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Forensic Accounting & Auditing Techniques on Public Sector Fraud in Nigeria

OGIRIKI, TONYE (Ph.D.)
Department of Accountancy & Finance, Niger Delta University, Wilberfroce Island, Bayelsa State

APPAH, EBIMOBOWEI (Ph.D., FCA) - Corresponding Author
Department of Accounting, Isaac Jasper Boro College of Education, Sagbama, P.M.B. 74, Yenagoa, Bayelsa State, Nigeria

Abstract
The purpose of this paper was to empirically analyze the effect of forensic accounting and auditing techniques on public sector fraud detection, investigation and prevention in Nigeria. Specifically, the study sought to establish the effect of the various techniques of forensic accounting on public sector fraud and secondly, to determine the effect of forensic auditing on fraud detection, investigation and prevention. The research design used in this study was expost factor design. The study employed restructured questionnaire for data collection after validity and reliability with regression analysis for hypothesis testing. The study revealed that the relationship between forensic accounting and auditing techniques and public sector fraud detection, investigation and prevention in Nigeria is quite significant. The study therefore concludes that forensic accounting and auditing techniques is a major panacea to the level of fraudulent activities experienced in the Nigerian public sector. It was recommended among others that government should consider providing more fraud hotlines, improve the whistleblowing policy and establish forensic accounting department in the public sector in order to enhance the fraud detection, investigation and prevention mechanism in the public sector. The paper fills an important gap in academic literature by providing insights into the techniques of forensic accounting and auditing in developing economies.
Keywords: Forensic Accounting, Auditing, Fraud, Public Sector.

INTRODUCTION

The Nigerian environment is filled with news of fraud and fraudulent activities. This is because financial fraud is now part and parcel of the daily activities of Nigerians. Okwoli (2004) stated that the Nigerian press is full of stories of wrong practices in the public sector. He further noted that stories of ghost workers, frauds and embezzlements are found everywhere in Nigeria. Bello (2001) also noted that huge amount of money is lost through fraud and financial irregularities, which to say the least drains the nation's limited financial resources through fraudulent means with its far reaching and attendant consequences on the development programmes of the nation. This is because several billions of Naira is lost in the public sector every year through fraudulent financial activities. Oyejide (2008) opined that fraud is a subject that has received a lot of attention both globally and in Nigeria. This interest has been heightened by several high profile cases involving several organizations. Issues relating to fraud have also been the subject of rigorous theoretical and empirical analysis in the academic literature (Appah and Appiah, 2010). According to Karwai (2002) maintains that the increasing wave of fraud is causing a lot of havoc in Nigeria. This is because fraud has eaten deep into every aspect of the Nigerian society to the extent that many organizations have lost confidence of their customers.

According to Eze (2015), wave of financial fraud in the world today has manifested in various ways including financial fraud has bedeviled the world globally and the resultant spate of failures and the inability of public sector organizations to fulfill their responsibilities placed greater functions on accountants to equip themselves with the skills to identify and act upon financial fraud and irregularities. The increase in the rate of public and private fraud embezzlement has caused a serious concern to investors, general public and owners of businesses. Ojaide (2000) submits that there is an alarming increase in the number of fraud and fraudulent activities in Nigeria emphasizing the visibility of forensic accounting and audit services. Okoye and Akamobi (2009), Owojori and Asaolu (2009), Izedonmi and Mgbame (2011), Kasum (2009) have all acknowledged in their various studies, the increasing incidence of fraud and fraudulent activities in Nigeria and these studies have argued that in Nigeria, financial fraud is gradually becoming a normal way of life. As Kasum (2009) noted, the perpetration of financial irregularities are becoming the specialty of both private and public sector in Nigeria as individuals perpetrate fraud and corrupt practice according to the capacity of their office. Fraud is the number one enemy of the business world.

It has become imperative for accountants at all levels to have the requisite skills and competencies for identifying, discovering as well as preserving evidence of all forms of financial fraud (Eze,2015). Hence, the widespread financial frauds in modern organizations have made traditional auditing and investigation ineffective and inefficient in the detection, prevention and reduction of fraud confronting both the public and private sectors. Owojori and Asaolu (2009) stated that the failure of statutory audit to prevent and reduce misappropriation of fraud and increase in crime has put pressure on accounting professionals to find a better way of exposing fraudulent activities. Consequently, there is an expectation that forensic accounting and auditing may be able to stem the tide of financial malfeasance witnessed in public sector of the Nigerian economy. Huber and DiGabrielle (2014) described forensic accounting as “the application of investigative and analytical skills for the purpose of resolving financial matters in a manner that meets the standards required by the court of law”. Also the Institute of Forensic Accountants of Nigeria (2011) defined Forensic audit is the activity that consists of data gathering, verifying, processing, analyzing and reporting in order to obtain material facts and/or evidence in the area of legal or financial disputes and or financial irregularities including fraud and giving preventive advice.

