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## **Accountants' Capability Requirements for Fraud Prevention and Detection in Nigeria**

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### **ABSTRACT**

This paper investigated the capability requirements as represented by knowledge requirements (KR) and skills requirements (SR) and competence requirement as represented by fraud risk assessment (FRA) of a forensic accountant and auditor in the Nigerian public sector. In addition, this study explored whether the forensic accountant possesses higher levels of SR, KR and FRA requirements than the auditor in an evolving area of fraud prevention, detection and response. The study embraced positivist paradigm, adopted cross-sectional design and a survey method. Of the 400 questionnaires distributed, 363 questionnaires were returned and out of which 316 questionnaires were retained for further analysis. The variables are operationalized with a total of 29 observable items, which included demography information. The study results confirmed the significant positive relationship between skill and knowledge on FRA. Furthermore, the findings showed that the forensic accountant has significantly higher levels of knowledge, skill and FRA than auditor regarding issues of fraud prevention, detection and response. The implication of this study might result in the overall reduction of corruption and fraud in the public sector, enhancement of institutional, regulatory, ethical and legal framework, and create awareness amongst the accounting and auditing systems management in Nigeria especially and similar developing nations in general. The results add value to the theory, method and practice on fraud prevention, detection, and response by introducing the empirical examination of KR, SR, and FRA in a workplace.

**Keywords:** Capability Requirement, Task Performance, Fraud Prevention and Detection, Government Policy and Regulation

**JEL Classifications:** M40, M41, M42, M48, M49

### **1. INTRODUCTION**

Despite the government of Nigeria efforts to reduce and curb the incidences of corruption and fraud through reforms through the introduction of the Fiscal Responsibility Act (2007) and the Public Procurement Act (2007), establishment of Due Process Policy in the Presidency (The Nigeria Treasury Circular of 05 July 2002), and strengthening the accountability organs such as the Independent Corrupt Practices Commission (2000), the Economic and Financial Crimes Commission (Act No. 5 of 2002) and the Code of Conduct Bureau (CCB) (Cap C15, LFN 2004), fraud and

corruption in the public sector continue to rise. Hence, the resultant outburst by the civil societies, opposition groups, and international organizations because of its effect on the populace, infrastructures, facilities, economic development and other stakeholders.

The prevalent lapse might reveal that accounting and auditing systems management in the public sector is a suspect of failure, and therefore, the motivation to make a difference with this study by investigating the accounting and auditing systems management vide capability and competence requirements on fraud prevention, detection and response in Nigeria. The loss that arises through

corruption and fraud in the public sector results in a direct impact on the growth and delivery 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 shows that no nation is an exception to corruption and fraud (Popoola, 2014; NFAAFI, 2013; Wuerges, 2011; Chui, 2010). It is imperative for the management in any organization to adopt measures to prevent and deter fraud as well as design appropriate procedures to detect and respond to fraud that may be difficult for any fraud perpetrator(s) to function.

As a result of the increase in corruption and fraud in the public sector, the necessity for reforms and the establishment of various frameworks to incorporate the accounting and auditing systems management cannot be ignored but ripe for attention and strong direction. Popoola et al. (2014) state that the American Institute of Certified Public Accountants (AICPA) represents the first among the auditing standard-setters to react to the fraud challenges. The AICPA releases the Statement on Auditing Standards (SAS) No. 99, Consideration of fraud in a financial statement audit (AICPA, 2002) that supersedes SAS 82, The Auditor's responsibilities to detect fraud. This standard is issued in response to contemporary accounting scandals at Enron, WorldCom, Adelphia, and Tyco. Following, the Institute of Chartered Accountants of Nigeria (ICAN) issues the Nigerian Standards on Auditing (NSA) No 5, The Auditor's responsibility to consider fraud in an audit of financial statements (Popoola et al., 2014; ICAN, 2005). The drive of the two professional bodies is to enhance the audit quality and restoring public trust. David (1997), ASB fraud task force chairperson states thus: "I am hopeful that the standard will enhance the likelihood of detection of material misstatement due to fraud, further enabling the CPA profession to serve the public interest and increase the value of our services."

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 specialized 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 AU 316.50, p.1733).

