary to this Ozkan (2018) analyze the association between audit quality and earnings management for non-financial firms quoted on Borsa Istanbul and found that auditor independence and audit industry specialization are significantly negatively related with likelihood of earnings management and long-term auditor and client relationship enables the management of firms to more actively

engage in earnings management. The findings support for the notion that the high-quality audit is one of the prominent factors that can mitigate earnings management practices.

Chi, Lisic and Pevzner (2011) examine whether firms resort to real earning management when their ability to manage accruals is constrained by higher quality auditors, and found that longer auditor tenure is associated with greater real earnings management, which could suggest merit of mandating audit firm rotation. Adebayo (2011) concluded that auditors' independence and the credibility of financial statement are to be significantly impaired when non-audit services are conducted and that there is a positive relationship between independence of an auditors and the credibility of financial statement and recommends that there should be rotation of auditors to improve the auditors' independence, implementation of peer assessment in other to ensure that audit are carried out with outmost professionalism and mutual respect and that auditors should not be allowed to provide audit client with any other advisory services. In the same vein, Kitiwong, Verma and Anderson (2017) confirmed that maintaining clients cause auditors to become more tolerant to high level of discretionary accruals, however Mukhlisin (2018) findings failed to prove that longer tenure audit can reduce independence so that it can become fatigue for companies to commit financial reporting fraud.

Adeniyi and Mieseigha (2013) examine the relationship between the tenure of auditor and audit quality in Nigeria using binary logit estimation technique and found a negative relationship between auditor tenure and audit quality though the relationship was not significant. However, the study recommend that there is need for financial reporting council and other regulatory bodies in line with best practices to look critically into the issue of audit tenure and its impact on audit quality in Nigeria and that further research should consider vital variables that effect audit quality such as non-audit services. In the same vein the study of Kitiwong, Verma and Anderson (2017) revealed that mandatory audit firm rotation can help promote audit quality, since long audit firm tenure will be associated with impaired audit quality.

In addition, Okolie (2014) examine the relationship between auditor tenure and auditor independence on the earnings management (measured by the amount of discretionary accruals) of companies in Nigeria. The study use secondary data extracted from a total of 342 companies' financial statements and the Nigerian Stock Exchange fact book to determine the level of earnings manipulations in corporate financial statements. Findings shows that audit tenure and

auditor independence have significant effects and exhibit significant relationship with the amount of discretionary accruals of quoted companies in Nigeria.

In addition, Gajevszky (2014) investigates the influence of auditor's opinion on earnings management of 60 companies listed on the Bucharest stock exchange, multiple regressions was used and the findings revealed that the probability to manage earnings to the decrease is related to the issuance of a qualified audit opinion report and presence of a Big 4 audit firms. Thus both audit opinion and auditor size are negatively related to discretionary accruals in the case of Romanian listed companies.

Aliyu, Musa and Zachariah (2015) examine the impact of audit quality on Earnings Management of listed deposit money banks in Nigeria and found out that audit quality has significant impact on the earnings management of listed deposit money banks in Nigeria. The study also found that audit firm size and joint audit services have significant negative impact on the earnings management of listed deposit money banks in Nigeria. Similarly, the study found that auditor financial dependence has significant positive impact on earnings management of listed deposit money banks in Nigeria. The study recommended that listed deposit money banks should emphasize the use of big 4 audit firm and joint audit services.

Martinez and Moraes (2016) investigates the relationship between audit fees and earnings management in the Brazilian market using a sample of 300 firms listed on the BM&FBovespa for which it was possible to identify the amount paid to the auditors, using data gathered from the Economatica database and the website of the Brazilian Securities Commission. The study analyzed the data using multiple regressions and the findings revealed a negative and significant relationship between audit fee and earnings management meaning that audit firms that charge less for their service tend to be more relaxed regarding earnings management by their client companies.

