FORENSIC ACCOUNTANTS, AUDITORS AND FRAUD: CAPABILITY AND COMPETENCE REQUIREMENTS IN THE NIGERIAN PUBLIC SECTOR

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ABSTRACT

The foundation of this study is to examine the task performance fraud risk assessment (TPFRA) among forensic accountants and auditors in the Nigerian public sector. Most importantly, the study explored the role of fraud related problem representation (FRPR) as a mediator on the relationship between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment. Importantly, this research employed the second generation statistical analysis tools of PLS-SEM and IBM SPSS. The ten out of fifteen hypotheses were tested through the use of PLS-SEM algorithm and bootstrap techniques on the hypothesized relationships while the remaining five hypotheses of differences among groups were tested using the Mann-Whitney U Test. The results provided verifiable support for the hypothesized relationships of the study. Specifically, knowledge, skills and mindset (forensic accountant and auditor), and fraud related problem representation are significant and positively related to task performance fraud risk assessment.

In addition, knowledge, skills and mindset (forensic accountant and auditor) are significantly and positively related to fraud related problem representation. Most gratifying is the significant positive influences of knowledge, skills and mindset and fraud related problem representation indicate that the variables are essential requirements in enhancing task performance fraud risk assessment. The research findings provided support for the differences between groups (forensic accountants and auditors) hypotheses in the area of fraud detection, prevention and response. Importantly, forensic accountants have higher levels of knowledge (KR), skills (SR), mindset (MR), fraud related problem representation (FRPR), and task performance fraud risk assessment (TPFRA) than auditors. Therefore, accountants and auditors in the Nigerian public sector should be encouraged to acquire forensic accounting knowledge, skills, mindset, fraud related problem representation (i.e. capability requirement) to enhance task performance fraud risk assessment (i.e. competences requirement) in the workplace.

Keywords: forensic accountants, auditors, fraud, capability, competence

ABSTRAK

Asas kajian ini adalah untuk mengkaji penilaian risiko penipuan prestasi tugas (TPFRA) di kalangan akauntan forensik dan juruaudit dalam sektor awam Nigeria. Paling penting, kajian ini menerokai peranan perwakilan masalah berkaitan penipuan (FRPR) sebagai pengantara kepada hubungan antara pengetahuan, kemahiran dan pemikiran (akauntan forensik dan juruaudit) dan penilaian risiko penipuan prestasi tugas. Yang penting, kajian ini menggunakan generasi kedua alat analisis statistik PLS-SEM dan IBM SPSS. Sepuluh daripada lima belas hipotesis telah diuji melalui penggunaan algoritma PLS-SEM dan teknik Bootstrap pada hubungan hipotesis tersebut manakala baki lima hipotesis berkaitan perbezaan di kalangan kumpulan telah diuji menggunakan Mann-Whitney U Test. Keputusan tersebut menyokong hubungan hipotesis kajian. Secara khusus, pengetahuan, kemahiran dan pemikiran (akauntan forensik dan juruaudit), dan perwakilan masalah berkaitan penipuan adalah penting dan dapat dikaitkan secara positif dengan penilaian risiko penipuan prestasi tugas.

Di samping itu, pengetahuan, kemahiran dan pemikiran (akauntan forensik dan juruaudit), adalah penting dan dapat dikaitkan secara positif dengan perwakilan masalah berkaitan penipuan. Paling menggembirakan adalah pengaruh positif pengetahuan, kemahiran dan cara berfikir dan perwakilan masalah berkaitan penipuan yang berkaitan menunjukkan bahawa pembolehubah adalah penting dalam meningkatkan penilaian risiko penipuan prestasi tugas. Dapatan kajian memberikan sokongan bagi perbezaan antara hipotesis kumpulan-kumpulan (akauntan forensik dan juruaudit) dalam bidang pengesanan penipuan, pencegahan dan tindak balas penipuan. Yang penting, akauntan forensik mempunyai tahap pengetahuan (KR), kemahiran (SR), pemikiran (MR), perwakilan masalah berkaitan penipuan (FRPR), dan penilaian risiko penipuan prestasi tugas (TPFRA) yang lebih tinggi daripada juruaudit. Oleh itu, akauntan dan juruaudit dalam sektor awam Nigeria harus digalakkan untuk memperoleh pengetahuan forensik perakaunan, kemahiran, cara berfikir, masalah perwakilan berkaitan penipuan (iaitu keupayaan keperluan) untuk meningkatkan penilaian risiko penipuan prestasi tugas (iaitu kompetensi keperluan) di tempat kerja.

Kata kunci: akauntan forensik, juruaudit, penipuan, keupayaan, kompetensi

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DEDICATION

In loving memories

Chief (Alhaji) Mustapha Akanbi Popoola

And

With love and respect

Alhaja Suwebat Wuraola Popoola

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LIST OF ABBREVIATIONS

ACFE	Association of Certified Fraud Examiners
AGF	Accountant General of the Federation
AICPA	American Institute of Certified Public Accountants
AO	Audit Ordinance, 1956
AudGF	Auditor General for the Federation
BBC	British Broadcasting Corporation (News)
CB-SEM	Covariance Based Structural Equation Modeling
CFRN	Constitution of the Federal Republic of Nigeria, 1999 as amended
CMV	Common Method Variance
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CPAOR	Corrupt Practices and Other Related Offences Act, 2000
EFCC	Economic and Financial Crimes Commission Act, 2002
FA	Finance (Control and Management) Act, 1958 Cap 144 LFN 1990
FIRS	Federal Inland Revenue Act, 2007 as amended
FR	Financial Regulations
FRA	Fiscal Responsibility Act, 2007
FRC	The Financial Reporting Council Act, 2011
FRPR	Fraud Related Problem Representation
FTT	Fraud Triangle Theory
GoF	Goodness of Fit
IBM SPSS	Integrated Business Machines Statistical Package for Social Sciences
ICAN	The Institute of Chartered Accountants of Nigeria Act, 1965
ICPC	Independent Corrupt Practices (Establishment) Act, 2000
IES	International Education Standards

IFAC	International Federation of Accountants
IPSASB	International Public Sector Accounting Standards Board
KR	Knowledge (forensic accountant and auditor)
MR	Mindset (forensic accountant and auditor)
NFAAFI	The National Fraud Authority Annual Fraud Index
NPSAS	Nigeria Public Sector Auditing Standards
OAGF	Office of the Accountant General of the Federation
OAudGF	Office of the Auditor General for the Federation
OYAGSB	Othman Yeop Abdullah Graduate School of Business
PAC	Public Accounts Committee
PCAOB	Public Company Accounting Oversight Board
PLS	Partial Least Squares
PLS-SEM	Partial Least Square Structural Equation Modeling
POB	Public Oversight Board
PPA	Public Procurement Act, 2007
SEM	Structural Equation Modeling
SR	Skills (forensic accountant and auditor)
TFAT	Triangle of Fraud Action Theory
TI	Transparency International
TPB	The Theory of Planned Behaviour
TPFRA	Task Performance Fraud Risk Assessment
TRA	The Theory of Reasoned Action
UUM	Universiti Utara Malaysia
VAF	Variance Accounted For
WB	World Bank

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The accounting and auditing services are yet to address effectively, and enhance significantly, accountability and transparency challenges in the public governance of Nigeria. Because corrupt and fraudulent practices increases at an alarming rate while public utilities, infrastructure and facilities are fast deteriorating (Civil Liberty Organisation (CLO), 2012; This Day Newspaper, November 23 and 25, 2012; The Punch, November 26, 2012; Leadership, November 26, 2012; Campaign for Democracy (CD), 2011).

Similarly, there is public outcry from civil societies, opposition leaders and academic community condemning fraud and corruption at all levels of the public sector in Nigeria. Newspapers are not left out with scintillating headlines: "$31 billion stolen under President Jonathan of Nigeria" (Ogunseye, Okpi & Baiyewu, 2012); "KPMG Nigeria: Nigeria most fraudulent country in Africa" (KPMG, 2012); "Nigeria: Court remands two in Economic and Financial Crimes Commission (EFCC) custody for alleged N14.6 million fraud" (Ugwu, 2012); "Nigeria: More boost for corruption" (Lamorde, 2012); "Nigeria: Ahmadu Ali's son arraigned over N4.4 billion subsidy fraud" (Usani, 2012); and "Nigeria: Lamorde's sermon on corruption" (Obia, 2012).

The Fiscal Responsibility Act (2007) and the Public Procurement Act (2007) introduced as panacea for public accountability and good governance in Nigeria with the objective of restoring and improving the effectiveness, economy and efficiency in

the public sector have not achieved significant success. This lack of potentially reducing the impact of the malaise called fraud and financial crimes may likely be due to poor policy implementation.

The Accountant General of the federation (AGF) has responsibilities for the management of State finances and substantially relied on Financial Regulations (FRs) as its framework in the conduct of its day-to-day activities. The AGF position, for the record, is yet to be provided for in the Constitution of the Federal republic of Nigeria (CFRN), 1999 as amended. The financial regulations, treasury and finance ordinances, and other pronouncements are not immune to lapse in relation to government expenditure, and this consequently gives room for corrupt and fraudulent practices to thrive in the Nigerian public sector.

On the other hand, Sections 86 and 87 of the CFRN (1999) as amended provides for the appointment and tenure of the Auditor General for the federation (AudGF). Despite its clear cut functions, powers and duties enshrined in the CFRN (1999); this office is rendered ineffective as a result of functions and powers overlap, poor reporting responsibilities flow, and interference on appointment of personnel to key functional areas. This organ of accountability and assurance acts as a government watchdog and is responsible to Public Accounts Committee (PAC) of the National Assembly (Bammeke, 2008; Hassan, 2001). The delay by the PAC to meet and discuss the AudGF report on the government financial statements, sometimes more than three years backlog symbolises an apparent deficiency in transparency and good governance, and thus, encourages fraud and corrupt practices in the public sector.

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Lamorde (2012a) as reported in the Guardian newspaper laments about the state of economic and social development in the country, which portraits public servants to have abandoned the pursuit of excellence on the altar of greed and corruption. He concedes the let-down of civil servants to perform creditably when the need arises has led to the prevalent poverty in the land. He attributes other consequences to include unemployment (millions of graduates roaming the streets in search of elusive jobs), epileptic power supply, and the near total decay of infrastructure, bad roads, erratic water supply, poor hospital facilities, and other social vice (Lamorde, 2012b).

Most specifically, the several probes allegedly attributed to corrupt enrichment by public officials are direct and associated indications to misuse of office and lack of transparency and accountability in the Nigerian public sector. The National Assembly embarked upon probes in the public sector covering money laundering, theft and diversion of assets, fuel subsidy mismanagement, pensions fund misappropriation and diversion, and capital market near collapse.

The Head of Risk Consulting KPMG Nigeria, Olayinka Olumide noted with disgust "the current notable trend where many cases either ended with a plea bargain or simply closed without any conviction is disheartening." This comment came on the heels of fraud and corruption cases that engulfed the banking, the oil and gas sectors in Nigeria (Olumide, 2012). He, therefore, concludes that the general belief in Nigeria is that the legal system is not effective enough. The reasons mostly adduced by the courts are traceable to insufficient evidence, which culminates into an inability to proof matters beyond a reasonable doubt suffice to convict erring public servants and high profile politicians. This lack of competency clearly shows that a vacuum

exists in the public sector accounting and auditing systems. With these insights, public sector accountants and auditors must obtain more specialised knowledge, enhanced skills and fraud related mindset qualifications in fraud and financial forensics. Improvement in the capability requirement is necessary in order to have a significant impact to change the perception and understanding of fraud schemes and fraud symptoms in the public sector environment.

Fraud in its entirety is not only costly but dangerous if one considers its impact on the public and government activities (Wuerges, 2011). Previous research has defined fraud as "an intentional act designed primarily to deceive or mislead another party" (Arens & Loebbecke, 1996). Regardless of the way and manner fraud rears its obnoxious head; a study has shown that it is not easy for auditors to identify because the perpetrators will most times take appropriate steps to conceal the ensuing irregularities through intentional means (Knapp & Knapp, 2001).

In addition, research has shown that fraud damages the reputation and the integrity of the audit profession, this is the outcome of many publicized scandals of the year 2002 (Wuerges, 2011). The loss of public trust may be justifiable when audited financial statements turn out to be unreliable, distorted and must be possibly reaffirmed as a result of fraud. Consequent upon this loss of trust, the general public and other stakeholder's expectation for auditors to detect fraud are high (Hooks, 1991; Nicolaisen, 2005; Hogan *et al.*, 2008).

Fraud risk assessment, one of the five components of internal controls (COSO, 2011), indicates not only the direction of the audit, but assists auditors to ascertain the

organisation conditions and the extent of audit procedures, which are prearranged for fraud detection, prevention and deterrence (Wuerges, 2011; Chui, 2010). Consequently, task performance fraud risk assessment is directly connected to the auditors' capability in the detection, prevention and response to fraud in an audit (Chui, 2010).

Task performance fraud risk assessment is carefully selected as a special area for this study because ministry, department, and agency of the State are not immune to the multiplicity of risks from internal and external sources. Fraud risk assessment comprises a vibrant and iterative course for identifying and assessing risks to the achievement of organisational objectives. It requires those in authority to reflect on the effect of changes in the external and within its own model which may make internal control ineffective. The Committee of Sponsoring Organisations of the Treadway Commission (COSO) identifies risk assessment as one of the five components of internal control and considers its implication in relation to potential and actual fraud in any government establishment or organisation (COSO, 2011).

Fraud related problem representation at various times is being described as "an internal reasoning structure that exemplifies an individual's understanding of the problem and the person's solving of a problem" (Sutton, 2003; Bedard & Chi, 1993; Christ, 1993; Greeno, 1977).

Prior research shows that individuals develop fraud related problem representation when confronted with a decision making job (Pitz & Sachs, 1984; Mani & Johnson-Laird, 1982; Gagné & White, 1978). This internal structure is assembled by plotting

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available problem information into individuals' existing information that relates to the nature of decision making job that might come their way (Koonce, 1993; Chi *et al.*, 1981). This process accelerates the assembly of psychological openings used to help persons store and retrieve information with respect to their decision assignment (Wyer & Srull, 1980; Pichert & Anderson, 1977).

Previous research has also shown that both forensic accountants and auditors acquire similar fundamental knowledge (Davis, Farrel & Ogilby, 2010). Specifically, the Institute of Chartered Accountants of Nigeria and other related professional bodies award forensic certification to members after successfully completing forensic education (including court mock sessions) programme. In Nigeria, forensic accountant carries the Certified Forensic Accountant designation.

In essence, forensic accounting can be described as "the integration of specialised knowledge, enhanced skills and mindset on fraud detection, prevention, and deterrence structures. These are, in addition to the gathering of information, investigation, analysing, reporting and communicating financial information to improve future task performance judgement or to resolve legal matters" (Popoola *et al.*, 2013a). As noted by Wuerges (2011) that without proper and adequate forensic education, any expectation from financial statement auditors to detect fraud is similar to pouring new wine into old bottles.

Forensic accountant skills represent exclusive skill sets, which are developed primarily to gather evidence for the purpose of fraud detection, prevention and response. Whereas, financial statement auditor skill sets are meant to "provide

reasonable assurance that the reported financial statements taken as a whole are stated fairly in all material respects, in accordance with the Nigerian Standards on Auditing and the International Auditing Standards, and are, therefore, free of material misstatement (Ekeigwe, 2011; Davia, 2000).

Most significantly, forensic accounting requires individuals to be accomplished in the "application of investigative and analytical skills." Most especially, in the areas of accounting records, gathering and evaluating financial statements evidence, interviewing all parties related to an alleged fraud situation, and serving as an expert witness in a fraud case" (Hopwood *et al.*, 2008; Singleton *et al.*, 2006; Rosen, 2006). Furthermore, this supports the argument that the mere requirement for auditors to be aware of the possibility of fraud in a financial statement audit (AICPA, 2002), is not enough to detect fraud (ACFE, 2004).

A forensic accountant mindset epitomises a unique approach of discerning about accounting records. There is a reason to believe that differences exist between forensic accountant mindset and auditor mindset. While auditors give much thought about the organisation's recorded businesses in terms of the availability, reliability of supporting documentation and an audit trail, they are not duty bound to validate accounting documentation (PCAOB, 2007). Forensic accountants, on the other hand, assume that recorded businesses are not free from fraud in as much as an opportunity and capability for fraud exist in the organisation (Singleton & Singleton, 2007; Singleton *et al.*, 2006; Wolfe & Hermanson, 2004).

The following sections discuss the problem statement, research questions, research objectives, significance of the study, scope of research, chapter summary, and definition of key terms.

1.2   Problem Statement

It is obvious from the background to this study that corrupt practices and fraud exist in the Nigerian public sector. Consequently, the penchant to carry out this study that examines the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in Nigeria with emphasis on the public sector. Table 1.1 depicts the measure of delinquencies in some nations of alleged political corruption through estimates of the funds allegedly embezzled by most leaders of the last 20 years. According to Transparency International (TI) Annual Report (2004, p. 13), these ten leaders are not necessarily the most corrupt leaders of the period and the estimates of funds allegedly embezzled are extremely approximate. This table was also confirmed and aired by the British Broadcasting Corporation (BBC) news of March 25, 2004: 17.23 GMT.

This survey demonstrates that an estimated figure of US $2 billion to US $5 billion dollars was allegedly embezzled by General Sani Abacha, the former President of Nigeria (1993-1998). Hence, one of the reasons for this research as United Nation Human Development Index (UNHDI) of Nigeria is considered to be very low. The UNHDI consists of the population, the life expectancy number of years; the number of children, the literacy rate of the adult and the gross domestic product per capita in US dollars of each of the countries is being highlighted in Table 1.1.

Table 1.1

Alleged Political Corruption through estimates of the funds allegedly embezzled by most leaders in the last 20 years

Head of Government	Nation	Estimates of Funds allegedly embezzled	GDP per Capita (2001)
Mohamed Suharto	President of Indonesia, 1967–98	US $ 15 to 35 billion	US $ 695
Ferdinand Marcos	President of Philippines, 1972–86	US $ 5 to 10 billion	US $ 912
Mobutu Sese Seko	President of Zaire, 1965–97	US $ 5 billion	US $ 99
Sani Abacha	President of Nigeria, 1993–98	US $ 2 to 5 billion	US $ 319
Slobodan Milosevic	President of Serbia/Yugoslavia, 1989–2000	US $ 1 billion	N/A
Jean-Claude Duvalier	President of Haiti, 1971–86	US $ 300 to 800 million	US $ 460
Alberto Fujimori	President of Peru, 1990–2000	US $ 600 million	US $ 2,051
Pavlo Lazarenko	Prime Minister of Ukraine, 1996–97	US $ 114 to 200 million	US $ 766
Arnoldo Alemán	President of Nicaragua, 1997–2002	US $ 100 million	US $ 490
Joseph Estrada	President of Philippines, 1998–2001	US $ 78 to 80 million	US $ 912

Source: TI Annual Report, 2004 and BBC News, 2004.

In addition, the World Bank annual report (2007) published the result of the embezzlement in developing nations. Table 1.2 shows the result of the alleged political corruption through estimates of the funds allegedly embezzled by most leaders of the last 20 years.

Table 1.2

The Impact of the alleged Political Corruption through estimates of the funds allegedly embezzled by most leaders of the last 20 years based on UNHDI

Country	Population	Life Expectancy No.	Children	Literacy Rate (Adult)	GDP Per Capita (In US $)
Indonesia	225 million	63 yrs	2	91%	1,923
Nigeria	147million	47 yrs	5	49%	1,127
Haiti	9 million	60yrs	4	62.1%	681
Nicaragua	5 million	72yrs	3	80%	1,135
Philippines	87 million	71yrs	3	93.4%	1,656
Ukraine	46 million	68yrs	1	99.7%	3,054
Congo DR	62 million	46yrs	6	N A	144
Serbia	7 million	73yrs	1	N/A	N/A
India	1,120 billion	61 yrs	3	66%	1,042
USA	301 million	78 yrs	2	*	45,884
Brazil	191 million	67 yrs	2	90.5%	6,880
Russia	141 million	66 yrs	1	99%	9.156
Pakistan	162 million	62 yrs	4	54.9%	886
Japan	127 million	82 yrs	1	*	34,462
Bangladesh	158 million	64 yrs	3	53.3%	428
Mexico	105 million	74 yrs	2	92.4%	8,508
Germany	82 million	76 yrs	1	*	4,021
Peru	27 million	71 yrs	3	90.5%	4,040
UK	61 million	79 yrs	2	*	44,718
China	1,320 billion	69 yrs	2	93.3%	2,486

* Less than 5% Illiteracy Rate.
Source: World Bank Report, 2007

Cases prosecuted by law enforcement or regulatory agencies against civil servants or public officials in Nigeria are usually being met with disappointing outcomes. As a result of the failure in prosecution, the corrupt civil servants or politicians are turned

to celebrities due to a deficit in the forensic accountant knowledge, skills and mindset essential to carry out a successful fraud examination, financial forensics and courtroom testimony.

Specifically, the personalities involved include former Governor of Delta State, former Executive Chairman of Intercontinental Bank (now Access bank), Erastus Akingbola; former Governor of Bayelsa State, Dipiere Alamesigha, former Governor of Ogun State, Otunba Gbenga Daniel; former Speaker of the House of Representatives, Rt. Hon. Dimeji Bankole; former Governor of Oyo State, Otunba Alao Akala; to mention a few. For instance, Chief James Ibori was arraigned in the Court in Nigeria on over 220 charges, tried and was eventually discharged and acquitted on technical grounds, lack of prosecutorial evidence, and frivolous charges, hence turning a fraudster to celebrity. However, the same Chief James Onanefe Ibori was extradited from Dubai to UK. He was arraigned before Southwark Crown Court 9, London with case number T20117192. During the course of the trial, he pleaded guilty to the 10-count charge of fraud, money laundering and corruption put at about $250 million. The court upheld his pleadings of guilt and sentenced him to 26 years imprisonment. Because he did not waste the Court time and cost, he was to serve only half of the sentence, that is, 13 years in jail and forfeiture to the Delta State the embezzled fund (Ibiam, 2012; Babalola & Famutinu, 2012).