As a result of the public dirges on the possible inability of auditors to address fraud issues, Pinkham (2012) states 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 are established. Also, the Fiscal Responsibility Act (2007) and Public Procurement Act (2007) are introduced to reducing fraudulent practices, misappropriation of funds,

diversion of government properties and other occupational fraud (Popoola et al., 2013). Similarly, other organs of accountability and transparency in Nigeria, such as the EFCC, ICPC, Special Control Unit on Money Laundering - an integral part of EFCC, CCB, and Code of Conduct Tribunal have far-reaching 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, and this could be traced to the failure of auditing and accounting systems management, that is, the Auditors and Forensic Accountants. The question is "who audits the auditor?" derive from the Latin words "Quis custodiet."

Furthermore, the National Assembly that serves as the legislative arm of the government instituted a federal investigation on several cases of fraud as part of their oversight function of ministries, departments and agencies (MDAs). Public investigations are carried out regarding the pension fund misappropriation, fuel subsidy scandals, the capital market near collapse, amongst others. The current study considers the likelihood failure of the accounting and auditing systems management as a stimulus that encourages the continued increase in fraud and corruption in Nigeria especially and developing countries in general. Hence, clamour for its investigation to restore public trust in the government (Davis et al., 2010; DiGabriele, 2008; IFAC, 2005b).

### 1.1. Objectives of the Study

1. To examine the relationship and the direction of such relationship between capability requirement (i.e., KR) of a forensic accountant and auditor and competence requirement (i.e., fraud risk assessment [FRA]) in the Nigerian public sector.
2. To investigate the relationship as well as the direction of the relationship between capability requirement (i.e., SR) of a forensic accountant and auditor and the competence requirement (i.e., FRA) in the Nigerian public sector.
3. To determine whether persons with forensic accounting KR, SR and FRA possess higher levels of fraud prevention, detection and response than individuals with auditing.

### 1.2. Scope of the Study and Unit of Analysis

The office of the accountant-general of the federation and the auditor-general for the federation of Nigeria constitute the scope of the study. Also, the unit of analysis is individuals and consists of the forensic accountant, accountant and auditor in the accounting and auditing systems management in the Federation of Nigeria.

## 2. LITERATURE REVIEW

### 2.1. FRA

FRA 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 FRA 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 rationalization (AICPA, 2002). The risk factors demonstrate that FRA has a direct relationship to the effectiveness of the forensic accountant and auditor's fraud detection, prevention and response in task performance.

## 2.2. Forensic Accountant and Auditor Knowledge Requirement (KR)

According to the AICPA core wheel, seven areas are identified as constituting specialized knowledge of forensic accounting (Davis et al., 2010). These areas consist of "fraud prevention, detection and response, computer forensic analysis, family law, valuation, financial statement misrepresentation, economic damages calculations, and bankruptcy, and insolvency and reorganization" (AICPA, 2008; Durkin and Ueltzen, 2009). This paper embraces fraud detection, prevention and response to bring to limelight the probable 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).

Prior research confirm that individuals who are inventive 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 et al., 2008; Singleton et al., 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 effect of state-of-the-art 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.

This study is in agreement with the Association of Certified Fraud Examiners (ACFE) that the standard-setters pronouncement is not adequate to detect fraud (ACFE, 2008). Furthermore, Popoola (2014) agrees that fraud prevention, detection, and response are not a child's play, and it requires a lot more than the specifics in IES No. 8, Competence requirements of audit professionals (IFAC, 2006).

## 2.3. Forensic Accountant and Auditor Skill Requirement (SR)

The public sector accountants require specialized 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 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 (Popoola, 2014; IFAC, 2005b). Forensic accountant skills represent 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 skills provides reasonable assurance about the audited financial statements taken as a whole be specified fairly, in all material respects, in accordance with NSAs and International Auditing Standards and are, therefore, free of material misstatement (ICAN, 2009; IFAC, 2005a; Davia, 2000). In addition, the International Education Standard No. 3 SR of professional accountants, (that is, auditors), to include intellectual skills, technical and functional skills, interpersonal and communication skills, and organizational and business management skills (IFAC, 2005b).

