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FORENSIC ACCOUNTING AND FRAUD DETECTION: EVIDENCE FROM MANUFACTURING INDUSTRY IN NIGERIA

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ABSTRACT

The increasing demand for forensic accounting is a certain defining feature of most businesses in the world. Forensic accounting occurs from the reason and result of fraud and technical errors invented by humans. It became relevant that forensic accounting is introduced and practiced, and forensic accountant to provide litigation support and investigative accounting. Therefore, this paper critically examined the effect of forensic accounting on fraud detection in the manufacturing industry in Nigeria. This study employed the survey design and data were collected using primary data and this was achieved via a structured questionnaire. The population of the study consists of all the employees of PZ Nigeria Limited. The target population of the study was the employees in the accounting department of PZ Nigeria Limited. Regression analysis was used to show the relationship between the dependent variable and the independent variable. The study found out there is a significant effect of forensic accounting on fraud detection. The study, therefore, recommended that industry in the manufacturing industry should build a continuous improvement in the internal control system and ensure effective and efficient internal checks. Also, the company should choose a sound accounting system and effective forensic accounting practices.

Keywords: Forensic Accounting, fraud, fraud detection, internal control, accounting practice, manufacturing industry

INTRODUCTION

The increasing demand for forensic accounting is a certain defining feature of most businesses in the world. Forensic accounting occurs from the reason and result of fraud and technical error invented by humans. In Nigeria, Forensic accounting is quite new as businesses are aware of the services of a forensic accountant as fraud cases have substantially increased in number. The application of financial skills and investigative mentality to unsettled issues, conducted within the context of the rules of evidence is known as forensic accounting (Arokiasamy & Cristal-Lee, 2009).

Forensic accounting involves the process of utilizing accounting, auditing, and investigative skills to help in legal matters. According to Apostolou, Hassell, and Webber (2000), it is a specialized field of accounting that explains engagements that arise from actual or anticipated disputes or litigation. Forensic accounting is therefore seen as a part of accounting that is suitable for legal review and offering the highest level of assurance.

The increasing need for forensic and investigative accounting in the banking sector arises from the complexities of modern-day banking with a large volume of complex data. This makes it difficult to monitor transactions by applying manual audit processes. This in turn makes the control utility of auditing ineffective (Centre for Forensic Studies Report, 2010).

Empirical and theoretical works have been carried out over the years on fraud and forensic accounting as a result of the recent scandal that rocked the corporate world. Examples of such are the cases of Enron and WorldCom often cited which has brought Forensic Accounting to the forefront in the fields of learning in the business world. Investors and indeed the general public expect an auditor to detect all forms of fraud and fraudulent practices. The primary responsibility of the management audits is to ensure that fraud and error are prevented or detected in the enterprise (Izedonmi & Mgbame, 2011).

Forensic accounting comprises investigation, litigation support, and dispute resolution (Dada, Enyi & Owolabi, 2013) and the upsurge in economic and financial crimes in countries and the world as a whole accentuated the need for the application of its techniques (Modugu & Anyaduba, 2013). Consequently, forensic accounting is perceived as a tool for combating economic and financial crimes. Thus, the effective application of forensic accounting techniques can investigate and detect economic and financial crime cases. Owolabi, Dada, and Olaoye (2013) added that forensic accountant might implement similar financial audit techniques, nonetheless with different objectives and procedures; and may validate calculations needed by scrutinizing a trail of paperwork to achieve a specific goal of the engagement.

Recently, so many frauds have been committed both in the public sector and the private sector of the economy. Evidence from literature (Yinus and Oladejo, 2015)

revealed that fraud is committed under the control of the internal auditors of a company. It is enough to say that the independence of the internal auditor is not guaranteed for he works as a staff of the government or company. As regards the opinion of external auditors, still frauds are being committed daily. It now becomes relevant that forensic accounting is introduced and exercised since the external auditors do not or may not have the required skill to be able to address modern frauds like white-collar crimes such as security fraud, embezzlement, bankruptcies, contract disputes, and possibly criminal financial transaction; including money laundering by organized criminals, furthermore, the competence of the forensic accountant will provide litigation support and investigative accounting. Therefore, the use of forensic accounting techniques could enhance the prosecution of economic and financial cases. This study was carried out to critically examine the effect of forensic accounting on fraud detection in the manufacturing industry in Nigeria.

LITERATURE REVIEW

Theoretical Review

Theory of Fraud Management Life Cycle

This theory was propounded by Wesley Kenneth in 2004. This theory explains that the presence and proper management of the entire fraud management lifecyc1e are what provide the opportunity for significantly decreased fraud losses. This comprises eight stages; Deterrence, prevention, monitoring programs, mitigation, analysis of losses, activities to evaluate, communicate, and deployment of policies to reduce the occurrence of fraud, investigation, and prosecution. Proper management of the Fraud Management Lifecycle begins with a shared knowledge or meaning of the processes in the lifecycle. As a result of lack of awareness and understanding, fraud management experts are unlikely to convey effectively with one another, with their counterparts in other sectors, and within their respective businesses. The Fraud Management Lifecycle, therefore, is a network lifecycle where each node in the network, each stage in the lifecycle, is a summed entity that is made up of interconnected, interdependent, and self-supporting actions, purposes, and operations.