Prior studies on fraud detection and prevention have focused mainly on the private sector entities (Alleyne and Horward, 2005; Bierstaker, Brody and Pacini, 2006; Apostolou and Crumbley, 2008 Oluwagbemiga, 2010; Smith, 2012; Onuorah and Appah, 2012; Durtschi, Rahman and Anwar, 2014 Enofe, Omagbon and Ehigiator, 2015). There were limited studies conducted on fraud detection, investigation and prevention in the public sector. There are various audit procedures that can be applied to detect fraud in the public sector (Othman, et al, 2015). However, there has not been adequate emphasis, especially survey evidence on how forensic accounting and auditing techniques can help to curb financial crimes beyond the several anecdotal views that abound. The question that arises at this juncture is to what extent can the application of forensic accounting and auditing techniques detect, investigate and prevent financial fraud in the Nigerian public sector? Therefore, it is against this backdrop that this study intends to examine to what extent the application of forensic accounting and auditing techniques can detect, prevent and public sector financial fraud in Nigeria. The rest of the paper is divided as follows: section two deals with the review of related literature; the materials and methods used is explained in section three, followed by presentation of results and discussions in section four, while section five explains the conclusion and recommendations.

LITERATURE REVIEW

The review of related literature in this study is divided into three sub-headings, namely, conceptual, theoretical and empirical framework.

Conceptual Framework

Fraud and Fraudulent Activities

Bello (2001) stated that fraud is generic and is used in various ways. Fraud assumes so many different degrees and forms that courts are compelled to context themselves with only few general rules for its discovery and defeat. It is better not to define the term lest men should find ways of committing frauds which might evade such definitions. Okafor (2004) also reported that fraud is a generic term and embraces all the multifarious means which human ingenuity can devise, which are resorted to by one individual to get advantage over another in false representation. No definite and invariable rule can be laid down as a general proposition in defining fraud as it includes surprise, trick, cunning and unfair ways by which another is cheated. According to Appah (2016), fraud is an act or course of deception, deliberately practiced to gain unlawful or unfair advantage; such deception directed to the detriment of another. Legally, fraud has been defined as the act of depriving a person dishonestly of something, which is, or of something to which he is or would or might be entitled but for the perpetration of fraud.

Karwai (2002), Appah (2016) are of the view of fraud in organizations vary widely in nature, character and method of operation in general. Fraud may be classified into two broad ways: nature of fraudsters and method employed in carrying out the fraud. On the basis of the nature of the fraudsters, fraud may be categorized into three groups, namely; internal, external and mixed frauds. **Internal fraud** relates to those committed by members of staff and directors of the organizations while **external fraud** is committed by persons not connected with the organization and **mixed fraud** involves outsiders colluding with the staff and directors of the organization.

Forensic Accounting

Forensic accounting is a discipline that has its own models and methodologies of investigative procedures that search for assurance, attestation and advisory perspective to produce legal evidence. It is concerned with the evidentiary nature of accounting data, and as a practical field concerned with accounting fraud and forensic auditing; compliance, due diligence and risk assessment; detection of financial misrepresentation and financial statement fraud (Skousen and Wright, 2008); tax evasion; bankruptcy and valuation studies; violation of accounting regulation (Dhar and Sarkar, 2010). Curtis (2008) argues that fraud can be a subjected to forensic accounting, since fraud encompasses the acquisition of property or economic advantage by means of deception, through either a misrepresentation or concealment. Bhasin (2007) noted that the objectives of forensic accounting include: assessment of damages caused by an auditors' negligence, fact finding to see whether an embezzlement has taken place, in what amount, and whether criminal proceedings are to be initiated; collection of evidence in a criminal proceedings; and computation of asset values in a divorce proceedings. He argues that the primary orientation of forensic accounting is explanatory analysis (cause and effect) of phenomenon-including discovery of deception (if any), and its effects-introduced into the accounting domain. According to Bhasin (2007), forensic accountants are trained to look beyond the numbers and deal with the business realities of situations. Analysis, interpretation, summarization and the presentation of complex financial business related issues are prominent features of the profession. He further reported that the activities of forensic accountants involve: investigating and analyzing financial evidence; developing computerized applications to assists in the analysis and presentation of financial evidence; communicating their findings in the form of reports, exhibits and collections of documents; and assisting in legal proceedings, including testifying in courts, as an expert witness and preparing visual aids to support trial evidence. In the same vein Degboro and Olofinsola (2007) stated that forensic accountants provide assistance of accounting nature in financial criminal and related economic matters involving existing or pending cases as specified by the Alliance for Excellence in Investigation and Forensic

Forensic Auditing

Forensic auditing is an activity that consists of gathering, verifying, processing, analyzing of, and reporting on data in order to obtain facts and evidence in a predefined context in the area of legal/financial disputes and/or irregularities and giving preventive advice (Institute of Forensic Auditors, Belgium, 2004). According to Eze (2015), forensic auditing is the application of accounting methods to the tracking and collection of forensic evidence for investigation and prosecution of criminal acts such as embezzlement or fraud. It is a type of professional service which results from actual or anticipated disputes or litigation. Greek (2011), defined forensic auditing as an examination and evaluation of a firm's or individual financial information for use as evidence in court. It can be conducted in order to prosecute a party for fraud, embezzlement or other financial claims. Forensic auditing is defined as ''the application of auditing skills to situations that have legal consequences''. Chatterji (2009). It is also seen as ''an examination and evaluation of a firm's or individual's financial information's for use as evidence in event''. During a forensic auditing, professionals compile and assess financial information to be used in legal proceedings, whereas the auditing is conducted by forensic auditors who rely on the principles of law, business and ethics. These reports are sometimes used to prepare legal defences as well as prosecuting a party for fraud, embezzlement or other financial claims. Forensic auditing is the application of accounting, investigative, criminology, and litigation services skills for the purpose of identifying, analyzing, and communication of evidence of underlying reporting event (Enofe, Omagbon and Ehigiator, 2015).