## 3. CONCEPTUAL RESEARCH FRAMEWORK

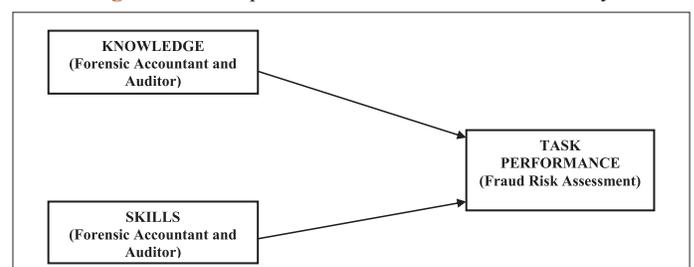
The assessment of fraud risks by applying the forensic accountant SR and KR may have the tendency to motivate higher task performance risk assessment than the auditor KR and SR in the public sector environment. Figure 1 represents the conceptual framework of the study.

## 4. THEORETICAL RESEARCH FRAMEWORK AND HYPOTHESIS DEVELOPMENT

### 4.1. Significance of KR (Forensic Accountant and Auditor) on FRA

In this study, the theoretical relationship demonstrates that the forensic accountant and auditor KR possesses a direct effect on FRA. Literature shows that any incremental changes in knowledge can produce significant performance changes as well as stimulate persons' confidence, determination, and commitment to achieve the decision-making task (DiGabriele, 2008; Ramaswamy, 2007). Popoola (2014) confirms the direct influence of KR on FRA in a study entitled "forensic accountants, auditors, and fraud: Capability

Figure 1: Conceptual research framework of the study



and competence requirements in the Nigerian public sector” and Davis et al. (2010) in a related study of the characteristics, traits and skills of the forensic accountant.

In the current study, forensic accountant KR contrasts with auditor KR about fraud prevention, detection, and response because the perpetrators would have obscured their activities through a series of various transactions that may be problematic to trace (Ramaswamy, 2007; Brooks et al., 2005). Similarly, SAS No. 99 recommends an increase in 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 rationalization and capability (Wolfe and 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 KR have the potentials to assess fraud risk. Thus, it is hypothesized that:

H1: There exists a relationship and also a positive relationship between capability requirement (i.e., KR) of a forensic accountant and auditor on competence requirement (i.e., FRA) in the Nigerian public sector.

#### 4.2. Significance of SR (Forensic Accountants and Auditors) on FRA

The second theoretical association in this research framework exemplifies the possibility that the forensic accountant and auditor SR has a direct influence on FRA. Prior literature shows that any other difference in skills can yield considerable performance changes (Popoola, 2014). The effect of SR on FRA 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 FRA in any ministry, department, and agency. Thus, it is hypothesized as follows:

H2: There exists a relationship and also a positive relationship between capability requirement (i.e., SR) of a forensic accountant and auditor on competence requirement (i.e., FRA) in the Nigerian public sector.

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

Previous research findings support the argument that forensic accountants have the capability to assess 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 KR's 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 regarding their KR. Thus, it is hypothesized that:

H3: Persons with forensic accounting KR possess higher levels of fraud prevention, detection, and response than auditing.

#### 4.4. Differences between SR of Forensic Accountant and Auditor

Previous research demonstrates differences between the forensic accountant SR and the auditor SR requirement about 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 et al., 2005). This study affirms that forensic accountants acquire specialized skills through education, training, and practice. The skills comprise 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 SR of auditors are intellectual skills, technical and functional skills, interpersonal and communication skills, and organizational and business management skills (IFAC, 2005b). The auditing standard-setters naturally require 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: Persons with forensic accounting SR possess higher levels of fraud prevention, detection, and response than auditing.

#### 4.5. Differences between FRA of Forensic Accountant and Auditor

Accounting practitioners, standard setters, and researchers express concern for auditors' apparent failure in detecting fraud during the audit assignment (Jamal, 2008; Wells, 2005; AICPA, 2002). The ACFE argues that financial statement auditors are not a 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 NSA No. 5, The Auditor's responsibility to consider fraud in an audit of financial statements (ICAN, 2005) and 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. Thus, a forensic accountant and auditor differ regarding their FRA in any ministry, department, and agency. Thus, it is hypothesized as follows:

H5: Individuals with auditing FRA requirement possess lower levels of fraud prevention, detection, and response than forensic accounting.

