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# Forensic Accountant and Auditor Knowledge and Skills Requirements for Task Performance Fraud Risk Assessment in the Nigerian Public Sector

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## Abstract

Despite the Nigerian government efforts at reducing the incidence of fraud and corruption through measures, such as establishing and strengthening organs of accountability and promoting the global best corporate practices, fraud and financial crimes in the public sector continue to be on the increase. This paper examines the capability and competence requirements – Knowledge (KR), Skills (SR) and Task performance fraud risk assessment (TPFRA) of a forensic accountant and auditor in the Nigerian public sector. Also, this study determines whether the forensic accountant has higher levels of SR, KR and TPFRA requirements than the auditor in an emergent area of fraud prevention, detection and response. The study employed cross-sectional design and a survey method. Of the 550 questionnaires distributed, 422 questionnaires were returned and out of which 328 questionnaires retained for analysis. The variables are considered a between-subject factor and measured at two levels with a total of 29 observable items (including demography information). The study used PLS-SEM (SmartPLS 2.0 M3) and IBM SPSS ver. 20.0 as the primary statistical analysis tools. The results of the study confirm the significant positive relationship of SR on TPFRA and KR on TPFRA. Also, the findings revealed that the forensic accountant has significant higher levels of KR, SR and TPFRA than auditor in respect of fraud prevention, detection and response. The implication of this study might result in the overall reduction of fraud and fraudulent acts, promote institutional, regulatory and legal framework, and create awareness amongst the accounting and auditing institutions in the Nigerian public sector.

**Keywords:** forensic accounting, auditing, skills, knowledge, fraud risk assessment, public sector, Nigeria

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## 1. INTRODUCTION

In Nigeria, in spite of the government determination to lessen the occurrence of fraud and corrupt practices through interventions such as establishing Fiscal Responsibility Act (2007) and Public Procurement Act (2007), creating Due Process Policy in the Presidency (The Nigeria Treasury Circular of 5 July 2002), and strengthening the Independent Corrupt Practices Commission (2000), the Economic and Financial Crimes Commission (Act No. 5 of 2002) and the Code of Conduct Bureau (Cap C15, LFN 2004), fraud and corruption in the public sector continue to be on the increase. Thus, the resultant outcry by the civil societies and opposition groups.

The prevalent lapse might indicate that accounting and auditing systems management in the public sector have failed, and hence, the motivation to make a difference with this study by investigating the accounting and auditing systems management (i.e. capability and competence requirements in fraud prevention, detection and response) in Nigeria. The accounting and auditing systems management lies with the Office of the Accountant-

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General of the Federation and the Auditor-General for the Federation. The two offices have responsibilities on the forensic accountants, accountants and auditors in the Nigerian public sector.

The tremendous loss attributable to the fraud in the public sector environment has a direct influence on the expansion and provision of infrastructure, facilities and utilities in Nigeria. Promoting public trust is incumbent on the management of every ministry, department and agency to institute adequate measures of control to strengthen its activities in order to attain the best corporate governance practices (COSO, 2013). Literature has shown that no nation is immune from fraud (Popoola, 2014; NFAAFI, 2013; Wuerges, 2011; Chui, 2010). It is necessary for the authority in any organisation to design adequate procedures for the primary purpose of detecting and responding to fraud that may be difficult for any fraud perpetrator(s) to function.

The corporate scandals (SOX Act, 2002) that occurred at the beginning of the century brought about mistrust to the auditing profession. The Public Accounting Oversight Board Standing Advisory Group (PCAOB, SAG) recognized the challenges faced by the auditor about fraud prevention, detection and response. Subsequently, the SAG charged accounting researchers to determine whether forensic accountants can detect fraud in a significant manner than auditors in the organisation (PCAOB, 2008).

Consequent upon the challenge motivated by the increase in public sector fraud, the necessity for reforms and the establishment of various institutional, legal, regulatory and ethical frameworks cannot be disregarded but ripe for strengthening and purposeful direction. Popoola, Ahmad and Samsudin (2014) stated that the American Institute of Certified Public Accountants (AICPA) was the first among the auditing standard-setters to react to the fraud challenges. The AICPA released the Statement on Auditing Standards (SAS) No. 99, Consideration of fraud in a financial statement audit (AICPA, 2002). The Institute of Chartered Accountants of Nigeria (ICAN), follows suit by issuing the Nigerian Standards on Auditing (NSA) No 5, The Auditor's responsibility to consider fraud in an audit of financial statements (Popoola, Ahmad & Shamsiah, 2014; ICAN, 2005). The motive of the two professional body is purely to enhancing the audit quality and restoring public trust.

These two standards seek to address the concerns that create public outcry on the financial statement auditors' failure or inability to prevent, detect, and response to fraud. One of the recommendations in SAS No. 99 deals with the overall responses to the risk of material misstatement due to fraud on the assignment of personnel and supervision. To be specific, section 50 states that "the auditor must assign additional persons with specialised skill and knowledge such as forensic and information technology specialists" in identifying and responding to the risk of material misstatement due to fraud or error in the financial statement audit" (AICPA, 2002).

As a result of the public lamentations on the failure of auditors to address fraud issues, Pinkham (2012) stated that the legislation responded by carrying out significant changes in the rules for corporate governance, auditor independence, financial disclosure, and corporate criminal liability. In Nigeria, other regulatory and inspecting institutions such as the Due Process and Debt Recovery were established. Also, the Fiscal Responsibility Act (2007) and Public Procurement Act (2007) were introduced to reducing fraudulent practices, misappropriation of funds, diversion of government properties and other occupational fraud (Popoola, Ayoib & Samsudin, 2013). Similarly, other organs of accountability and transparency in Nigeria, such as the EFCC, ICPC, Special Control Unit on Money Laundering (SCUML) – an integral part of EFCC, Code of Conduct Bureau (CCB), and Code of Conduct Tribunal (CCT) have extensive powers to implement all applicable laws to arraign, prosecute, and confiscate money and property from any fraud offenders on behalf of the government, and to regulate the conduct of public sector employees, that is, the civil servants. Notwithstanding all these measures, loss due to fraud in the public sector continues to be on the increase.