Forensic Accounting and Auditing on Fraud Detection, Investigation and Prevention

Fraud prevention calls for measures to stop fraud from occurring in the first place. Fraud detection comes next once fraud prevention has failed as it involves identifying fraud as quickly as possible once it has been perpetrated (Bolton and Hand, 2002). By nature, fraud detection must be used and worked continuously as fraud evolves. It requires more sophisticated approach from preventative to detection. One of the modern approaches that can be used from the prevention to detection is called forensic accounting. According to Hansen (2009), computer forensics is currently the investigators best tools in detecting and implementation of white-collar investigations. Degboro and Olofinsola (2007) described forensic accounting as the application of criminalistic methods, and integration of accounting investigative activities and law procedures to detect and investigate financial crimes and related accounting misdeeds. According to Dhar and Sarkar (2010), forensic accounting, also called investigative accounting or fraud audit, is a merger of forensic science and accounting. Crumbley (2003) defined forensic science as the application of laws of nature to the laws of man. He described forensic scientists as examiners and interpreters of evidence and facts in legal cases that also offers expert opinions regarding their findings in court of law.

Baird and Zelin (2009) stated that forensic accounting is important investigative tool for detection of fraud. Gray (2008) reported that the forensic accountants investigation include identification fraud. Gottschalk (2010) stated that the focus of forensic accounting is on evidence revealed by the examination of financial documents. The evidence collected or prepared by a forensic accountant may be applied in different contexts. According to Curtis (2008), forensic accountants are essential to the legal system, providing expert services such as fake invoicing valuations, suspicious bankruptcy valuations, and analysis of financial documents in fraud schemes.

According to Hopwood, Young and Leiner (2013), fraud investigation is the systematic process of gathering and reviewing evidence for the purpose of documenting the presence or absence of fraud. It involves the engagement process, the evidence collection process, the reporting process and the loss recovery process. Albrecht and Albrecht (2001) described forensic investigations as the utilization ofspecialized investigative skills in carrying out an enquiry conducted in such a manner that the outcome will have application to the court of law. According to Kasum (2009), the services of forensic accountants are more required in the public sector compared to the private sector. It is crucial to have forensic accountants function in the public sector in order to assist governments to detect, prevent and investigate fraud cases (Omar, Mohamed, Jomatin, and Haron, 2013).

Theoretical Framework

Over the years, a number of theories and models have been formulated through which the present day intellectual discuss on fraud theories is derived. According to Wolf and Hermanson (2004), Crumbley, Heitger and Smith (2007), Eze (2015), the theories of fraud include the following differential association theory, fundamental observation theory, fraud diamond Theory, social learning theory, hyper motivation theory, anomie fraud theory, low handing theory, social control theory, differential opportunity theory, social ecology theory, rotten apply theory. However, the theory of fraud diamond is the bedrock for this research. Eze (2015) stated that the diamond theory of fraud explains an individual's capability, personality traits and abilities contribute a major role in determining whether fraud may occur. According to Wolf and Hermanson (2004), Crumbley, Heitger and Smith (2007), the fraud perpetrator of fraud must have the necessary traits, abilities, or positional authority to pull off his crime. Eze (2015) further noted that while opportunities can open the doorways to fraud, incentive and rationalization will attract people to it, but such an individual must have the capability to recognize the open doorway as an opportunity and should be able to take an undue advantage of the identified loopholes.

Empirical Framework

Empirical evidence from a study by Boritz, Kotchetova and Robinson (2008) confirms that forensic accountants could prevent significantly higher number of fraud than auditors. Srivastava, Mock and Turner (2003) in their study found that forensic audit procedures significantly lowered fraud risks. Furthermore, research has also proven that proactive forensic data analysis using computer based sophisticated analytical tests can prevent fraud that may remain unnoticed for years (Brown, Aiken, and Visser 2007). A study by Bierstaker, Brody and Pacini (2006) researched accountants' perception regarding fraud detection and prevention methods. The findings revealed that organizational use of forensic accountants was the latest often used of anti-fraud method but had the highest effectiveness rating. This is similar to the findings of Ernst and Young's (2003) worldwide fraud survey, which states that only 20% of organizations employed forensic accountants although the satisfaction level for the service 88% was the highest. Omar and Bakar (2012) conducted a survey on Fraud Prevention Mechanisms of Malaysian Government-Linked Companies: An Assessment of Existence and Effectiveness and their results showed that management review of internal controls and external audits of financial statements ranked as the top-most fraud prevention mechanisms in terms of the percentage of existence in organizations as perceived by internal auditors and fraud investigators, followed by operational audits, internal audits or fraud examination departments, and internal control review and improvements by departments. Islam, Rahman, and Hossan (2011) found that forensic accounting is a critical tool in the fight against corruption, detection and prevention of fraud in Bangladesh. While, Dada, Owolabi, and Okwu (2013) and Modugu and Anyanduba (2013) found a positive linkage between forensic accounting and fraud reduction, consequently forensic audit is a useful tool in fraud detection and reduction. Similarly, Njanike, Dube, and Mashayanye (2009) recognized forensic accounting as administrative function in Zimbabwe whilst they identified forensic auditor's duties to include detection and prevention of fraud as well as detection of potential red flag.