These observed lapses call for a study to examine the mediating influence of fraud related problem representation on knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment in the Nigerian public sector.

To the best of the researcher's experience, no study has examined the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in Nigeria with a special focus on the public sector. Although, Chui (2010) in a study examines the effect of problem representation on fraud specialist and auditor mindset and fraud risk assessment performance on private sector environment (accounting firms) using accounting students in two separate auditing classes as participants. Previous literature has, however, shown that the use of student surrogates lacks accurate prediction of another population and could not be used as substitutes or surrogates for business people or professionals (Zikmund, 2003; Morgan, 1979).

In addition, Zikmund in his book, "Business Research Methods" argues that any study that uses student surrogates should be careful and must ensure that the student subjects and the "real people" they are to portray is similar. The only condition acceptable is when the population under study matches the student population in literacy, alertness and rationality (Zikmund, 2003, p. 274). As a result, the expectation of this study requires a fill in the gap created in Chui's (2010) study through the use of the "real professional people" such as public sector accountants and auditors in Nigeria as respondents. The use of students as surrogates could not match the literacy, alertness and rationality of the real people the study expects to generalise the results. Similarly, Chui (2010) did not discuss underpinning theory to support the findings and conclusions of his work.

Furthermore, the public sector accounting relies on constitutional and regulatory frameworks. These consist of the Federal Republic of Nigeria constitution (1999),

audit ordinance (1956), finance (control and management) act (1958), financial regulations, and finance or treasury circulars and adopt cash basis of accounting policy (ICAN, 2009; Bammeke, 2008; Daniel, 2004; Johnson, 1996).

On the contrary, the private sector accounting must comply with institutional, regulatory and legal frameworks. These frameworks consist of accepted accounting principles and practices, the Nigerian standards on auditing issued by the Institute of chartered accountants of Nigeria, statement of accounting standards issued by the Financial Reporting Council of Nigeria, formerly Nigerian Accounting Standards board. Other frameworks include Code of Conduct for members (ICAN, 2010) issued by the Institute of Chartered Accountants of Nigeria, Code of Ethics for professional accountants (IFAC, 2009) issued by the International Federation of Accountants, judicial pronouncements, and regulatory policies (ICAN, 2009; Popoola, 2008).

The private sector in Nigeria adopts the accrual basis of accounting, whereas the public sector adopts the cash basis and modified cash basis of accounting. In essence, the findings and results from any empirical study conducted on private sector of the Nigerian economy may likely meet with breaches because the public sector accounting policies differ significantly. This may have dictated the compelling desires to study the mediating impact of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in the Nigerian public sector.

Prior research conducted by National fraud authority annual fraud indicator (2011; 2009) in the United Kingdom indicate that the losses attributed to fraud are usually

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higher in the public sector in comparison with all other sectors (the private sector, not for profit organisations, and individuals) put together. For instance, the National Fraud Authority Annual Fraud Indicator (NFAAFI), UK in its study, "Fighting fraud together: the strategic plan to reduce fraud" identifies public sector fraud and financial crimes in 2011 to have constituted the highest loss of £21.2 billion (55%) out of £38.4 billion. Other areas include private sector £12 billion (31%), individual £4 billion (11%), and charity organisations £1.2 (3%), (NFAAFI, 2011). Figure 1.1 illustrates the pie chart attributed to loss due to fraud in the United Kingdom, 2011.
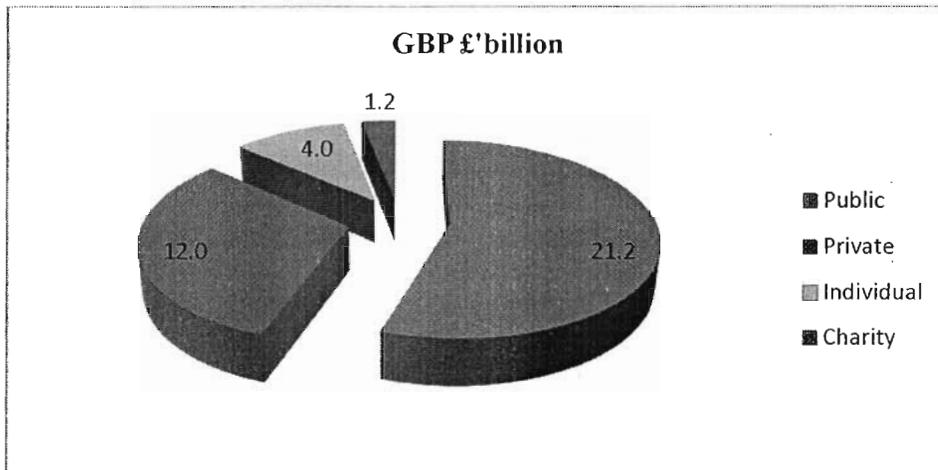
Figure 1.1
Loss Due to Fraud in United Kingdom, 2011
Source: National Fraud Authority Annual Fraud Indicator, UK (NFAAFI), 2011.

However, there are no statistical data available from the Federal Office of Statistics (FOS), the Central Bank of Nigeria (CBN), the Economic and Financial Crimes Commission (EFCC) or any other government agencies or departments on fraud and fraud related issues in Nigeria.

As noted earlier, to the best of the researcher's knowledge, only one study (Chui, 2010) had attempted to examine the effect of fraud specialist and auditor mindset on

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fraud risk assessment and the development of problem representation in the private sector. Previous empirical studies had been carried out on "characteristics of creativity in relation to auditors' recognition of fraud cues" (Herron, 2012); "characteristics and skills of forensic accountants" (Davis, Farrel & Ogilby, 2010); "moderator and mediator analysis" (Baron & Kenny, 1986); "corporate fraud and managers' behaviour" (Cohen, Ding, Lesage & Stolowy, 2010); "empirical investigation of the relevant skills of forensic accountants and planning fraud detection" (DiGabriele, 2008; Boritz, Kotchetova & Robinson, 2008); "financial statement fraud" (Hogan, Rezaee, Riley & Velury, 2008); "auditors' responsibility for fraud detection: the new wine in old bottles?" (Wuerges, 2011); but regrettably their attempts have been fragmented and piecemeal.

This study emphasises the preference for a wholestic approach to investigating in the Nigerian public sector the influence of task performance fraud risk assessment (as the dependent variable), fraud related problem representation (as mediating variable), and knowledge – fundamental and specialised; skills – core and enhanced; and mindset (as independent variables) for a between subject factors at two levels (forensic accountant and auditor).

Many scholars on the auditing and investigation have, however, lamented of the auditors' shortcomings to detect and prevent financial statement fraud. It was the scholars concern that those failures may backfire leading to the replacement of auditors with forensic accountants to audit organisations financial statements as an assurance to the stakeholders of their been protected from fraud (Chui, 2010; Boritz,

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Kotchetova & Robinson, 2008; Hogan, Rezaee, Riley & Velury, 2008; Jamal, 2008; Rosen, 2006; Smieliauskas, 2006; Wells, 2005, Knapp, & Knapp, 2001).

Furthermore, previous research has shown that accounting researchers committed much research with emphasis on fraud risk challenges (Allen *et al.*, 2006; Cushing *et al.*, 1995). In another review, some studies have discovered that accountants or auditors are not competent to evaluate risk of fraud and financial crime, and most times they were unable to discover fraud in the organisation financial statements (Knapp & Knapp, 2001; Hackenbrack, 1992). As a result of these scholars' lamentations, this study seeks to confirm, accept or challenge the findings of the scholars with respect to auditors' responsibility towards fraud detection, prevention and response.

Compared to other research on forensic accounting and financial criminology in other parts of the world, research in the Nigerian public sector is a bit scarce, scanty and sometimes without depth (Kasum, 2010; Okunbor & Obaretin, 2010; Okoye & Jugu, 2010). The potential failure of public sector accountants, auditors and law enforcement agents with accounting background in Nigeria to assess fraud and financial crimes portend a grave danger and thus not justifiable. As noted by Wuerges (2011), any failure to address fraud and fraud related issues may be too costly to the general public and consequently constitutes a damaging effect to the auditing profession.

Similarly, studies have shown that the frequency of accounting fraud, financial crimes and audit failures had a grave impact on the economy and causes a loss of

stakeholders' confidence in the auditing profession (Hogan *et al.*, 2008; Silverstone & Davia, 2005). Houck *et al.* (2006) assert that a fraud and forensic accounting affect the accounting profession every day.

Furthermore, the public company accounting oversight board standing advisory group highlights many areas of fraud related challenges which require immediate attention from accounting researchers (PCAOB, 2004). One of the areas recommended by the standing advisory group for future research is in fraud detection in any organisation with respect to ascertaining whether forensic accountants are capable and competent than auditors in detecting fraud. Specifically, the PCAOB is potentially interested in the influence of forensic accountants' specialised knowledge, enhanced skills and mindset using fraud related problem representation on task performance fraud risk assessment with a view to improving transparency and accountability, especially in the Nigerian public sector working environment.

In the Nigerian public sector, the growth in occupational fraud, money laundering, embezzlement, the concealment of debt, the concealment of assets, terrorism financing, corruptions, illegal or unethical acts and other financial crimes are the critical factors of gap, thus creating a niche to encourage investigation on the influence of the forensic accountant knowledge, skills and mindset and auditor knowledge, skills and mindset to improve transparency and accountability with an emphasis on accountants and auditors in the public sector of Nigeria.

The deficit forensic accounting knowledge, mindset and skills recognised in the public sector accountants and auditors task performance may likely have contributed

to various thrown out cases instituted by law enforcement agencies like the Economic and Financial Crimes Commission, Nigerian Drugs Law and Enforcement Agency, the Independent Corrupt Practices Commission, the Police Force (PF) and Federal Inland Revenue Service from courts of law in Nigeria.

Previous study has shown the need for future research in the areas of a forensic accountant knowledge (Chui, 2010; Rose *et al.*, 2009), forensic accountant characteristics, traits and skills sets (Davis *et al.*, 2010; Sale *et al.*, 1998), creativity (Herron, 2012), components of fraud and prediction of a contingency model (Cohen *et al.*, 2010). This study embraces the clarion call from Chui (2010) and Davis, Farrell & Ogilby (2010). Based on many gaps identified in the previous research of the public sector environment, the forensic accountant knowledge, skills and mindset and auditor knowledge, skills and mindset deserve special investigation as independent variables and task performance fraud risk assessment as the dependent variable with fraud related problem representation as a mediating variable. Therefore, it is crystal clear that there are gaps in the practical aspects as well as empirical evidences, hence the motivation for the study to fill up these gaps.

This study examines the mediating influence of fraud related problem representation on task performance fraud risk assessment, the forensic accountant knowledge, skills, and mindset with a view to improving an understanding of fraud and financial crimes as well as to stimulate transparency and accountability in the Nigerian public sector. Consequently and from the problem statement, it is crystal clear that (1) fraud and corrupt practices are prevalent in the public sector and loss due to fraud is rising based on the public outcry in newspapers, public forum, and opposition leaders'

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lamentations; (2) there is a need to examine in wholestic manner capabilities (knowledge, skills and mindset) and competence (task performance fraud risk assessment) of forensic accountants and auditors in the Nigerian public sector with respect to fraud prevention, detection, deterrent and response; and (3) there is a necessity also to embrace global best practices in fighting fraud and fraud related crimes in the Nigerian public sector.

This section concludes the problem statement and consequently leads to the next section which discusses the research questions.

1.3   Research Questions

In the light of the foregoing phenomenon, the following pertinent questions are examined:

1.   Do knowledge (KR), skills (SR) and mindset (MR) of forensic accountants and auditors relate to task performance fraud risk assessment (TPFRA)?

2.   Does fraud related problem representation (FRPR) mediate the relationship between knowledge (KR), skills (SR), and mindset (MR), and task performance fraud risk assessment (TPFRA)?

3.   Do forensic accountants have higher levels of knowledge (KR), skills (SR), mindset (MR), fraud related problem representation (FRPR), and task performance fraud risk assessment (TPFRA) requirements than auditors?

These phenomenal questions lead to what constitutes the objectives of the study.

1.4   Research Objectives

The central objective of the study is to investigate the task performance fraud risk assessment in the offices of the Auditor General for the federation and Accountant General of the federation through the effective utilisation of forensic accounting knowledge, skills and mindset. The researcher postulates that the results of the study have the advantage to enhance the understanding of fraud schemes by the enforcement agencies and regulators; increase the capability and competence of accountants and auditors towards fraud prevention, detection and response; and usher in best corporate governance practices, in the Nigerian public sector.

In addition, this study ascertained whether the Federal government policy on human capital development is on the right course. The policy thrust has to do with the provision of excellent service delivery to the general public through training and retraining of personnel engage in enforcement, regulation and investigation of fraud, financial crime and other non-related fraud and crime in government ministries, departments and agencies. Such notable beneficiary agencies include the Economic and Financial Crimes Commission, the Independent Corrupt Practices Commission, and the Police Force, and the Federal Inland Revenue Service.

The specific objectives of the study are:

1.   To examine the relationship between Knowledge (KR), Skills (SR), Mindset (MR) of forensic accountants and auditors, and Task performance fraud risk assessment (TPFRA).

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2. To examine the mediating influence of Fraud related problem representation (FRPR) on Knowledge (KR), Skills (SR), Mindset (MR) of forensic accountants and auditors, and Task performance fraud risk assessment (TPFRA).

3. To examine whether forensic accountants have higher levels of knowledge (KR), skills (SR), mindset (MR), fraud related problem representation (FRPR), and task performance fraud risk assessment (TPFRA) than auditors.

1.5   Significance of the Study

This study contributes significantly as the impact of loss due to fraud in the public sector is overwhelming and, as a result, ignoring such in this era of globalisation and best practices in fighting fraud seems calamitous. It also serves as an eye opener towards empowering public sector accountants on forensic accounting knowledge, skills and mindset with a view to detecting, preventing, deterring, remediating and responding to fraud and fraud related crimes in Nigeria. In addition, it is capable of assisting regulators in terms of understanding the mechanisms of fraud and the methodology of dealing with fraudsters.

This study that deals with the investigation of the mediating influence of fraud related problem representation on knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment seems most important to the theory, methodology and practice.

1.5.1. Theoretical Significance

On the basis of and implications to theory, this study makes several contributions to forensic accounting and financial criminology and fraud risk assessment literature.

First, this study is significant as being the first to investigate the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills, and mindset (forensic accountant and auditor) in the country's public sector.

Second, the study contributes to the literature of forensic accounting as it makes a distinction between forensic accounting knowledge, skills and mindset and auditing knowledge, skills and mindset with emphasis on fraud detection, prevention and response in the public sector environment.

Third, it integrates the triangle of fraud action theory and the theory of planned behaviour (an association of "TFAT/TPB") as a theory model for fraud detection, prevention and response since the unit of analysis is on an individual.

Fourth, it offers additional reaction on the methodology in educating future forensic accountants.

1.5.2 Methodological Significance

First, the study is significant on the adoption of quantitative research with cross-sectional design which has the distinctive characteristic of no time dimension, reliance on existing differences rather than change following intervention, and group based on

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existing differences rather than random allocation (De Vaus, 2011). In addition, cross-sectional design employs a relatively inactive method to causal inferences which make it distinguishable from experiments design that explains variation in the dependent variable (De Vaus, 2011; Marsh, 1982).

Second, the use of real people, that is, forensic accountants and auditors as representative samples that facilitate generalisation of the results as against the students surrogate makes the study to be significant (Zikmund, 2003; Morgan, 1979).

1.5.3 Practical Significance

First, the study creates awareness within the public sector domain that government money(s) belongs to all the citizens and not for a few individuals who relish in fraud and criminal activities as democracy is intended to be people oriented government for public good.

Second, this study has the potential to contribute to the institutional, regulatory and legal framework in the public sector accounting, especially with respect to organisational objectives, namely: (1) operating objective, (2) reporting objective, and (3) compliance objective, all in a bid to enhance transparency and accountability in the public sector working environment in Nigeria.

Third, it complements the Educational goal of the Institute of Chartered Accountants of Nigeria and the American Institute of Certified Public Accountants have developed - the Certified Forensic Accountant (CFA) and the Certified in Financial Forensics

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(CFF) designations respectively in relation to knowledge, skills and mindset requirements for fraud prevention, detection and response.

1.6   Scope of the Study

This study covers the public sector accountants and auditors working in the office of the Accountant General of the federation and the Auditor General for the federation in Nigeria. It is from the pool of accountants and auditors in these two offices that those government ministries, departments, and agencies engage in enforcement; regulation and investigation build confidence on for professional assistance in the areas of fraud and financial crimes detection, prevention and prosecution.

1.7   Chapter Summary and Organisation of the Study

1.7.1   Chapter Summary

This study discussed the mediating impact of fraud related problem representation on task performance fraud risk assessment (competence) and knowledge, skills and mindset of forensic accountant and auditor (capability) in the Nigerian public sector having elaborated on the problem statement, research objectives, significance of the study, and scope of the study. The study helps in understanding the mechanisms of forensic accounting in the area of fraud reduction, improved fraud mediation and deterrent, and fraud responses not only to the Nigerian public sector environment but accounting profession as a whole.

1.7.2   Organisation of the Study

This study is best arranged in six chapters, namely: Chapter 1 – Introduction, Chapter 2 – Literature Review, Chapter 3 – Research Framework and Hypothesis

Development, Chapter 4 – Research Methodology, Chapter 5 - Results and Chapter 6 - Discussions.

Chapter 1 comprises background to the study, problem statement, research questions, research objectives, significance to and scope of the study and definition of key terms.

Chapter two encompasses the literature review and the underpinning theories of the five major constructs to the study. These are knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment. Others include the theory of reasoned action, the theory of planned behaviour, the fraud triangle theory, and the triangle of fraud action theory. The chapter highlights on the previous studies on capability and competence with emphasis on knowledge, skills, and mindset (forensic accountant and auditor). The potentials embedded in fraud related problem representation as a mediator on the relationship between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment are well discussed.

Chapter three presents conceptual framework of the study consequent upon the review of the literature, the direct and indirect relationship between the five major constructs and hypothesis testing and validation.

Chapter four discusses the research paradigm, the research process and the research design, the type of research, population of the study, sampling techniques, method of data collection, method of data analysis, and ethical considerations in relation to the design of the study.

Chapter five presents the descriptive analysis, the measurement model and structural model of the respondents, empirical results and key findings as well as the test of the hypothesis of the study through the use of software such as IBM Statistical Programme for Social Sciences (IBM SPSS Version 20), SEM-SmartPLS (Version 2.0 3M) and literature on output interpretation.

Chapter six discusses the results in the context of research questions, hypotheses and literature review, implications of the research, limitation to the study, signposts future research direction and conclusion.

1.8   Definition of Key Terms

1.8.1   Task Performance Fraud Risk Assessment (TPFRA)

Task performance fraud risk assessment is being defined as the forensic accountant and the auditor's ability to assess the risk of fraud to a distinct standard in the workplace.

1.8.2   Fraud Related Problem Representation (FRPR)

Fraud related problem representation is being defined as the forensic accountant and the auditor mental representation of information towards understanding a fraud related problem and solving a fraud related problem through a strategy based on prior or existing knowledge, skills and mindset.

1.8.3   Knowledge (KR) - Forensic Accountant and Auditor

Knowledge is being defined as the forensic accountant and the auditor's attribute and proficiency competence necessary and relevant to discharge technical and innovative

task, especially with respect to identifying and analysing measures of controls and procedures for fraud prevention, detection and response.

1.8.4 Skills (SR) – Forensic Accountant and Auditor

Skills are being defined as an attribute of the forensic accountant and the auditor, which relates to competence in the areas of knowledge and ability as well as those that relates to performance in fraud detection, prevention and response.

1.8.5 Mindset (MR) – Forensic Accountant and Auditor

Mindset is being defined as the positive mental attitude of the forensic accountant and the auditor to prevent, detect and response to fraud.

CHAPTER TWO

LITERATURE REVIEW

2.1   Introduction

The preceding chapter one discusses the introduction, motivation and issue for the research, which has to do with forensic accounting and fraud: capability and competence requirements in Nigerian public sector. This entails the investigation of the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor). This chapter is divided into twelve major sections. First, sections 2.1 and 2.2 deal with the introduction of the chapter and background to the literature review. Second, section 2.3 discusses the overview of public sector accounting and auditing systems, and the many organs of accountability in Nigeria.

Similarly and third, sections 2.4 to 2.8 provide a detailed discussion on the evolution of forensic accounting and financial criminology, fraud, fraud risk assessment, responsibility of auditors to detect fraud, and comparison between forensic accounting and auditing. Fourth, section 2.9 discusses capability and competence requirements of forensic accountants and auditors in specific working environments and industries. Fifth, the next section 2.10 provides a discussion on fraud related problem representation. Sixth, section 2.11 presents the underpinning theory of the study. Seventh and last, section 2.12 provides a short chapter summary, therefore, concludes all the twelve sections of chapter two of this study.

2.2   Background to the Literature Review

In the modern era of trade globalisation, high level acquisition and adoption of technology as a business enabler, increased fraudulent and corrupt practices, and new and complicated legislation that offers new opportunities for both the perpetrators of fraud and forensic accountants, it is the responsibility of the management of every organisation in the public sector environment to put in place adequate measures of controls and procedures to strengthen its activities and imbibe good corporate governance practices.

Consequent upon the vastly publicised corporate scandals involving Adelphia, Enron, WorldCom, Tyco, and others at the dawn of the new century, and combined with anxieties over money laundering in aid of terrorism and racketeering activities, the responsibility of the auditor to detect significant fraud within organisations has become an issue in the public domain.