Furthermore, the National Assembly that serves as the legislative arm of the government instituted a federal investigation on several cases of fraud and widely televised as part of their oversight function of Ministries, departments and agencies (MDAs). The National Assembly investigated the Pension Fund misappropriation, Fuel Subsidy scandals, the Capital Market near collapse, amongst others. Readers are advised to visit the various organs of accountability in Nigeria websites for more fraud and fraud-related cases.

To the best of the authors' knowledge, perhaps this is the first time an empirical study had examined the relationship between KR and SR (forensic accountant and auditor) and TPFRA in relation to fraud prevention, detection and response in the Nigerian public sector.

This study recognises that the failure of the accounting and auditing systems management in the public sector encourages the continued increase in fraud and corruption in Nigeria and must be investigated with a view to restoring public trust in the government (Davis et al., 2010; DiGabriele, 2008; IFAC, 2005b).

## **1.1 Research Questions**

1. Do forensic accountant and auditor KR relate to TPFRA in the Nigerian public sector?
2. Do forensic accountant and auditor SR relate to TPFRA in the Nigerian public sector?
3. Does forensic accountant has higher levels of KR, SR and TPFRA than auditor?

## **1.2 Objectives of the study**

1. To examine the relationship between KR (forensic accountant and auditor) and TPFRA in the Nigerian public sector.
2. To investigate the relationship between SR (forensic accountant and auditor) and TPFRA in the Nigerian public sector.
3. To determine whether forensic accountant has higher levels of KR, SR and TPFRA requirements than the auditor.

## **1.3 Scope of the Study and Unit of Analysis**

The unit of analysis is individuals and consists of the forensic accountant, accountant and auditor in the accounting and auditing institutions in the Federation of Nigeria. These establishments are the Office of the Accountant-General of the Federation and the Auditor-General for the Federation of Nigeria, which form the scope of the study.

## **2. LITERATURE REVIEW**

### **2.1 Public Sector**

The term “Public sector” is synonymous with the provision of essential services, facilities and infrastructure where profit maximisation is not the primary motive. Therefore, the public sector can be described as organisation that is not privately owned but established, run and funded by the government on behalf of the public (IPSASB, 2012; ICAN, 2009; Hassan, 2001).

### **2.2 TPFRA**

Fraud risk assessment involves a vigorous and iterative process for identifying and assessing risks to the achievement of organization objectives (COSO, 2013). It requires management of an organisation to consider the effect of changes in the internal and external environment that have the opportunity to render internal control less effective. The literature identifies risk assessment as one of the five elements of internal controls and consequently considers its implications as to the potential and actual fraud in the organisational settings (COSO, 2013).

TPFRA is the choice for this study since every ministry, department, and agency of government is prone to a variety of risks from all sources. Prior studies have confirmed that TPFRA supports auditors regulate the nature and extent of audit procedures considered to influence the prospect of detecting fraud (Wuerges, 2011; Chui, 2010). Also, the documentation of fraud risk (AICPA, 1997) during the planning stage of the audit and subsequent review throughout the course of the engagement enhances auditors work. However, SAS No. 99 identifies risk factors to include an incentive, opportunity and attitude or rationalisation (AICPA, 2002). The risk factors demonstrate that fraud risk assessment has a direct relationship to the effectiveness of the forensic accountant and auditor’s fraud detection, prevention and response in task performance.

### **2.3 Forensic Accountant KR and Auditor KR**

According to Davis, Farrell and Ogilby (2010), the AICPA Core Wheel identifies seven areas as constituting specialised knowledge of forensic accounting. The areas include fraud prevention, detection and response, computer forensic analysis, family law, valuation, financial statement misrepresentation, economic damages calculations, and bankruptcy, insolvency and reorganisation (AICPA, 2008; Durkin & Ueltzen, 2009). This paper embraces fraud detection, prevention and response to counter the failure of the accounting and auditing systems management in Nigeria. A forensic accountant has the wherewithal to entertain fraud and fraud related assignment based on its education and training in communication, legal, criminology, information technology and investigation (Davis et al., 2010). Similarly, consequent upon the impact of trade globalisation, new and

complicated legislation, advance in the use of and sophistication of technology, forensic accounting services will continue to be in hot demand in future years due primarily to the increased activities of fraudsters (Ekeigwe, 2011; Davis et al., 2010; Wells, 2005).

The literature is replete with the fact that individuals who are resourceful in the use of information technology, legal, investigative, criminology, and accounting will perform better in the areas of accounting records and gathering, evaluating financial statement evidence, interviewing, and serving as an expert witness than individuals in auditing (Hopwood, Leiner, & Young, 2008; Singleton, Singleton, Bologna & Lindquist, 2006). To buttress the assertion, the International Education Standard No 8, Competence Requirements for Professional Accountants identifies the knowledge capability of auditors to comprise “historical financial information audit at a higher level, financial accounting and reporting at a higher standard, and information technology” (IFAC, 2006). The authors of this paper are in agreement with the position of the previous studies since no individual can give what he has not got. The knowledge capability of auditors as presently constituted might not be adequate and sufficient to counter the impact of sophisticated technology being deployed by fraud perpetrators. As a result, it will be an effort in futility to demand more than stipulated in the standards from the auditors in detecting, preventing and responding to fraud that may emanate from the financial statement audit.