Enofe, Omagbon and Ehigiator (2015) focusing their study on forensic audit and corporate fraud using survey method and least square regression technique reveals that frequent utilisation of forensic audit services will significantly help in the detection, prevention and reduction of corporate fraud. A study conducted by Othman et al (2015) on detection and prevention methods in Malaysian public sector accountants and internal auditors using structured questionnaire for data collection. The study concluded that operational audits, enhanced audit committees, improved internal controls, implementation of fraud reporting policy, staff rotation and forensic accountants are among the most effective fraud detection and prevention mechanisms employed in the public sector. Okoye and Gbegi (2013) investigated forensic accounting on fraud detection and prevention in the public sector in Kogi State using survey research methods of 370 questionnaire and analysis of variance. Their result reveals that forensic accounting does significantly reduce the occurrence of fraudulent activities in the public sector. An empirical study conducted by Sidharts and Fitriyah (2015) on forensic accounting and fraud prevention in Indonesia public sector, it was shown that the use of forensic accounting do significantly reduces the occurrence of fraud cases in the public sector. A study conducted by Dauda, Ombugadu and Aku (2016) on forensic accounting: a preferred technique for modern fraud detection and prevention in the public sector of Nasarawa State. Their study shows that forensic accounting is relevant in fraud detection and prevention in Nigeria public sector. Igweonyia (2016) focusing her study on forensic accounting on fraudulent practices in Nigeria public sector using questionnaire and chi-square for data analysis. The result shows that forensic accounting will significantly reduce the occurrence of fraud cases in the public sector. In an empirical study conducted by Akani and Ogbeide (2017) on forensic accounting and fraudulent practices in the Nigerian public sector, it was revealed that there is a significant relationship between forensic accounting and reduction of fraudulent practices in the Nigerian public sector.

Hence, on the basis of the prior empirical studies reviewed, this present study hypothesized as follows:

- There is no significant relationship between forensic accounting and auditing on public sector fraud detection, investigation and prevention in Nigeria.

MATERIALS AND METHODS

This study adopted ex-post facto research design in the selection of data modes. Primary and secondary data were employed. A target sample size of 450 accountants and internal auditors was used. The target population consisted of 450 accountants and internal auditors in the public sector of Bayelsa, Delta and Rivers States in South-South Nigeria using a purposive sampling technique for the period August 2016 to May 2017. The questionnaire designed consists of four sections. The first part of the questionnaire contains questions on organization and respondents characteristics. The second part of the questionnaire contains questions on forensic accounting items (Okoye and Gbegi, 2013; Sidharts and Fitriyah 2015,Dauda, Ombugadu and Aku, 2016; Igweonyia, 2016) using five point calibrated scale of ranging from Strongly Agree (coded as '5') to Strongly Disagree (coded as '1'). The third part of the questionnaire examines forensic auditing items (Njanike, Dube and Mashajanye, 2009; Enofe, Omagbon and Ehigiator, 2015) and the last part of the questionnaire consists of public sector fraudulent activities consistent with Basadur and Basadur (2011), Basadur, Basadur and Licina (2013), Popoola, Ahmad and Samsudin (2015), Akani and Ogbeide (2017). The 450 questionnaire were distributed to respondents and a response rate of 62% (279) was recorded, but only 264 copies were used for data analysis. Face validity, content validity and pilot tests were used to validate the instruments. The Cronbach's Alpha reliability test gave a result of (r = 0.758) and (r = 0.714). Regression was used for data analysis at 5% levels of significance. The ordinary least square was adopted for the purpose of hypotheses testing. The ordinary least square was guided by the linear model below:

$PSF = \beta_0 + \beta_1 BDA_1 + \beta_2 DMA_2 + \beta_3 FRA_3 + \beta_4 CAATS_4 + \beta_5 COA_5 + \varepsilon$ ---------------- (1)

That is B_1-β_5>0

Where: PSF = Public Sector Fraud; BDA = Bedford Digital Analysis; DMA = Data Mining Analysis; FRA = Financial Ratio Analysis; CAATs = Computer Assisted Tools and Techniques; COA = Continuous Auditing, and $\beta_1 - \beta_5$ are the coefficients of the regression, while ε is the error term capturing other explanatory variables not explicitly included in the model.