The need for reforms and the establishment of several institutional, legal and regulatory frameworks become inevitable. The frameworks include the formation of the Public Company Accounting Oversight Board (PCAOB), passage of the Sarbanes-Oxley Act (2002), the American Institute of Certified Public Accountants Statement on Auditing Standards (SAS) No. 99, Consideration of fraud in a financial statement audit (AICPA, 2002), and the Institute of Chartered Accountants of Nigeria Standards on Auditing (NSA) No. 5, The Auditor's responsibility to consider fraud in an audit of financial statements (ICAN, 2005). These frameworks are meant to address the challenges on internal controls for preventing and deterring fraud and also to

embolden financial statement auditors to be more vibrant and decisive in searching for fraud (Kranacher *et al.*, 2008).

In addition, prior literature has confirmed several changes made through legislation on the procedures for corporate governance, financial disclosure, auditor independence and corporate criminal liability (Pinkham, 2012). The global environment also makes great strides in the procedures through which forensic accountants conduct investigations of detecting, preventing, and responding to fraud, the approach to be adopted by the internal auditors to plan and complete task, and the statutory independent auditors to assess the possibility and significance of fraud risk in an audit.

Similarly, Statement on auditing standards No. 99, Consideration of fraud in a financial statement audit (AICPA, 2002) provides the direction that has potential to improve audit quality in respect of discovering significant financial misstatements, which may be caused by fraud or error. Most importantly, the Statement of auditing standard No. 99 guideline on the assignment of personnel and supervision about overall responses to the risk of material misstatement recommends "an auditor may respond to an identified risk of material misstatement due to fraud by assigning additional persons with specialised skills and knowledge, such as forensic and information technology (IT) specialists" (AICPA, 2002).

Consequently, Statement on auditing standards No. 99 describes and classifies three key risk factors related to fraud as the incentive to perpetrate a fraud, the opportunity to carry out the fraud, and the attitude to rationalise the fraudulent action (AICPA,

2002). Wolfe and Hermanson (2004) argue that there are four key risk factors of fraud, sometimes refer to as "elements of fraud," that is, the previous three elements originated by Cressey (1953; 1950) – incentive or pressure, opportunity, and attitude or rationalisation and a new element: capability (Wolfe & Hermanson, 2004). Hence, the four elements (Wolfe & Hermanson, 2004; Cressey, 1953) are currently being referred to as "the fraud diamond theory." Wolfe and Hermanson's (2004) position are quite logical in the sense that fraud perpetrators must possess the mindset, skills and knowledge, that is, "capability" to be able to commit fraud by observing the available opportunity, identifying weaknesses in the internal control, and, therefore, turning it into reality.

The Cressey (1953, 1950) fraud triangle, adopted by the auditing profession through AICPA SAS No. 99 (2002), and Wolfe and Hermanson (2004) fraud diamond elevated public consciousness about fraud and forensic accounting. It places emphasis on the importance of ensuring that public sector accountants have the required forensic accounting knowledge, skills and mindset to detect, prevent or deter and respond to fraud using fraud risk assessment to enhance task performance. Hence, forensic accountants would continue to be in high demand (Wells, 2005) as long as criminals exist in the areas of fraud, white collar crime, corruption, money laundering, terrorism financing, computer fraud, asset misappropriation and conversion, theft, and tax fraud.

2.3 Overview of Public Sector Accounting and Auditing Systems and the Various Organs of Accountability in Nigeria

Nigeria, as one of the developing nations, got independence from the British colonial masters in 1960. The country is well blessed in terms of resources such as human

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resources, natural resources (solid minerals, oil, hydro electric energy, and water), agriculture, and good climate conditions. Despite the availability of these resources in abundance, the rate of economic development appears potentially low, human capital development and provision of utilities; infrastructure and facilities are actually not adequate and sufficient. This slow pace of growth may be attributed to the high level of fraud, corruption, theft of government assets, misappropriation and conversion of government properties, greed and mal-administration. As a result, most of the citizens migrate to other countries in the world in search of better opportunities such as economic and social empowerment, and sustainability.

2.3.1 Public sector

The term "public sector" can be defined as "all organisations which are not privately owned and operated, but which are created, managed and financed by the government on behalf of the public" (IFAC, 2012; ICAN, 2009; 2006). In essence, the public sector comprises organisations which are under the control of the public, as against private ownerships. The objective involves the provision of services, where profit is not the main motive. However, it is not possible to realistically measure the utilisation of resource performance in the public sector because of its objectives, which are linked to the non-profit reason and the existence of intangible services whose benefits cannot be easily measured or quantified (ICAN, 2009).

2.3.2 Public Sector Accounting

According to Adams (2004), public sector accounting refers to "a process of recording, communicating, summarising, analysing and interpreting government financial statements and statistics in the aggregate and details; it is concerned with the

receipts, custody and disbursement, and rendering of stewardship of public funds entrusted." This definition is similar to the universally accepted financial accounting definition as accounting is in all sectors of the economy whose essentials are to "record all historical costs and incomes that when administered become useful information necessary for the current appraisal, future decision making and performance control" (ICAN, 2006).

2.3.3 Purposes of Public Sector Accounting

Most importantly, from the definition of public sector accounting, one can make inferences to these purposes that are universal in nature. They are the determination of the legitimacy and compliance of transactions in accordance with the conventional standards, guidelines and laws; the availability of proof of stewardship and solutions to identified problems in the system; the provision of basis and details for decision making and unsettled long term financial commitments; the encouragement of the assessment process of management and the evaluation of the economy, efficiency and effectiveness (value for money audit) in the system (ICAN, 2009).

Specifically, other objectives of public sector accounting include "the identification of the sources of funding recurrent and capital projects, and recognition of the numerous sources of revenues and expenditures to be generated and incurred; the ability to match costs with benefits and provision of measurement to compare actual performance with the budget; and the observation of effective planning, controlling and timely reporting" (ICAN, 2009).

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2.3.4 Significance of Public Sector Accounting Information to Users

Public sector accounting information is significant both to the internal users as well as external users. For instance, the internal users need accounting information to ascertain whether compliance of the regulatory framework is maintained and sustained; actual expenditures are in agreement with the appropriations, and adequate and sufficient safeguards are in place for public resources. On the other hand, the external users need accounting information to investigate the financial sustainability of the public sector organisations, and the efficiency and effectiveness of their management (ICAN, 2009; 2006).

2.3.5 Governance Structure of the Public Sector Accounting

The public sector accounting in Nigeria is administered by the constitutional, legal and institutional frameworks such as (1) the Nigerian constitution (1999 as amended), which regulates the receipts and payments of public funds, (2) the Audit ordinance of 1956 or Act of 1956 Section 13 subsections 1-3 that mandates the AGF to provide the Auditor General for the federation (AudGF) with the country's financial statements. Likewise, the Auditor General shall within 60 days of receipt of the financial statements from the Accountant General of the federation (AGF) transmits the audited report to each House of the National Assembly in Nigeria, (3) the Finance (control & management) act of 1958 administers the management and operation of all state funds (accounting and auditing systems), (4) the Financial regulations represent the accounting manual of the government ministries, departments, and agencies, and (5) the Finance or treasury circulars, which serve as the administration tools to amend existing provisions or to introduce new policy guidelines in relation to the Financial regulations and public service rules (ICAN, 2009; Bammeke, 2008).

It is relevant to point out that there is no section in the constitution of the Federal Republic of Nigeria (1999), which deals with the appointment and tenure of the Accountant General of the federation on one hand, and the period within which the Accountant General of the federation must submit financial statements to the Auditor General for the federation (AudGF).

On the contrary, Sections 86 and 87 of the CFRN (1990) deal with the appointment and tenure of the AudGF. Furthermore, the AudGF has the time limit of within 60 days after the receipt of the government financial statements to submit an audited report to the two houses of the National Assembly of Nigeria. Table 2.1 shows other sections of the constitution of the federal republic of Nigeria, 1999 as amended with significant implications for accounting and auditing systems in the Nigerian public sector.

Table 2.1
Other sections of the CFRN (1999) with significant implications for accounting and auditing systems of public sector

Section	Particulars
80	Establishment of the Consolidated Revenue Fund (CRF)
81	Authorisation of expenditure from the CRF
82	Authorisation of expenditure in default of appropriations
83	Establishment of the Contingencies Fund
84	Remuneration of Statutory Officers
84(4)	Comprehensive list of Statutory Officers
85	Audit of public accounts
86	Appointment of the Auditor General for the Federation
87	Tenure of office of the Auditor General for the Federation
88	Power to conduct investigation by the National Assembly
89	Power as to matters of evidence
149	Declaration of assets and liabilities and oaths of office
153	List of statutory commissions
162	Establishment of the Federation Accounts
163	Allocation of other revenue
164	Federal grants in aid of State revenue
	Independent Corrupt Practices and other Related Offences (ICPC) Act of 2000
	Pension Reform Act of 2004

Source: Constitution of the Federal Government of Nigeria (CFRN), 1999 as amended

2.3.6 Accountant General of the Federation (AGF) and its powers

The Accountant General of the federation by the provisions of financial regulation No. 101 is being regarded as the Chief accounting officer of the receipts and payments of the Federal government, loaded with the responsibility of general supervision of the accounts of all ministries, departments, and agencies, and the preparation of annual financial statements of the country, as may be required by the *Honourable Minister of Finance* (italics are for emphasis). He or his representative shall have unfettered access at any reasonable time to all documents, information and records which are required for the preparation of the accounts of every ministry, department and agency (FR, 101). Thus, the preparation of the State financial statement must be solely at the discretion of and as may be required by the Honourable Minister of Finance.

The Accountant General of the federation derives its powers from the financial regulation No. 103. These are "power of access to books and records of all ministries, departments and agencies at any reasonable time, power to request for information and explanation necessary for his duties, power to carry out special investigations in any ministries, departments and agencies, and power to carry out ad-hoc investigation in any ministries, departments and agencies" (ICAN, 2009).

2.3.7 The Auditor General for the Federation (AudGF) and its powers

The provisions of Financial regulation No. 102 authorises any officer responsible under the constitution of the Federal republic of Nigeria (1999) as amended for "the audit and reports on the public accounts of the federation, including all persons and bodies established by law entrusted with the receipts, custody, issue, sale, transfer or

delivery of any stamps, securities, stores or other property of the state of the federation and for the certification of the annual accounts of the nation" (CFRN, Sec. 85, 1999). The officer shall have "unrestricted access to examine the accounts of the State in such a manner as he may deem necessary" and report whether in his opinion (1) "the accounts have been properly kept; (2) all public monies have been fully accounted for, and the rules and procedures applied are sufficient to secure an effective check on the assessment, collection and proper allocation of revenues; (3) monies have been expended for the purposes for which they were appropriated, and the expenditures have been made as authorised, and (4) essential records are maintained, and the rules and procedures applied are sufficient to safeguard public property and funds" (FR 102).

The Auditor General for the federation derives its powers in accordance with financial regulation No. 103. These include "power of access to books and records of all ministries, departments and agencies at reasonable times; power to request for information and explanation necessary for his duties; power to carry out special investigations in any ministries, departments and agencies; and power to carry out ad-hoc investigation in any ministries, departments and agencies" (FR No. 103).

This study reviews and discovers the existence of overlapping powers between the Accountant General of the federation and the Auditor General for the federation. The researcher argues that the result of the overlapping powers may likely have a significant adverse impact on the task performance of accountants and auditors in the public sector, especially when consideration is given to the knowledge, skills and

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mindset of the occupiers of the two offices in terms of fraud detection, prevention and response.

2.4   Fraud

The Black's Law Dictionary (6th ed.) describes "fraud (sometimes referred to as the fraudulent act) as an intentional perversion of truth for the purpose of inducing another in reliance upon it to part with some valuable thing or to surrender a legal right, a false representation of a matter of fact" (Nolan, Nolan-Haley, Connolly, Hicks & Alibrandi, 1990).

Prior literature defines fraud as an "intentional act designed to deceive or mislead another party" (Knapp & Knapp, 2001; Arens & Loebbecke, 1996). In the same way, Wells (2002) describes fraud as trickery and classifies it into two, namely: internal fraud is most often committed by employees and officers of organisations while external fraud is usually committed by organisations against individuals, individuals against organisations, and organisations against organisations. To elucidate on the concept of internal and external fraud, a banking executive filing a false report with the Central bank of Nigeria or an insurance executive with the National insurance commission is committing internal fraud. On the contrary, a customer of the same insurance company filing a deceptive accident claim is deep in external fraud.

Several researchers describe fraud as "a means by which a person can achieve an advantage over another by false suggestions or suppression of the truth" (Keshi, 2011; Bellovary, 2006; Singleton *et al.*, 2006). Similarly, some scholars identify four components of an action to constitute fraud. These are: "false representation of fact,

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scienter (intention to deceive), reliance, and damages" (Cohen *et al.*, 2010; DiGabriele, 2006; Skalak *et al.*, 2006; Wells, 2004a; Wells, 2004b). This clearly indicates the occurrence of fraud may be as a result of reliance by the victim through false representation of fact from a perpetrator who has deceptive intention, which led the victim to incur loss or damages.

Most importantly, fraud evolves from numerous court decisions around the globe. For example, in a celebrated judgement which involves Fomento (Sterling Area) Ltd vs. Selsdon Fountain Pen Co. Ltd. (1958), Lord Denning, as he then was, concluded "the auditor has to be suspicious …. and in order to perform his task properly he must come to it with an inquiring mind, that is, not suspicious of dishonesty or fraud, but suspecting that someone might have made a mistake somewhere and that a check must be made to ensure that there has been none" (Keshi, 2011; Roach, 2010).

According to the Association of certified fraud examiners (ACFE), three main categories of fraud affect organisations and institutions (ACFE, 2008). First category of internal fraud is the asset misappropriation which relates to theft or misuse of organisation's asset. Examples are theft of plant, inventory or stock and cash, false invoicing, accounts receivable fraud and payroll fraud.

Second category of internal fraud relates to fraudulent statements, that is, falsification of financial statements (e.g. falsifying documents such as employee credentials.

Third and final category of internal fraud is corruption which entails bribes or acceptance of kickbacks, improper use of confidential information, conflicts of

interest and collusive tendering. The Chartered institute of management accountants (CIMA, 2008) agrees with the position of ACFE (2008) that these types of fraud significantly influence the organisation settings. Figure 2.1 represents the summary of the internal fraud in any organisation or institution.
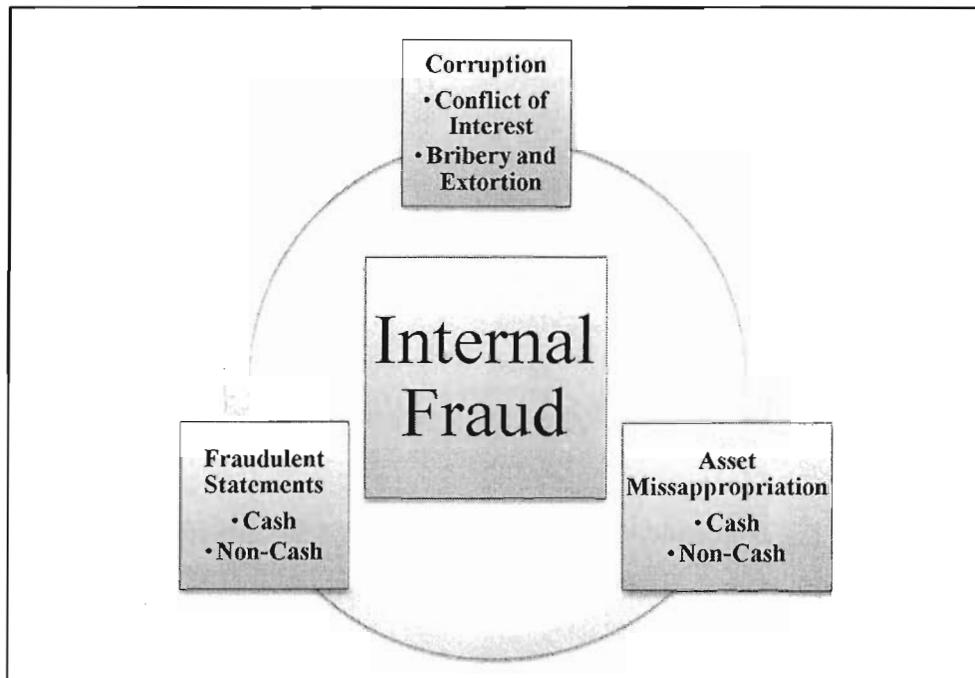
Figure 2.1
Key categories of Internal Fraud
Source: Adopted from Chartered Institute of Management Accountants (CIMA, 2008)

As noted by Wuerges (2011), fraud is "costly and dangerous" in consideration of its general effect on the public and government activities. It brings to disrepute the credibility of the auditing profession due to the unreliability of financial statements. Because of this serious charge, that is, the auditor's apparent failure to fraud detection or discovery in the audit assignment, the general public and other stakeholders require

the auditors to raise the quality of their work to such a level where fraud detection and deterrent could be easily managed (Hogan *et al.*, 2008; Nicolaisen, 2005; Hooks, 1991; Elliot & Jacobson, 1987).

The conviction of the standard setters is that Statement of auditing standard No. 99 (AICPA, 2002) would increase auditors' awareness to the prevalence of fraud during their audit engagements. Despite their laudable efforts to improve the auditors' ability to detect fraud in a litigious environment, the Public accounting oversight board (PCAOB) inspection team observes instances where auditors fail appropriately to implement Statement of auditing standard No. 99 (PCAOB, 2007). The PCAOB inspection report proves to be disappointing, and its findings are not all that surprising to the Association of certified fraud examiners (Wuerges, 2011).

For many years, the Association of certified fraud examiners (ACFE) has consistently argued that financial statement auditors are not fraud examiners and that the statutory independent audits are not capable of detecting or preventing fraud (ACFE, 2010; ACFE, 2008; ACFE, 2006; ACFE, 2004; ACFE, 2002). Similarly, in forming an opinion, statutory auditors are expected to determine whether the company's financial statements are presented fairly, in all material respects, in accordance with accepted accounting principles, the International financial reporting standards issued by the International federation of accountants and other relevant local statutes.

2.5   Evolution of Forensic Accounting and Financial Criminology

Several forensic accounting and fraud investigation scholars give conflicting accounts about the origin of forensic accounting and financial criminology. Most importantly,

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scholars such as Wells (2000) assumes the origin to be in Egypt during Pharaoh's reign; Crumbley (2001) traces the origin to the 1817 court decision, a young Scottish accountant advertises expertise in arbitration, in 1824, and Peloubet symbolises the paramount individual to use the phrase forensic accounting in 1946; Joshi (2003) ascribes the origin of forensic accounting to Kautilya, a 4th Century BCE economist who revealed forty ways of embezzlement.

Importantly, Montgomery (1921) recalls the early foundational days of auditing when students had an impartation that the main purpose of an audit rests on detection or prevention of fraud as well as the detection or prevention of errors. According to Wells (2000b), out of necessity, future textbooks and accounting philosophy altered the tract when financial transactions are so numerous to be audited, and the accrual basis of accounting became the norm. As a result, reporting challenges became the main focus of attention for the auditing profession and vouching of each transaction from the beginning to the end, which guarantees many frauds to be caught and prevented, was abandoned and consigned to the grave.

Specifically, the researcher discovers that this major lapse was capitalised upon by criminals and the resultant effect was the remarkable financial frauds and embezzlements that occurred such as McKesson & Robbins scandal, the Salad Oil swindles, the Equity Funding scam, the Savings and Loan frauds (Wells, 2000). As a result of this unhealthy environment, the accounting profession had considerable financial means of answering to the fraud challenges in the 1980s. Also, in 1987 a body called "the National commission on fraudulent financial reporting (the

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Treadway Commission)" came into existence to conduct research for all the challenges pertaining to fraud and financial crimes.

Most specifically and in 1992, the Committee of sponsoring organisations of the Treadway Commission (COSO) issued a report advocating for improved internal control systems that will assist the management to meet its objectives. Similarly, the public oversight board in a special report, "In the Public Interest" came to the conclusion that the public and other stakeholders look up to the statutory independent auditor to detect fraud, and it is the responsibility of the auditor to make sure their interest is met (POB, 2000). The profession embarked on other initiatives which led the American institute of certified public accountants in 1997 to bring out statement on auditing standards No. 82, consideration of fraud in a financial statement audit. This standard No. 82 reaffirms the profession's obligation towards fraud detection (DiGabriele, 2002; Wells, 2000).

The Certified public accountants uncover several financial statement frauds, embezzlements and tax offences such as in New Jersey, a certified public accountant assists a client to "avoid a loss of $2.4 million (and an apparent criminal indictment) by advising him not to invest in illegal tax shelter." Similarly, a Nebraska Certified public accountant discovers the book-keeper to have embezzled $420,000, all of these are achievable because certified public accountants are increasingly becoming more accomplished about the mechanisms of fraud, and achievement stories are growing and widespread (Wuerges, 2011). Ramaswamy (2007) and the Institute of chartered accountants of Nigeria (ICAN, 2013) highlight major milestones in the development of forensic accounting as represented in Table 2.2.

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Table 2.2
Major milestones in forensic accounting

Year	Milestone
1942	Maurice E. Peloubet published "forensic accounting: Its place in today's economy."
1982	Francis C. Dykman wrote, "Forensic Accounting: The Accountant as an Expert Witness."
1986	The AICPA issued Practice Aid No. 7, outlining six areas of litigation services – damages, antitrust analysis, accounting, valuation, general consulting and analyses.
1987	The National Commission on Fraudulent Financial Reporting (the Treadway Commission) was formed to study the issues of fraud and financial crimes.
1988	Association of Certified Fraud Examiners found
1988	A new genre of detective novels where the forensic accountant was the star.
1992	The American College of Forensic Examiners was found.
1997	The American Board of forensic accountants was found
1997	The AICPA issue Statement on Auditing Standards (SAS) No. 82: Consideration of fraud in a financial statement audit
2000	The Journal of Forensic Accounting, Auditing, Fraud and Taxation was established
2002	The AICPA issued Statement No. 99: Consideration of fraud in a Financial Statement audit
2008	The AICPA issued Certified in Financial Forensics Core Focus Wheel outlining areas of forensic knowledge: fundamental forensic knowledge and specialised forensic knowledge
2009	3500 Certified Public Accountants awarded Certified in Financial Forensics (CFF) certifications by the AICPA CFF Credential Committee as at September.
2009	Certified Forensic Accountants (CFA) in Nigeria was established by the Institute of Chartered Accountants of Nigeria (ICAN).
2012	400 Chartered Accountants awarded Certified Forensic Accountants (CFA) by the Institute of Chartered Accountants of Nigeria (ICAN) as at December.