Fraud Triangle Theory

This theory was developed and by an American Criminologist Donald Cressey (1950) but widely published in 1953 in a book called “Other people’s money”. Forensic accountant depends on the fraud triangle to recognize suspected fraud, the reason, and the challenges in the system that prompted the fraud. As a result of the fraud triangle concept, the tripartite factors that result in the triangle are; pressure, opportunity, and opportunity-employees use their rank to perpetrate fraud when internal controls are not strong, or where there is inadequate management oversight on internal control implementation. Most workers who perpetrate fraud do so

because they have the advantage to access assets and information that allows them to hide their fraudulent acts. employees need access to a certain platform to carry out their jobs. The same access given to the employees allows them to perpetrate fraud. Pressure/Incentive-Pressure can make an employee perpetrate fraud. Pressure does not only mean financial pressure. Lister (2007) opined that there are three types of motivation or pressure; personal pressure to pay for lifestyle, employment pressure from continuous compensation structures, or management's financial interest, and external pressure such as threats to the business financial stability, financial covenants, and market expectations.

The Fraud Diamond Theory

This theory is an improvement in the existing fraud triangle. This theory considered the four elements of fraud by Wolfe and Hermanson (2004). They believe that the fraud triangle could be enhanced to better both fraud prevention and detection by considering the fourth element. Furthermore, in addressing incentive, opportunity, and rationalization, the Wolfe and Hermanson's four-sided fraud diamond" also reflects an individual's range of abilities personal traits and competence that play an important part in whether fraud may occur even with the presence of the other three elements. Many frauds especially some of the multibillion-dollar ones would not have occurred without the right person with the right capabilities in place. Opportunity opens the doorway to fraud and incentive.

This study, therefore, hinged on the fraud diamond theory.

Conceptual Review

A concept is an abstract or general idea inferred or derived from specific instances (Kombo & Tromp, 2006). In this study, the conceptual framework has shown in figure 2.1 shows the relationship between the independent and dependent variables. The independent variables of this study include forensic investigation, forensic litigation, and forensic accountant investigative tenure while the dependent variable is fraud detection.

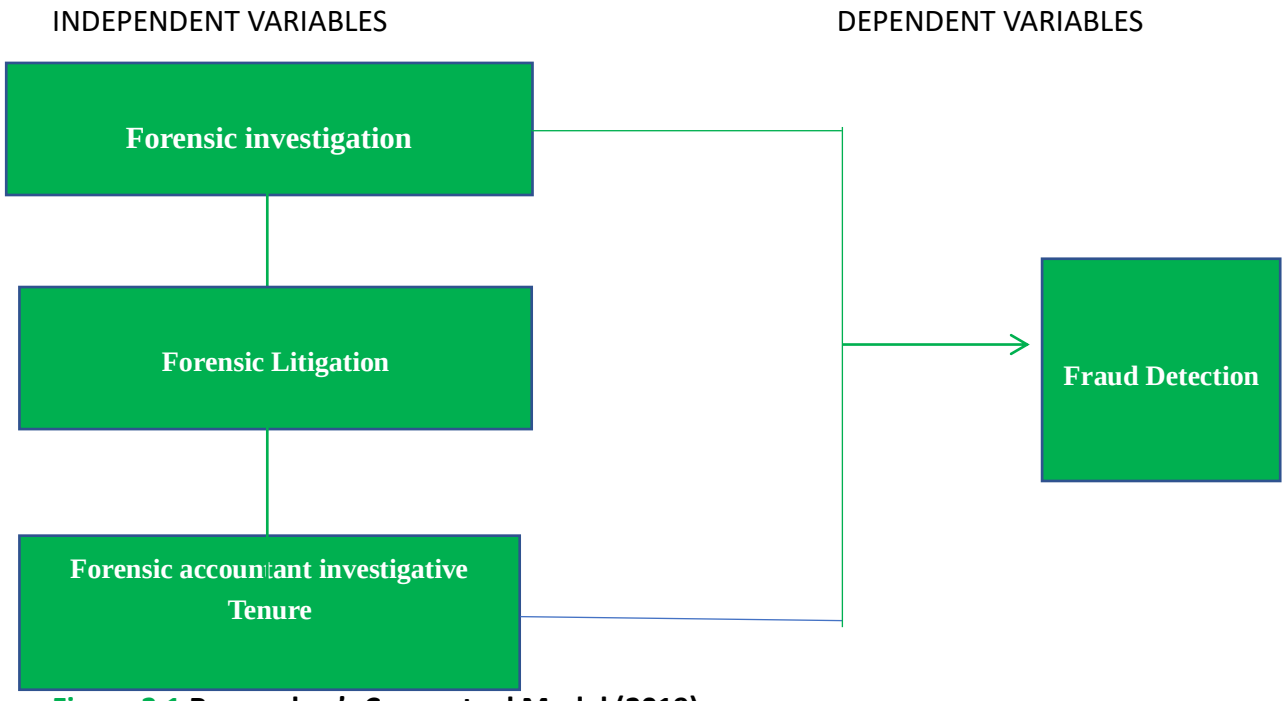

Figure 2.1 Researcher's Conceptual Model (2019)