RESULTS AND DISCUSSIONS

This section of the study examines the results and discussions obtained from questionnaires administered to respondents from the sampled accountants and internal auditors in the public sector of sampled states in Nigeria.

Descriptive Analysis

Table 1: Demographic Profile of Respondents

Variable	Characteristics	Frequency	%	Total
Gender	Male	170	64	
	Female	94	36	264
Educational Qualification	First Degree Only	106	40	
	Second Degree	54	20	
	First Degree with Professional	71	27	
	Second Degree with Professional	28	12	
	Third Degree with professional	5	2	264
Length of Work Experience	0 -5	87	33	
	6 – 10	92	35	
	11 -15	58	22	
	Above 15	27	10	264
Department/function	Internal Audit	125	47	
	Accountant	139	53	264

Source: Field Survey, 2017

Table 1 displays the demographic profile of the respondents. Out of the total respondents, there were 190 males (64%) and 94 females (36%). The educational qualification of the respondents shows that 106 (40%) holds first degree only, 54 (20%) holds second degree, 71 (27%) holds first degree with professional certification of ICAN and ANAN, 28 (12%) possesses second degree with professional certification of ICAN and ANAN and 5 (2%) possesses third degree with professional certification of ICAN and ANAN. It is noted that 87 (33%) of the respondents have work experience between 0 – 5 years, 92 (35%) have work experience between 6 – 10 years, 58 (22%) have work experience between 11 – 15 years and 27 (10%) have work experience above 15 years. These statistics suggest that respondents are expected to possess requisite academic and professional qualifications and work experiences to address the questions contained in the research instruments, thus ensuring that the perception provided is typical of internal auditor and accountant on forensic accounting and auditing on public sector fraud detection, investigation and prevention in Nigeria.

Table 2: Forensic Accounting and Auditing Techniques on Fraud Detection in the Public Sector

Options	Responses	% of Response
Strongly agree	145	55
Agree	64	24
Not Sure	16	06
Disagree	18	7
Strongly disagree	21	8
Total	264	100%

Source: Field Survey, 2017

Table 2 reveals the frequency of each item on forensic accounting and auditing techniques on public sector fraud detection in the administered questionnaire. 145 (55%) of the respondents strongly agree that forensic accounting and auditing techniques assists in fraud detection in the public sector of Nigeria. 64 (24%) of the respondents agree, 16 (6%) of the respondents not sure, 18 (7%) of the respondents disagree and 21 (8%) of the respondents strongly disagree. This means that the respondents agreed that forensic accounting and auditing assists in fraud detection in the Nigerian public sector. The result was supported by Okoye and Gbagi (2013), Dauda, Ombugadu, and Aku (2016) and Akani and Ogbeide (2017). They averred that forensic accounting and auditing helps public sector organisations to detect fraudulent activities. This position was further supported by a study on forensic audit and corporate fraud in Nigeria conducted by Enofe, Omagbon and Ehigiator (2015) where they found that the application of forensic audit would result in increase in the detection of corporate fraud incidence.

Table 3: Forensic Accounting and Auditing Techniques on Fraud Prevention in the Public Sector

Options	Responses	% of Response
Strongly agree	131	50
Agree	73	28
Not Sure	10	04
Disagree	34	12
Strongly disagree	16	06
Total	264	100%

Source: Field Survey, 2017

Table 3 shows the frequency of each item on forensic accounting and auditing techniques on public sector fraud prevention in the administered questionnaire. 131 (50%) of the respondents strongly agree that forensic accounting and auditing techniques assists in fraud prevention in the public sector of Nigeria. 73 (28%) of the respondents agree, 10 (4%) of the respondents not sure, 34 (12%) of the respondents disagree and 16 (6%) of the respondents strongly disagree. This means that the respondents agreed that forensic accounting and auditing assists in fraud prevention in the Nigerian public sector. The result was supported by Okoye and Gbegi (2013), Enofe, Omagbon and Ehigiator (2015), Dauda, Ombugadu, and Aku (2016) and Akani and Ogbeide (2017). This position was further supported by a study on forensic accounting and fraud prevention in the Indonesia public sector carried out by Sidharts and Fitriyah (2015) where they found that forensic accounting can help better in preventing public sector fraud.

Table 4: Forensic Accounting and Auditing on Fraud Investigation in the Public Sector

Options	Responses	% of Response
Strongly agree	121	46
Agree	91	35
Not Sure	12	05
Disagree	30	11
Strongly disagree	10	03
Total	264	100%

Source: Field Survey, 2017

Table 4 shows the frequency of each item on forensic accounting and auditing on public sector fraud investigation in the administered questionnaire. 121 (46%) of the respondents strongly agree that forensic accounting and auditing techniques assists in fraud investigation in the public sector of Nigeria. 91 (35%) of the respondents agree, 12 (5%) of the respondents not sure, 30 (11%) of the respondents disagree and 10 (%) of the respondents strongly disagree. This means that the respondents agreed that forensic accounting and auditing assists in fraud investigation in the Nigerian public sector. This position was supported by a study on the effectiveness of forensic auditing in detecting, investigating and preventing bank frauds in Zimbabwe carried out by Njanike, Dube and Mashayange (2009) where they found that forensic auditing can help in the investigation of fraud.