Similarly, auditor's knowledge in practice is limited to the particular organisation environment and scope of the audit assignment. Popoola, Che-Ahmad and Samsudin (2015) argue that the statement by the auditing standard-setters that requires auditors to be aware of the probability of fraud in a financial statement audit (Hopwood et al., 2008; AICPA, 2002) is meant to avoid liability occasioned by litigation. The pronouncement is merely scratching the back and mistrust amongst the financial statement stakeholders because fraud is real and brings in no return on investments.

This study aligns with the Association of Certified Fraud Examiners (ACFE) statement that the standard-setters proclamation is not enough to detect fraud (ACFE, 2008; 2004). In addition, Popoola (2014) agrees that fraud prevention, detection and response is not a child's play and it requires a lot more than knowledge of historical financial information audit at a higher level, financial accounting and reporting at a higher standard, and information technology (IFAC, 2006).

#### **2.4 Forensic Accountant SR and Auditor SR**

Specifically, the public sector accountants require specialised skills to look at the evidence from different standpoints to recognize different possible interpretations of that evidence and the implications of those interpretations of the subject at hand. The forensic accounting literature that has arisen since the 1990s reflects on the shifting scope of concerns concerning the characteristics, traits and skills of the forensic accountant (Davis et al., 2010; DiGabriele, 2008).

Skills are attributes that relate to competences in the areas of knowledge and ability (IFAC, 2005b). Forensic accountant skills represent an exceptional skill sets and techniques developed for the purpose of detecting the evidence of fraud (Davis et al., 2010; DiGabriele, 2008). The literature supports that the auditor SR provides reasonable assurance about the audited financial statements taken as a whole are specified fairly, in all material respects, in accordance with Nigerian Standards on Auditing (NSAs) and International Auditing Standards (IASs) and are, therefore, free of material misstatement (ICAN, 2009; Davia, 2000).

In addition, the International Education Standard No. 3 Skills requirement of professional accountants, (that is, auditors), to include intellectual skills, technical and functional skills, interpersonal and communication skills, and organisational and business management skills (IFAC, 2005b). Prior studies had shown that the forensic accountant skills requirements are deductive analysis, critical thinking, investigative flexibility, specific legal knowledge, composure and communication (Popoola, 2014; DiGabriele, 2008)

### **3. RESEARCH FRAMEWORK**

The assessment of fraud risks by applying the forensic accountant SR and KR may have the tendency to motivate higher task performance than the auditor KR and SR in the public sector environment. Figure 1 represents the theoretical framework of KR and SR on TPFRA.

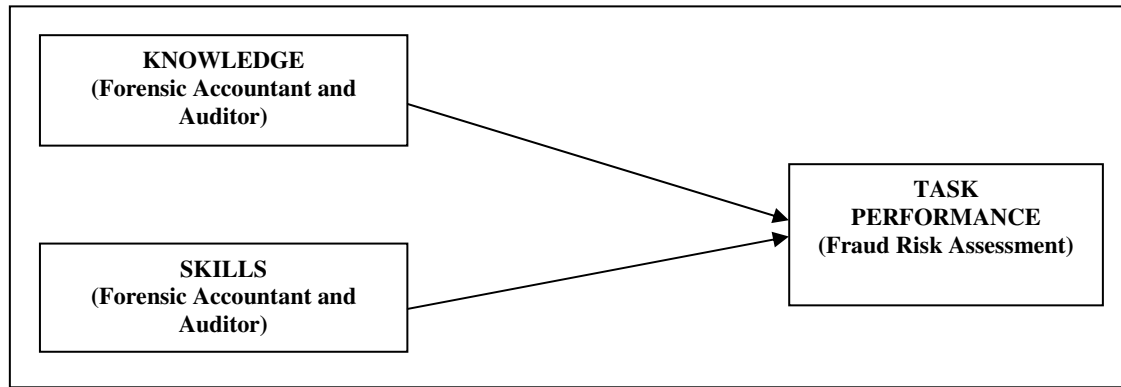


Figure 1. Theoretical Framework of KR and SR on TPFRA

#### 4. HYPOTHESIS DEVELOPMENT BASED ON EXTANT LITERATURE

##### 4.1 Importance of KR (Forensic Accountant and Auditor) on TPFRA

The first theoretical relationship in this study framework shows that the KR (forensic accountant and auditor) has a direct influence on TPFRA. Prior studies had demonstrated that any incremental differences in knowledge (specialized) can yield substantial performance changes as well as stimulating persons' confidence, determination, and commitment to accomplish the decision-making task (DiGabriele, 2008; Ramaswamy, 2007). Popoola (2014) empirically confirms the direct influence of KR on TPFRA in its study entitled "Forensic Accountants, Auditors and Fraud: Capability and Competence Requirements in the Nigerian Public Sector" and Davis et al. (2010) in its study of the Characteristics, Traits and Skills of the Forensic Accountant.

In this study, forensic accountant KR differs from auditor KR in relation to fraud prevention, detection and response because the perpetrators have concealed their activities through a series of complex transactions that may be difficult to trace (Ramaswamy, 2007; Brooks, Riley, & Thomas, 2005). Similarly, SAS No. 99 recommended an increase to the use of forensic accounting procedures to detect financial reporting fraud (AICPA, 2002).