Adapted from Ramaswamy (2007) and ICAN (2013)

2.5.1 Designation of forensic accounting experts

The designation of individuals who perform forensic accounting services is uncertain but varied as it depends on the professional accounting body or bodies in each country. According to the director of the forensic unit in South Africa, Danie du Plessis (2007), the designation in use includes expert accountant, forensic accountant, fraud auditor, fraud investigator, fraud examiner, and risk control manager. In

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Nigeria, the individuals who perform forensic accounting services are designated as forensic accountants having been certified by the Institute of Chartered Accountants of Nigeria (ICAN), the body established by an Act of Parliament No. 15, 1965 to regulate the accounting profession. In like manner, the forensic accounting experts in America are referred to as "fraud specialists or fraud examiners" having been certified by the American institute of certified public accountants (AICPA) and the Association of certified fraud examiners (ACFE). Hence, this study uses the term "forensic accountants" for forensic accounting professionals in Nigeria.

Most importantly, understanding this development is crucial to the researcher's understanding of forensic accounting and fraud: capability and competence requirements (i.e. forensic accounting knowledge, skills and mindset on task performance fraud risk assessment) in the Nigerian public sector working environment.

2.5.2 Forensic Accounting

The word "forensic accounting" in relation to the accounting profession exists as a field in the accounting profession. It can be argued that any accountant wishing to practice forensic accounting must possess fundamental knowledge of law, information technology knowledge, accounting knowledge, investigative skills, and communication skills – both oral and written communication (Davis *et al.*, 2010)

Prior studies have defined forensic accounting based on legislation, practice and theory and the use to which forensic accounting services embrace (Davis *et al.*, 2010; Houck et al., 2006; ACFE, 2004; Messmer, 2004). The most general definition

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includes "the use of accounting principles, theories, and disciplines to the facts or hypotheses at issue in a legal dispute, and encompasses every branch of accounting information. It also consists of two major components: (1) litigation services that recognise the role of the Certified public accountant as an expert or consultant and (2) investigative services that make use of the Certified public accountant 's skills, which may or may not lead to courtroom testimony" (AICPA). Thus, forensic accounting may involve the "use of special skills in accounting, auditing, finance, quantitative methods, certain areas of the law and research, and investigative skills to collect, analyse, and evaluate evidential matter and to interpret and communicate findings" (AICPA FLSC).

Forensic accounting may involve either an attest or consulting engagement (Crumbley *et al.* 2005). Boleigha (2011) describes forensic accounting or investigative accounting as "a detailed study and analysis of business documents and records for use as evidence in a court of law", and whereas, Bolutife (2011) identifies forensic accounting "to be focused upon the evidence of economic transactions and reporting as contained within an accounting system, and the legal framework which allows such evidence to be suitable to the purpose(s) of establishing accountability and/or valuation".

Other scholars define forensic accounting as "the use of business skills and an investigative mentality to unresolved issues, conducted within the context of the rules of evidence" (Bologna & Lindquist, 1995). To buttress, Bologna and Lindquist (1995) describe forensic accounting as "a discipline that encompasses financial expertise, fraud knowledge, and a sound knowledge and understanding of business

reality and the performance of the legal system, its development has been primarily achieved through on-the-job training as well as experience with investigating officers and legal counsel" (Bologna & Lindquist, 1995).

Similarly, Okunbor and Obaretin (2010) as well as Damilola and Olofinsola (2007) in their research define forensic accounting to be "the use of criminalities techniques and integration of the accounting, investigative activities and law procedures to detect and investigate financial crimes and related economic misdeeds."

For this study, the researcher defines forensic accounting as "the application of fundamental knowledge, enhanced skills and mindset in the accounting profession to resolve legal issues pertaining to the detection, prevention and response to fraud. It entails a process of task preparation, data collection, study, analysis and reporting organisation's financial and business related issues in a form suitable for litigation and public discussion or debate."

From the various definitions of forensic accounting by the scholars and the researcher's viewpoint, a deduction can be made about the peculiarity of forensic accounting with respect to specialised knowledge of fraud detection, prevention and response as well as enhanced skills to resolve issues as a field of the accounting profession. It is relevant to emphasise that not all engagements from the forensic accounting field would end up in a court of law (AICPA).

In as much as an opportunity arises for criminals to flourish and operate because of the influence of information technology in the global environment as a business

enabler, there would be no end to fraud challenges and demand for a forensic accountant. The challenges would culminate into reforms and changes in the definition of forensic accounting. In essence, as time goes, the forensic accounting definition would continue to evolve.

2.6   Fraud Risk Assessment

Fraud risk assessment involves a dynamic and iterative process for identifying and assessing risks to the achievement of organisational objectives. It requires those in authority to consider the impact of changes in the external environment and within its own activity model which may render internal control less effective.

The Financial reporting council (FRC) expresses concern over auditor's identification of and response to fraud risks, and the auditor's consideration of laws and regulations. This is the sequel to a review of six audit firms (BDO LLP, Deloitte LLP, Ernst & Young LLP, Grant Thornton UK LLP, KPMG LLP and KPMG Audit plc. and PricewaterhouseCoopers LLP) audit methodology and guidance and training provided to staff in respect of fraud risks and consideration of laws and regulations (FRC, 2014). Furthermore, COSO identifies risk assessment as one of the five components of internal control and considers its value in relation to potential and actual fraud in any government establishment or organisation (Internal Control Framework: COSO, 2011).

As noted by scholars, fraud risk assessment does not only indicates the direction of the audit, but assists auditors ascertain the organisation's conditions and scope of audit procedures which are planned purposely to identify the possibility and

significance of fraud occurring in any organisation (Wuerges, 2011; Chui, 2010). It involves an iterative process and in stages. The stages are: (1) developing a fraud risk assessment framework; (2) populate fraud risk; (3) rate likelihood and importance; (4) identify controls and assess alignment; (5) identify gaps, and (6) remediation (Owens, 2012).

The literature has shown that fraud by definition involves intentional misconduct that is primarily planned to escape any detection (Wells, 2005; Crumbley, 2005). Management of every organisation should initiate fraud risk assessment framework in anticipation of the behaviour of a possible fraud perpetrator. Due to the result of fraud in any organisation and in order to design procedures meant to detect fraud that may be difficult for any fraud perpetrator to penetrate requires a skeptical mindset and involves asking questions such as (1) how might a fraud perpetrator exploit weaknesses in the system of controls?; (2) how could a perpetrator override or circumvent controls?; and (3) what could a perpetrator do to conceal the fraud?

With these questions in mind, a fraud risk assessment mostly consists of three major elements such as the "identification of inherent fraud risk, the assessment of the possibility and significance of inherent fraud risk, and response to reasonably likely and significant inherent and residual fraud risks" (Owens, 2012; ACFE, 2009).

Considering the importance of fraud risk assessment on audit and investigation, previous research in accounting attested to the fact that much attention has been focused on fraud and fraud risk concerns (Allen *et al.*, 2006; Nieschwietz *et al.*, 2000). Regrettably, these studies discover that auditors are not competent to evaluate

the risk of fraud and, therefore, cannot be in a position to detect fraud in the audit of financial statements (Knapp & Knapp, 2001; Hackenbrack, 1992).

In order to re-establish public confidence in the auditing profession, the accounting and auditing standard setters in Nigeria, that is, the Financial reporting council of Nigeria (FRC) and the Institute of chartered accountants of Nigeria (ICAN) have issued guidelines on the procedures to be taken by the auditors in order to detect, deter, prevent, remediate and respond to fraud in the financial statement audit. Similarly, the O'Malley Commission suggests that auditors in the exercise of their duties should integrate forensic accounting procedures which are primarily instituted at fraud detection on every audit of financial statements (Turner, 2000; POB, 2000).

In another related instance, the PCAOB standing advisory group highlights several challenges that relate to fraud requiring accounting researchers' immediate attention. One of the issues suggested for consideration is a future research to determine whether forensic accountants are more capable than auditors in fraud detection, prevention and response (PCAOB, 2008). This clearly shows that the Standing advisory group is concerned at the impact of a forensic accountant's knowledge, skills and mindset and an auditor's knowledge, skills and mindset on task performance fraud risk assessment.

According to International standards on auditing, it is the responsibility of the auditors

> "To select appropriate procedures based on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are

appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control" (IFAC, 2009; MIA, 2008; PCAOB, 2007; ICAN, 2005).

Asare and Wright (2004) examine the influence of alternative risk assessment and programme development tools on two aspects of fraud planning efficiency. They are the quality of audit procedures in relation to a standard authenticated by a panel of experts and the tendency to consult forensic accountants. It was discovered from the study that auditors who incorporated the use of standard risk checklists on task assignment according to a statement of auditing standard No. 82 (AICPA, 1997); the predecessor to statement of auditing standard No. 99 achieved low risk assessments than those without a checklist. Most importantly, the use of the checklist was predicated on inefficient fraud diagnosis, which is suggestive of the facts that fraud risk assessment may not necessarily be associated with the planning efficiency of fraud procedures, but directly linked to the desire for consultation with forensic accountants.

Similarly, Wilks and Zimbelman (2004) in their study examine the influence of a separate assessment of attitude, opportunity, and incentive risks prior to the assessment of overall fraud risk raises auditors' feeling to opportunity and incentive signals when views of management's attitude suggest low fraud risk in an experiment with 52 practicing audit managers. Their findings indicate that "auditors who decompose fraud risk assessments are more sensitive to opportunity and incentive signals when making overall assessments than auditors who only make an overall fraud risk assessment."

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Notable researchers such as Knapp and Knapp (2001), and Hackenbrack (1992) find out also that auditors are not competent to assess the risk of fraud risk in any organisation. This pronouncement evokes reaction from some accounting researchers towards improving auditors' fraud risk assessment. Notably, studies were carried out on "the auditors' use and effectiveness of red flag questionnaires" (Asare & Wright, 2004; Pincus, 1989; Albrecht & Romney, 1986), "the use of empirically derived fraud risk models (Skousen & Wright, 2006; Tseng & Chang, 2006; Hansen *et al.*, 1996) and "the alternative methods to improve auditor's fraud risk assessment performances" (Bamber *et al.*, 2008; Wilks & Zimbelman, 2004; Jiambalvo & Waller, 1984).

Specifically, the Financial reporting council in its "2014 audit quality thematic review: fraud risks and laws and regulations" recommends six good practice on fraud to auditors, one of which is the use of forensic specialists in fraud risk discussions and in running computer assisted audit techniques (CAATs) for journal testing (FRC, 2014, p. 5).

As a result of the divergent observations of the scholars and regulators on the knowledge of the auditors to assess the risk of fraud, this study focuses on "the mediating influence of fraud related problem representation on task performance fraud risk assessment and the forensic accountant knowledge, skills and mindset and auditor knowledge, skills and mindset in the Nigerian public sector," the outcome or findings have the potential to either support or oppose the observation on fraud good practice.

2.7   Responsibility of Auditors to Detect Fraud

In the early days of auditing as a field of accounting, fraud detection was once the topmost audit objective as far back as 1500 and beyond (Wuerges, 2011; Albrecht *et al.*, 2001; Brown, 1962). According to Wuerges (2011) early British auditing objectives, which centre on the unearthing of defalcations, formed the foundation of American auditing purposes during its formative years when auditors were trained about the primary objective of the audit, which was to detect and prevent fraud and error (Brown, 1962; Montgomery, 1921; Dicksee, 1900). Auditors' ability to detect fraud was well thought out to be a virtue of the profession:

> "The detection of fraud is the most important portion of the Auditor's duties, and there will be no disputing the contention that the Auditor who is able to detect fraud is – other things being equal – a better man than the Auditor who cannot. Auditors should, therefore, assiduously cultivate this branch of their functions – doubtless the opportunity will not for long be wanting – as it is undoubtedly a branch that their clients will most appreciate." (Dicksee, 1900, p. 8)

Long before the Enron, WorldCom debacle of 2002, the audit profession was confronted with the infamous McKesson and Robbins scandal in late 1938. According to Carey (1939), McKesson and Robbins scandal was like "a torrent of cold water that shaken the accountancy profession into breathlessness." The result of the scandals made the audit profession come to an accord that "auditor (s) could not, and should not, be primarily concerned with the detection of fraud" (Brown, 1962). This incidence accounts for the shift in the nature and extent of audit in order to limit potential liability exposure for auditors and is reflected in the statement of auditing procedures No. 1, Extension of auditing procedure:

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"The ordinary examination incident to the issuance of financial statements accompanied by a report and opinion of an independent certified public accountant is not designed to discover all defalcations because that is not its primary purpose, although the discovery of defalcation frequently results... To exhaust the possibility of exposure of all cases of dishonesty or fraud, the independent auditor would have to examine in detail all transactions. This would entail a prohibitive cost to the great majority of business enterprises – a cost that would pass all bounds of reasonable expectation of benefit or safeguard therefrom, and place an undue burden on industry" (Wuerges, 2011; AICPA, 1939).

The standard marks the turning point as auditors are to be concerned with determining the fairness of their clients' reported financial statements in accordance with the accounting standards (Brown, 1962).

Due to public clamour, the Securities and Exchange Commission requests to seek further clarification from the American institute of certified public accountants with respect to auditor's responsibility on the detection of fraud (Albrecht *et al.*, 2001, Brown, 1962). In response, the umbrella organ of the auditing profession, issued another Statement of auditing practice No. 30, responsibilities and functions of the independent auditor in the examination of financial statements in 1960. Indeed, Statement of auditing practice No. 30 acknowledges that auditors should be conscious of the prospect of fraud existence during an audit; this was not positively specified and left auditors with little or no commitment to detect fraud (Wuerges, 2011; Scott & Frye, 1997; Albrecht & Willingham, 1993).

Additionally, according to International standards on auditing issued by International auditing and assurance standards board of the International federation of accountants

(IFAC, 2005) and the Nigerian standards on auditing issued by the ICAN, auditor's responsibility on the financial statements is solely to express an opinion on the audit which must be conducted in accordance with applicable standards, that is, the Nigerian standards on auditing. These standards require that auditors comply with ethical requirements and plan and perform the audit in such a manner as to obtain reasonable assurance whether the financial statements are free from material misstatement. Based on the standard requirement, the researcher argues it will, therefore, be inappropriate and misnomer to say that the responsibility for fraud detection still rests on the auditors. In addition, Gerson et al. (2006) presented a simple analogy to help clarify the differences between these two professions by equating financial statement auditors to patrolmen and forensic specialists to detectives.

On the contrary, the responsibility to prepare financial statements in agreement with accepted accounting principles and the International public sector accounting standards rests with the management of the organisation (IFAC, 2012). In performing this responsibility, management is expected to "include designing, implementing and maintaining internal controls relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies, and making accounting estimates that are reasonable in the circumstances" (IFAC, 2012).

This study intends to investigate the assertion of researchers in the conduct of fraud prevention; detection and response who are more in favour of accountants who hold forensic accounting capability will assess fraud risk higher in all conditions than

accountants who hold auditing capability (Wuerges, 2011; Crumbley, 2001; Wells, 2000).

2.8   Comparison between Forensic Accounting and Auditing

As noted by Adebisi (2011), forensic accounting and auditing can be compared in nine areas are shown in Table 2.3.

Table 2.3
Comparisons between Forensic Accounting and Auditing

Areas	Forensic Accounting	Auditing
Scope	Deeper details of why an occurrence with necessary and conclusive proof	Mainly to ascertain validity and reliability of financial statements and expression of opinion
Technique for obtaining evidence	Data examination, observation, interview, electronic evidence review and preservations, and so on.	Sampling
Staffing Requirement	Experts only	Can be done by internal and external staff (including Audit Trainee)
Timing	If necessary	Anytime (continuous or periodical)
Skills requirement	Specialised investigative, oral and written communication and information technology skills that the result will have application to a court of law. E.g., accounting, medicine, engineering, etc.	Accounting, legal and auditing
Limitation to use of the report	Usually for the hirer mainly for litigation support	Addressed to the management / Board of director. The report must be made public for Plc.
Users of services and reports	Lawyers; Police Force; Insurance Companies; Government Regulatory Bodies and Agencies; Banks; Courts; Business Community, etc.	Investors, Regulatory authority, Management, employee, suppliers, etc.
Frequency	Only when there are disputes that may result in litigation.	At least, yearly
Purpose	Often to analyse, interpret, summarise and present complex financial and business related issues in a form allowing for litigation processes. Scientific and indisputable outcome needed.	Statutory

Source: Adapted from the ICAN Audit, Investigations and Forensic Accounting Faculty (2011)

In Table 2.3, it is apparent that the forensic accountant has a higher competence to detect, prevent and respond to fraud than auditor in terms of design, frequency, limitation to use of the report, skills requirement, staffing requirements, technique of obtaining evidence, and scope areas. Hence, forensic accounting knowledge, skills and mindset are significant in task performance fraud risk assessment with emphasis on fraud detection, prevention, and response than the auditing knowledge, skills and mindset in the Nigerian public sector. To buttress, Boritz *et al.* (2008) while building on the study of Asare and Wright (2004) alluded to the fact that forensic accountants identified considerable "more fraud risk factors, and assessed control and fraud risks higher than the financial statement auditors."

This concludes section 8 and thereby leads the review to section 9 on capability and competence requirements of forensic accountants and auditors.

2.9 Capability and Competence requirements of Forensic Accountants and Auditors in specific working environments and industries

2.9.1 Definition of Capability and Competence

The International education standard No 8, Competence requirements for audit professionals issued by the International Accounting Education standards board, an organ of the International federation of accountants recommends pre-requisite requirements for accountants who assume the audit professionals role and also who have responsibility to make important judgments in an audit of historical financial information in specific working environments and industries (IFAC-IES, 2006).

The framework for International education statement defines and explains two key words, "capability and competence," which the researcher intends rigidly to use in this study.

2.9.1.1 Capability

This represents the attribute own by individuals which give them the opportunity to perform. It is described as "the professional knowledge, professional skills, professional values, ethics, and attitudes required to demonstrate competence" (IFAC-IES 8.8, 2006). The standard further explains "capability" to mean the attribute held by individuals that enable them to perform their roles competently in the workplace. The term capability comprises "content knowledge, technical and functional skills, behavioural skills, intellectual abilities (including professional judgements) and professional values, ethics and attitudes" (IFAC-IES 8, 2006). Some other literature describes capability as "competences, capacities, abilities, key skills, core skills, fundamental skills and values, attitudes, distinguishing characteristics, pervasive qualities and individual attributes" (Chui, 2010; Davis *et al.*, 2010; DiGabriele, 2008).

For this study, the researcher asserts that the importance of "capability" in terms of attribute (knowledge and skills) held by individuals and attitude (mindset) of individuals to enhance their competence (task performance fraud risk assessment) in the work area deserves much consideration and also with respect to their relationships.

2.9.1.2 Competence

This is defined as the actual demonstration of performance. It also refers to the ability to perform work roles to a defined standard with reference to the real working environment (IFAC-IES 8.8, 2006). In essence, competence is explained as the demonstrated ability to perform relevant roles or tasks to the required standard. For this study, the researcher asserts the relevance of "competence requirement" is

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significant as task performance fraud risk assessment is an issue in the Nigerian public sector accounting and auditing systems.

2.9.2   Forensic Accountant Knowledge and Auditor Knowledge

Durkin and Ueltzen (2009) describe basic fundamental forensic knowledge to include:

> "Professional responsibilities and practice management, laws, courts and dispute resolution, planning and preparation, information gathering and preservation (documents, interviews or interrogations, electronic data), finding, reporting, experts and testimony."

Bolutife (2011) supports the argument that a forensic accountant needs a high degree of competence, integrity and honesty to perform. He points out that a forensic accountant must be thoroughly trained and must prove his competence by passing all relevant examinations to become a member of a recognised accountancy body.

According to International education standard No. 8, Competence requirements of professional accountants sections 36 - 41, auditor's knowledge is classified into three, namely: (1) historical financial information audit at a higher level, (2) financial accounting and reporting at a higher level, and (3) information technology (IFAC-IES, 2006).

Forensic accountant knowledge comprises fundamental forensic knowledge and specialised forensic knowledge (AICPA, 2008). The fundamental forensic knowledge includes: "professional responsibilities and practice management; laws, courts and dispute resolution; and planning preparation; information gathering and preservation; discovery; and reporting, experts and testimony" (Davis *et al.*, 2010; Durkin & Ueltzen, 2009).

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The Certified in Financial Forensics core focus wheel confirms specialised forensic knowledge to include: "fraud prevention, detection and response; valuation; financial statement misrepresentation and family law; computer forensic analysis; bankruptcy, insolvency and re-organisation; and economic damages calculations" (Davis *et al.*, 2010; Durkin & Ueltzen, 2009).

This study focuses on one of the specialised forensic knowledge, that is, fraud prevention, detection and response.   Davis *et al.* (2010) when reflecting on the specialised knowledge requirements argue that "being an effective accountant or auditor does not necessarily translate into being an effective forensic accountant or auditor; and being an effective forensic accountant requires the professional to possess a broad spectrum of skills and knowledge".

Ramaswamy (2005) argues also that "as state business grows in size and complexity, uncovering fraud requires a forensic accountant to become proficient in an ever increasing number of professional skills and competences." Some of the areas of competences include: in-depth knowledge of financial statements, thorough understanding of fraud schemes, ability to comprehend internal control systems of corporations, knowledge of psychology, knowledge of criminology, command of criminal and civil laws, knowledge of organisation's governance policies, proficiency in computers and knowledge of network systems, and interpersonal and communication skills (Ramaswamy, 2005).