Empirical Review

Fury and Eka (2013) examined forensic accounting and fraud prevention in Indonesia public sector. The objective of this study was to examine forensic accounting as a tool for fraud detection and prevention in the public sector organization. Both primary and secondary sources of data were appropriately used. Two hundred questionnaires were administered to employees of four ministries in Indonesia. Tables and simple percentages were used to analyze the data. The statistical tool used to test hypotheses was the analysis of variances (ANOVA). The study found out that the use of forensic accounting does significantly reduces the occurrence of fraud cases in the public sector.

Evans (2017) carried out a study on the examination of forensic accounting and the combating of economic and financial crimes in Ghana used primary sources of data.The research design used was a survey consisting of 66 technical officers of the economic and organized crime office of Ghana. The statistical tools used to test the hypotheses were the regression model. Among the findings was that forensic accounting plays a major role in combating economic and financial crime in Ghana.

Oyier (2013) conducted a study on the impact of forensic accounting services on fraud detection and prevention among commercial banks in Kenya. The study employed the use of a descriptive research survey design and used a sample of forty-seven respondents in sixteen commercial banks in Kenya. Structured Questionnaire was used as an instrument of data collection for the study. The study

findings indicated that the application of forensic accounting services by banks led to increased fraud prevention in the commercial banks and the highest application was on enhancing the quality of financial reporting.

In the work of Okoye and Gbegi (2013) titled Forensic Accounting: A Tool for Fraud Detection and Prevention in the Public Sector, (A Study of Selected Ministries in Kogi State). Three hundred and seventy questionnaires were administered to staff of five selected ministries in the Kogi area. The study found out that the use of forensic accounting does significantly reduce the occurrence of fraud cases in the public sector and therefore can help better in detecting and preventing fraud cases in the public sector organization.

According to Enofe, Okpako, and Atube (2013), they examined the effect of forensic accounting on fraud detection in Nigerian firms. The objective of their study was to determine the relationship between fraud detection and forensic accounting. Their data was collected from primary sources with the aid of a well-structured questionnaire administered to fifteen firms in Benin City Edo State. The collected data were analyzed with descriptive statistics using the ordinary least square (OLS) regression and Chi-square. The study revealed that the application of forensic accounting services on firms affects the level of fraudulent activities.

Okafor and Agbiogwu (2016) in their study titled the effect of forensic accounting skills on the management of bank fraud in Nigeria. The study made use of a non-probability sampling technique to select the five commercial banks used as the population for the study. From the analysis, the study findings revealed that possession of basic forensic skills significantly reduces the occurrence of fraud cases in the banking sector. Also, there is a significant difference between the services of forensic accountants and External auditors, and that the presence of forensic accountants in Banks can aid in reducing fraud cases.

Onodi, Okafor, and Onyali (2015) examined the effect of forensic investigation methods incorporate fraud deterrence in Nigerian Banks. This study employed a survey research design and data from the primary source were collected through interviews and administration of questionnaires, while secondary source consists of reports on fraud and forgery in the banking sector. The result revealed that there is a significant relationship between forensic investigative methods and corporate fraud deterrence. The finding revealed that expert services of forensic investigators are normally required in the prosecution of fraud, but the majority of the audit and accounting personnel in Nigeria are suffering from poor perception and knowledge of forensic investigative methods.

Ogundana, Okere, Ogunleye, Oladapo (2018) in their examination of forensic accounting and fraud detection in the Nigerian banking industry, the objective of the study was to examine the role of a forensic accountant in the detection and prevention of fraud in Nigeria banking sector. Data was gotten through primary sources.100 questionnaires were administered to 4 selected banks, 25 each. Simple regression, T-test, one way ANOVA as used to analyze the data. The statistical tool

used to test hypotheses was Analysis of Variance (ANOVA). Among the findings was there is a positive impact of forensic accounting on fraud detection.

Bassey (2018) focused on the effect of forensic accounting on the management of fraud in microfinance institutions. The aim objectives of this study focused on forensic accounting as it affects fraud management in a microfinance institution in the Cross River state. Primary sources and secondary sources of data were used. 55 staff were chosen from the selected microfinance bank in Calabar. ordinary least square technique was used. It was concluded that the role of a forensic accountant under contemporary conditions no doubt is very important because there are professional and regulatory bodies and other institutions in investigating and documenting fraud.