This study argues that forensic accountants and auditors have the tendency to assess all fraud risk factors such as incentive, opportunity, attitude or rationalisation and capability (Wolfe & Hermanson, 2004; AICPA, 2002; Cressey, 1953) at a higher and lower level based on the application of certain controls and procedures. Hence, a forensic accountant and auditor knowledge requirement have the potentials to assess fraud risk. Thus, it is hypothesised that:

**H1:** KR (forensic accountant and auditor) has a positive relationship with TPFRA

##### 4.2 Importance of SR (Forensic Accountant and Auditor) on TPFRA

The second theoretical association in this research framework exemplifies the possibility that the forensic accountant and auditor SR has a direct influence on TPFRA. Prior literature shows that any extra difference in skills can yield considerable performance changes (Popoola, 2014). The effect of SR on TPFRA can impact persons' confidence, determination, and commitment to achieve the real decision-making (DiGabriele, 2008; Davis et al., 2010). Thus, a forensic accountant and auditor SR has a direct relationship with TPFRA in any ministry, department and agency. Thus, it is hypothesised as follows:

**H2:** SR (forensic accountant and auditor) has a positive relationship with TPFRA.

##### 4.3 Differences between Forensic Accountant and Auditor KR

Prior literature results support the argument that forensic accountants have the capability to assess all fraud risk factors at a higher and lower level than auditors (Popoola, 2014; Wuerges, 2011; Chui, 2010; Davis et al., 2010). The statement has the potentials of force because of the forensic accountant specialized knowledge requirements such as information technology knowledge, accounting knowledge, investigative knowledge (theories, methods and patterns of fraud abuse), legal system and court procedures knowledge, and technology knowledge (Davis et

al., 2010; DiGabriele, 2008; Hopwood et al., 2008; Ramaswamy, 2007, 2005). Thus, a forensic accountant and auditor differ in terms of their KR. Thus, it is hypothesised that:

**H3:** Forensic accountant has significant higher levels of KR than the auditor.

#### **4.4 Differences between Forensic Accountant and Auditor SR**

Previous research demonstrated differences between the forensic accountant SR and the auditor SR in relation to fraud and financial crimes identification because the perpetrators have concealed their activities through a series of complex transactions, which may not be easy for the auditor to unravel (DiGabriele, 2008; Brooks, Riley & Thomas, 2005). The forensic accountants play a significant role in government for symptoms of apprehensive financial activity and fraud by persons and businesses, whereas the financial auditors are not expected to look for any symptoms of fraud, rather they are meant to ascertain, record, and evaluate the documents (IFAC, 2005a), be conscious of the possibility of fraud (AICPA, 2002) and thereafter express an opinion (IFAC, 2005a).

This study affirms that forensic accountants acquire specialised skills through education, training and practice. The skills comprises information technology skills, auditing skills, investigative skills, communication skills, legal system and court procedural skills, and technology skills (DiGabriele, 2008; Davis et al., 2010; Hopwood et al., 2008). On the other hand, the skills requirements of auditors are intellectual skills, technical and functional skills, interpersonal and communication skills, and organisational and business management skills (IFAC, 2005b). The auditing standard-setters naturally want auditors to be conscious of the possibility of fraud in a financial statement audit (AICPA, 2002). By extension, this is not a surety or assurance that its responsibility includes fraud detection. Thus, it is hypothesized that:

**H4:** Forensic accountant has significant higher levels of SR requirement than the auditor.

#### **4.5 Differences between Forensic Accountant and Auditor Fraud Risk Assessment**

Accounting practitioners, standard setters, and researchers express concern for auditors' superficial failure in detecting fraud during the audit assignment (Jamal, 2008; Wells, 2005; AICPA, 2002). The Association of Certified Fraud Examiner (ACFE) argues that financial statement auditors are not forensic accountant (fraud examiner) and that external audits are not the most efficient way to detect or discover fraud (ACFE, 2010; ACFE, 2008).

Similarly, the Nigerian Standards on Auditing (NSA) No. 5, The Auditor's responsibility to consider fraud in an audit of financial statements (ICAN, 2005) and Statement on Auditing Standard (SAS) No. 99, Consideration of fraud in a financial statement audit (AICPA, 2002) afford auditors the opportunity of better direction on how to enhance their potentials to improve audit quality in respect of discovering significant financial misstatements, which may be caused by fraud or error.

SAS No. 99 guidelines for the assignment of personnel and supervision about overall responses to the risk of material misstatement recommended:

“An auditor may respond to an identified risk of material misstatements due to fraud by giving additional persons with specialized skills and knowledge, such as forensic and information technology (IT) specialists” (AICPA, 2002, Sec. 316.50, p. 177).

Thus, a forensic accountant and auditor differ in terms of their TPFRA in any ministry, department and agency. Thus, it is hypothesised as follows:

**H5:** Forensic accountant has significant higher levels of TPFRA requirement than an auditor.

## **5. METHODOLOGY**

### **5.1 Data Collection**

The study employed the cross-sectional design and a survey method. A final questionnaire was prepared and distributed after carrying out the content validity of the instruments, which involves consultation with 12 experts who are familiar with the constructs of the study. The questionnaire requests the respondents on their

capabilities and competences about fraud prevention, detection and response. The sample size of 404 is determined through the use of Cohen, Cohen, West and Aiken (2003) criterion from a sampling frame of 10,196 forensic accountants and auditors. In total, 550 questionnaires were distributed to the respondents in the Office of Accountant General of the Federation and the Auditor-General for the Federation. The oversampling (i.e. 146 questionnaires) is to take care of the loss due to damages and cared free respondents (Popoola, 2014; Salkind, 1997), and to ensure that non-response bias and non-response rate will by no means affect the results of the survey (Ringim, Razalli, & Hasnan, 2012). The authors ensure distribution ratio of 50:50 to these two Offices.