## 5. METHODOLOGY

### 5.1. Data Collection

The study used positivist paradigm, adopted 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 (i.e., forensic accountants and auditors) on their capabilities and competences about fraud prevention, detection and response. In total, 400 questionnaires were distributed to the forensic accountants and auditors in the Office of Accountant

General of the Federation and the Auditor-General for the Federation. The oversampling (i.e., 146 questionnaires) represents the loss due to damages and cared free respondents (Popoola, 2014; Salkind, 2003), and to ensure that non-response bias and the non-response rate will by no means affect the findings of the survey (Ringim et al., 2012). The authors ensure distribution ratio of 50:50 to these two Offices. 400 questionnaires distributed, 363 questionnaires were returned and out of which 316 questionnaires.

In total, 363 questionnaires were returned that represent 91% response rate. Out of 363, 94 questionnaires were declared not suitable (incompleteness and ineligibility (31, 11%) and univariate and multivariate outliers (16, 6%), while usable questionnaires (316, 60%) represent 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. Operationalization of the Constructs/Variables

The instruments to measure the three constructs of KR, SR, and FRA in the current study were adopted from Popoola (2014). The dependent variable of FRA is considered a between-subject factor and measured at two levels (high and low conditions). The measurement instruments of FRA were adopted from Popoola (2015) and Dzomira (2014) on a 5-point 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 the levels of a forensic accountant and auditor. The measurement instruments were adapted from Popoola (2014), 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, partial least square structural equation modeling (PLS-SEM) in particular SmartPLS software (Ringle et al., 2005) and IBM SPSS Statistics for Windows 22.0 (Coakes, 2013) were employed for the data analysis.

## 6. RESULTS AND DISCUSSION

### 6.1. Descriptive Analysis of the Constructs

Out of the three constructs of study, KR construct disclosed the highest mean value of 4.69 (KR1 = 4.82; KR2 = 4.81; KR3 = 4.73; KR4 = 4.77; KR5 = 4.58; KR6 = 4.60; KR7 = 4.55) while the FRA construct indicated the lowest mean value of 4.39 (FRA1 = 4.50; FRA2 = 4.48; FRA3 = 4.44; FRA4 = 4.15). Furthermore, as reported in Table 1, the construct of SR recorded mean value of 4.67 (SR1 = 4.84; SR2 = 4.82; SR3 = 4.31; SR4 = 4.84; SR5 = 4.49; SR6 = 4.52; SR7 = 4.82; SR8 = 4.85; SR9 = 4.50).

### 6.2. Assessment of the Uni-dimensionality

This study adopted the baseline criterion for the evaluation of the constructs mean uni-dimensionality (Anderson and Gerbing,

**Table 1: Descriptive statistical analysis of the KR, SR and FRA constructs**

Indicators	N	Minimum	Maximum	Mean±SD
KR1	316	3	5	4.82±0.448
KR2	316	3	5	4.81±0.411
KR3	316	3	5	4.73±0.497
KR4	316	4	5	4.77±0.422
KR5	316	3	5	4.58±0.532
KR6	316	3	5	4.60±0.540
KR7	316	3	5	4.55±0.575
SR1	316	4	5	4.84±0.368
SR2	316	4	5	4.82±0.382
SR3	316	3	5	4.31±0.730
SR4	316	4	5	4.84±0.366
SR5	316	3	5	4.49±0.577
SR6	316	2	5	4.52±0.572
SR7	316	2	5	4.82±0.593
SR8	316	2	5	4.85±0.529
SR9	316	2	5	4.50±0.635
FRAR1	316	2	5	4.50±0.615
FRAR2	316	3	5	4.48±0.537
FRAR3	316	3	5	4.44±0.580
FRAR4	316	3	5	4.15±0.853
Valid N (list wise)	316			

SD: Standard deviation, FRA: Fraud risk assessment, SR: Skills requirements, KR: Knowledge requirements

1988). The variable constructs of KR, SR and FRA consist of 7, 9 and 4 indicators respectively. However, after the application of PLS-SEM algorithm tool, 3 (KR5, KR6, KR7), 4 (SR3, SR5, SR6, SR9) and 3 (FRAR1, FRAR2, FRAR4) items respectively were reserved for analysis. The evaluation of uni-dimensionality revealed that the meaning of the path model are preserved by these indicators since no indicator is below 0.40 (Hair et al., 2011, Hayduk and Littvay, 2012).