METHODOLOGY

The study made use of the survey design. A descriptive research design was used to examine the impact of forensic accounting on fraud detection in the manufacturing industry in Nigeria. The population of the study consists of all the 1,318 employees of PZ Nigeria Limited as at the 2018 Annual Report. The target population of the study was the employees in the accounting department of P.Z. Nigeria Limited. sample of the respondents was grouped into strata of the employees of P.Z. Nigeria Limited. Within each of the strata, simple random sampling was used to identify individual respondents who were issued with a questionnaire to respond to research statements. The following formula developed by Cochran (1963) was used to guide the selection of the respondents as suggested by Mugenda (2008).

$$n = \frac{Z^2 * p * (1-p)}{e^2}$$

Where: n = Sample size for large population

Z = Normal distribution Z value score, (1.96)

p = Proportion of units in the sample size possessing the variables under study, where for this study it is set at 50% (0.5)

e = Precision level desired or the significance level for the study which is expressed as decimal (e.g., .05 = +/- 0.05 percentage points).

The substituted values in determining the sample size for a large population are as follows.

$$n = \frac{(1.96)^2 * (0.5)(0.5)}{(0.05)^2} = 384$$

Primary data was employed for this study using a questionnaire. a structured questionnaire was administered to respondents in the manufacturing company. The questionnaire was retrieved after the respondents have filled it.

Model Specification

Y=f(X)…….. (1)

Y= Dependent Variable

X= Independent Variable

Where: Y= Fraud Detection (dependent variable)

X=Forensic Accounting (independent variable)

And X= x_1, x_2, x_3

Y=f(X)

X= Forensic Accounting (FA)

x_1= Forensic litigation (FL)

x_2= Forensic investigation (FI)

x_3= Forensic accountant investigative skills (FAIS)

β_0= Constant

β_1, β_2, β_3=Model Coefficient

eit= Error term

Functional Relationship (Multiple Regressions)

$Y= \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + eit$

FD = (FL, FI, FAIS) ……1

$FD=\beta_1 FA + \beta_2 FL + \beta_3 FAIS + eit$ 2

***A-Priori* Expectation**

It was expected that forensic accounting as a tool for fraud detection would have a positive impact on the manufacturing industry.

RESULTS AND DISCUSSIONS

Response Rate

The response rate for the study is important because it reflects the suitability of the study procedure. According to Bailey (2000), a response rate of 50% is adequate, 60% is considered good, and a response greater than 70% is considered very good. The study achieved a response rate of 86% and a non-response rate of 14% from a sample of 449 questionnaires administered to the staff of P.Z. Nigeria Limited in Nigeria out of which 387 were completed and returned. The high response can be attributed to the elaborate data collection procedures. The questionnaire was administered and collected from the respondents on a face to face interaction. Table 1 shows the distribution and response rate of questionnaires from the respondents.

Table 1: Response Rate

Response	Total	Percent
Returned	387	86%
Unreturned	62	14%
Total	**449**	**100%**

Author's Computation (2019)

Reliability Tests

When the assumptions of the linear regression model are correct, ordinary least square (OLS) provides efficient and unbiased estimates of the parameters (Long & Ervin, 2000). To keep up with the assumptions, this study conducted the following diagnostic tests: factor analysis, reliability test, normality test, homoscedasticity test, and multicollinearity test on the variables.

Reliability is an indication of the stability and consistency with which the instrument measures a concept and helps to assess the goodness of a measure. Reliability was measured using Cronbach's Alpha coefficient which was used to measure the internal consistency of the study measures. It is used to indicate how well the items in the set are correlated with each other. According to Sekaran (2006) the closer a Cronbach's Alpha is to 1 the higher the reliability and a value of at least 0.7 is recommended. Velicer and Fava (1998) recommend magnitudes of between 0.40 and 0.70. The study consists of one independent variable and three dependent variables. The independent variables were forensic litigation, forensic investigation, and forensic accountant investigation skills; the dependent variable was fraud detection.

Table 2: Reliability Test

Constructs	Number of Items	Overall Cronbach's Alpha	Comment
FL	5		
0.832	Accepted		
FI	5		
0.812	Accepted		
FAIT	5		
0.792	Accepted		
FD	5		
0.805	Accepted		

Author's Computation (2019)

The findings in table 2 Forensic Litigation (FL) had a coefficient of 0.832, Forensic Investigation (FL) had a coefficient of 0.812, Forensic Accountant Investigative Skills (FAIS) had a coefficient of 0.792 and Fraud Detection (FD) with a coefficient of 0.823. All the constructs had Cronbach's Alpha above the minimum acceptable reliability coefficient of 0.7 and good internal consistency. In conclusion, all the constructs had Cronbach's Alpha above the minimum acceptable reliability coefficient of 0.7 and thus considered all the variables reliable and accepted for investigating purpose.

Diagnostic Tests

Normality Tests

Inferential statistics are meant to infer whether there is an underlying relationship within the respective variables for purposes of sequential analysis. The dependent variable was subjected to normality to check whether the data provided was normally distributed or not. The best to evaluate how far data is normal is to test for one sample Kolmogorov-Smirnov.