In total, 422 questionnaires were returned that represent 77% response rate. Out of 422, 94 questionnaires were declared unusable (incompleteness and ineligibility (63, 11%) and univariate and multivariate outliers (31, 6%), while usable questionnaires (328, 60%) constitute the effective response rate. Linus (2001) considered 50% as the acceptable response rate for any social science studies in Nigeria, which indicates this study met the response rate requirement of 77% and effective response rate of 60%.

## **5.2 Variables Measurement**

All the measurement instruments for the three constructs (KR, SR, and TPFRA) in this study were adapted. The dependent variable of TPFRA is considered a between-subject factor and measured at two levels (high and low conditions). The measurement instruments of TPFRA were adapted from Dzomira (2014), Owens (2012), and ACFE (2009) with 5 points Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) with 4 items. The independent variable of SR is considered a between-subject factor measured at two levels (forensic accountant and auditor). The measurement instruments were adapted from DiGabriele (2008) and Davis et al., (2010) from 1 (strongly disagree) to 5 (strongly agree) with 9 items. Lastly, the independent variable of KR is considered a between-subject factor measured at two distinct levels (forensic accountant and auditor). The measurement scales were adapted from Davis et al., (2010) and Ramaswamy (2007, 2005) from 1 (strongly disagree) to 5 (strongly agree) with 7 items.

## **5.3 Data Analysis**

In this study, the use of Statistical Packages for Social Sciences (IBM SPSS) for Windows v.20.0 (Coakes, 2013; Pallant, 2010) and Partial Least Square Structural Equation Modeling (PLS-SEM) in particular SmartPLS software v. 2.0 3M (Ringle et al., 2005) were encouraged in the data analysis. IBM SPSS for Windows version 20.0 were used for descriptive and statistical inferences with respect to data preparation, editing and coding, data screening and transformation, missing data and outliers (univariate and multivariate), analysis of non-response bias, common method variance and Mann-Whitney U Test (non-parametric test for differences between groups). Also, SmartPLS version 2.0 3M was engaged for the reflective measurement models (algorithm) for internal consistency reliability, convergent validity, discriminant validity. The structural models (bootstrapping) statistical analysis of the relationships (KR, SR and TPFRA) path coefficient, t-value, p-value (statistical significance),  $R^2$  effect size, and  $f^2$  effect size.

PLS-SEM was adopted because it belongs to the multivariate technique type that combines the aspect of factor analysis and regression. In essence, it enables the simultaneous examination of the relationships among measured variables and latent variables as well as between latent variables (Popoola, 2014, Kline, 2005). The Structural Equation Modeling (SEM) has become one of the most widely statistical analysis tools due to its ever increasing importance of understanding latent phenomena such as attitudes, attributes, consumer perceptions or intentions as well as the impact on organisational performance measures (Hair et al., 2014, Hershberger, 2003). The constructs in this study relate to attributes (KR and SR) and organisational performance (TPFRA). Based on justifiable facts, there is no better alternative statistical analysis tool than PLS-SEM (SmartPLS) for its accurate predictive capabilities (Hair et al., 2014).

# **6. RESULTS AND DISCUSSION**

## **6.1 Descriptive Analysis of the Constructs**

Out of the three constructs of study, SR construct reveals the highest mean value of 4.84 while the KR construct indicates the lowest mean value of 4.59 among the independent variables. As shown in Table 1, the dependent variable of TPFRA recorded an average value of 4.41.



Table 1. Descriptive Statistical Analysis of the Constructs

Construct	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Min.</i>	<i>Max.</i>
<i>Knowledge</i>	328	4.59	0.49	3	5
<i>Skills</i>	328	4.84	0.40	3	5
<i>Task Performance Fraud Risk Assessment</i>	328	4.41	0.57	3	5

## 6.2 Assessment of the Uni-dimensionality

This study adopts Anderson and Gerbing (1988) criterion for the assessment of the constructs mean uni-dimensionality. The variable constructs of KR, SR and TPFRA comprise 7, 9 and 4 items respectively. However, after the application of PLS-SEM algorithm statistical analysis tool, 3 (KR5, KR6, KR7), 4 (SR5, SR6, SR7, SR9) and 2 (TPFRA1, TPFRA4) items respectively were retained for further analysis. The evaluation of uni-dimensionality reveals that the meaning of the path model has been preserved by these indicators since no indicator is below 0.40 (Hair, Ringle, & Sarstedt, 2011, Hayduk & Littvay, 2012).

## 6.3 Results for the Reflective Measurement Model

Table 2 represents the summary of the internal consistency reliability, convergent and discriminant validity of the study, which is on the three constructs of KR, SR and TPFRA.

In determining the reflective measurement model, the estimates of the relationship between the latent variables and their indicators are essential, and as illustrated in Table 2. In this study, all outer loadings of the constructs KR, SR and TPFRA are higher than the minimum acceptable level for outer loadings 0.5 (0.7082) except SR7 (0.576) that was retained, which if the item is removed increases the CR and AVE above the threshold value (Hair et al., 2014). The observable item, SR7 (outer loading, 0.576) has the smallest indicator reliability with a value of 0.3312 (0.5762), and the indicator item, KR5 (outer loading, 0.9286) has the highest indicator reliability with a value of 0.8623 (0.92862). Therefore, all the indicators for the three constructs are well above the minimum acceptable level for outer loadings 0.5 (0.7082).

As an evaluation criterion, convergent validity builds on the Average variance extracted (AVE) (Hair et al., 2014). In the study, the AVE values of KR (0.7945), SR (0.6779) and TPFRA (0.7965) are well above the minimum level of 0.50. It shows that the three constructs of KR, SR and TPFRA have a high degree of convergent validity.