Most importantly and for this research, forensic accountant knowledge as an attribute suggests the use of accounting, laws, quantitative analysis, information technology

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and criminology know-how to prevent, detect and respond to fraud in the public sector environment while auditor knowledge as an attribute implies the designing of audit procedures considered necessary to provide sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement.

2.9.3 Forensic Accountant Skills and Auditor Skills

Specifically, skills are defined as an attribute which relates to competences in the areas of knowledge and ability as well as those that relates to performance in fraud risk assessment task in the public sector environment (IFAC-IES 3, 2005). By inference, the knowledge and ability component on one part refers to whether an individual has the background knowledge and thinking skills to be effective, whereas the performance component on the other part identifies the ability of an individual to make this knowledge and ability into an operational presentation.

International education standard No 3, Professional skills issued by the International federation of accountants in 2005 describes skills as "an essential part of the set of capabilities needed for professional accountants to demonstrate competence" (IFAC-IES, 2005). The skills requirements of professional accountants are "intellectual skills, technical and functional skills, personal skills, interpersonal and communication skills, and organisational and business management skills" (IFAC-IES 3.3, 2005).

Forensic accountant skills represent exclusive skills which are developed primarily to gather evidence for the purpose of fraud detection, prevention and response, unlike a

financial statement auditor whose skills are meant to "provide reasonable assurance that the reported financial statements taken as a whole are stated fairly, in all material respects, in accordance with Nigerian standards on auditing and International auditing standards and are, therefore, free of material misstatement" (Ekeigwe, 2011; Davia, 2000).

Most specifically, forensic accounting requires individuals who are skilful in the "use of investigative and analytical skills related to the areas of accounting records, gathering and evaluating financial statement evidence, interviewing all parties related to an alleged fraud situation, and serving as an expert witness in a fraud case" (Hopwood *et al.*, 2008; Rosen, 2006; Singleton *et al.*, 2006). On the contrary, auditors require exclusive skills to look at the evidence placed before him from different standpoints, having recognised different possible interpretations and the implications of the matter in hand.

The forensic accounting literature that has emerged since the 1990s reflected the shifting scope of apprehensions about the characteristics and skills of the forensic accountant. Several articles focused on the high demand for accountants and auditors to conduct forensic accounting assignments and on the widening meaning of forensic accounting away from the parochial fraud finding meaning (Rezaee *et al.*, 2006; Baron, 2006; Wells, 2003). David (2007) argues on the specific skills of forensic accountants to involve not only in objective verification but also abilities gained from experience in the workplace.

According to Davis *et al.* (2010), prior research queried what constitutes the importance specialised skills and technical abilities of forensic accountants (Ramaswamy, 2005; Messmer, 2004; Cohen, Crain, & Sanders, 1996) and experience levels (Grippo & Ibek, 2003). As a follow up, James DiGabriele in an article titled "an empirical investigation of the relevant skills of forensic accountants" identifies nine relevant skills of forensic accountants (DiGabriele, 2008). These competences are: deductive analysis, critical thinking, unstructured problem solving, investigative flexibility, analytical proficiency, composure, specific legal knowledge, written communication and oral communication.

As noted by Owojori and Asaolu (2009), the need for forensic accountants became an issue as a result of the let-down of audit system in the organisation since the organisation's internal and external audit did not live up to the required standard to figure out definite errors in the management system. Reacting to the skills of accountants, Dubinsky (2006) emphasises:

> "Even though forensic accounting is currently on the hot list of client services, there are plenty of accountants getting involved who should not be because they do not understand the ins and outs of the niche. Many accountants think it is only fraud investigation, and it is not. It is really much more than dealing with the numbers. It is no longer just basic fraud business."

Kahan (2006) in its publication titled "Sherlock Holmes enters accounting: Dramatic increase in fraud brings more CPA sleuths into the industry" agrees with the position taken by Bruce Dubinsky (2006), a partner and director of forensic accounting and dispute analysis at the Bethesda, Maryland firm of Dubinsky & Company, PC. Daniel and Lee (2006) also concur with Dubinsky's assertion that other accountants may look at the charts, but forensic accountants actually dig into the body.

This study defined skills (forensic accountant and auditor) as all-encompassing person's attributes necessary and relevant to demonstrate competence in task performance fraud risk assessment.

For this research, the researcher affirms the position of both Dubinsky (2006), Daniel and Lee (2006), and Kahan (2006) with regard to entry into the forensic accounting profession as forensic accountants dig deep in order to objectively verify facts and figures relevant to resolve legal issues involving complex financial matters and report in such a way that a layman can understand and make informed useful decisions.

2.9.4   Forensic Accountant Mindset and Auditor Mindset

Mindset is defined as "a characteristic mental attitude or a fixed state of mind that usually influences an individual's behaviour towards a situation; it is also referred to as a predisposition or a habit, and it is usually challenging to alter" (Ask.com, 2013). Falconer (2012) defines mindset as a "state of mind, experienced as a powerful but subtle, and yet mostly unacknowledged feeling as distinct from an emotion, held as core assumptions forming the principal motivations for participation". Dweck (2006) defines mindset as two primary psychology attitudes and orientations, which she finally refers to as "the fixed and growth mindsets". Similarly, mindset can be defined as a qualitative motivation for all action, forming the quantitative basis of all outcomes (Falconer, 2012).

For this study, the researcher defines mindset as a positive mental attitude which influences individual's cognitive behaviour towards a task performance fraud risk assessment.

Mindset for several decades has become a source of state intelligence policy let-downs. Effective and efficient study methods to get out of mindset challenges have also been established, but bureaucratic undercurrents in government make those methods very difficult to implement. One of the most promising methods for getting over mindset is, according to Chui, the evidence-based multiple scenario analysis that is possibly best utilised in a lightly structured and interacted organisation (Chui, 2010).

According to Feder (2000), strategic planners and intelligence professionals whose efficiency and effectiveness depend on overpowering mindset face a phenomenal challenge when working in a bureaucratic setting. Torelli and Kaikati (2009) posit that values are abstract representations of the ideal, and, therefore, more probably employed to influence behaviour when individuals think abstractly or concretely and focus on high or low level motivations for interpreting their actions.

Similarly, Brandstatter & Frank (2002) in a study with a sample size of 243 students, the hypothesis tested was that mindset affects goal-directed persistence at behavioural conflict situations. The inferences that could be made from their findings are that the implemental mindset is a self-regulatory instrument that permits a flexible response to the demands of a particular situation. In essence, it is evident that mindset affects the behaviour of people most especially in the areas of task performance fraud risk assessment.

The auditor has immunity from the auditing standard (PCAOB, 2007) with respect to document authentication. The auditing standard states that "an audit rarely involves

the authentication of documentation, nor is the auditor trained as or expected to be an expert in such authentication" (PCAOB, 2007). Undoubtedly, forensic accountant thought is based on the authenticity of events and activities relating to accounting records (Singleton & Singleton, 2007; Singleton *et al.*, 2006). More importantly, forensic accountants are commissioned with the sole aim of making a categorical assertion about the presence of fraud (Wuerges, 2011; Singleton & Singleton, 2007; Singleton, *et al.*, 2006; Silverstone & Davia, 2005).

Previous research has shown that forensic accountants are more thoughtful and better accomplished than auditors in fraud finding in the audit assignment especially when fraud exists (Boritz *et al.*, 2008), and also that the forensic accountant mindset is more significant than auditor mindset in task performance fraud risk assessment (Chui, 2010).

For this study, the researcher explores the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills, and mindset (forensic accountant and auditor) in the Nigerian public sector: a developing country public sector since Chui (2010) and Boritz *et al.* (2008) studies reflected on private sector environment (accounting firm) in a developed country.

2.10   Fraud Related Problem Representation

Problem representation has at various times been described as "an internal reasoning structure, which embodies an individual's understanding and interpretation about a fraud related problem situation" (Christ, 1993; Chi *et al.*, 1981; Greeno, 1977).

Prior research shows that persons cultivate problem representation when the need to carry out the decision making job arise (Pitz & Sachs, 1984; Mani & Johnson-Laird, 1982). This internal structure is assembled by fashioning available problem information into persons existing data which is necessary and appropriate for the kind of decision assignment they might be involved (Koonce, 1993; Chi *et al.*, 1981). As noted by previous research, the fashioning process accelerates the assembling of emotional slots used to help persons accumulate information with respect to decision making job (Wyer & Srull, 1980; Pichert & Anderson, 1977).

Lastly, this transforming process enables persons to create a mental image or better still a road map of contextual challenges, which in turn assists in addressing and solving the decision making job in addition to the retrieval of relevant information from the earlier assembled psychological slots (Glaser, 1984; Wyer & Srull, 1980). For example, auditors who have the assignment of reviewing the internal control system of the organisation would articulate a fraud related problem representation that helps to understand the contextual nature of the assignment to be appraised.

The underlying purpose of a fraud related problem representation is to encourage individuals' understanding of a problem and solving of the challenge (Markman & Gentner, 2001; Rouse & Morris, 1986). Also, such representation empowers individuals to deduce the significance of the work outside the rudimentary specifics which are given before undertaken the job (Christ, 1993; Pitz & Sachs, 1984).

This concludes section 10 of the literature review and commences section 11, which deals with the underpinning theory of the research.

2.11 Underpinning Theory

In this section two of the literature review, the researcher discusses the theory of reasoned action, the theory of planned behaviour (extended), the fraud triangle theory, and the triangle of fraud action theory.

2.11.1 Theory of Reasoned Action

The theory of reasoned action is primarily used to explain individuals' behaviour through the impact of attitude as far back to the period of 1918 - 1970. This theory originates from the expectancy value theories in the social psychology field. Ajzen and Fishbein (1980) emphasise that the theory of reasoned action is "designed to explain essentially any human behaviours".

The basis of the theory of reasoned action is premised on the postulation that individuals are rational. It is expected that they will make organised use of the information at their disposal in order to take necessary, reliable and relevant action. In essence, individuals consider the implications of their actions before they make a decision either to engage or not to engage in a particular behavioural situation (Ajzen & Fishbein, 1980). The theory of reasoned action emphasises that in making rational decisions, intention is the best predictor of behaviour (Fishbein & Ajzen 1975).

In addition, the theory of reasoned action has shown that the most significant determining factor of an individual's behaviour is behavioural intentions, which is a grouping of attitude towards the performance of the behaviour and subjective norms. However, according to Ajzen (1985), the theory of reasoned action is limited by what is known as correspondence. This is buttressed by Sheppard *et al.* (1988) that

intention and attitude must agree on a course of action in order to predict particular behaviour.

The theory of reasoned action may be applicable for the current study because attitude and subjective norms possess significant impacts on the behaviour of individuals such as forensic accountant and auditor in the public sector. However, there is a limitation to the use of the theory of reasoned action due to its inability to account for external and threat perception factors beyond individual level.

2.11.2 Theory of Planned Behaviour (Extended)

The theory of planned behaviour is an offshoot of the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) that includes only the first two constituents of the model: (1) attitude, and (2) subjective norms. According to Cohen, Ding, Lesage & Stolowy (2010), and Hess (2007) the theory of planned behaviour is a "parsimonious model" but has substantial power to explain disparities of intentions. The straightforwardness of the design makes it a veritable tool for understanding and clarifying the numerous studies conducted on the ethical behaviour in organisations.

The theory of planned behaviour is very useful to predict dishonest actions (Beck & Ajzen, 1991). As noted by Al-Qeisi (2009), the theory of planned behaviour does not recognise person's volitional control before it addresses the problem of behaviours that happen, and it contrasts from the theory of reasoned action owing to the inclusion of perceived behavioural control. This element accounts for circumstances where a person has less than absolute control over the behaviour. This can vary across conditions and actions (Ajzen, 1991).

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As noted by Ajzen (2006), the theory of planned behaviour deals with the backgrounds of attitude, subjective norms and perceived behavioural control, and; therefore, it assumes that behaviour is a role of salient beliefs applied to that behaviour. The beliefs include: (1) behavioural beliefs, (2) normative beliefs, and (3) control beliefs. As confirmed in a survey study by Carpenter and Reimers (2005), the theory of planned behaviour can assist to shed more lights on unethical and fraudulent financial reporting.

There is no model that has no limitation and; therefore, the theory of reasoned action and the theory of planned behaviour are not without limitation. Even though, the theory of planned behaviour came into existence as a replacement of the theory of reasoned action. In view of its volitional control drawback which states that behaviours are "deliberate and planned", the theory of planned behaviour does not show how do people plan and how does planning mechanism relate to the theory.

2.11.3 The Fraud Triangle Theory

The fraud triangle theory came into prominence through Cressey (1950) as a PhD student in criminology who began the research on embezzlement behaviour. As noted by Dorminey, Fleming, Kranacher and Riley (2012), Cressey conducts interviews with inmates in the Illinois State Penitentiary at Joliet, and notices common attributes among convicts serving time for white collar offences and based on his observations, three criteria for criminal violations of trust were hypothesised. These are "a non-shareable financial problem, knowledge of the workings of a specific enterprise and the opportunity to violate a position of trust, and the ability to adjust one's self-

perception such that violating this trust does not constitute, in his or her mind, criminal behaviour" (Cressey, 1950).

These criteria develop into (1) perceived pressure, (2) perceived opportunity, and (3) rationalisation. This eventually evolves into what we know today as the "fraud triangle" (Dorminey *et al.*, 2012). As noted by Cohen *et al.* (2010), these three elements of fraud were first recognised by Sutherland (1949) and were later developed by Cressey (1953).

In addition, Albrecht *et al.* (1982) in their study adapt the concept from criminology to accounting and reinforced the disintegration with a study of over 1500 fraud references. Their study acknowledged 82 fraud related variables which are classified into three as: (1) situational pressures, (2) opportunities to commit fraud, and (3) personal integrity.

Similarly, Statement of auditing standard No 99, Consideration of financial statement fraud in an audit (AICPA, 2002) posits three requirements for fraud to occur. These are: (1) management or other employees have an incentive or are under pressure that provides a reason to commit fraud; (2) conditions exist in the absence of controls, ineffective controls, or the ability of management to override controls – that provide an opportunity for fraud to be perpetrated, and (3) those involved are able to rationalise committing a fraudulent act.

Prior research has shown that some persons possess an attitude, character, or a set of moral values that allow them to knowingly and intentionally commit a dishonest act

(Cohen *et al.*, 2010). In essence, there is a link from these definitions to the fraud triangle which clearly indicates the theory can render useful means of predicting the perspective in which individuals may act unethically and thus, encourage the perpetuation of fraud.

2.11.4 The Triangle of Fraud Action Theory

The Triangle of fraud action theory deals with the features of the white collar crime, that is, the action. As noted by Dorminey *et al.* ((2012), the fraud triangle identifies the conditions under which fraud may occur, whereas the triangle of fraud action theory describes the actions an individual must perform to perpetrate the fraud. The meta-model structure which shows the Fraud triangle and Fraud Diamond, and the Triangle of fraud action as a measure for evaluating the anti-fraud profession's response are illustrated in Figure 2.2.
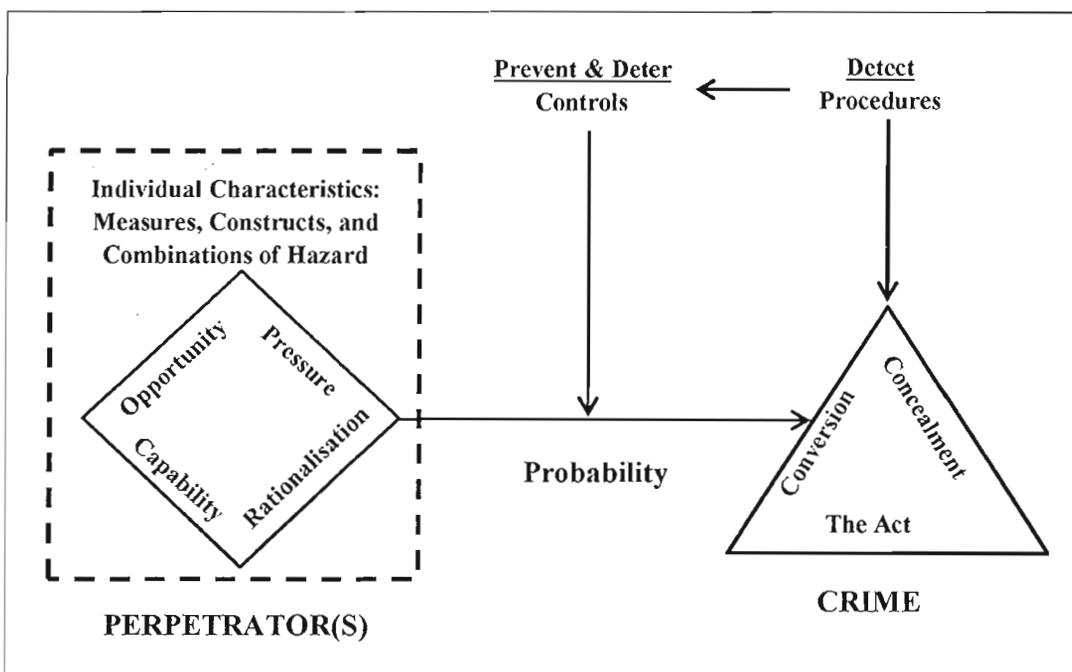
Figure 2.2
A Meta-model Framework for Evaluating the Anti-fraud Profession's Response
Source: Adapted from Dorminey *et al.*, (2012); Wolfe and Hermanson (2004); and Cressey (1953).

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Previous research has shown that the consequence to the fraud triangle is the lesser-known triangle of fraud action, sometimes referred to as the "components of fraud" (Kranacher *et al.*, 2011; Albrecht *et al.*, 2006). The three components of the triangle of fraud action are: (1) the act/theft, (2) the concealment, and (3) the conversion. For example, the "act" represents the execution and methodology of the fraud such as embezzlement, cheque kiting, or substantial fraudulent financial reporting. Also, the "concealment" represents hiding the fraudulent act such as creating false journal entries, falsifying bank reconciliations or destroying files while the "conversion" is the process of turning the ill-got gains into something usable by the perpetrator in a way that appears to be legitimate, such as money laundering, cars, or homes.

The incremental value of the triangle of fraud action theory according to Dorminey *et al.*, (2012) is that it represents the documentation of specific actions with evidence as well as control points where the potential fraud may be prevented, detected or remediated. This clearly shows that forensic accountants could develop certain procedures, controls, or structure their audits in such a way to illuminate the act, the concealment or the conversion.

The triangle of fraud action theory is the greatest value of the forensic accountant or fraud specialist where evidence of intent is required. While the fraud triangle directs forensic accountants to why people might commit fraud, the evidentiary trail might not be firm or unavailable. For example, the financial pressure and rationalisation elements of the fraud triangle are not directly observable and accordingly a lack of fraud evidence which is not proof that a fraud has not occurred (Ramamoorti, 2008).

It, therefore, follows that forensic accountants require an evidenced-based approach to conduct audits or investigations, and the triangle of fraud action is most helpful in this regard because the components can be directly observed and documented.

The triangle of fraud action theory represents a theory model for detecting fraud and obtaining prosecutorial evidence. This means the evidence of the act; concealment and conversion could be collected and presented in a court of law or public adjudication. In totality, it could be said the triangle of fraud action makes it an undeniable fact for the perpetrator to argue that the act was accidental or to deny the role in the act. Dorminey *et al.* (2012) argues that the evidence of concealment especially provides a convincing argument that the act was intentional.

2.11.5 Integrating the Triangle of Fraud Action Theory (TFAT) and the Theory of Planned Behaviour (TPB)

For this study, the researcher examines the mediating impact of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) by adapting and integrating the triangle of fraud action theory (Dorminey *et al.*, 2012; Kranacher *et al.*, 2011; Albrecht *et al.*, 2006) with the theory of planned behaviour (Ajzen, 1991; 1988; 1985).

It is to be noted that the triangle of fraud action theory describes the actions an individual must perform to perpetrate fraud; that is, the three components - the act, the concealment, and the conversion; and the theory of planned behaviour that integrates attitude, subjective norms, perceived behavioural control, and Beck and Ajzen's (1991) moral obligation. To buttress further, Carpenter and Reimers (2005) confirm

in an empirical study that the theory of planned behaviour can assist to shed more lights on unethical and fraudulent financial reporting.

Although, it is significant to state that the research from Chui (2010) excludes any underpinning theory. This study having realised the occurrence of a gap and in contribution to the body of literature hereby addresses the seemingly apparent gap. Hence, the researcher reviews and discusses relevant underpinning theories with respect to the investigation of the fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) and brands the association "TFAT/TPB" (for "triangle of fraud action theory/theory of planned behaviour applied to fraud" that is depicted in Figure 2.3.

Given that the Triangle of fraud action theory and the theory of planned behaviour as shown in Figure 2.3 are complementary theories, this study, therefore, integrate them for use as a theory model in this research. Prior study also shows that auditors usually perceive "attitudinal" factors to be significant fraud signals than "situational" factors (Heiman-Hoffman *et al.*, 1996).