### 6.3. Results for the Reflective Measurement Model of the Study

Table 2 illustrated the summary of the internal consistency reliability, convergent and discriminant validity of the study. 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 FRA are higher than the minimum acceptable level for outer loadings 0.5 (0.708) (Hair et al., 2014). The observable item, SR9 (outer loading, 0.83) has the smallest indicator reliability with a value of 0.69 (0.83), and the indicator item, KR5 (outer loading, 0.93) has the highest indicator reliability with a value of 0.86 (0.93). Therefore, all the indicators for the three constructs are well above the minimum acceptable level for outer loadings 0.5 (0.708).

As an evaluation criterion, convergent validity builds on the average variance extracted (AVE) (Hair et al., 2014). The AVE (convergent validity) values of FRA (0.771), KR (0.790) and SR (0.782) are well above the minimum required level of 0.50, thus demonstrating convergent validity for all three constructs.

As a standard, the composite reliability (CR) and Cronbach's alpha ( $\alpha$ ) vary between 0 and 1 with higher values representing higher levels of reliability. In this study, the coefficient reliability (consistency)

values of FRA (CR: 0.91,  $\alpha$ : 0.85), KR (CR: 0.92,  $\alpha$ : 0.87), and SR (CR: 0.93,  $\alpha$ : 0.91) are within the values considered as satisfactory. Any value that is  $\geq 0.95$  is recognized as unsatisfactory according to the criterion (Hair et al., 2014; Hayduk and Littvay, 2012). Thus, all three reflective constructs have high levels of internal consistency reliability, as demonstrated by the Table 2 CR values.

The positive evaluation of the discriminant validity in Tables 2 and 3 showed 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 model measurement results that determines the data supported the concept empirically, and the concept has been confirmed empirically.

**6.4. Results for the Reflective Structural Model of the Study**

*6.4.1. Direct relationships of the hypothesized model*

Table 3, Figures 2 and 3 illustrated the direct relationships between capability (i.e., KR and SR) and competence requirements (i.e., FRA). Firstly, the findings in Table 3 indicates that KR as an attribute maintained a significant positive relationship with

FRA. Thus, FRA in the Nigerian public sector requires specialized knowledge of forensic accountant and auditor ( $n = 316$ ;  $\beta = 0.467$ ;  $t = 6.430$ ;  $P = 0.000$ ).

Hypothesis H1 of this study stated that there exists a relationship and also a positive relationship between capability requirement (i.e., KR) of a forensic accountant and auditor on competence requirement (i.e., FRA) in the Nigerian public sector. The result provided support for this hypothesis. The current findings agreed with the previous research (Popoola, 2014; 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 additional knowledge about fraud detection, prevention and response, the individual level of FRA continues to increase. Also, the result of KR development would correspondingly increase the forensic accountant and auditor proficiency competences in fraud forensics.

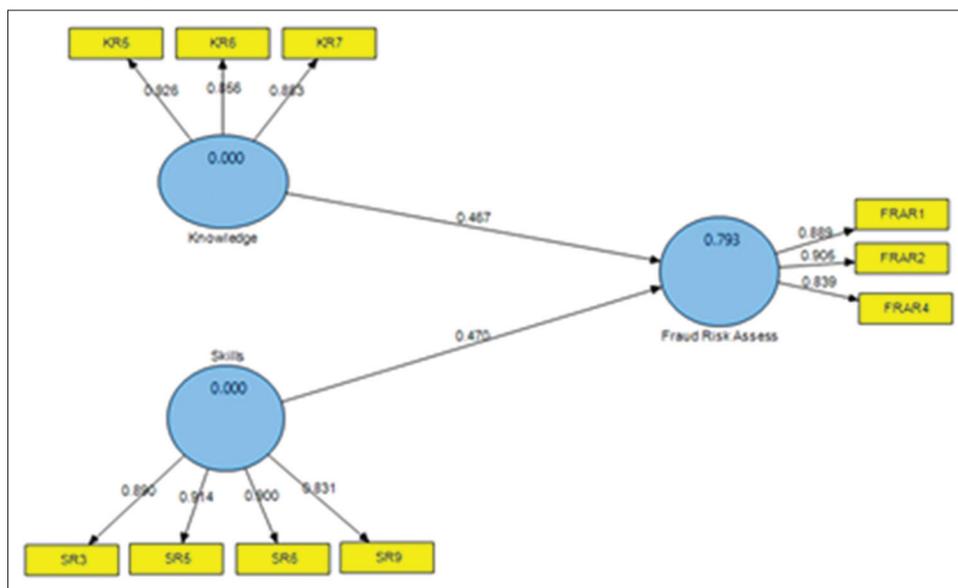
Second, Table 4 reflected the significant positive relationship between SR requirement (forensic accountant and auditor) on FRA. It illustrated that SR as an attribute held by individuals has significant relationship with FRA ( $n = 316$ ;  $\beta = 0.470$ ;  $t = 6.856$ ;  $P = 0.000$ ).