Table 2: Summary of Internal Consistency Reliability, Convergent and Discriminant Validity

Latent Variables	Indicators	Cross Loadings	Indicator Reliability	AVE	Cronbach's Alpha ( $\alpha$ )	Composite Reliability (CR)	Discriminant Validity
Knowledge Requirement	KR5	0.9286	0.8623	0.7945	0.8703	0.9205	Yes
	KR6	0.8553	0.7315				
	KR7	0.8886	0.7896				
Skills Requirement	SR5	0.9093	0.8268	0.6779	0.8354	0.8911	Yes
	SR6	0.9092	0.8266				
	SR7	0.576	0.3312				
	SR9	0.8523	0.7264				
Task Performance Fraud Risk Assessment	TPFRAR1	0.9044	0.8179	0.7965	0.7452	0.8867	Yes
	TPFRAR4	0.8804	0.7751				

As a standard, the Composite reliability (CR) and Cronbach's Alpha ( $\alpha$ ) vary between 0 and 1 with higher values indicating higher levels of reliability. In this study, the coefficient reliability (consistency) values of KR (CR 0.92,  $\alpha$  0.87), SR (CR 0.89,  $\alpha$  0.84), and TPFRA (CR 0.89,  $\alpha$  0.75) are within the values considered as satisfactory. Any value that is definitely  $\geq 0.95$  is recognised as unsatisfactory according to the criterion (Hair et al., 2014; Hayduk & Littvay, 2012). Hence, all the three constructs: KR, SR, and TPFRA have higher levels of internal consistency reliability within the acceptable criterion as represented in Table 6.2.

The positive evaluation of the discriminant validity in Table 6.2 shows that the construct is unique and captures phenomena not represented by other constructs in the reflective model (Hair et al., 2014). Figure 2 presents the assessment of the measurement model results that determines the data supported empirically the concept, and the concept has been confirmed empirically.

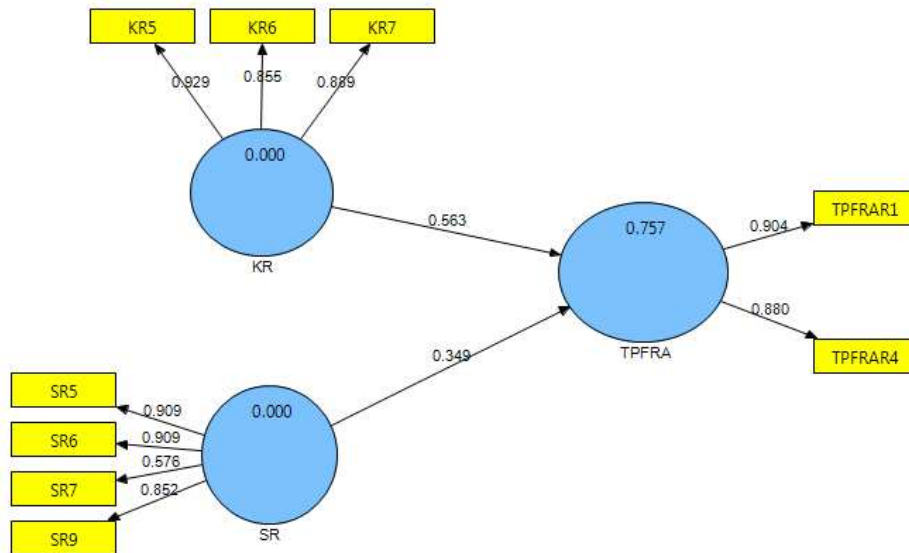


Figure 2: Results of the Algorithm Reflective Measurement Model

## 6.4 Results for the Reflective Structural Model

### 6.4.1 Direct Relationships of the Hypothesised Model

Table 3, Figure 2 and Figure 3 depict the direct relationships between KR and SR on TPFRA, which portends two scenarios:

First, the result in Table 3 shows that KR as an attribute (capability) maintained a significant positive relationship with TPFRA (competency). Thus, TPFRA in the Nigerian public sector requires specialised knowledge of forensic accountant and auditor (beta = 0.563;  $t = 7.445$ ;  $p = .000$ ).

Hypothesis H1 of this study states that KR (forensic accountant and auditor) has a positive relationship with TPFRA. The result provided support for this hypothesis. The current findings significantly agreed with the previous research (Wuerges, 2011; Davis et al., 2010) that found a positive relationship. It is evident from the results that as a forensic accountant and an auditor obtain extra knowledge about fraud detection, prevention and response, the individual level of fraud risk assessment continues to increase. Also, the result in KR development would correspondingly increase the forensic accountant and auditor proficiency competences in fraud forensics. Also, the respondents might have demonstrated TPFRA as a competence requirement in an attempt to assess the KR (forensic accountant and auditor) in the Nigerian public sector.

Table 3. Direct relationship effects of KR and SR on TPFRA

No	Hypothesis	Path Coefficient	Standard Error	T Value	P Value	Decision
1	KR -> TPFRA	0.5628	0.0756	7.445	0.000	Support
2	SR -> TPFRA	0.3489	0.0719	4.8499	0.000	Support

Second, Table 3 reflects the significant positive relationship of SR (forensic accountant and auditor) on TPFRA. It shows SR as an attribute held by individuals has strong relationship with TPFRA (beta = 0.3489;  $t = 4.8499$ ;  $p = 0.000$ ).

Hypothesis H2 of the study states that SR (forensic accountant and auditor) has a positive relationship with TPFRA. The result provides support for this hypothesis as demonstrated in Table 3. The results of this study

significantly agree with prior research (Davis et al., 2010; DiGabriele, 2008), which established a positive relationship. It clearly shows that as a forensic accountant and auditor gain more SR competences in the area of fraud detection, prevention and response, the individual level of TPFRA rises. Similarly, the respondents of this study in Nigeria confirmed and reaffirmed the position of previous studies carried out in developed country (Davies et al., 2010; DiGabriele, 2008).