Consequently, this study brands the association "TFAT/TPB" (for "triangle of fraud action theory/theory of planned behaviour applied to fraud"). This association is depicted in Figure 2.3, and most specifically considered to be an integral part of this study.
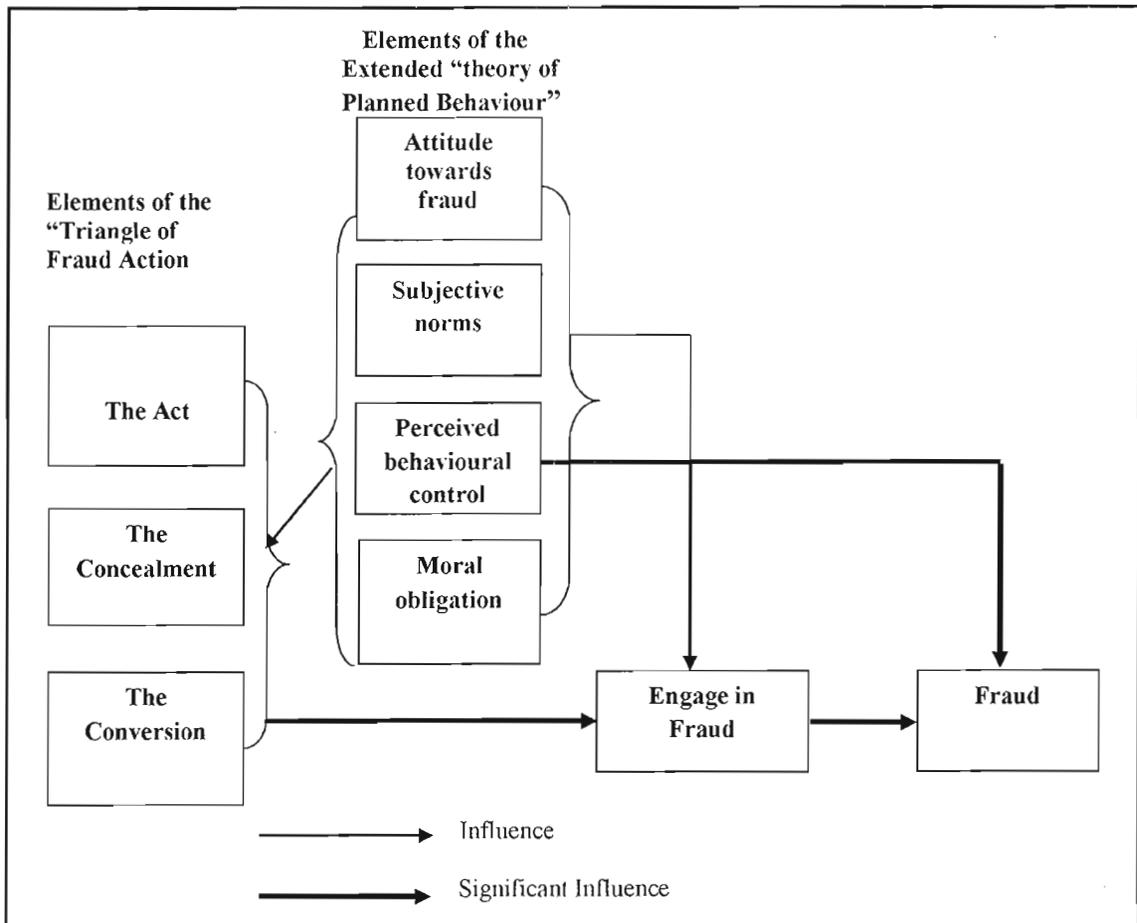
Figure: 2.3
An integration of triangle of fraud action theory (TFAT) and theory of planned behaviour (TPB): an association of "TFAT/TPB"
Source: Adapted from Albrecht *et al.* (2006); Ajzen (1991); Beck & Ajzen (1991).

2.12   Chapter Summary

This chapter has reviewed the relevant literature on forensic accounting and fraud: capability and competence requirements (i.e. the mediating influence of fraud related problem representation on task performance fraud risk assessment and forensic accountant and auditor knowledge, skills and mindset) in the Nigerian public sector.

The first part of section one discussed public sector accounting and auditing systems, the organs of accountability in Nigeria, the evolution of forensic accounting and

financial criminology which is aimed at rendering assistance towards understanding task performance fraud risk assessment as a dependent variable. The second part of section one highlighted on forensic accountant and auditor's knowledge, forensic accountant and auditor's skills; forensic accountant and auditor's mindset as independent variables. Thus, fraud related problem representation is adjudged an essential constituent of an individual's task performance judgment for its influence on individuals' problem understanding and problem solving assignment (Chui, 2010; Sutton, 2003; Christ, 1993; Bedard & Chi, 1993, Pitz & Sachs, 1984; Greeno, 1977).

Section two has also discussed several relevant theories relating to the subject, which was apparently not covered in an earlier study by Chui (2010) such as the theory of reasoned action, the theory of planned behaviour, the fraud triangle and triangle of fraud action. In addition, it integrated the triangle of fraud action theory (TFAT) and the theory of planned behaviour (TPB) to illustrate a theory model for detecting fraud and obtaining prosecutorial evidence and the importance of attitude factors to red flags or symptoms of fraud that is central to this study.

Following, this section of the study led to the next chapter that are designed primarily to discuss the research framework and the development of hypotheses established for empirical testing and validation.

CHAPTER THREE

RESEARCH FRAMEWORK AND HYPOTHESIS DEVELOPMENT

3.1   Introduction

In this chapter, several hypotheses are established for empirical testing and validation

based on five major constructs. These constructs constitute the knowledge, skills, and

mindset (forensic accountant and auditor) as the independent variables. In addition,

fraud related problem representation as the mediating variable, and task performance

fraud risk assessment as the dependent variable. Fifteen hypotheses were formulated

for empirical testing. Ten of which deal with relationship between the variables and

five relate to differences in assessment rankings between forensic accountant and

auditor on knowledge, skills, mindset, fraud related problem representation, and task

performance fraud risk assessment in the Nigerian public sector.

This chapter of the study is divided into eight major sections. First, section 3.1

presents an introduction to the chapter. Second and following the introduction, section

3.2 affords a detailed discussion of the overall research framework (i.e. capability and

competence requirements in the public sector environment). Third, sections 3.3 to 3.5

provide a vivid discussion on the linkages between knowledge, skills, mindset and

task performance fraud risk assessment. Furthermore, a detailed study on the linkages

between knowledge, skills, mindset and fraud related problem representation, and as

well as fraud related problem representation and task performance fraud risk

assessment. Fourth, section 3.6 highlights theoretical framework and hypotheses of

the study. Fifth, the differences between forensic accountants and auditors on

knowledge, skills, mindset, fraud related problem representation and task performance

fraud risk assessment takes the centre stage of section 3.7. Sixth and last, section 3.8 deals with short chapter summary, therefore, brings to an end all the eight main sections of chapter three of this study.

3.2   Research Framework

The research framework in this study is an offshoot from Chui (2010) which was applicable to the private sector (audit firms) in a developed country, United States of America. This study fills the research gap and extends the research frontier to public sector in a developing country; Nigeria that Chui (2010) acknowledged to be valuable and interesting if future research can be undertaken on the relationship between mindset, problem representation and knowledge of forensic accountant and auditor on task performance fraud risk assessment (Chui, 2010 p.87).

Furthermore, the research framework is being derived from auditing standards such as Nigerian Standards of Auditing (NSA) No 5, The Auditor's responsibility to consider fraud in an audit of financial statements (ICAN, 2005), Statement of Auditing Standards (SAS) No 99, Consideration of fraud in a financial statement audit (AICPA, 2002) with specifics on the assignment of personnel and supervision on the overall responses to the risk of material misstatement (AICPA, 2002, section 316.50). Section 316.50 states that "an auditor may respond to an identified risk of material misstatement due to fraud by assigning additional persons with 'specialised skills and knowledge', such as forensic and information technology (IT) specialists" (AICPA, 2002, Sec. 316.50, p. 177).

Similarly, the research framework is built on the literature review for a wholestic study which had earlier been done in piecemeal (Davis, Farrel & Ogilby, 2010; DiGabrielle, 2008) and adopted the International Education Standard (IES) No 8, Competence requirements for audit professionals (IFAC-IES, 2006). It is important to state that the International education standards board (IESB) is an organ of the International federation of accountants whose functions among others include the issuance of International education standards.

The International Education Standard (IES) No 8 in its structure identifies two key terms, namely: (1) capability, and (2) competence as essentials for accountants who assume the audit professionals role and also who have responsibility to make important judgments in an audit of historical financial information in specific working environments and industries (IFAC-IES, 2006).

3.2.1 Capability

The term "capability" refers to the quality possess by individuals that give such individuals the opportunity to perform. This attribute is recognized as: (1) professional knowledge, (2) professional skills, (3) professional values, ethics, and attitudes necessary for individual accountants and auditors to demonstrate competence (IFAC-IES 8.8, 2006). In essence, capability enhances individual performance in the workplace.

As noted by IES No 8, capability consists of "content knowledge, technical and functional skills, behavioural skills, intellectual abilities (including professional judgements) and professional values, ethics and attitudes" (IFAC-IES 8, 2006). Prior

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study describes capability as "competences, capacities, abilities, key skills, core skills, fundamental skills and values, attitudes, distinguishing characteristics, pervasive qualities and individual attributes" (Davis, Farrel & Ogilby, 2010; DiGabrielle, 2008).

For this study, the researcher asserts that the value of "capability" in terms of attribute (knowledge and skills) held by individuals and attitude (mindset) of individuals to enhance their competence (task performance fraud risk assessment) in the work place deserves to be researched upon in the public sector considering their relationships and the impact of fraud on the nation's economy.

3.2.2   Competence

The term "competence" refers to the actual demonstration of performance. It also embodies the ability to perform work roles to a defined standard with reference to the real working environment (IFAC-IES 8.8, 2006). In essence, competence is explained as the demonstrated ability of forensic accountants and auditors to perform relevant roles or tasks assigned to the required standard.

For this study, the researcher emphasizes the importance of "competence" to forensic accountants and auditors' task performance fraud risk assessment in the Nigerian public sector and, as such cannot be over-emphasised or ignored.

In view of the above, the researcher examines the relationship between fraud related problem representation on knowledge, skills, mindset (capability) and task performance fraud risk assessment (competence) of auditors and forensic accountants, the research framework is developed as shown in Figure 3.1.
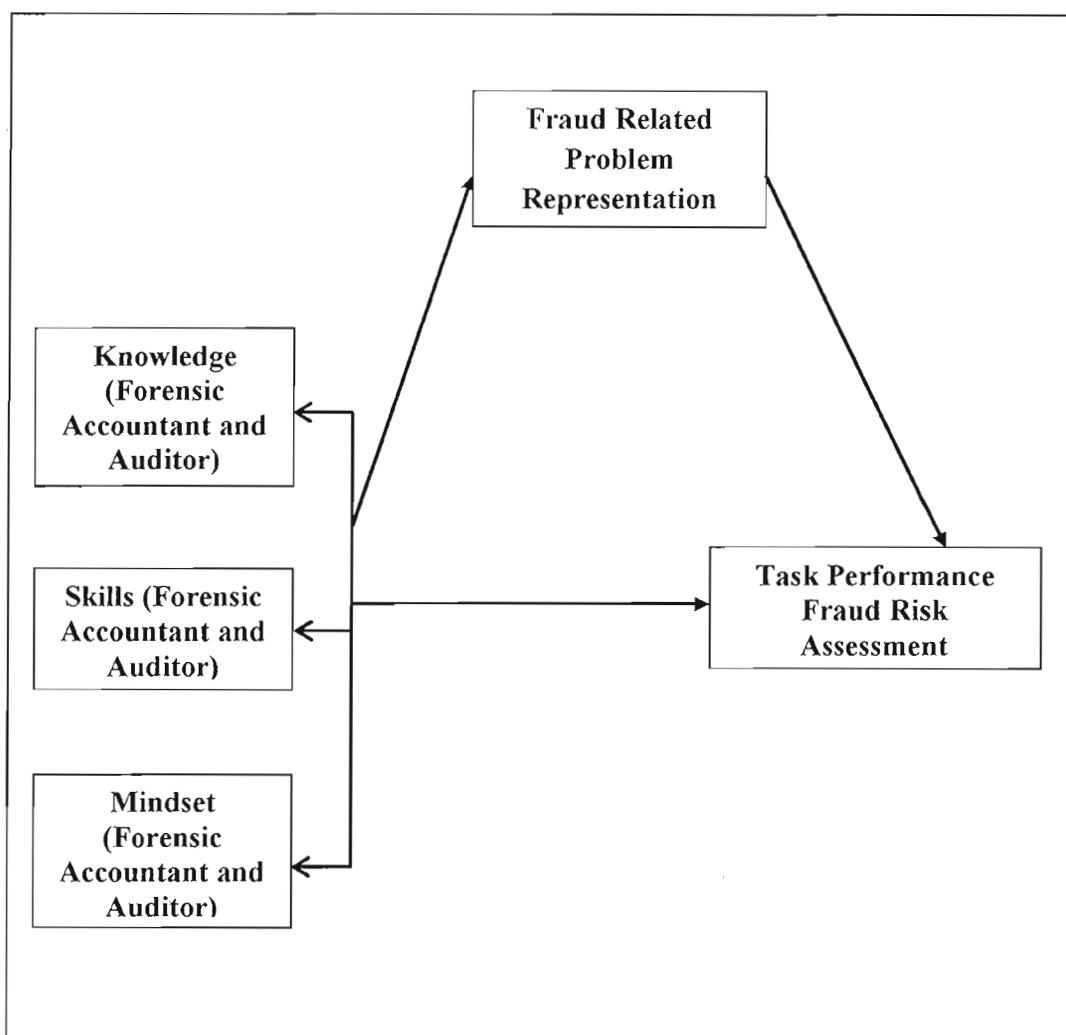
Figure 3.1
Research framework - Forensic Accountants, Auditors and Fraud: Capability and Competence requirements

3.3 The Influence of Knowledge, Skills, and Mindset on Task Performance Fraud Risk Assessment

The first theoretical linkage in this research framework represents the prediction that knowledge, skills and mindset (forensic accountant and auditor) have a direct influence on task performance fraud risk assessment. Based on previous literature, a modest change in knowledge, skills and mindset could produce considerable performance changes as well as impact individuals' sureness, resolve, and obligation

to achieve decision-making job (Chui, 2010; Davis *et al.*, 2010; DiGabriele, 2008; Brandstatter & Frank, 2002; Gollwitzer, 1990). This research postulates three hypotheses as follow:

Hypothesis 1a: There is a positive significant relationship between Knowledge (forensic accountant and auditor) and task performance fraud risk assessment.

Hypothesis 1b: There is a positive significant relationship between Skills (forensic accountant and auditor) and task performance fraud risk assessment.

Hypothesis 1c: There is a positive significant relationship between Mindset (forensic accountant and auditor) and task performance fraud risk assessment.

3.4   The Influence of Knowledge, Skills and Mindset on Fraud Related Problem Representation

The second theoretical relationship in this research framework epitomises the impact of knowledge, skills and mindset on the fraud related problem representation. Knowledge, skills and mindset have indirect influences on decision making task performance through the development of an emotional structure which is often referred to as fraud related problem representation (Kleinman & Palmon, 2007; Gupta & Govindarajan, 2002; Bargh & Chartrand, 2000; Galinsky & Moskowitz, 2000; Gollwitzer, 1996; Allport, 1940).

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The relationship between knowledge, skills and mindset, and fraud related problem representation have been recognised and buttressed by the psychology and accounting literature. These studies have made available empirical evidence to argue the assertion that skills, knowledge and mindset influence the development of individuals' fraud related problem representation, which in turn inspire their task performances (Torelli & Kaikati, 2009; Kadous & Sedor, 2004; Armor & Taylor, 2003). Following on the discussion, this study asserts that there is a significant relationship between knowledge, skills and mindset and fraud related problem representation. Specifically and in recognition of this reasoning, three hypotheses are thus formulated:

Hypothesis 2a: There is a positive significant relationship between Knowledge (forensic accountant and auditor), and fraud related problem representation.

Hypothesis 2b: There is a positive significant relationship between Skills (forensic accountant and auditor), and Fraud related problem representation.

Hypothesis 2c: There is a positive significant relationship between Mindset (forensic accountant and auditor), and Fraud related problem representation.

3.5   The Influence of Fraud Related Problem Representation on Task Performance Fraud Risk Assessment

Prior study has shown that the fraud related problem representation has a consequential impact on individual's judgement and decision making (Kadous &

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Sedor, 2004). In addition, Bierstaker *et al.* (1999) study that investigate auditors' problem representation and their performance on analytical procedure job using a think aloud verbal protocol to elicit auditors' problem representation about their clients' allocation of overhead costs lend weight to Kadous and Sedor (2004) study.

Based on the above discussion, this study asserts that there is a significant relationship between fraud related problem representation and task performance fraud risk assessment. On the basis of this reasoning, the formulated direct hypothesis is:

Hypothesis 3a: There is a positive significant relationship between fraud related problem representation and task performance fraud risk assessment.

3.5.1 Mediating Hypotheses

Most importantly, and as stated in Hypotheses 2a, 2b, 2c, and 3a, there is positive significant relationship between knowledge, skills and mindset, and fraud related problem representation on one part, and also a positive significant relationship between fraud related problem representation and task performance fraud risk assessment on the other part. Thus, this study asserts that fraud related problem representation mediates the relationship between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment. It is, therefore, hypothesised as follows:

Hypothesis 4a: Fraud related problem representation positively mediates the relationship between knowledge and task performance fraud risk assessment.

Hypothesis 4b: Fraud related problem representation positively mediates the relationship between skills and task performance fraud risk assessment.

Hypothesis 4c: Fraud related problem representation positively mediates the relationship between mindset and task performance fraud risk assessment.

3.6   Theoretical Framework and Hypothesis of the Study

Specifically, Figure 3.2 summarises the theoretical framework and hypothesis of this study. Path diagram (I) denotes the direct effect of knowledge, skills and mindset on task performance fraud risk assessment. Path diagram (II) signifies the indirect effect of knowledge, skills and mindset on task performance fraud risk assessment through the mediator variable – fraud related problem representation.

Figure 3.2 represents the Theoretical framework and Hypothesis development of Fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (Forensic Accountant and Auditor).
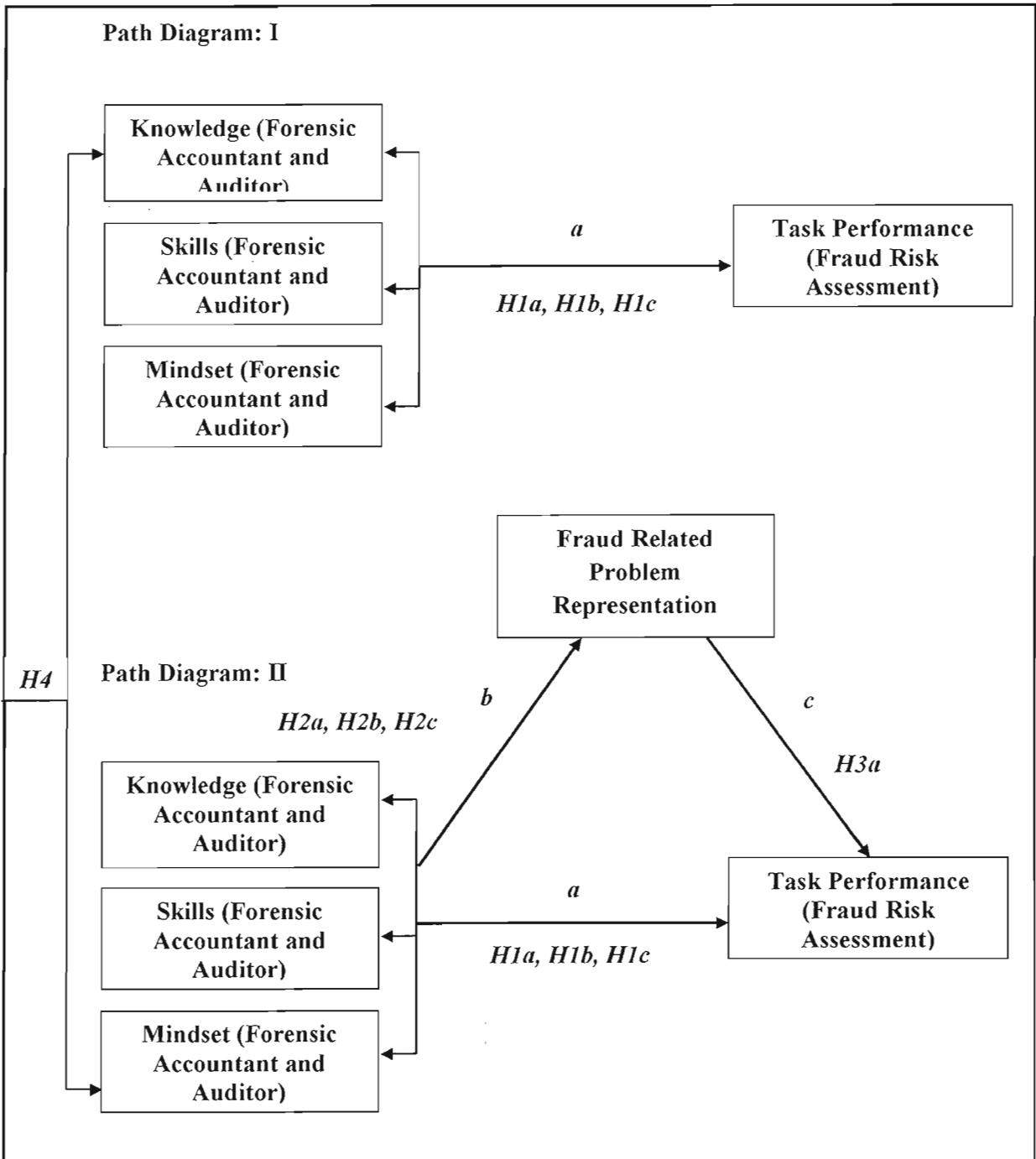
Figure 3.2
*Theoretical framework and Hypothesis development of Forensic Accountants,
Auditors and Fraud: Capability and Competence requirements*
Source: Adapted from Chui (2010); and Fritz and MacKinnon (2007)

Specifically, Hypotheses 1a, 1b and 1c (H1a, H1b and H1c) in the path diagram (I) embody the hypothesised relationships between knowledge, skills and mindset, and task performance fraud risk assessment. In the path diagram (II), Hypothesis 2a, 2b and 2c (H2a, H2b and H2c) represent the hypothesised association between knowledge, skills and mindset, and fraud related problem representation. Hypothesis 4a, 4b, 4c (H4a, H4b, H4c) are exemplified by the two path diagrams, (I) and (II), considered as a whole, that is, the total effect.