Similarly, Nawaish (2016) examine the prediction that external audit quality is positively associated with earnings management in Jordanian banking firms listed in Amman Stock Exchange (ASE). Findings revealed that audit tenure, audit fees, and auditor specialization have significant relations with earnings management. It means, future earnings management forecast is predictable based on audit quality leading indicators (audit tenure, audit fees, and auditor

specialization). contrary to this Lobo, Paugam, Zhang & Casta (2016) document that firms audited by Big 4-non-Big 4 auditor pair (BS) are more likely to book an impairment and book a larger impairment than firms audited by a Big 4-Big 4 auditor pair (BB) when low-performance indicators suggest a greater likelihood of impairment. Moreover, firms audited by a BB pair reduce impairment disclosures when they book impairments, while firms audited by a BS pair do not, suggesting lower transparency for firms audited by a BB pair.

Ahmad, Suhara and Ilyas (2016) assess the impact of audit quality on earnings management of manufacturing companies listed on Indonesia Stock Exchange and the results showed that audit quality and earning management are negatively related. Similarly, Saleem and Alzoubi (2016) examine the association between audit quality and earnings management, the findings revealed a negative and significant association between audit quality and earnings management.

Jayeola, Taofeek and Toluwalase (2017) examine relation between audit quality and earnings management on Nigerian listed deposit money banks and found a significant positive relationship between joint audit and earning management which implies that a change to joint audit from single audit increases earnings management which implies that every unit increase in audit specialization decreases earnings management, a significant positive relationship between audit independence and earnings management, and insignificant negative relationship between audit tenure and earnings management and concluded that lengthy audit tenure be discouraged.

Ozkan (2018) analyze the association between audit quality and earnings management for non-financial firms quoted on Borsa Istanbul. Ordinary least square regression analysis was employed, and three different proxies for audit quality (auditor independence, audit industry specialization and auditor tenure) were used based on a sample of 97 non-financial firms quoted on Borsa Istanbul from 2013 to 2018. The findings indicates that auditor independence and audit industry specialization are negatively and significantly related with likelihood of earnings management, long-term auditor and client relationship enables the management of firms to more actively engage in earnings management. The findings support notion that the high-quality audit is one of the prominent factors that can mitigate earnings management practices.

Ishaku *et al.* (2019) examines the impact of audit quality on the level of earnings manipulation and found that total audit fees, non-audit fees and joint audit have a positive but not significant relationship with the level of earnings manipulations, however, audit partner rotation and board independence exhibit a negative but not significant relationship with the level of earning manipulations. The study recommended that regulatory bodies should encourage joint audit as this will reduce the domination of big 4 audit firms in the audit market allowing fair competition and enabling small indigenous audit firms to excel.

2.3 Theoretical framework

Two theories relevant to this study were considered to give the theoretical basis for understanding the dynamics of audit quality and its roles in minimizing earnings management of listed non-financial companies in Nigeria. These include Agency theory and Stakeholders theory. However, the theory that best guide this study is the stakeholder theory because audit failure might have a detrimental effect not only on the shareholders but on all stakeholders, as such stakeholder theory was adopted to guide this study.

3.0 Methodology

This study adopted *ex-post facto* research design because the study entails the use of data extracted from annual report and accounts of the non-financial companies in Nigeria, it was adopted in view of its relative importance to the actualization of the research objective which is to examine the relationship between audit quality and earnings management of non-financial companies Nigeria.

The population of the study comprises the entire non-financial companies listed on the Nigerian stock exchange as at December, 2018. There are one hundred and twelve (112) non-financial companies listed on the NSE out of the one hundred and sixty two (162). In order to ensure availability of data required by the study 36 companies were selected (Appendix 1).