**Table 2: Summary of internal consistency reliability, convergent, and discriminant validity**

Latent variables	Indicators	Outer loadings	Indicator reliability	AVE	Cronbach's alpha	Composite reliability	Discriminant validity
FRA	FRAR1	0.89	0.79	0.77	0.85	0.91	Yes
	FRAR2	0.90	0.82				
	FRAR4	0.84	0.70				
KR	KR5	0.93	0.86	0.79	0.87	0.92	Yes
	KR6	0.86	0.73				
	KR7	0.88	0.78				
SR	SR3	0.89	0.79	0.78	0.91	0.93	Yes
	SR5	0.91	0.84				
	SR6	0.90	0.81				
	SR9	0.83	0.69				

AVE: Average variance extracted, FRA: Fraud risk assessment, SR: Skills requirements, KR: Knowledge requirements

**Figure 2: Results of the algorithm reflective measurement model of the study**



Hypothesis H2 of the study stated that there exists a relationship and also a positive correlation between capability requirement (i.e., SR) of a forensic accountant and auditor on competence requirement (i.e., FRA) in the Nigerian public sector. The result

**Table 3: Correlations and discriminant validity-fornell-lacker and cross loading criteria correlations and discriminant validity-fornell-lacker criteria**

Latent variables	Interconstruct correlations			
	FRA	KR	SR	
FRA	1	0	0	
KR	0.8466	1	0	
SR	0.8471	0.8078	1	
Latent variables	Squared interconstruct correlations			
	FRA	KR	SR	
FRA	0.7712	0	0	
KR	0.7167	0.7901	0	
SR	0.7176	0.6525	0.7817	
Latent variables	Discriminant validity-cross loading criteria			
	Indicators	FRA	KR	SR
FRA	FRAR1	0.898	0.770	0.832
	FRAR2	0.909	0.736	0.746
	FRAR4	0.825	0.723	0.596
KR	KR5	0.808	0.926	0.672
	KR6	0.712	0.856	0.747
	KR7	0.732	0.883	0.686
SR	SR3	0.814	0.686	0.890
	SR5	0.687	0.687	0.914
	SR6	0.719	0.718	0.900
	SR9	0.759	0.762	0.831

FRA: Fraud risk assessment, SR: Skills requirements, KR: Knowledge requirements

**Table 4: Direct relationship effects of KR and SR requirement on FRA**

Hypothesis	Path coefficient	SE	t	P	Decision
KR → FRA	0.467	0.073	6.430	0.000	Support
SR → FRA	0.470	0.069	6.856	0.000	Support

FRA: Fraud risk assessment, SR: Skills requirements, KR: Knowledge requirements

provided support for this hypothesis as demonstrated in Table 3. The results of this study significantly agreed with prior research (Davis et al., 2010; DiGabriele, 2008), which established a positive relationship. It clearly showed that as a forensic accountant and auditor gain more SR (competence requirement) in the area of fraud detection, prevention and response, the individual level of FRA rises. Similarly, the respondents of this study in Nigeria established and reaffirmed the position of previous studies carried out in developed country (Davies et al., 2010; DiGabriele, 2008).

Figure 3 presented the assessment of the structural model results that determined the data empirically support the concept, and the concept empirically confirmed.