As depicted in the theoretical framework, a forensic accountant knowledge, skills and mindset and auditor knowledge, skills and mindset have both a possible direct influence as stated in section 3.3 and illustrated in Path Diagram I of Figure 3.2 on task performance fraud risk assessment and the indirect influence as highlighted in section 3.4 and illustrated in Figure 3.2 (Path Diagram II) on task performance fraud risk assessment. Figure 3.2 illustrates the total effect of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in the Nigerian public sector.

This study is in agreement with the conditions set by Baron and Kenny (1986) for path analysis. For instance, in order to establish mediation, four conditions as noted by prior study of Baron and Kenny (1986) must be met. These are (1) The independent variables of knowledge, skills and mindset (forensic accountant and auditor) must be significant in relation to the dependent variable of task performance fraud risk assessment, and this is represented by (a) in Path Diagram I; (2) The independent variables (knowledge, skills and mindset of forensic accountants and auditors) must be significant in relation to the mediating variable (fraud related

problem representations) as represented in (b) of Path Diagram II; (3) The mediating variable (fraud related problem representations) must be significant in relation to the dependent variable (fraud risk assessment) as represented by (c) in Path Diagram II, and (4) In controlling the effects of the fraud related problem representations on the fraud risk assessment, the effect of the knowledge, skills and mindset of forensic accountants and auditors on the fraud risk assessment should not be significant.

3.7 Differences between Forensic Accountant and Auditor on Knowledge, Skills, Mindset, Fraud Related Problem Representation and Task Performance Fraud Risk Assessment

Specifically, previous studies advocate that auditors may appear not to demonstrate a sense of compassion in eagle-eying the indicative signs of fraud owing to the much publicised scandals of Enron, WorldCom and others, yet they are not by any means subordinate to forensic accountants based on their experience, professionalism, education, and training (Wuerges, 2011; Brown, 1962; AICPA, 1939).

Similarly, literature has shown that several commonalities exist between the financial statement auditors and the forensic accountants (Hopwood *et al.*, 2008). It is obligatory for the forensic accountants and auditors to uphold a high degree of integrity, objectivity and independence; to be inventive; to eschew prejudices in all conditions and situations and to possess deep knowledge of accepted accounting principles, business practices and processes (Bologna, 1984).

Although, financial statement auditors and forensic accountants possess similar characteristics; the main difference between the two subject factors lies in their mission. The main goal of any auditor is to "examine whether the company's reported

financial statements, taken as a whole, are stated fairly in all material respects in conformity with accepted accounting principles" (Rittenberg *et al.*, 2008) and to "express an opinion on the financial statements of the entity in accordance with the International financial reporting standards and other local standards as appropriate" (IFAC, 2012).

More importantly and on the contrary, the forensic accountants' primary goal is objective verification. This is in line with its professional services as an expert witness for either the prosecution or the defence as forensic accountants can work in both civil and criminal court cases. A successful forensic accountant must be detail oriented, ambitious, persistent and organised. Creativity is significant to forensic accounting profession as most often a forensic accountant must clarify complex financial concepts to an audience that lacks basic accounting experience (Hinders, 2013).

Accounting practitioners, standard setters, and researchers express concern for auditors' apparent failure in detecting fraud during the audit (Jamal, 2008; Wells, 2005; AICPA, 2002). The Association of certified fraud examiner (ACFE) argues that financial statement auditors are not fraud examiner and also states that external audits are not the most effective way to detect or limit fraud (ACFE, 2010; ACFE, 2008; ACFE, 2006; ACFE, 2004; ACFE, 2002).

Similarly, the Nigerian standards on auditing (NSA) No. 5, The Auditor's responsibility to consider fraud in an audit of financial statements issued by the Institute of Chartered Accountants of Nigeria (ICAN, 2005) and Statement on

auditing standard (SAS) No. 99, Consideration of fraud in a financial statement audit (AICPA, 2002), which was issued to replace Statement of auditing standard No. 82, Consideration of fraud in a financial statement audit, affords auditors the opportunity of better direction on how to enhance their ability to detect fraud during financial statement audit. This standard provides the direction that has potential to improve audit quality in respect of discovering significant financial misstatements, which may be caused by fraud or error.

Statement of auditing standard No. 99 guidelines on the assignment of personnel and supervision about overall responses to the risk of material misstatement recommends "an auditor may respond to an identified risk of material misstatement due to fraud by assigning additional persons with specialised skills and knowledge, such as forensic and information technology (IT) specialists" (AICPA, 2002, Sec. 316.50, p. 177).

The emergence of Statement of auditing standard No. 99 increases public consciousness of fraud and forensic accounting. Those standard highlights the significance of endorsing that all auditors have the necessary forensic accounting knowledge, skills and mindset to detect, prevent and respond to fraud through task performance fraud risk assessment with a view to act decisively on any evidence emanating from financial statements that links to fraud detection, prevention, and response.

In the context of this study, a forensic accountant knowledge, skills and mindset differ from an auditor knowledge, skills and mindset in terms of purpose, frequency, scope

and objective. Forensic accountants are to carry out deep investigation and to decide whether fraud exists, the perpetrators, and remedial action.

Auditor on the other hand is "to determine the fairness of reported financial statements taken as a whole, and while auditors are required to exercise professional skepticism in their consideration of fraud, they have been criticised for being creatures of habit and are not good at thinking outside the box" (PCAOB, 2007; Sickinger, 1995).

Given the specifics of differences between forensic accountants and auditors, this study evaluates whether the ranks of the two groups differ significantly on knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment in the Nigerian public sector. Thus, forensic accountants may have significant higher levels of knowledge, skills, mindset, fraud related problem representation, and task performance fraud risk assessment requirements than auditors. On the basis of this reasoning, the formulated hypotheses are:

Hypothesis 5a: Forensic accountants have significant higher levels of the knowledge requirement than auditors.

Hypothesis 5b: Forensic accountants have significant higher levels of skill's requirement than auditors.

Hypothesis 5c: Forensic accountants have significant higher levels of mindset requirement than auditors.

Hypothesis 5d: Forensic accountants have significant higher levels of fraud related problem representation requirement than auditors.

Hypothesis 5e: Forensic accountants have significant higher levels of task performance fraud risk assessment requirement than auditors.

3.8   Chapter Summary

This chapter discussed the research framework as subject factor to be operationalised at two levels – forensic accountant and auditor in the Nigerian public sector and also the hypothesis development of the study applying the constructs of Knowledge, Skills, Mindset, Fraud related problem representations, and Task performance fraud risk assessment in adherence to the PCAOB standing advisory group proposal for further research on whether Forensic Accountants (fraud specialists) are more competent than auditors in detecting fraud (PCAOB, 2008). It also complements Chui's (2010) agreement with PCAOB proposal, which recommends further research on the relationship between problem representation, mindset, and knowledge and task performance fraud risk assessment.

In addition, the research framework is extensively in agreement with the International education standard No 8, Competence requirements for audit professionals which highlighted the importance of the terms "capability and competence" in relation to task performance (IFAC-IES 8, 2006).

Most importantly, a total of fifteen hypotheses were formulated and to be tested in accordance with the research questions stated in Chapter 1 section 1.3. These hypotheses were as a result of the direct, indirect, and differences in group linkages:

First, a study on the direct relationships between knowledge, skills, and mindset, and task performance fraud risk assessment; direct relationships between knowledge, skills, mindset, and fraud related problem representation; and direct relationship between fraud related problem representation and task performance fraud risk assessment.

Second, a discussion on the indirect effect of fraud related problem representation on knowledge, skills, mindset (forensic accountant and auditor), and task performance fraud risk assessment.

Third and last focuses on a discussion of the differences between forensic accountant and auditor in relation to knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment.

The conclusion of the summary of this chapter leads to the next and significant stage in the social science research, which represents research methodology.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1   Introduction

This chapter focuses on practical issues regarding methods and procedures in the light of the research objectives and the research questions the study seeks to address. This chapter is divided into ten major sections. Following the introduction, Section 4.2 and Section 4.3 discuss the research paradigm and research process of the study. Section 4.4 details out explanation on research design of the study. Information on rationale for the selected methods, study procedures, data collection and data analysis procedures are provided in Sections 4.5 to 4.9. Finally, in Section 4.10 there is a discussion on ethical considerations with respect to the design of the study.

4.2   Research Paradigms

Thomas Kuhn in the early 1960s introduced the concept of paradigms. This concept is referred to as "ideologies, myths, theories, standards, frames of reference, perspectives, approved procedures, norms, and people's value judgements that govern individuals thinking and action" (Gummersson, 2000). No doubt, Creswell (2003) ascribes to the fact that the design of a research study commences with the selection of a topic and research paradigm. In the view of Guba and Lincoln (1989), paradigm was "a basic set of beliefs or a set of assumptions individuals are willing to make that eventually serve as touchstones upon which one's activities are guided".

According to Chisick (2008), any research that deserves respect must be anchored in the scientific method and most especially in the social science research. These

scientific methods and principles apply to what is known as "quantitative research" that is based on positivism paradigm.

However, another school of thought argues against positivism paradigm in the sense that it is only an effective approach when issues are known and regarded as facts, objects or other measurable entities (Onwuegbuzie, 2002; Smith, 1983). This school of thought argument is reflected on the notion that most of the social science researches deal with action and behaviour, which are generated from within the human mind and, therefore, needed to be interpreted by the participants. Hence, the emergence of another model known and called "constructivism model" (Guba & Lincoln, 2005). Consequently, social science researchers adopt what is known as "qualitative research" that is based on constructivism paradigm.

Constructivist principles are routed through the use of sociological perspectives such as phenomenology, grounded theory, narrative, ethnography, and case study (Hartini, 2012; Zaleha, 2012). Shank (2002) defines qualitative research as "a form of systematic empirical inquiry into meaning" while Denzin and Lincoln (2000) confirms that qualitative research involves an interpretive and naturalistic approach: "this means that qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them."

As time passes by, both paradigms become general methods for adoption in social science research, especially by scholars who advocate "mixed methods" approaches (Creswell, 2012; Creswell & Clark, 2007; Creswell, 2003). While the mixed method

or triangulation approach is being employed by the researchers, its application remains a subject for debate (Creswell & Tashakkori, 2007; Schultz & Hatch, 1996). Table 4.1 represents the key features of Quantitative and Qualitative paradigms.

Table 4.1
Key characteristics of Quantitative and Qualitative Paradigms

Characteristics	Quantitative	Qualitative
Focus of research	Quantity	Quality (nature, essence)
Philosophical roots	Positivism, logical empiricism	Phenomenology, symbolic interactionism
Associated phase	Experimental, empirical, statistical	Fieldwork, ethnographic, naturalistic, grounded, constructivist
Goal of investigation	Prediction, control, description, confirmation, hypothesis testing	Understanding, description, discovery, meaning , hypothesis generating
Design characteristics	Predetermined, structured	Flexible, evolving, emergent
Sample	Large, random, representative	Small, non-random, purposeful, theoretical
Data collection	Inanimate instrument (scale, tests, survey, questionnaires, computers)	Researcher as primary instrument, interviews, observations, documents
Mode of analysis	Deductive (by statistical methods)	Inductive (by researchers)
Findings	Precise, numerical	Comprehensive, wholestic, expansive, richly descriptive

Source: Adapted from Zaleha Othman (2012), Introduction to Qualitative Research.
UUM Doctoral Training Programme, p.29-30.

Based on extant literature, quantitative researchers are more interested in finding answers to questions such as: "how many", "how often?", "to what extent?" Qualitative researchers, on the other hand, are interested in finding the answers to questions such as "how" - how are individuals affected by the events that happen around them, and "why" - why are employees behaving the way they do? (Hartini, 2012; Zaleha, 2012; Miles & Huberman, 1994).

4.2.1 Justification for the choice of Positivist Paradigm

This research adopts the positivist ontology, empirical epistemology and quantitative methodology. The main reason for this adoption rests on the fact that other positivist studies have been carried out in this area of forensic accounting and financial criminology by notable scholars. According to Remenyi *et al.*, (1998), a methodological framework could be derived from a review of the relevant literature which provides the researcher with a clear expectation of how a particular phenomenon is likely to behave, from which a researcher formalises a model or paradigm.

In relation to task performance fraud risk assessment studies, significant numbers of previous research (Wuerges, 2011; Chui, 2010; Davis, Farrel & Ogilby, 2010; Di-Gabrielle, 2008; Fritz & MacKinnon, 2007; Ramaswamy, 2007; 2005) applied the quantitative approach. Therefore, there is in existence significant body of literature, known variables and existing theories to support the work undertaken in this research. In essence, this study rather than exploring in an interpretive way, sought to causal-predict, confirm, support or challenge the findings of other scholars in different research setting and context. For that reason, the quantitative paradigm is used in this research.

The second reason for using a quantitative method in this research, as opposed to a qualitative process, has to do with the reality nature of quantitative research, and with its unquestionable external validity, but scientific in analysis (De Vaus, 2011; Creswell, 2010; Zikmund, 2003), which signpost the bedrock of positivist research. In addition, that method is especially appropriate and relevant when the need to

establish generalisations that hold over different circumstances arises as most social science oriented researchers make observations in various situations (De Vaus, 2011; Stake, 1995).

Another significant reason for the use of quantitative research for this study is based on the following parameters: (1) scientific - quantitative data lend themselves to different forms of statistical techniques; (2) confidence - as statistical tests of significance give researcher added credibility in its findings; (3) measurement - the analysis of quantitative data are based on measured quantities rather than impressions; (4) analysis of large quantitative data becomes easy and simple; and (5) presentation and communicating the findings to others (Denscombe, 2010).

The final reason for this study to use quantitative research concerns the potential audience. From hindsight, most of the prior research related to fraud and fraud related issues employed quantitative approach (Kasum, 2010; Okunbor & Obaretin, 2010; Davis *et al.*, 2010; DiGabriele, 2008). It is, therefore, logic to assume that the potential audience (e.g. stakeholders in public sector accounting, forensic accountants, auditors, fraud investigators, journal editors, and readers) have tended to approach this topic from a quantitative perspective. Hence, it is appropriate to employ a quantitative approach for this research.

Although, there are some criticisms against the quantitative research method, these are also highlighted by Denscombe (2010) and include: (1) quality of data; (2) technicist; (3) data overload; and (4) quantitative analysis is not as scientifically objective as it might seem on the surface. Hence, the researcher acknowledges that

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all of these may affect the research rigour in terms of reliability, generalisation and validity to some extent.

4.2.2 Assumption of Quantitative and Qualitative Methodologies

Granting a decision has been made on the choice of paradigm for this study, there is a need to follow up with various assumptions, which distinguish quantitative methodology from the qualitative methodology. These assumptions that act as guidelines in conducting this research are: 1) ontological; 2) epistemological; 3) axiological; 4) rhetorical; and 5) methodological. These assumptions are represented in Table 4.2.

Table 4.2
Key Assumptions of Quantitative and Qualitative Methodologies

Assumption	Question	Quantitative	Qualitative
Ontological	What is the nature of reality?	Reality is objective and singular, apart from the researcher	Reality is subjective and multiple as seen by participants in a study
Epistemological	What is the relationship of the researcher to that researched	Researcher is independent from that being researched	Researcher interacts with that being researched
Axiological	What is the role of values?	Value free and unbiased.	Value laden and biased
Rhetorical	What is the language of research?	Formal. Based on set definitions. Impersonal voice and use of accepted quantitative words	Informal. Evolving decisions. Personal voice and accepted qualitative words
Methodological	What is the process of research?	Deductive process. Cause and effect. Static design-categories isolated before study. Context-free. Generalisations are leading to the prediction, explanation and understanding. Accurate and reliable through validity and reliability.	Inductive process. Mutual simultaneous shaping of factors. Emerging design-categories identified during the research process. Context-bound. Patterns, theories developed for understanding. Accurate and reliable through verification.

Source: Creswell (1994)

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In the 19th century, there was no doubt that quantitative investigations were the prevalent research paradigm. As noted by Onwuegbuzie and Leech (2005), the quantitative proponents "promoted research studies that were value-free, using rhetorical neutrality which resulted in discoveries of social laws, from which in time and context-free generalisations ensued". Following, on the view-point of the ontological quantitative model is "there is only one truth, objective reality that exists independent of the human perception" (Sale, Lohfeld, & Brazil, 2002).

Furthermore, the belief of the quantitative model proponents is that a social science inquiry should be objective and contends "the observer is different from the entities that are subject to observations" (Johnson & Onwuegbuzie, 2004). According to Scott and Usher (1999), procedures used in quantitative methodology were predominantly mathematical, statistical and experimental, and used to control, measure, manipulate, and predict social behaviour through large sample.

Positivism could be regarded as a research philosophy that assumes the phenomena under consideration possesses stable fact, measurable from the outside by an objective observer (Guba & Lincoln, 2005). Similarly, the ontological assumption is that the researcher views reality as objective and out there in the field independent of the researched. This research, therefore, is about the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in the Nigerian public sector. Thus, follows a set of research over many years which were produced by scholars in the area of forensic accounting and financial criminology (Owens, 2012; Wuerges, 2011; Chui, 2010; Davis *et al.*, 2010; McLeod, 2009; ACFE, 2009; DiGabrielle, 2008;

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Ramaswamy 2007; 2005; Basadur, 1995). The researcher assumes the knowledge, skills and mindset (forensic accountant and auditor), fraud related problem representation and task performance fraud risk assessment could be identified and measured objectively, and as for this study, a survey was utilised to meet that purpose.

Epistemology is concerned with the study of knowledge and what is assumed as being valid knowledge (Collis & Hussey, 2003). It is important to state that only phenomena that are observable and measurable can be validly regarded as empirical knowledge. For this research, the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in the Nigerian public sector were measured using appropriate constructs, and quantitative data and results derived.

The axiological assumption rests on values. It is necessary to say that the researcher's values are kept out of the study in a quantitative project (although a reference is made to Knorr-Cetina (1999) for debate on this issue). The phenomena under this research attention are regarded as objects, more importantly when they had been identified and studied previously as such; in this case, issues relating to task performance fraud risk assessment. The researcher is interested in the interrelationship of the objects and believed that these objects were prevalent before developing an interest in them.

Based on the rhetorical assumption, the language used in this study is impersonal and formal in context. All the main constructs are well defined based on accepted definitions.

With respect to the methodological assumption, the researcher adopted a quantitative approach. The main concern of this study is to enhance generalisations that contribute to theory, process and practice as well as providing better causal-prediction, explanation and understanding of the phenomena under study.

This study adopts positivist, empirical and quantitative approach based on three main principles. First, the researcher accepts that there are underlying laws and principles which govern how things work in the world. The researcher plays a major role to discover these laws and principles primarily by not moving closer to the respondents.

Second, once the laws and principles have been identified, the way forward is to document and describe the facts. Third and final, in analysing the data, well established and justified statistical techniques are used with the sole aim of countering speculations and biases.

4.3   Research Process

This study employs a research process which is common to all scientifically based investigations. According to Zikmund (2003), there are seven phases of the research process. These are: 1) defining the problem; 2) planning a research design; 3) planning a sample; 4) gathering the data; 5) processing and analysing the data; 6) formulating conclusions and preparing the report. Since phases of the research process are iterative, a phase of a new problem emerges thereafter, and the phases continue. Figure 4.1 represents the phases of the research process.
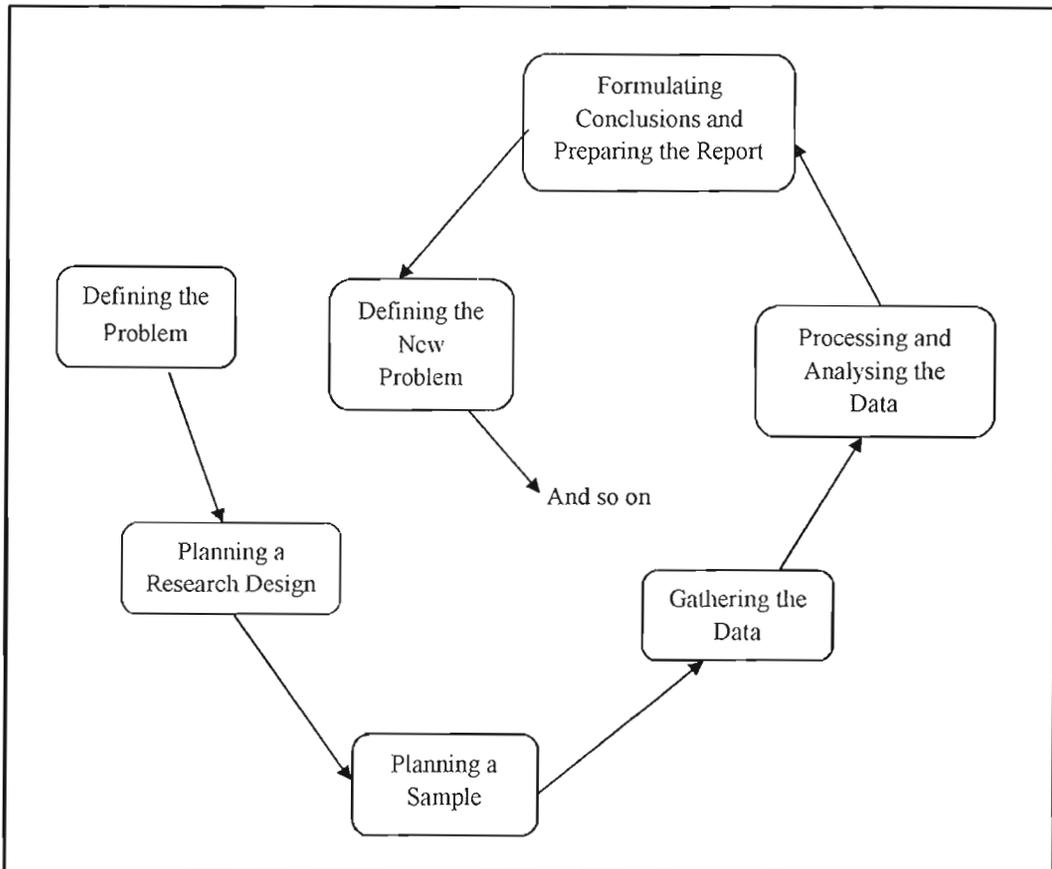
Figure 4.1
Key Phases of the Research Process
Source: Adapted from Business Research Methods/William G. Zikmund. – 7th Ed. (2003), 59.
Copyright @ 2003 by South-Western, a part of Cengage Learning

In this study, the research process commences with the literature review to identify the gaps in the literature for the purpose of stating the problem, and developing the research questions. A review of relevant literature was carried out and stated in Chapter Two. Problem statement and research questions are also listed in Chapter One of this study.