Table 3.1 Variables and their Measurement

| Variable Name | Type of Variable | Measurement | Sources |
|--------------------------------------|------------------|---|--|
| Discretionary Accruals (DA) | Dependent | Total accruals minus Non-discretionary accruals | Li & Lin (2005) and Lisar, Lisar & Zadeh (2016) |
| Audit Independence (AI) | Independent | Non-audit fees divided by total audit fees | Lin & Hwang (2010) |
| Audit Firm Size (AFS) | Independent | Big 4 audit company 1, Non-Big 4 audit company | Basiruddin (2011)Lisar, Lisar & Zadeh (2016) |
| Audit Firm Tenure (AFT) | Independent | Number of years the audit firm served in the firm | Ishaku, Dandago, Muhammad & Barde; 2019 |
| Audit leading Partner Rotation (APR) | Independent | Change in leading partner 1, otherwise 0 | Nwoye & Anichebe, 2018; and Ishaku, Dandago, Muhammad & Barde 2019 |
| Auditor Specialization (AS) | Independent | Auditor with industry experience 1, otherwise 0 | Lisar, Lisar & Zadeh (2016) |
| Return on Asset (ROA) | Control | PBIT divided by total assets | Ishaku, Dandago, Muhammad & Barde; 2019 |
| Firm Size (Fsize) | Control | Log of total assets | Lisar, Lisar & Zadeh (2016) |
| Net Cash Flow to Total Asset (NCFTA) | Control | Net operating cash flow divided by total assets | Andreas 2017 & Ishaku, Dandago, Muhammad & Barde; 2019 |

Source: Literature Review, 2020.

In order to address the problem of endogeneity ignored by previous (Khalil & Ozkan (2016); Abubakar, (2017); Jayeola, Taofeek & Toluwalase (2017) and Ishaku *et al.* (2019) the proposed Arelleno and Bover generalized method of moments (GMM) was used to determine the relationship between audit quality and earning management on listed non-financial companies in Nigeria because the number of cross sections (thirty six companies) is more than the period of the study 7 years (2012-2018).

4.0 Results and Discussion

This section presents the results of the analysis conducted on the data collected from the annual report and report and account of the companies under study. The descriptive statistics, correlation and Arelleno and Bover generalized method of moments regression results are presented below.

Table 4.1 Descriptive statistics of the variables

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|----------|-----|---------|-----------|---------|---------|
| dac | 252 | 0.00730 | 0.0360 | 0 | 0.4022 |
| audfs | 252 | 0.4087 | 0.4926 | 0 | 1 |
| auind | 252 | 0.00660 | 0.0317 | 0 | 0.2575 |
| audtten | 252 | 5.083 | 3.4057 | 1 | 14 |
| alpr | 252 | 0.36900 | 0.4835 | 0 | 1 |
| audtsp | 252 | 0.8849 | 0.3198 | 0 | 1 |
| fsiz | 252 | 10.1471 | 0.86598 | 4.186 | 12.0315 |
| ncfltt | 252 | 0.1275 | 0.1858 | -0.3290 | 1.4033 |
| roa | 252 | 0.0809 | 0.1582 | -0.2873 | 0.8689 |

Source: Regression results computed by the authors using STATA

The descriptive statistics on Table 4.1 revealed that discretionary accruals has a mean of 0.0073, standard deviation of 0.0300, with a minimum and maximum of 0 and 0.4022 respectively, the standard deviation of 0.0360 signifies high variation in discretionary accruals of the companies within the period under study. Audit firm size has a mean of 0.4926, standard deviation of 0.4087, with a minimum and maximum of 0 and 1 respectively. This shows that audit firm size of the companies under study deviated significantly. Audit independence has a mean of 0.0066, a standard deviation of 0.0317 with a minimum and maximum of 0 and 0.2575 respectively. Audit tenure has a mean of 5.083 meaning on average auditors serve for 5 years with a minimum and maximum of 1 and 14 respectively and a standard deviation of 3.4257 which shows that the audit firm tenure of the companies under study did not deviated significantly. Audit leading partner rotation has a mean of 0.3690, a standard deviation of 0.835 with a minimum and maximum of 0 and 1 respectively.