Table 5: Multiple Regression Analysis
Dependent Variable: PSF
Method: Least Squares
Date: 05/10/17 Time: 15:58
Sample(adjusted): 1 264
Included observations: 264 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.275444	2.256856	1.451330	0.1488
BDA	0.285935	0.095662	2.989017	0.0033
DMA	0.249495	0.106627	2.339885	0.0206
FRA	0.216547	0.102573	2.111150	0.0363
CATTs	0.273341	0.123184	2.218965	0.0400
COA	0.220526	0.104976	2.100727	0.0327
R-squared	0.435481	Mean dependent var		12.99346
Adjusted R-squared	0.382318	S.D. dependent var		3.098167
S.E. of regression	2.888766	Akaike info criterion		4.997962
Sum squared resid	1226.711	Schwarz criterion		5.116803
Log likelihood	-376.3441	F-statistic		5.567008
Durbin-Watson stat	2.16401	Prob(F-statistic)		0.000100

Source: e-view output

Table 5 reveals the multiple regression analysis of forensic accounting and auditing techniques on fraud detection, investigation and prevention in the Nigerian public sector. The result suggests that Bedford digital analysis (BDA), data mining analysis (DMA), financial ratio analysis (FRA), computer assisted tools and techniques (CAATs) and continuous auditing (COA) with p-values of 0.0033, 0.0206, 0.0363, 0.0400 and 0.0327 is less than the critical value of 0.05.Hence, we deduce that there is a significant relationship between the various forensic accounting and auditing techniques on public sector fraud detection, investigation and prevention in Nigeria. The R^2 (coefficient of determination) of 0.318414 and adjusted R^2 of 0.285935 shows that the variables combined determines about 32% and 29% of public sector fraud. The F-statistics and its probability shows that the regression equation is well formulated explaining that the relationship between forensic accounting and auditing techniques and public sector fraud detection, investigation and prevention in Nigeria are statistically significant (F-stat = 5.567008; F-pro. = 0.000100). The result was supported by Okoye and Gbagi (2013), Dauda, Ombugadu, and Aku (2016) and Akani and Ogbeide (2017). They averred that forensic accounting and auditing helps public sector organisations to detect fraudulent activities. This position was further supported by a study on forensic audit and corporate fraud in Nigeria conducted by Enofe, Omagbon and Ehigiator (2015) where they found that the application of forensic audit would result in increase in the detection of corporate fraud incidence. This position was further supported by a study on the effectiveness of forensic auditing in detecting, investigating and preventing bank frauds in Zimbabwe carried out by Njanike, Dube and Mashayange (2009) where they found that forensic auditing can help in the investigation of fraud. Also, this position was further supported by a study on forensic accounting and fraud prevention in the Indonesia public sector carried out by Sidharts and Fitriyah (2015) where they found that forensic accounting can help better in preventing public sector fraud. The findings are further buttressed by Othman et al (2015) in a study of fraud detection and prevention methods in the Malaysian public sector: accountants and internal auditors' perception where they found that forensic accountants are among the most effective fraud detection and prevention mechanisms employed in the public sector. Similarly, Islam, Rahman, and Hossan (2011) study in Bangladesh found that forensic accounting is a critical tool in the fight against corruption, detection and prevention of fraud.

CONCLUSION AND RECOMMENDATIONS

The study presented a detailed investigation on the effects of forensic accounting and auditing techniques on public sector fraud in Nigeria. Review of literature provides strong evidence of the effectiveness of forensic accounting and auditing methods on fraud detection, investigation and prevention. This research empirically substantiated the results of prior studies Njanike, Dube and Mashayange (2009), Okoye and Gbagi (2013), Akenbor and Ironkwe (2014), Othman et al (2015), Sidharts and Fitriyah (2015), Dauda, Ombugadu, and Aku (2016) and Akani and Ogbeide (2017). The study highlights the various techniques of fraud detection, investigation and prevention. The empirical analysis provided a significant relationship between Bedford digital analysis, data mining analysis, financial ratio analysis, continuous audit and computer assisted audit tools on public sector fraud detection, investigation and prevention in Nigeria. On the basis of the empirical result, the paper concludes that the adoption of forensic accounting and auditing techniques would help to detection, investigate and prevent public sector fraud in Nigeria. However, it was also noticed that forensic accounting and auditing techniques are less common used in the Nigerian public sector and these techniques cannot be used to reduce the level of fraud witnessed in the Nigerian public sector. Therefore, on the basis of the conclusion, the papers recommends as follows:

1. Government should consider providing more fraud hotlines, improve the whistleblowing policy and establish forensic accounting department in the public sector in order to enhance the fraud detection, investigation and prevention mechanism in the public sector.
2. The Nigerian legal system should be up to date with latest advancement in technology to ensure admissibility of evidence in a court for successful prosecution of criminal and civil cases.
3. The public sector in Nigeria should embrace forensic accounting and auditing techniques with complete implementation of International Public Sector Accounting Standards (IPSAS) and the establishment of Forensic accounting departments.
4. The relevant anti-graft agencies in Nigeria like the EFCC and ICPC should ensure they have their technical, investigative and accounting staff trained in the various techniques of forensic accounting and auditing techniques used in advance countries.
5. Government ministries, departments and agencies should take advantage of the modern accounting and auditing software to enhance efficiency and smooth operation of forensic accounting and auditing practice.