Figure 3 presents the assessment of the structural model results that determines the data empirically supported the concept, and the concept has also been confirmed empirically.

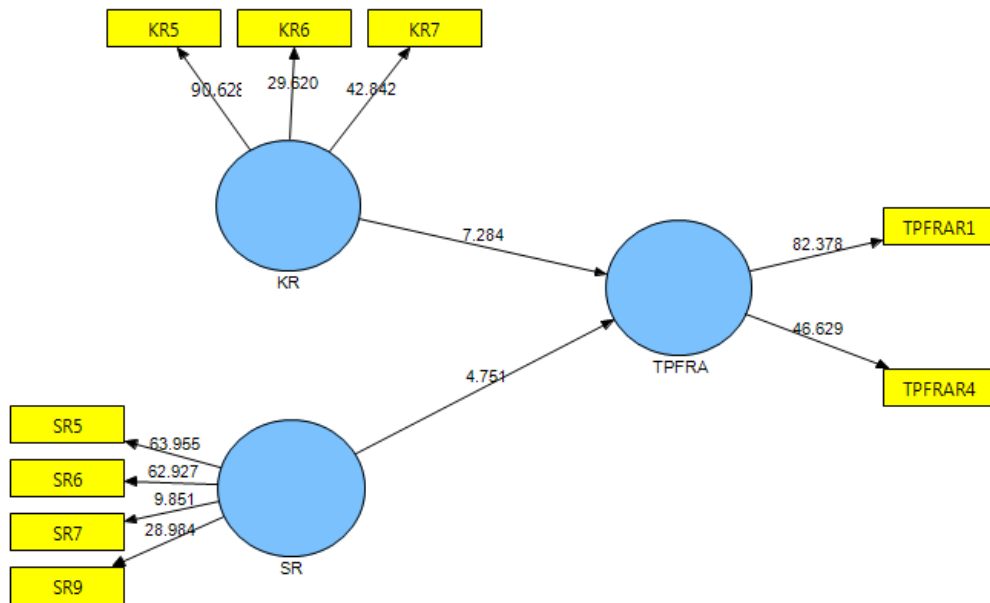


Figure 3: Results of the Bootstrapping Structural Model

#### 6.4.2 Assessing the $R^2$ Effect Size of the Model

$R^2$  typifies the amount of explained variance of the endogenous construct, TPFRA. In Figure 2, the model delivers the substantial  $R^2$  value of 0.757. The minimum acceptable baseline criteria (Chin, 2010; Albers, 2010) for interpreting  $R^2$  values of target construct is 0.25 (weak), 0.50 (medium) and 0.75 (substantial). The substantial baseline recorded of  $R^2$  value of 0.757 has provided rigid support for this study.

#### 6.4.3 Evaluating the $f^2$ Effect Size of the Model

The  $f^2$  effect size is meant to capture the contribution of each exogenous variable (KR and SR) to the  $R^2$  value of the endogenous variable (TPFRA). Table 4 demonstrates the  $f^2$  effect size of the study.

Table 4: Determination of  $f^2$  effect size of the Study  
Task Performance Fraud Risk Assessment (TPFRA)

Endogenous Construct	$R^2_{incl}$	$R^2_{excl}$	$R^2_{incl} - R^2_{excl}$	$1 - R^2_{incl}$	Effect Size
KR	0.757	0.651	0.106	0.243	0.436
SR	0.757	0.714	0.043	0.243	0.177

By adopting the Cohen (1988) criterion, the contribution of KR (0.436) and SR (0.177) to the endogenous variable TPFRA represents large and medium effect sizes respectively. The Cohen (1988) baseline criterion for assessing  $f^2$  is 0.02, 0.15, and 0.35 respectively, which denote small, medium, and large effect sizes. In essence, the two exogenous variables of KR and SR made large and medium contribution to TPFRA and by extension supported the model of the study.

## 6.5 Evaluating Differences between Forensic Accountant and Auditor in terms of KR, SR and TPFRA levels

The authors employ Mann-Whitney U Test to answer the research questions identified in Chapter 1.3.3. Three hypotheses in the context of this study associated with dissimilarity between two independent groups, i.e. forensic accountant and auditor on a continuous measure. We compared the medians and evaluated the ranks for the groups for statistical significance. Also, we describe the direction of the differences. Table 5 demonstrates the Mann-Whitney U Test summary of the difference between a forensic accountant and auditor as hypothesised in 3-5 of Chapter Three.

Table 5: Summary of the Difference between Forensic Accountant and Auditor in KR, SR and TPFRA

Hypot hesis	Latent Variable	Role of Forensic Accounting	Ranks		Test Statistics			Means		
			N	Mean Rank	Sum of Ranks	Mann- Whitney U Test	Z-Score	Asymp. Sig. (2- tailed)	Median	Decision
3	KR mean	1 FA	181	222.62	40294.00	2784.000	-13.645	.000	5.00	Support
		2 Auditor	147	92.94	13662.00				4.00	
		Total	328						5.00	
4	SR mean	1 FA	181	229.59	41555.00	1523.000	-14.751	.000	5.00	Support
		2 Auditor	147	84.36	12401.00				4.57	
		Total	328						4.71	
5	TPFRA mean	1 FA	181	234.34	42415.00	663.000	-15.728	.000	5.00	Support
		2 Auditor	147	78.51	11541.00				3.50	
		Total	328						4.50	

From the Table 5, the probability value is less than or equal to 0.05 (asym. Sig. (2 tailed). So, the result is significant. It indicates there is statistically significant difference in the KR, SR, and TPFRA of a forensic accountant and auditor.