Auditor firm specialization has a mean of 0.8849, meaning on average 88% of audit firms that audit the companies under study have industry expertise, a standard deviation of 0.3989 with a minimum and maximum of 0 and 1 respectively.

On average the companies under study have an average size of 10.1471, a standard deviation of 0.8659 with the minimum and maximum of 8.4186 and 12.0315 respectively.

Net cash flow to total assets of the companies under study has a mean of 0.1275, a standard deviation of 0.1858 with a minimum and maximum of -0.3200 and 1.4033 respectively signifying high rate of fluctuation in net cash flow to total assets within the period under study.

ROA has a mean of 0.0809, meaning on average the sales growth rate is 8% with the minimum and maximum of -0.2873 and 0.8689 respectively, however, a standard deviation of 0.3829 signifies much variation within the period under study.

Table 4.2: Results of Two-Step System GMM (Audit Quality and Discretionary Accruals)

| Variables | Expected sign | Coefficient | Sig. |
|--------------------------|------------------|-------------|-----------|
| DA _{t-1} | -0.0135 0.000*** | | |
| AUDFS | (-) | -0.0131 | 0.061* |
| AUIND | (-) | 0.0585 | 0.507 |
| AUDTTEN | (+) | 0.0026 | 0.435 |
| ALPR | (-) | 0.0076 | 0.611 |
| AUDTSP | (-) | 0.1754 | 0.017 *** |
| FSIZE | (+) | -0.1019 | 0.000*** |
| NCFLT | (+) | -0.0253 | 0.025 ** |
| ROA (+) | -0.0908 | 0.001*** | |
| CONS | 0.0339 | 0.000*** | |
| <hr/> | | | |
| Number of Observation | 180 | | |
| Number of Companies | 36 | | |
| Chi2 | | | |
| P-value | 0.0013 | | |
| Mean VIF | 1.19 | | |
| Sargan Test | 13.626 | 0.4779 | |
| Arrelano-Bond AR(2) Test | -1.1353 | 0.2563 | |

Source: Regression results computed by the authors using STATA

Table 4.2 presents the results of two-step system GMM. The instruments of validity and reliability are indicated by the Sargan test and Arrelano-Bond serial correlation test AR(2), the results indicate the validity of the instruments used and the absence of serial correlation at second order. The coefficient of the lagged Discretionary Accruals (DA_{t-1}) reveals a negative and

statistically significant effect on current discretionary accruals. This suggests that the previous discretionary accrual has significant impact in determining the current discretionary accruals (DA_t).

The results shows that audit firm size (AUDFS) have negative and significant impact on discretionary accruals. This implies that firms audited by BIG 4 audit firm report lower discretionary accruals. This is consistent with findings of Saleem and Alzoubi (2016) who empirically found that earnings management level is significantly lower among companies using the services of big 4 auditors in Jordan and Nwoye & Anichebe (2018) found that audit firm size has a significant negative effect on earnings management. However, this findings contradict Memis and Cetenak (2012) whose findings revealed that big four auditors do not constrain earnings management incentives, and Yasar (2013) who document no difference in audit quality between Big four and non-Big four audit firms for restriction of earnings management in Turkey.

Audit firm independence measured as the ratio of non-audit fees to total audit fees revealed a positive and insignificant effect on current discretionary accruals. This finding is consistent with the findings of Li and Lin (2005) who provides evidences that total audit fees and non-audit fees are positively associated earnings restatements. Equally consistent with Adeyemi, Okpala & Dabor (2012) who reported that provision of non-audit services would likely have a significant effect on the audit quality in Nigeria.