One-Sample Kolmogorov-Smirnov Test (KS)

A One-Sample Kolmogorov-Smirnov Test was done to test the normality of the dependent variable fraud detection. The Kolmogorov-Smirnov test (also known as the K-S test or one-sample Kolmogorov-Smirnov test) is a non-parametric procedure that determines whether a sample of data comes from a specific distribution, i.e., normal, uniform, Poisson, or exponential distribution. It is mostly used for evaluating the assumption of univariate normality by taking the observed cumulative distribution of scores and comparing them to the theoretical cumulative distribution for a normally distributed variable. The null and alternative hypotheses were stated as follows:

H0: The data is not normally distributed
H1: The data is normally distributed

The rule is that if the p-value is greater than 0.05, H0 is not rejected and H1 is rejected, if the p -value is less than 0.05, H0 is rejected and H1 is accepted. The results obtained in table 3 indicate that Kolmogorov-Smirnov Z is 2.331 (p-value=0.245). Since the p-value is greater than 0.05, the null hypothesis was not rejected and concluded that the data was normally distributed.

Table 3 One-Sample Kolmogorov-Smirnov Test

		Fraud Detection
N		387
Normal Parametersa,b	Mean	26.2536
	Std. Deviation	4.30099
Most Extreme Differences	Absolute	.115
	Positive	.115
	Negative	-.102
Kolmogorov-Smirnov Z		2.331
Asymp. Sig. (2-tailed)		0.245

a. Test distribution is Normal.

Table 4 Test for Homoscedasticity in the Response and Residuals

Test – Statistic	Degree of Freedom	P-Value
6.6494	3	0.8395

Author's Computation (2019)

Test for Multicollinearity

Multicollinearity is an unacceptable high level of inter-correlation among the independent variables, such that the effects of independent variables cannot be separated (Garson, 2012). In multiple regression, the variance inflation factor (VIF) is used as an indicator of multicollinearity.

Garson (2012) asserts that the rule of thumb is that VIF > 4.0 multicollinearity is a problem and other scholar use more lenient cut off of VIF > 5.0 when multicollinearity is a problem. However, O'Brien (2007) suggests that this rule of thumb should be assessed on a contextual basis taking into account factors that influence the variance of the regression coefficient. He further argued that the VIF value of 10 or even 40 or higher does not necessarily suggest the need for common treatment of multicollinearity such as using ridge regressions, elimination of some variables, or combine into a single variable.

This study adopted a VIF value of 4.0 as the threshold. Forensic Investigation had a VIF of 3.413, Forensic Litigation 3.216, and Forensic Accounting Investigation Skills 2.013. These results indicate that the VIF values of the independent variables were within the threshold of 4.0. This indicated that there was no threat of multicollinearity problems and therefore, the study used a linear regression model. The results of the analysis are shown in table 5.

Table 5: Multicollinearity Test

Variable	Tolerance	VIF
Forensic Investigation	0.307	3.413
Forensic Litigation	0.282	3.216
Forensic Accounting Investigation Skills	0.483	2.013

Author's Computation (2019)

Regression Analysis

Objective 1: Effect of forensic investigation on fraud detection of the manufacturing industry in Nigeria

Regression is the determination of a statistical relationship between two or more variables (Kothari, 2004). In simple regression, there are two variables, one variable

(defined as an independent) is the cause of the behavior of another one (defined as the dependent variable). Table 6 shows the regression relationship analysis result between forensic investigation and fraud detection. The regression analysis shows a relationship between R=0.682 and R2=0.460. This meant that 46.0% of the variation in fraud detection be explained by a unit change in forensic investigation. The remaining percentage of 54.0% is explained by other variables outside the model.

Table 6 Model Summary for Forensic Investigation and Fraud Detection

R	R Square
.682a	.460

a. Predictors: (Constant), Forensic Investigation

Author's Computation (2019)

ANOVA is a procedure for testing the difference among different groups of data for homogeneity (Kothari, 2004). The purpose of ANOVA is to show the total amount of variation in a set of data is broken down into two types, that amount which can be attributed to specified causes. F-test was carried out to test the null hypothesis that there is no relationship between forensic investigation and fraud detection. The ANOVA test in Table 7 shows that the significance of the F-statistic 0.000 is less than 0.05 meaning that the null hypothesis is rejected and concludes that there is a relationship between forensic investigation and fraud detection.

Table 7 ANOVA results for Forensic Investigation and Fraud Detection of Manufacturing Industry in Nigeria

		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	3177.679	1	3177.679	295.460	.000b
	Residual	4388.223	385	10.755		
	Total	7565.902	386			
a. Dependent Variable: Fraud Detection						
b. Predictors: (Constant), Forensic Investigation						

Author's Computation (2019)

To test the significance of the regression relationship between forensic investigation and fraud detection, the regression coefficients (β), the intercept (α), and the significance of all coefficients in the model were subjected to the t-test to test the null hypothesis that the coefficient is zero. The null hypothesis state that, β (beta) = 0, meaning there is no significant relationship between forensic investigation and fraud detection as the slope β (beta) = 0 (no relationship between the two variables). The results on the beta coefficient of the resulting model in table 4.8 show that the constant α = 12.065 is significantly different from 0, since the p-value = 0.000 is less

than 0.05. The coefficient β = 0.605 is also significantly different from 0 with a p-value=0.000 which is less than 0.05.