The authors also considered the direction of the difference (which group is higher) by reporting the median values for each group instead of the mean ranks. The median values of KR (5.00), SR (5.00) and TPFRA (5.00) of the forensic accountant are higher than the auditor (KR = 4.00; SR = 4.57; TPFRA = 3.50).

In addition, the result of the Mann-Whitney U Test revealed a significant difference in the KR levels of forensic accountant (Md = 5, n = 181) and auditor (Md = 4, n = 147), U = 2784.000, z = -13.645, p = .000. Hypothesis H3 states that the Forensic accountant has significant higher levels of KR than auditors. The finding provides support for the hypothesis, and this is in agreement with previous research (Davis et al., 2010; Ramaswamy, 2007, 2005) that found a positive relationship. It is clear from the findings that the forensic accountant has significant higher levels of KR than auditor in the area of fraud detection, prevention and response. In this study, respondents might have enhanced the fact that forensic accountant and auditor differs in terms of their levels of KR in the Nigerian public sector.

Similarly, there is a significant difference in the SR levels of forensic accountant (Md = 5, n = 181) and auditor (Md = 4.57, n = 147), U = 1523.000, z = -14.751, p = .000. Hypothesis H4 states that the Forensic accountant has significant higher levels of SR than auditors. The finding stimulates support for the hypothesis, and this is in agreement with previous research (Davis et al., 2010; DiGabriele, 2008) that found a positive relationship. It manifests from the findings that the forensic accountant has significant higher levels of SR than auditor in fraud prevention, detection and response.

Also, the result revealed significant difference in the TPFRA levels of forensic accountant (Md = 5, n = 181) and auditor (Md = 3.50, n = 147), U = 663.000, z = -15.728, p = .000. Hypothesis H5 states that the forensic accountant has significant higher levels of TPFRA than auditors. The finding provokes support for the hypothesis, and this is significantly consistent with previous research (Popoola, 2014; Owens, 2012; Chui, 2010) that found a positive relationship. It is evident from the results that the forensic accountant has significant higher levels of TPFRA than the auditor in the area of fraud prevention, detection and response.

## **7. IMPLICATIONS OF THE STUDY**

### **7.1 Theoretical Implications**

Considering the different constructs enunciated in this study, the current findings have contributed to literature and theory development in major ways, which include increasing TPFRA literature within the organisational context in a developing nation, establishing the positive significant influence of KR and SR on TPFRA, and establishing forensic accountant and auditor differences in terms of their levels of KR, SR and TPFRA.

### **7.2 Methodological Implications**

Previous studies on KR, SR (forensic accountant and auditor) and TPFRA have used statistical analysis tools such as SPSS to produce their findings (Wuerges, 2011, Chui, 2010, Davis et al., 2010). However, this study explored a relatively robust statistical analysis tool, PLS-SEM that consists of PLS-SEM Algorithm and PLS-SEM Bootstrapping tools. PLS-SEM is a multivariate technique that combines features of factor analysis and regression. It thus enables the simultaneous examination of the relationships among measured variables and latent variables as well as between latent variables. Therefore, the use of this robust analytical tool is an important methodological contribution as this is the first time of its deployment to the best of the authors' knowledge.

### **7.3 Practical Implications**

The results emanating from this study contribute to practice in many ways, namely: revealing the value of KR, SR (forensic accountant and auditor) as a significant capability requirement in the workplace; revealing the importance of KR, SR and TPFRA as a significant capability and competence requirements in the working environment.

## **8. CONCLUSION**

This paper examined the relationship between KR, SR (forensic accountant and auditor) and TPFRA beyond the ordinary scope of developed countries. The two capability requirements (KR and SR) were found to associate with TPFRA (competence requirement) in the Nigerian public sector. The study complied with the PCAOB's challenges to the accounting researchers on the capability of auditors to detect fraud. Also, it drew the attention of users of public sector forensic accountants and auditors such as the regulatory and enforcement institutions, courts, ministries, departments and agencies to the fact that understanding the mechanisms of fraud schemes and the ability to prevent, detect and respond to fraud require a holistic approach by adopting the forensic accounting knowledge and skills in task performance fraud risk assessment.

This paper, perhaps for the first time carried out an empirical analysis of the relationship between KR and SR (forensic accountant and auditor) and TPFRA. In addition, the analysis of differences in groups between forensic accountant and auditor in terms of their levels of KR, SR and TPFRA were done using IBM SPSS v20.0 Mann-Whitney U Test (a non-parametric statistical analysis tool) and backed by a robust second generation statistical analysis tool of PLS-SEM, that is, SmartPLS. Undoubtedly, the results confirmed that TPFRA is associated with KR and SR in the Nigerian public sector accounting and auditing institutions.

Similarly, the findings of the study confirmed that the forensic accountant has significant higher levels of KR, SR and TPFRA than the auditor in the Nigerian environment. In conclusion, by testing all the hypothesised relationships to a developing country, Nigeria, this paper assisted to create an all-inclusive global picture of KR, SR (forensic accountant and auditor) on TPFRA. This paper has, thus, provided a verifiable starting point in the examination of KR, SR (forensic accountant and auditor) on TPFRA in non-western countries. Despite adding new information to the literature of TPFRA in the specialised area of fraud prevention, detection and response, the results were predicted to assist the public sector accounting and auditing systems management to deal with fraud and related crimes effectively. This paper asserted that no nation is immune from fraud, and fraud, though, costly can be reduced by engaging the services of forensic accountants in the public sector, notwithstanding the deployment of sophisticated technology.

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