**6.5. Evaluating the R<sup>2</sup> Effect Size of the Model**

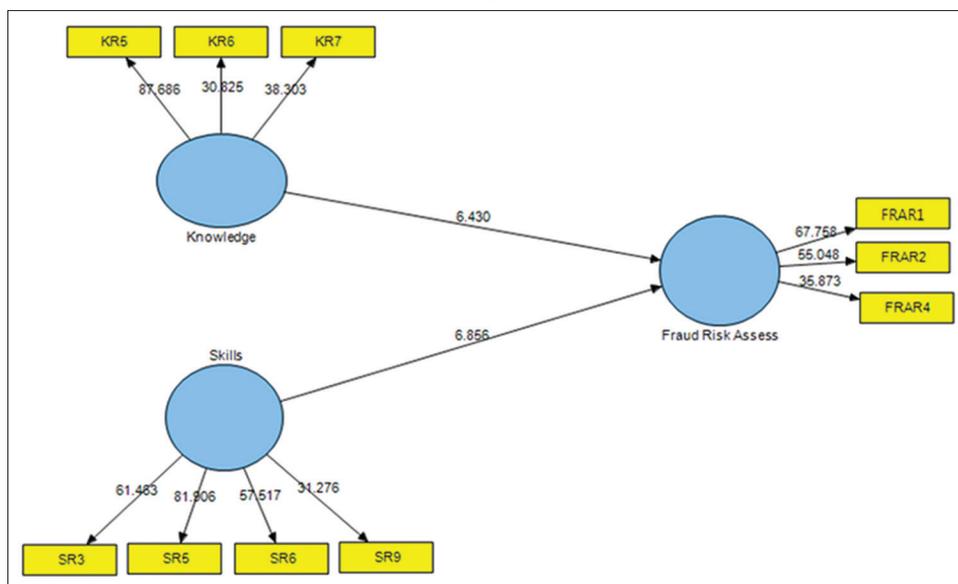
R<sup>2</sup> typifies the amount of explained variance of the endogenous construct, FRA. The model in Figure 2 provides the substantial R<sup>2</sup> = 0.793. According to Chin (2010) and Albers (2010), the minimum acceptable baseline criteria for interpreting R<sup>2</sup> values of target construct is 0.25 (weak), 0.50 (medium) and 0.75 (substantial). The research recorded the R<sup>2</sup> = 0.793 of substantial baseline, and thus, has provided rigid support for this study.

**6.6. Evaluating Differences between Auditor and Forensic Accountant Regarding Levels of KR, SR and FRA Requirements**

The researchers used Mann-Whitney U-test to answer the research questions identified in the study. Three hypotheses in the context of this study associated with the differences between two independent groups, that is, a forensic accountant and auditor on a continuous measure. We matched the medians and evaluated the ranks for the groups for statistical significance. Also, we describe the direction of the differences. Table 5 illustrated the Mann-Whitney U-Test summary of the difference between an auditor and forensic accountant as hypothesised in Section 3 of the study.

From the Table 5, the Z-value for KR is -13.24 (rounded) with a significance level (P) = 0.000. Furthermore, SR and

**Figure 3: Results of the bootstrapping structural model of the study**



**Table 5: Summary of the differences between auditor and forensic accountant regarding levels of KR, SR and FRA requirements**

Hypothesis	Latent variable	Role to forensic accounting	N	Ranks		Test statistics			Means Median	Decision
				Mean rank	Sum of ranks	Mann-Whitney-test	Z-score	Asymp. significant (two-tailed)		
3	KRimean	FA	169	216.17	36,532	2676.000	-13.235	0.000	5.00	Support
		Auditor	147	92.2	13,554				4.00	
		Total	316						5.00	
4	SRimean	FA	169	227.46	38,441	767.000	-15.258	0.000	5.00	Support
		Auditor	147	79.22	11,645				4.00	
		Total	316						4.75	
5	FRARimean	FA	169	227.99	38,530.5	677.500	-15.072	0.000	5.00	Support
		Auditor	147	78.61	11,555.5				3.67	
		Total	316						4.50	

FRA: Fraud risk assessment, SR: Skills requirements, KR: Knowledge requirements

FRA requirements Z-values are  $-15.26$  and  $-15.07$  (rounded) respectively with significance level ( $P$ ) = 0.000. The probability value  $P \leq 0.05$  (asympt. significant two-tailed). Thus, the result is significant. In essence, there is statistically significant difference in the KR, SR and FRA scores of forensic accountants and auditors.

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 FRA (5.00) of the forensic accountants are higher than the auditors (KR = 4.00; SR = 4.00; FRA = 3.67).