This implies that the null hypothesis $\beta 1=0$ is rejected and the alternative hypothesis $\beta 1\neq 0$ is taken to hold implying that the model Y=12.065+0.605FI (forensic investigation) is significantly fit. The model Quality of Fraud Detection = $\alpha + \beta$ (Forensic Investigation) holds as suggested by the test above. This confirms that there is a positive linear relationship between forensic investigation and fraud detection.

Table 8 Coefficient for Relationship between Forensic Investigation and Fraud Detection

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	12.065	1.148		10.506	.000
	Forensic Investigation	.605	.048	.648	12.511	.000
a. Dependent Variable: Fraud Detection						

Author's Computation (2019)

Objective 2: Effect of forensic litigation on fraud detection of the manufacturing industry in Nigeria.

Regression analysis was conducted to determine whether forensic accounting was a significant determinant of fraud detection. Regression results in table 9 indicate the goodness of fit for the regression between Forensic Litigation and Fraud Detection. The regression analysis shows a relationship between R=0.678 and R2=0.460. This shows that 46.0% of the variation in fraud detection be explained by a unit change in forensic litigation. The remaining percentage of 54.0% is explained by other variables outside the model.

Table 9 Model Summary for Forensic Litigation and Fraud Detection

R	R Square
.678a	.460

a. Predictors: (Constant), Fraud Litigation

Author's Computation (2019)

F-test was then carried out to test the null hypothesis that there is no relationship between forensic litigation and fraud detection. Analysis of variance (ANOVA) was used to determine whether there is a regression relationship, between forensic litigation and fraud detection. The ANOVA test in Table 10 shows that the significance of the F-statistic 0.000 is less than 0.05 meaning that the null hypothesis is rejected

and concludes that there is a relationship between forensic litigation and fraud detection.

Table 10 ANOVA results for Forensic Litigation and Fraud Detection

		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	3480.315	1	3480.315	347.544	.000b
	Residual	4085.587	385	10.014		
	Total	7565.902	386			
a. Dependent Variable: Fraud Detection						
b. Predictors: (Constant), Forensic Litigation						

Author's Computation (2019)

To test the significance of the regression relationship between forensic litigation and fraud detection, the regression coefficients (β), the intercept (α), and the significance of all coefficients in the model were subjected to the t-test to test the null hypothesis that the coefficient is zero. The null hypothesis state that, β (beta) = 0, meaning there is no significant relationship between forensic litigation and fraud detection as the slope β (beta) = 0 (no relationship between the two variables). The results on the beta coefficient of the resulting model in table 11 show that the constant α = 14.500 is significantly different from 0, since the p-value = 0.000 is less than 0.05. The coefficient β = 0.492 is also significantly different from 0 with a p-value=0.000 which is less than 0.05. This implies that the null hypothesis $\beta 1=0$ is rejected and the alternative hypothesis $\beta 1\neq 0$ is taken to hold implying that the model Y=14.500+0.492FL (Forensic Litigation) + e, is significantly fit. The model Mandatory Disclosure = α + β (Forensic Litigation) holds as suggested by the test above. This confirms that there is a positive linear relationship between forensic litigation and fraud detection.

Table 11 Coefficient for Relationship between Forensic Litigation and Fraud Detection

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	14.500	1.196		12.120	.000
	Forensic Litigation	.492	.049	.678	9.952	.000
a. Dependent Variable: Fraud Detection						

Author's Computation (2019)

Objective 3: Effect of forensic accounting investigation skills on fraud detection of the manufacturing industry in Nigeria.

Regression analysis was conducted to determine whether forensic accounting investigation skills was a significant determinant of fraud detection. Regression results in table 12 indicate the goodness of fit for the regression between Forensic Accounting Investigation Skills and Fraud Detection. The regression analysis shows a relationship between R=0.754 and R2=0.570. This shows that 57.0% of the corresponding change in fraud detection be explained by a unit change in forensic accounting investigation skills as shown in table 12. This is a strong relationship as the remaining percentage of 43.0% is explained by other variables outside the model.

Table 12 Model Summary for Forensic Accounting Investigation Skills and Fraud Detection

R	R Square
.754a	.570

a. Predictors: (Constant), Forensic Accounting Investigation Skills

Author's Computation (2019)

F-test was further carried out to test the null hypothesis that there is no relationship between forensic accounting investigation skills and fraud detection. Analysis of variance (ANOVA) was used to determine whether there is a regression relationship, between forensic accounting investigation skills and fraud detection. The ANOVA test in Table 13 shows that the significance of the F-statistic 0.000 is less than 0.05 meaning that the null hypothesis is rejected and concludes that there is a relationship between forensic accounting investigation skills and fraud detection.