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REFERENCES

Akani, F. and Ogbeide, S.O. (2017). Forensic Accounting and Fraudulent Practices in the Nigerian Public Sector. *International Journal of Arts and Humanities*, 6(2), 171-181.

Akenbor, C. O. and Ironkwe, U. (2014). Forensic auditing techniques and fraudulent practices of public institutions in Nigeria. *Journal of Modern Accounting and Auditing,* 10(4), 451-459.

Albrecht, C. and Albrecht, U. (2001). Can Auditors Detect Fraud: A review of the Research Evidence: *Journal of Forensic Accounting.* 11,1-12.

Alleyne, P., and Howard, M. (2005). An Exploratory Study of Auditors' Responsibility for Fraud Detection in Barbados. *Managerial Auditing Journal,* 20(3), 284–303. doi:10.1108/02686900510585618.

Appah. E. (2016). *Auditing and Assurance Services (2nd ed.)*, Port Harcourt, Vinson Publishers.

Appah, E. and Appiah, Z.K.A. (2010), Fraud and the development of sound Financial Institutions in Nigeria*, Nigerian Journal for Development Research*, 1(1), 49-56.

Apostolou, N. and Crumbley, D.L. (2008). Auditors' Responsibilities with respect to Fraud: a possible shift?CPA Journal. Retrieved on 17 December 2016 from http://www.nysscpa.org/cpajournal/2008/208/essentials/p32.htm

Basadur, M., Basadur, T., and Licina, G. (2013). Simplexity Thinking. *Encyclopedia of Creativity, Invention, Innovation and Entrepreneurship*, 1617-1634.

Basadur, M., and Basadur, T. (2011). Where are the generators?. *Psychology of Aesthetics, Creativity, and the Arts*, 5(1), 29.

Baird, J.E. and Zelin, R.C. (2009). An Examination of the Impact of Obedience Pressure on Perceptions of Fraudulent Acts and the likelihood of Committing Occupational Fraud, *Journal of Forensic Studies in Accounting and Business*, Winter, 1-14.

Bello, S. (2001). Fraud Prevention and Control in Nigerian Public Service: The Need for a Dimensional Approach, *Journal of Business Administration*, 1(2), 118 – 133.

Bierstaker, J.L., Brody, R.D., and Pacini, C. (2006). Accountants' Perceptions regarding Fraud Detection and Prevention Methods. *Managerial Auditing Journal,* 21(5), 520-535.

Bhasin, M. (2007), Forensic Accounting: A New Paradigm for Niche Consulting, The Chartered Accountant, January 2007: 1000-1010.

Bolton, R.J. and Hand, D.J., (2002). Statistical Fraud Detection: A Review. *Statistical Science*, 17(3), 235–255

Crumbley D.L., Heitger L.E., and Smith G.S. (2007), *Forensic and Investigative Accounting*, (3rd ed), Chicago: CCH.

Dada, S. O., Owolabi, S. A., & Okwu, A. T. (2013). Forensic accounting a panacea to alleviation of fraudulent practices in Nigeria. *International Journal Business, Management and Economic Research, 4*(5), 787-792.

Dauda, I.A., Ombugadu, B.A. and Aku, S.U. (2016). Forensic Accounting: A Preferred Technique for Modern Fraud Detection and Prevention in the Public Sector (A Case of Nasarawa State). *Account and Financial*

Management Journal, 1(7): 463 -472.

Degboro, D. and Olofinsola, J. (2007), Forensic Accountants and the Litigation Support Engagement, *The Nigerian Accountant*, 40(2), 49-52.

Dhar, P. and Sarkar, A. (2010), "Forensic Accounting: An Accountant's Vision", Vidyasagar *University Journal of Commerce,* 15(3), 93-104.

Durtschi, C., Hillison, W. and Pacini, C., (2004). The effective use of Benford's Law to assist in Detecting Fraud in Accounting Data. *Journal of Forensic Accounting*, 17-34.

Ehioghiran, E.E. and Atu, O.O.K (2016). Forensic Accounting and Fraud Management: Evidence from Nigeria, *Igbinedion University Journal of Accounting*, 2: 245 – 283.

Enofe, A.O., Omagbon, P. and Ehigiator, F.I. (2015). Forensic Audit and Corporate Fraud. *International Journal of Economics and Business Management,* 1(7).

Eze, G.P. (2015). *Corporate Fraud and Forensic Accounting,* Port Harcourt: Vinson Publishers.

Gottschalk, P. (2010), Prevention of White Collar Crime: The Role of Accounting, *Journal of Forensic and Investigative Accounting*, 3(1): 23-48.