Audit tenure measured as the number of years the audit firm serves showed a positive relationship with discretionary accruals implying that longer audit tenure increase earnings management and this relationship is not significant, meaning an increase in audit tenure by 1% increase discretionary accruals by 0.0026%. This means that long-term auditor and client relationship enables the management of the companies to engage in earnings management because the longer the audit firm tenure the higher the level of familiarity threats and this will have a detrimental effect on earning management. This findings is consistent with the findings of Chi, Lisic & Pevzner (2011) who found that longer auditor tenure is associated with greater real earnings management, Dantas & Medeiros (2014) also found that audit quality will be lower when auditor-client relationship is of long term, equally in line with the findings of Nawaiseh, (2016) and Jayela, Taofeek & Tolwoelse (2017) found a negative relationship between audit tenure and earning management. However Mukhlisin (2018) found that longer tenure audit has

no significant effects on auditors' independence so that it can become fatigue for companies to commit financial reporting fraud.

Audit firm leading partner rotation exhibits a positive and insignificant relationship with discretionary accrual this implies that a change in audit firm leads engagement partner will significantly reduce discretionary accrual. This finding is equally consistent with the findings of Ayorinde & Babajide (2015) who recommends mandatory rotation of audit firm lead partner and the review partner on an engagement for publically listed companies.

Audit firm industry specialization exhibits a positive and significant relationship with discretionary accruals implying that an audit firm with industry expertise report higher discretionary accrual; this is contrary to a prior expectation because audit firm with industry expertise are expected reduced earnings management.

5.0 Conclusion and Recommendations

This study empirically examined the impact of audit quality on earnings management of listed non-financial companies in Nigeria. Based on the findings; the study concludes that Audit tenure influence earnings management of listed non-financial companies in Nigeria. The study recommends that lengthy audit firm tenure should be discouraged to avoid familiarity threats. In addition regulatory authority's (SEC) should ensure strict compliance of mandatory audit firm rotations and reduce the number of years same audit firm will serve the company since longer audit tenure increase familiarity threats to auditors independence and this would significantly influence earnings management.

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Sample Size of the Study

| S/N | Sectors/Firms | Year of Incorporation | Year Listed | S/N | Sectors/Firms | Year of Incorporation | Year Listed |
|-----|----------------------------|-----------------------|-------------|-----|--------------------------------------|-----------------------|-------------|
| 1. | Agriculture | | | 7. | Industrial Goods | | |
| | 1. Presco Plc. | 1991 | 2002 | | 20. Premier paints plc. | 1982 | 1995 |
| | 2. livestock feeds plc. | 1963 | 1978 | | 21. Chemical and Allied Products Plc | 1965 | 1978 |
| | 3. Okomu Oil Palm Plc. | 1971 | 1991 | | 22. First Aluminium Nigeria Plc | 1960 | 1992 |
| | | | | | 23. Cutix plc. | 1982 | 1987 |
| 2. | Conglomerates | | | | 24. Cement Co. of North. Nig. Plc. | 1962 | 1993 |
| | 4. A.G. Leventis Nig. Plc. | 1958 | 1978 | | 25. Beta glass plc. | 1974 | 1986 |
| | 5. John holt plc. | 1974 | 1961 | | | | |
| | 6. Chellarams plc. | 1974 | 1977 | | | | |
| | 7. U A C N Plc | 1931 | 1993 | | | | |
| 3. | Construction/Real Estate | | | 8. | Natural Resources | | |
| | 8. Julius Berg. Nig. Plc. | 1970 | 1991 | | 26. Thomas wyatt nig. Plc | 1948 | 1978 |
| | | | | | 27. B.O.C Gases Plc. | 1959 | 1979 |
| | | | | | 28. Aluminium extrusion ind. Plc. | 1982 | 1986 |
| 4. | Consumer Goods | | | 9. | Oil and Gas | | |
| | 9. Flour Mills Nig. Plc. | 1960 | 1979 | | 29. Oando Plc. | 1969 | 1992 |
| | 10. Guinness Nig. Plc. | 1950 | 1965 | | 30. 11 plc | 1951 | 1991 |
| | 11. Nestle Nig. Plc. | 1969 | 1979 | | | | |
| | 12. Nig. Brew. Plc. | 1946 | 1973 | | | | |
| | 13. Unilever Nigeria Plc | 1973 | 1923 | | | | |