Table 13 ANOVA results for Forensic Accounting Investigation Skills and Fraud Detection

		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	4312.564	1	4312.564	540.896	.000b
	Residual	3253.338	385	7.973		
	Total	7565.902	386			
a. Dependent Variable: Fraud Detection						
b. Predictors: (Constant), Forensic Accounting Investigation Skills						

Author's Computation (2019)

To test the significance of the regression relationship between forensic accounting investigation skills and fraud detection, the regression coefficients (β), the intercept (α), and the significance of all coefficients in the model were subjected to the t-test

to test the null hypothesis that the coefficient is zero. The null hypothesis state that, β (beta) = 0, meaning there is no significant relationship between forensic accounting investigation skills and fraud detection as the slope β (beta) = 0 (no relationship between the two variables). The results on the beta coefficient of the resulting model in table 14 show that the constant α = 24.246 is significantly different from 0, since the p-value = 0.000 is less than 0.05. The coefficient *β* = 0.097 is also significantly different from 0 with a p-value=0.000 which is less than 0.05. This implies that the null hypothesis *β*1=0 is rejected and the alternative hypothesis *β*1≠0 is taken to hold implying that the model Y=24.246+0.097 (forensic accounting investigation skills) + e, is significantly fit. The model Quality of Fraud Detection = α + *β* (forensic accounting investigation skills) holds as suggested by the test above. This confirms that there is a positive linear relationship between forensic accounting investigation skills and fraud detection.

Table 14 Coefficient for Relationship between Forensic Accounting Investigation Skills and Fraud Detection

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	24.246	1.022		23.723	.000
	Environmental Accounting	.097	.048	.754	2.008	.000

a. Dependent Variable: Fraud Detection

Author's Computation (2019)

Overall Regression Analysis

Overall Regression Model for Forensic Investigation, Forensic Litigation, Forensic Accounting Investigation Skills, and Fraud Detection

The overall regression models for the relationship between the independent variables Forensic Investigation, Forensic Litigation, Forensic Accounting Investigation Skills, and the dependent variable fraud detention is shown in table 15. The results indicate that R2 = .964 and R = .982. R-value points out that a strong relationship between Fraud Detention and Forensic Investigation, Forensic Litigation, Forensic Accounting Investigation Skills in Nigeria is 0.964. This means that about 96.4% of the variation in fraud detention is explained by the model of the study while 3.6% of the variation in fraud detection is unexplained by the model. The multiple linear regression models are stated below as the equation shows the linear regression model of the independent variable against the dependent variables.

$$Y = \beta 0 + \beta 1FI + \beta 2FL + \beta 3FAIS$$

Where Y = dependent variable –odds of Fraud Detention
Where;

X1 = forensic investigation (FA)
X2 = forensic litigation (FL)
X3 = forensic accounting investigation skills (FAIS)
β – Parameters to be estimated, while β1, β2, β3 are the coefficient of the independent variable.

Hypothesis for the multiple linear regression models:

H0: $\beta 1 = \beta 2 = \beta 3 = 0$
H1: at least one of $\beta 1$, $\beta 2$, $\beta 3$, is not equal to 0.
From table 4.22, it is concluded that the relationship between the independent variables Forensic Investigation, Forensic Litigation, Forensic Accounting Investigation Skills, and Fraud Detection is so strong.

Table 15 Overall Regression Model on Forensic Investigation, Forensic Litigation, Forensic Accounting Investigation Skills, and Fraud Detection

R	R Square
.982a	.964

a. Predictor: Forensic Accounting

Author's Computation (2019)

The ANOVA test in table 16 shows that the independent variables Forensic Investigation, Forensic Litigation, Forensic Accounting Investigation Skills has a significant effect on Fraud Detention since the p-value 0.000 is less than 0.05 meaning the null hypothesis is rejected and concludes that there is a relationship between all independent variables jointly and fraud detection.

Table 16: ANOVA Results for Independent and Dependent Variables

		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	279709.587	3	69927.397	2716.832	.000
	Residual	10449.863	384	25.739		
	Total	290159.450d	387			

a. Dependent Variable: Fraud Detection

Author's Computation (2019)

A further test on the beta coefficients of the resulting model shows that Forensic Investigation, Forensic Litigation, Forensic Accounting Investigation Skills have a

significant positive effect on Fraud Detection with gradients 0.303, 0.179, and 0.405 respectively with a p-value of 0.000 less than 0.05. The regression model was:

Y = β0 + β10.303 (FI) + β20.179 (FL) + β30.405 (FAIS)

This implies that for every unit increase in the forensic investigation there is an increase in fraud detection by 0.303, for every unit increase in the forensic investigation there is an increase in fraud detection by 0.179, and for every unit increase in forensic accounting investigation tenure there is an increase in fraud detection by 0.405. Therefore, it is concluded that there are significant relationships between all the independent variables and the fraud detection of manufacturing companies in Nigeria.