In addition, the result of the Mann-Whitney U-test revealed a significant difference in the KR levels of forensic accountants ( $Md = 5$ ,  $n = 169$ ) and auditors ( $Md = 4$ ,  $n = 147$ ),  $U = 2676.000$ ,  $Z = -13.235$ ,  $P = 0.000$ . Hypothesis H3 stated that the Forensic accountant has significantly higher levels of KR than auditors. The results gave greater support for the hypothesis, and this was in agreement with previous research (Popoola, 2014; Davis et al., 2010; Ramaswamy, 2007) that established a positive correlation. It is evident from the findings that the forensic accountant has significantly higher levels of KR than auditor in detecting, preventing and responding to fraud. In this study, respondents might have boosted the fact that forensic accountant and auditor differs regarding their levels of KR in the Nigerian public sector.

Similarly, there is a significant difference in the SR levels of forensic accountant ( $Md = 5$ ,  $n = 169$ ) and auditor ( $Md = 4.00$ ,  $n = 147$ ),  $U = 767.000$ ,  $Z = -15.26$ ,  $P = 0.000$ . Hypothesis H4 states that the Forensic accountant has significantly higher levels of SR than auditors. The finding inspired support for the hypothesis, and this is in agreement with previous research (Popoola, 2014; Davis et al., 2010; DiGabriele, 2008) that established a positive correlation. It revealed from the results that the forensic accountant has significantly higher levels of SR than auditor in preventing, detecting, and responding to fraud.

Also, the findings revealed significant difference in the FRA levels of forensic accountant ( $Md = 5$ ,  $n = 169$ ) and auditor ( $Md = 3.67$ ,  $n = 147$ ),  $U = 677.500$ ,  $Z = -15.07$ ,  $P = 0.000$ . Hypothesis H5 stated that the forensic accountant has significantly higher levels of FRA than auditors. The finding supports the hypothesis, and this is consistent with previous research (Popoola, 2014; Owens,

2012; Chui, 2010) that found a positive relationship. It is evident from the findings that the forensic accountants have significantly higher levels of FRA than the auditors in preventing, detecting, and responding to fraud.

## 7. IMPLICATIONS OF THE STUDY

Given the different constructs articulated in this study, the current findings have contributed to literature and theory development in major ways, which include increasing FRA literature within the organisational context in a developing country, establishing the positive significant influence of KR and SR on FRA, and establishing forensic accountant and auditor differences regarding their levels of KR, SR, and FRA requirements.

Previous studies on KR, SR, and FRA used non-parametric statistical analysis tools to produce their findings (Chui, 2010, Davis et al., 2010). However, this study explored a robust statistical analysis tool, PLS-SEM. PLS-SEM is a multivariate technique that combines features of factor analysis and regression (Hair et al., 2014). It, thus, enabled 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 to this study as this is the first time of its deployment to the best of the authors' knowledge.

## 8. CONCLUSION

This study investigated the relationship between KR, SR, and FRA beyond the ordinary scope of developed countries. The two capability requirements (KR and SR) were found to correlate with competence requirement (FRA) in the Nigerian public sector. The study portrayed to the stakeholders of public sector accounting and auditing systems management, namely: The regulatory authorities, enforcement establishments, courts, MDA to the fact that understanding the mechanisms of fraud schemes and the ability to prevent, detect and respond to fraud require a holistic approach that entails the adoption of the forensic accounting knowledge and skills in task performance judgement or decision-making.

This paper, perhaps for the first time conducted an empirical analysis of the relationship between KR and SR on FRA.

In addition, the analysis of differences between the forensic accountant and the auditor regarding their levels of KR, SR, and FRA were done using IBM SPSS Mann-Whitney U Test (a non-parametric statistical analysis tool) and supported by a strong second generation statistical analysis tool, SmartPLS. Specifically, the results established that FRA is correlated with KR and SR in the accounting and auditing systems management as well as accounting and auditing institutions.

Similarly, the findings of the study recognized that the forensic accountant has significantly higher levels of KR, SR and FRA requirements than the auditor in developing country, Nigeria. In conclusion, this paper assisted to create a comprehensive global picture of KR, SR (forensic accountant and auditor) on FRA. This article, therefore, provided a valid point in the examination of KR and SR on FRA in developing countries.

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