| | | | | | | |
|----|---|------|------|----|-----------------------------------|-----------|
| | 14. Nascon Allied Industries Plc | 1973 | 1992 | | | |
| | 15. Nigerian Enamelware Plc. | 1960 | 1979 | | | |
| | | | | 10 | Services | |
| | | | | | 31. Trans-nationwide express plc. | 1984 1992 |
| | | | | | 32. Studio press (Nig) plc. | 1965 1979 |
| | | | | | 33. Interlinked Technologies | 1981 1993 |
| 5. | Healthcare | | | | 34. Capital Hotel Plc | 1981 1990 |
| | 16. Neimeth International Pharmaceuticals Plc | 1957 | 1979 | | 35. Academy press plc. | 1964 1995 |
| | 17. May & baker nigeria plc. | 1944 | 1994 | | 36. University press plc. | 1978 1978 |
| | 18. Evans medical plc. | 1954 | 1979 | | | |
| | | | | | | |
| | | | | | | |
| 6. | Inform. & Comm. Technology | | | | | |
| | 19. Ncr Nigeria Plc | 1949 | 1979 | | | |

Source: Generated by the Researcher from NSE Daily Official Listing, 2018

____ (R)
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Notes:

1. (/m# option or -set memory-) 500.00 MB allocated to data
2. (/v# option or -set maxvar-) 5000 maximum variables

running C:\Users\ahmed ishaku\Documents\yola 2018\Stata11-Portable\profile.do ..

> .
unable to change to C:\temp\
r(170);

. *(50 variables, 252 observations pasted into data editor)

. xtset comp year
panel variable: comp (strongly balanced)
time variable: year, 2012 to 2018
delta: 1 unit

. summarize dac audfs auind audtten alpr audtsp fsiz ncfitt roa

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|-------------|-----|----------|-----------|----------|----------|
| -----+----- | | | | | |
| dac | 252 | .0072772 | .0360449 | 0 | .40218 |
| audfs | 252 | .4087302 | .4925776 | 0 | 1 |
| auind | 252 | .0065976 | .0317179 | 0 | .2574862 |
| audtten | 252 | 5.083333 | 3.405673 | 1 | 14 |
| alpr | 252 | .3690476 | .4835072 | 0 | 1 |
| -----+----- | | | | | |
| audtsp | 252 | .8849206 | .3197528 | 0 | 1 |
| fsiz | 252 | 10.1471 | .8658986 | 8.418587 | 12.03145 |

```
ncfltt | 252 .1275278 .1858197 -.3290325 1.403256
roa | 252 .0809445 .1582433 -.2872964 .8689481
```

correlate dac audfs auind audtten alpr audtsp fsize ncfltt roa
(obs=252)

```

| dac audfs auind audtten alpr audtsp fsize
+-----+
dac | 1.0000
audfs | -0.0837 1.0000
auind | 0.0252 -0.0221 1.0000
audtten | -0.0838 0.1221 -0.0693 1.0000
alpr | 0.0558 0.1169 -0.0286 -0.1059 1.0000
audtsp | -0.0287 0.2239 -0.1026 0.1003 -0.1623 1.0000
fsize | -0.1449 0.4075 0.0787 0.0277 0.0529 0.1732 1.0000
ncfltt | 0.2895 0.0830 0.2138 0.0672 -0.0295 -0.0201 0.0043
roa | 0.0179 0.1767 0.1543 0.0956 -0.0770 0.0681 0.0307

| ncfltt roa
+-----+
ncfltt | 1.0000
roa | 0.4649 1.0000
```