Table 17: Overall Regression Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	Forensic Investigation	.303	.042	.253	7.288	.000
	Forensic Litigation	.179	.040	.156	4.494	.000
	Forensic Accounting Investigation skills	.405	.050	.321	8.070	.000

a. Dependent Variable: Fraud Detection

Author's Computation (2019)

HYPOTHESES TESTS

The study used multiple regression analysis to determine the linear statistical relationship between the independent and dependent variables. All stated null hypotheses as stated in chapter one of this study were tested using linear regression models.

Hypothesis 1: There is no significant effect of forensic investigation on fraud detection of manufacturing companies in Nigeria

To test the significance of the regression relationship between forensic investigation and fraud detection, the regression equations were first obtained using the standard beta coefficients on the line of best fit. The study also carried out the t-test to each beta coefficients in the fitted regression models. The findings in Table 17 indicated that Forensic Investigation positively and significantly influences fraud detection of

manufacturing companies in Nigeria with β = 0.303 with p-value = 0.000 < 0.05. It implies that for every unit increase in the forensic investigation there is an increase in fraud detection by 0.303 units.

Hypothesis 2: There is no significant effect of forensic litigation on fraud detection closure of manufacturing companies in Nigeria

To test the significance of the regression relationship between forensic litigation and fraud detection, the regression equations were first obtained using the standard beta coefficients on the line of best fit. The study also carried out the t-test to each beta coefficients in the fitted regression models. The findings in Table 17 indicated that Forensic Litigation positively and significantly influence fraud detection of manufacturing company in Nigeria with β = 0.179 with p-value = 0.000 < 0.05. It implies that for every unit increase in forensic litigation there is an increase in fraud detection by 0.179 units.

Hypothesis 3: There is no significant effect of forensic accounting investigation skills on fraud detection of manufacturing companies in Nigeria

To test the significance of the regression relationship between forensic accounting investigation skills and fraud detection, the regression equations were first obtained using the standard beta coefficients on the line of best fit. The study also carried out the t-test to each beta coefficients in the fitted regression models. The findings in Table 17 indicated that forensic accounting investigation skills positively and significantly influence fraud detection of manufacturing Companies in Nigeria with β = 0.405 with p-value = 0.000 < 0.05. It implies that for every unit increase in forensic accounting investigation skills there is an increase in fraud detection by 0.405 units.

DISCUSSION OF FINDINGS

The study revealed that forensic accounting as a tool for fraud detection has a positive effect on the manufacturing sector. The study revealed that there is a significant positive relationship that exists between forensic accounting and fraud detection in the manufacturing industry in Nigeria. The study is in line with Fury and Eka (2013); Evans (2017); Oyier (2013), Okoye and Gbegi (2013).

Fury and Eka (2013) examined forensic accounting and fraud prevention in Indonesia public sector. The purpose of this study was to examine forensic accounting as a tool or fraud detection and prevention in the public sector organization with references to Indonesia. Among the findings was that the use of forensic accounting does significantly reduces the occurrence of fraud cases in the public sector.

Evans (2017) in his study on an examination of forensic accounting and the combating of economic and financial crimes in Ghana used primary sources of data. The study found out that forensic accounting plays a major role in combating economic and financial crime in Ghana.

Oyier (2013) examined the impact of forensic accounting services on fraud detection and prevention among commercial banks in Kenya. The study findings indicated that the application of forensic accounting services by banks led to increased fraud prevention in the commercial banks and the highest application was on enhancing the quality of financial reporting.

Okoye and Gbegi (2013) in his study titled Forensic Accounting: A Tool for Fraud Detection and Prevention in the Public Sector, (A Study of Selected Ministries in Kogi State). Among the findings was that the use of forensic accounting does significantly reduce the occurrence of fraud cases in the public sector and therefore can help better in detecting and preventing fraud cases in the public sector organization.
Bassey (2018) focused on the effect of forensic accounting on the management of fraud in microfinance institutions. The study concluded that the role of a forensic accountant under contemporary conditions no doubt is very important because there are professional and regulatory bodies and other institutions in investigating and documenting fraud.

CONCLUSION AND RECOMMENDATIONS

The study revealed that forensic accounting as a tool for fraud detection has a positive effect on the manufacturing sector. The study revealed that there is a significant positive relationship that exists between forensic investigation and fraud detection. Also, the study revealed that there is a significant positive relationship that exists between forensic litigation and fraud detection. This means that an increase in forensic litigation will increase fraud detection. The study revealed that a positive relationship exists between forensic accountant investigation skills and fraud detection which was also found to be statistically significant as evidenced by an examination of the probability Value. The study explained that an increase in forensic accountant investigation skills will result in higher fraud detection.
The study, therefore, recommended that appropriate penalties should be applied when fraud is detected and proper forensic procedures need to be adhered to during investigation such as professional forensic accountants should conduct the investigation. Proper training and guidance are essential in achieving the effectiveness of the strategy for the detection and prevention of fraud. Manufacturing companies should properly embrace the practice of forensic accounting, the standard-setting process should be modernized to ensure that guidelines can be created or eliminated as changing conditions commands.

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