Gray, D. (2008), "Forensic Accounting and Auditing: Compared and Contrasted to Traditional Accounting and Auditing", *American Journal of Business Education,* 1(2): 115-126.

Hansen, L.L. (2009), "Corporate Financial Crime: Social Diagnosis and Treatment", *Journal of Financial Crime*, 16(1): 28-40.

Hopwood, W., Young, G. and Leiner, J. (2013). *Forensic Accounting and Fraud Examination*, New York: McGraw Hill.

Huber, W. D. and DiGabrielle, J. A. (2014). Research in Forensic Accounting - What Matters? *Journal of Theoretical Accounting Research,* 10(1), 40-70.

Igweonyia, O.V. (2016). Forensic Accounting as a Panacea to Alleviation of Fraudulent Practices in Nigeria Public Sector Organisations (A Case Study of Selected Ministries in Enugu State). *International Journal of Management and Applied Science*, 2(9), 183 – 188.

Islam, M. J., Rahman, M. H., and Hossan, M. T. (2011). Forensic accounting as a tool for detecting fraud and corruption: an empirical study in Bangladesh. *ASA University Review, 5*(2), 77-85.

Karwai, S.A. (2002), Bank Fraud: Can Shari'ah prevent it?, *Journal of Business Administration*, 2(1), 62-78.

Kasum A.S (2009): The Relevance of Forensic Accounting to financial Crimes in Private and Public Sectors of Third World Economics: A Study from Nigeria. Proceedings of the 1st *International Conference on Forensic Accounting:* htt://ssrn.com/abstract=1384242.

Modugu, K. P., and Anyanduba, J. O. (2013). Forensic accounting and financial fraud in Nigeria: An empirical approach. *International Journal of Business and Social Science, 4*(7), 281-289.

Njanike, K., Dube, T., and Mashayanye, E. (2009). The effectiveness of forensic auditing in detecting, investigating, and preventing bank frauds. *Journal of Sustainable Development in Africa, 10*(4), 405-425.

Ojaide, F. (2000). Frauds detection and prevention: the case of pension accounts *ICAN NEWS* January/March, 8

Okoye E.I and Akamobi N.L (2009): The Role of Forensic Accounting in Fraud Investigation and Litigation Support. *The Nigerian Academic Forum 1*.

Okoye, E.I. and Gbegi, D.O. (2013). Forensic Accounting: A Tool for Fraud Detection and Prevention in the Public Sector (A Study of Selected Ministries in Kogi State). *International Journal of Academic Research in Business and Social Sciences,* 3(3): 1-18.

Okwoli, A.A. (2004). Towards Probity, Accountability and Transparency in Revenue Generation in the Nigerian Public Sector", *Nigerian Journal of Accounting Research*, 1(1), 1 – 9.

Oluwagbemiga, O.A. (2010). The Role of Auditors in Fraud Detection, Prevention and Reporting in Nigeria. Library Philosophy and Practice (ejournal). Retrieved on 20 December 2016 from http://digitalcommons.unl.edu/libphilprac/517

Omar, N. and Bakar, K.M.A. (2012). Fraud prevention mechanisms of Malaysian government-link Companies: An Assessment of Existence and Effectiveness. *Journal of Modern Accounting and Auditing, January*, 8(1), 15-31.

Omar, N., Jomitin, B., Haron, R., (2013). The Relevance of Forensic Accounting in Public Sector: A study of selected government agencies in Klang valley. *The 5th International Conference on Financial Criminology (ICFC).*

Onuorah, A.C. and Appah, E. (2012). Fraudulent Activities and Forensic Accounting Services of Banks in Port Harcourt, Nigeria. *Asian Journal of Business Management,* 4(2), 124 – 129.

Othman, R. et al. (2015). Fraud Detection and Prevention Methods in Malaysian Pubic Sector: Accountants and Internal Auditors' Perceptions. *Procedia Economics and Finance*, 28: 59-67.

Owojori, A.A and Asaolu T.O. (2009): The Role of Forensic Accounting in Solving the Vexed Problem of Corporate World. *European Journal of scientific Research* 29(2), 183-187

Oyejide, A. (2008), "Corruption and Development: A Nigerian Perspective", *The Nigerian Accountant*, 41(4):28-42.

Popoola, O.M.J., Ahmad, A.C. and Samsuden, R.S. (2015). An empirical Investigation of Fraud Risk Assessment and Knowledge Requirement on Fraud Related Problem Representation in Nigeria. *Accounting Research Journal*, 28(1), 78-97.

Sidharts, E.A. and Fitriyah, F.K. (2015). Forensic Accounting and Fraud Prevention in Indonesia Public Sector. *International Journal of Business and Management Studies*, 4(1), 123 – 131.

Smith, G.S. (2012).Can an Auditor ever be a first responder to Financial Frauds? *Journal of Financial Crime,* 19(3), 291 – 304.

Wolf, D.T. and Hermanson, S.R. (2004). The fraud diamond: considering the four elements of fraud''. *The CPA journal, December*.