. regress dac audfs auind audtten alpr audtsp fsize ncfltt roa

```

Source | SS df MS Number of obs = 252
+-----+ F( 8, 243) = 4.76
Model | .044167053 8 .005520882 Prob > F = 0.0000
Residual | .28194011 243 .001160247 R-squared = 0.1354
+-----+ Adj R-squared = 0.1070
Total | .326107163 251 .001299232 Root MSE = .03406

+-----+
| dac | Coef. Std. Err. t P>|t| [95% Conf. Interval]
+-----+
audfs | -.0032805 .0050209 -0.65 0.514 -.0131705 .0066096
auind | -.0282052 .0707268 -0.40 0.690 -.1675211 .1111107
audtten | -.0009082 .0006457 -1.41 0.161 -.00218 .0003636
alpr | .004855 .0046153 1.05 0.294 -.0042361 .0139461
audtsp | .0040964 .0071332 0.57 0.566 -.0099543 .0181471
fsize | -.0054001 .0027545 -1.96 0.051 -.0108258 .0000256
ncfltt | .0709998 .0132741 5.35 0.000 .0448529 .0971467
roa | -.0286518 .0156926 -1.83 0.069 -.0595627 .0022591
_cons | .0560641 .0276325 2.03 0.044 .0016344 .1104938
+-----+
```

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of dac

chi2(1) = 1070.61

Prob > chi2 = 0.0000

. estat vif

```

Variable | VIF 1/VIF
+-----+
roa | 1.33 0.749611
audfs | 1.32 0.755720
ncfltt | 1.32 0.759775
fsize | 1.23 0.812576
audtsp | 1.13 0.888556
auind | 1.09 0.918543
alpr | 1.08 0.928261
audtten | 1.05 0.956028
+-----+
```

Mean VIF | 1.19

```
. xtabond dac audfs auind audtten alpr audtsp fsize ncfltt roa, lags(1) twostep
> artests(2)
```

```
Arellano-Bond dynamic panel-data estimation Number of obs      =   180
Group variable: comp          Number of groups   =    36
Time variable: year

Obs per group:  min =    5
                avg =    5
                max =    5
```

```
Number of instruments =   24      Wald chi2(9)      =  583.01
Prob > chi2          =  0.0000
```

Two-step results

| | Coef. | Std. Err. | z | P> z | [95% Conf. Interval] |
|---------|-----------|-----------|-------|-------|----------------------|
| dac | | | | | |
| L1. | -.0135168 | .0032612 | -4.14 | 0.000 | -.0199086 -.0071249 |
| audfs | -.0130803 | .0069717 | -1.88 | 0.061 | -.0267447 .000584 |
| auind | .0585159 | .088137 | 0.66 | 0.507 | -.1142295 .2312612 |
| audtten | .0002593 | .0003319 | 0.78 | 0.435 | -.0003912 .0009098 |
| alpr | .0007571 | .0014878 | 0.51 | 0.611 | -.0021588 .0036731 |
| audtsp | .0175406 | .0073525 | 2.39 | 0.017 | .0031301 .0319512 |
| fsize | -.1019377 | .0220957 | -4.61 | 0.000 | -.1452444 -.0586309 |
| ncfltt | -.0252707 | .011303 | -2.24 | 0.025 | -.0474241 -.0031173 |
| roa | -.0908333 | .0273534 | -3.32 | 0.001 | -.1444449 -.0372217 |
| _cons | 1.033966 | .2272032 | 4.55 | 0.000 | .5886558 1.479276 |

Warning: gmm two-step standard errors are biased; robust standard errors are recommended.

Instruments for differenced equation

GMM-type: L(2/.)dac

Standard: D.audfs D.auind D.audtten D.alpr D.audtsp D.fsize D.ncfltt D.roa

Instruments for level equation

Standard: _cons

```
. estat sargan
```

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(14) = 13.62635

Prob > chi2 = 0.4779

```
. estat abond
```

Arellano-Bond test for zero autocorrelation in first-differenced errors

| Order | z | Prob > z |
|-------|---------|-----------|
| 1 | -1.8516 | 0.0641 |
| 2 | -1.1353 | 0.2563 |

H0: no autocorrelation