By extension of the literature review, this study identifies the relevant underpinning theories, which serve as a platform towards the theoretical framework and hypothesis development. A full disclosure of the theoretical framework and the development of a justified hypothesis are reflected in Chapter Three of this study.

The next phase has to do with the planning research design for this study. In carrying out this task, the researcher needs to identify the relevant research paradigm as described in the earlier section 4.2 of this chapter. Having made a choice on the research model (that is, positivism), the researcher applied the appropriate research design (that is, cross-sectional design) for this study.

In the planning a sample phase of the research process, the researcher pays careful attention to the process of developing and designing the survey questionnaire, which serves as an instrument for the study. The survey questionnaire was reviewed by 12 experts in the area of forensic accounting and financial criminology. Their comments on the review have also been considered before the final survey questionnaire was ratified and produced.

Following the planning of a sample phase, the next level of the phases of the research process is "gathering the data." In the first instance, a pilot study was carried out to assess the internal consistency reliability and validity of the study. As soon as the survey questionnaire passes the scrutiny of the panel of experts report, the finalised instrument is used to collect data from the sample of respondents (that is, forensic accountants and auditors in the Nigerian public sector).

In the processing and analysing the data phase of the research process, the data collected was analysed by using two types of software. The software includes IBM SPSS Version 20.0 for windows (descriptive analysis) and SmartPLS-SEM Version 2.0 M3 (structural equation modeling). A detailed analysis of the data is presented in Chapter 5 of the study.

For this research, the last phase of the research process involves the formulation of conclusions and the preparation of the report. It was meticulously carried out, and details are presented in Chapter Six of this study. It is necessary to state that the researcher confers with relevant theories and literature for the purposes of making unambiguous interpretation, and simple and clear discussion based on the understanding of the findings.

However, in view of the fact that decision making is not the end of any problem solving process, the seventh phase of the research process, that is, defining a new problem emerges, which is dealing with future research recommendation phase of the study.

4.4   Research Design

The purpose of research design is to provide the necessary information on the research and also to hypothesise in an accurate manner (Hair, Black, Money, Samuel & Page, 2010; 2007). In addition, research design is an avenue for the researcher to use a series of investigation to carry out data collection (Babatunde, 2014). A research design is described as "not only just a work plan which embraces what has to be done to complete the project, but the work plan will flow from the project's research design" (De Vaus, 2011). The function of research design is to give credence to the evidence obtained in order for the researcher to answer the research questions as unequivocally as possible (De Vaus, 2011). As noted by Yin (1989), research design deals with "logical problem and not a logistical problem."

Research design in quantitative research is classified into four types: (1) experiment, (2) case study, (3) longitudinal, and (4) cross-sectional (De Vaus, 2011; Hair *et al.*, 2007). There are several methods to carry out quantitative research (Creswell, 2012; De Vaus, 2011; Sekaran & Bougie, 2010; Denscombe, 2010; Zikmund, 2003). Research methods in social science research consist of (1) questionnaire, (2) observation, (3) interviews (structured or loosely structured), (4) analysis of documents and (5) unobtrusive methods (De Vaus, 2011). The choice of research method influences the way in which the researcher makes practical considerations related to time, access and sources of data (Denscombe, 2003; 1998). It is to be noted that different research methods imply unique suppositions, skills and varied research practices.

In the accounting context, of which quantitative research is relevant to the study of social and cultural phenomena such as social activities and practices, a forensic accountant knowledge, skills and mindset; and auditor knowledge, skills and mindset can be related to public sector accountants' activities and public sector accountants' practices.

4.4.1 Components of Research Design

Prior literature shows three components of research design that deals with the purpose of any research study. These components of research design include descriptive, exploratory, and explanatory design (Sekaran, 2010; 2003; Zikmund, 2003). Descriptive design refers to a particular situation where there is in existence little knowledge of the nature of the problem. According to Sekaran (2003) and Zikmund (2000), this category of design is conducted in order to provide detailed specific

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description of the problem. Exploratory design is useful when gathering information on a particular problem at hand, of which the results may not be conclusive. The justification for adopting this category is that it enhances the understanding of a new phenomenon, which attracts further studies in order to arrive at verifiable and conclusive evidence (Zikmund, Babin, Carr, & Griffin, 2010). Explanatory design is needed when there is a need to further provide specific knowledge and description of the nature of relationships among the variables under investigation (Sekaran, 2003; Zikmund, 2003).

In this study, explanatory design is adopted as it enhances the explanation of the relationships between knowledge, skills and mindset (forensic accountant and auditor), fraud related problem representation and task performance fraud risk assessment. In essence, hypotheses were formulated with a view to provide an explanation of the relationships between the variables as well as a demonstration of the status (significant or not significant) of the variable's relationship.

4.4.2 Cross-sectional Design

A cross-sectional design is used in this study as data were collected at a single point in time. In addition, it is a strategy of research in terms of suitability, feasibility and ethical considerations in relation to task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in the Nigerian public sector. A strategy is, however, defined as "a plan of action planned to accomplish a definite goal" (Denscombe, 2010).

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Another reason put forward for the choice of cross-sectional design is because of its uniqueness in having more successes than other designs towards achieving representativeness. In making decisions as to the external validity of the study, representative samples are needed if one wishes to generalise from the results obtained in a sample of the wider population that the sample is meant to represent. The best way of achieving representative sample is to adopt probability sampling methods, where each person in the population (forensic accountants and auditors in the Nigerian public sector) to which one wish to generalise has an equal or known chance of being selected in the sample.

4.4.3 Survey Method

Requesting the respondents on their competences in relation to fraud related problem representation and task performance fraud risk assessment in the workplace, and their capability by way of attribute and attitude, that is, knowledge, skills, and mindset may tend to look awkward and somewhat sensitive. To resolve this behavioural issue, the most appropriate method is found to be survey method.

Survey works as an accurate and reliable means of assessing information about the sample, which culminate into a researcher to draw conclusions and to generalise the findings from a sample of responses to the population (Creswell, 1994; Chisnall, 1992).

In addition, according to Hair, Bush and Ortinau (2003), survey method is suitable for a study with a large sample size (that is, 200 or more respondents). It is found to be inexpensive, quick and efficient to administer (Sekaran, 2003; Zikmund, 2003;

Churchill, 1995). Shaughnessy and Zechmeister (1997) recommend the survey method as proper when asking about respondents' thoughts, opinions and feelings, and most especially when collecting data that relates to beliefs, attitudes and motives (Burns & Bush, 2000).

Following from the benefits inherent in the use of survey method, Spector (1992) criticises the method for over reliance on self-reported data. Similarly, Hair *et al.*, (2003) lists out three deficiencies on the survey method. These are 1) lack of detail and in-depth information, 2) lack of control over the timeliness, and 3) difficulty in determining the truthfulness of the answers. The researcher recognises these pitfalls and, therefore, adopts guidelines that were recommended by Hair *et al.*, (2003). One of the guidelines is the use of only previously tested, reliable and valid scales for this study. In addition, the survey questionnaire is written in simple (easy to read and understand), and clear (avoidance of ambiguity) language to mitigate any response bias.

4.5   Operational Definitions and Measurement of Variables/Constructs

Specifically, operationalisation involves a process of clarifying abstract constructs or concepts and translating them into specific and observable measures, thus descending the ladder of abstraction (De Vaus, 2011). In essence, it is a process of sliding down the ladder of abstraction into ascending the ladder of observation.

As noted by De Vaus (2011), operational definition refers to the observations to measure the construct or concept. For this research, the researcher operationally defines "forensic accounting as the application of fundamental and specialised

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knowledge, core and enhanced skills and mindset in the accounting profession to resolve legal issues pertaining to the detection, prevention and response to fraud. It entails a process of task preparation, data collection, examination, analysis and reporting organisation financial and business related issues in a form relevant for litigation and public discussion or debate."

This study comprises five major constructs. These are knowledge, skills, and mindset (forensic accountant and auditor), fraud related problem representation and task performance fraud risk assessment. More importantly, measurements in this study are primarily generated through simple random sampling technique selections of forensic accountants and auditors as respondents within the public sector in Nigeria. These respondents are selected from the office of the Accountant General of the federation and the Auditor General for the federation. In addition, this category of respondents generates organisation task performance measures which have continuously been adopted in fraud detection, prevention and response literatures (Davis *et al.*, 2010; DiGabriele, 2008).

This study adopts this class of respondents, especially when there is a need to generalise to a large population. The illustrative sections that follow relates to the dependent variable, independent variables and the mediating variable which depict the objective measures that will be obtained from the targeted respondents.

4.5.1 Dependent Variables

The subsections 4.5.1.1 and 4.5.1.2 discuss task performance fraud risk assessment and fraud related problem representation (forensic accountant and auditor) as the dependent variables.

4.5.1.1 Task Performance Fraud Risk Assessment (TPFRA)

Task performance fraud risk assessment is the bedrock of the audit assignment with respect to fraud detection, prevention and responses in the public sector environment. It symbolises the fact that the procedures to be adopted will depend upon the organisation's environment, timing and scope of the audit assignment.

Task performance fraud risk assessment refers to the forensic accountant and auditor's ability to assess the risk of fraud to a defined standard in the real working environment. This study considers task performance fraud risk assessment a between subject factor to be operationalised at two levels: all risk conditions (high and low risk conditions). So, task performance fraud risk assessment is considered a between subject factor which is to be measured at two levels: all risk conditions (High and Low risk conditions) in relation to fraud detection, prevention and response. The measurement scales were adopted from Owens (2012), Dzomira (2014), and ACFE (2009). A 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) of 4 items as identified in Table 4.3 were employed.

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Table 4.3
Measures of Task Performance Fraud Risk Assessment construct

Construct	Indicators	Sources
Task Performance Fraud Risk Assessment	1. It is mandatory to identify inherent fraud risk - gather information to obtain the group of fraud risks that could apply to the organisation.	Owens (2012), Dzomira (2014), and ACFE, (2009).
	2. It is mandatory to evaluate the likelihood and importance of inherent fraud risk - assess the relative probability and potential significance of identified fraud risks based on historical information, known fraud schemes, and interviews with staff, including business process owners.	
	3. It is mandatory to respond to reasonably likely and significant inherent and residual fraud risk.	
	4. It is mandatory to perform a cost-benefit analysis to determine what the response should be to address the identified risks.	

4.5.1.2 Fraud Related Problem Representation (FRPR)

Specifically, a problem refers to "a situation in which a person or group is requested to perform a task for which there is no readily accessible algorithm or method that completely determines a solution" (Yackel, 1984; Lester, 1978). A representation as noted by Glass and Holyoak (1986) describes how information is stored and accessed in the memories of individuals and the way such information is recorded or expressed. So, a problem representation is how a solver mentally processes or represents the information contained within the problem.

This study defines fraud related problem representation as a forensic accountant and auditor mental representation of information towards understanding a fraud related problem and solving a fraud related problem through a strategy based on prior or existing knowledge, skills and mindset. According to Hayes and Simon (1974), it is an interactive stage, rather than in sequential stage, and hence, solving of a problem

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follows the understanding of the problem. The fraud related problem representation of individual's mental image has to do with the understanding and resolving of fraud related task performance problem based on 8-simplex problem solving model of Basadur, Basadur, and Licina (2013), and Basadur (1995). This study considers Fraud Related Problem Representation a between subject factor to be operationalised at two levels: forensic Accountant and auditor.

The study adopted Basadur, Basadur, and Licina (2013), Hester *et al.* (2012), Mumford, Medeiros, and Partlow (2012), Basadur and Basadur (2011), Reiter-Palmon, Herman, and Yammarino (2008), Basadur (2004; 1995), and Basadur, Runco, and VEGAxy (2000) measurement of fraud related problem representation established on simplex problem solving skill's model. This problem solving model consists of eight processes stages with indicators denoted in brackets, namely: find the problem (7, 12); find the facts (10, 14); define the problem (3, 9); find the ideas (4, 13); select and evaluate the ideas (6, 15); plan (1, 16); sell the idea (5, 8), and act (2, 11). Thus, it considers fraud related problem representation as a between subject factor to be measured at two levels: forensic accountant and auditor using a 5-point Likert scale ranging from 1 (not at all) to 5 (very often) of 16 items as stated in Table 4.4.

Table 4.4
Measures of Fraud Related Problem Representation construct

Construct	Indicators	Sources
Fraud Related Problem Representation	1. Once a solution is chosen, one develops a plan with the sequence of events necessary for completion.	Basadur, Basadur, and Licina (2013), Hester *et al.* (2012), Mumford, Medeiros, and Partlow (2012),
	2. After the solution has been implemented, I immediately look for ways to improve the approach and avoid future problems.	
	3. To avoid asking the wrong question, one takes care to define each problem carefully before trying to solve it.	Basadur and Basadur (2011).
	4. One strives to look at problems from various perspectives and generate multiple solutions.	Reiter-Palmon, Herman, and Yammarino (2008),
	5. One tries to address the political issues and other consequences of the change being proposed so that others will understand and support the solution.	Basadur, Runco, and VEGAxy (2000), and Basadur (2004, 1995)
	6. One assesses potential solutions carefully and thoroughly against a predefined standard.	
	7. One systematically searches for issues that may become problems in the future.	
	8. When one decides on a solution, there is a follow up to make it happen no matter what opposition I may face.	
	9. One finds that small problems often become much bigger in scope, and thus very difficult to solve.	
	10. I ask myself lots of different questions about the nature of the problem.	
	11. After a solution is implemented, I relax and focus again on other regular duties.	
	12. I focus on keeping current operations running smoothly and hope that problems do not appear.	
	13. It is better to evaluate potential solutions as one think of them.	
	14. I do have all information to solve problems when one is faced with an issue.	
	15. When evaluating solutions, one takes time to think about how to choose between options.	
	16. Making a decision is the end of the problem solving process.	

4.5.2 Independent Variables

The subsections 4.5.2.1 to 4.5.2.3 discuss on Knowledge, Skills and Mindset (forensic accountant and auditor) as the independent variables.

4.5.2.1 Knowledge

The measures of knowledge construct refer to the forensic accountant and auditor attribute and experience towards competent performance in the workplace as stated in Table 4.5. Therefore, knowledge in this study refers to the forensic accountant and the auditor's attribute and proficiency competences necessary and relevant to discharge technical and innovative task, especially with respect to identifying and analysing methods and procedures for fraud prevention, detection and response from the Nigerian public sector environment. This study considers Knowledge a between subject factor to be operationalised at two levels: forensic accountant and auditor.

Table 4.5

Measures of Knowledge (Forensic accountant and auditor) construct

Construct	Indicators	Sources
Knowledge	1. There is an increasing need for a forensic accountant to be a more broadly experienced professional.	Davis, Farrell & Ogilby (2010); Ramaswamy (2007: 2005)
	2. There is an increasing need for a forensic accountant to be more specialised within the field of fraud detection, prevention and response.	
	3. There is an increasing need for a forensic accountant to have more general business experience.	
	4. There is an increasing need for the forensic accountant to have more technical accounting knowledge	
	5. There is an increasing need for a forensic accountant to have more criminal and civil laws, and court proceedings knowledge.	
	6. There is an increasing need for a forensic accountant to have more information technology knowledge.	
	7. There is an increasing need for a forensic accountant to have more criminology knowledge.	

The measurement scales were adapted from Davis, Farrell and Ogilby (2010) and Ramaswamy (2007; 2005). A 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) of 7 items are illustrated in Table 4.5 of this study.

4.5.2.2 Skills

Skills are defined as forensic accountant and auditor's attribute that relates to competences in the areas of knowledge and ability as well as those that relates to performance in fraud risk assessment task in the public sector environment.

Table 4.6
Measures of Skills (Forensic accountant and auditor) construct

Construct	Indicators	Sources
Skills	1. An important skill requirement is deductive analysis - the ability to take aim at financial contradictions that do not fit in the standard pattern of an assignment.	Davies, Farrell and Ogilby (2010); DiGabriele (2008)
	2. An important skill requirement is critical thinking - the ability to decipher between opinion and fact.	
	3. An important skill requirement is unstructured problem solving - the ability to approach cach situation (inherently unique) prepared to solve problems with an unstructured approach.	
	4. An important skill requirement is investigative flexibility – the ability to move away from standardised audit procedures and thoroughly examine circumstances for typical warning signs.	
	5. An important skill requirement is analytical proficiency – the ability to examine what should be given rather than what is provided.	
	6. An important skill requirement is oral communication – the ability effectively to communicate in speech via expert testimony and general explanation the basis of opinion.	
	7. An important skill requirement is written communication – the ability to communicate effectively in writing via reports, charts, graphs, and schedules the basis of opinion.	
	8. An important skill requirement is a specific legal knowledge – the ability to understand basic legal processes and legal issues including the rules of evidence.	
	9. An important skill requirement is composure – the ability to maintain a calm approach in pressured situations.	

By inference, the knowledge and ability component on one part refers to whether an individual has the background knowledge and thinking skills to be effective, whereas the performance component on the other part identifies the ability of an individual to make this knowledge and ability into an operational presentation.

This study considers Skills a between subject factor to be operationalised at two levels: forensic Accountant and auditor.

The study adapts Davies, Farrell and Ogilby (2010) and DiGabriele (2008) measurement of skills. Thus, the study considers skills a between subject factor to be measured at two levels: forensic accountant and auditor using a 5-point Likert scale ranging from 1 (strongly disagree to 5 (strongly agree) of 9 items as described in Table 4.6.

4.5.2.3 Mindset

Mindset is the positive mental attitude of a forensic accountant and auditor to prevent, detect and response to fraud. In essence, mindset is a positive mental attitude of thought towards task performance fraud risk assessment. The Mindset construct refers to the forensic accountant and auditor attitude and mental reasoning towards competent performance in the workplace. Thus, the study considers Mindset as between subject factors to be operationalised at two levels: forensic accountant and auditor.

The study adapts Chui's (2010) measurement of mindset for all risk conditions and McLeod's (2009) attitude measurement. Thus, the study considers mindset as

between subject factors to be measured at two levels: forensic accountant and auditor

using a 5-point Likert scale ranging from 1 (strongly disagree to 5 (strongly agree) of

25 items as shown in Table 4.7 which flows to the next page.

Table 4.7

Measures of Mindset (Forensic accountant and auditor) construct

Construct	Indicators	Sources
Mindset	1. One finds it hard to imitate the behaviour of other people.	Chui, (2010); McLeod (2009)
	2. The behaviour put up is usually an expression of one true inner feelings, attitudes, and beliefs.	
	3. At parties and social gatherings, one does not attempt to do or say things that others will like.	
	4. One can only argue for things that I already believed.	
	5. One can make impromptu speeches - even on topics about which there is almost no information.	
	6. I guess one put on a show to impress people.	
	7. When I am uncertain how to act in a social situation, one looks to the behaviour of others for cues.	
	8. I believe what evidence backs up, no matter what one believed previously.	
	9. One rarely needs the advice of my friends to choose movies, books, or music.	
	10. One sometimes looks to others to be experiencing deeper emotions than I am.	
	11. One is willing to hear both sides before setting an opinion.	
	12. In a group of people, one rarely becomes the centre of attention.	
	13. In different situations with different people, one often acts like very different persons.	
	14. I am not particularly good at making other people like me.	
	15. Even if one is not enjoying oneself, one often pretends to be having a good time.	
	16. I am not always the person I appear to be.	
	17. One would not change my opinions in order to please someone else.	
	18. If one is considered to be an entertainer in a debate, one does not bother to ponder the validity of the other side.	
	19. In order to get along and be liked, I tend to be what people expect me to be rather than anyone else.	
	20. Whenever friends say something is true, and it is against my beliefs, one will change mind to agree with them.	
	21. I have trouble changing my behaviour to suit different people and different circumstances.	
	22. At a party, one let others keep the jokes and stories going.	
	23. Once an idea is in one's head, I stick with it.	
	24. One can look anyone in the eye and tell a lie with a straight face – if for a good cause.	
	25. One may deceive people by being friendly when one dislikes them.	

4.5.3 Demographic Data

In this study, nine demographic variables were employed and categorical scales used for measurement. These are (1) name of the organisation (Accountant General office and Auditor General office), (2) position or title in the organisation (forensic accountant and auditor), (3) gender (male and female), (4) highest academic education (B.Sc./HND, Postgraduate Diploma, Master, and PhD), (5) highest professional qualification (ACA, FCA, CNA, FCNA, and Others – ACCA, ICMA, CPA), (6) certification in forensic accounting (yes and no), (7) forensic accounting role (forensic accountant and auditor), (8) forensic accounting functions by organisation (yes and no), and (9) involvement in fraud investigation by organisation (yes and no).

4.6 Research Equation

A research equation in regression statistical method is described by Babatunde (2014) and John (2008) as a means of explaining the relationship between two or more predictors and criterion. In this study, a mediated effect will be calculated using three regression equations as adapted from Fritz and MacKinnon (2007) on the research framework and the hypothesised model.

Based on the interpretation by Fritz and MacKinnon (2007) in relation to a mediation model, the result of the independent variable (X) on the dependent variable (Y) is transmitted through a third intervening, or mediating, variable (M). In essence, X causes M, and M causes Y. Specifically, the total effect is represented by X on Y, and the indirect effect by X on Y through M and the direct effect by X on Y controlling for M. It, therefore, follows that if M is held constant in a model in which the

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mediator explains all of the variation between X and Y (that is, a model in which there is complete mediation), then the relationship between X and Y is zero.

4.6.1 Simple Regression Analysis

Assuming simple regression analysis is to be used where one independent variable is hypothesised to affect one dependent variable; the total effect equals direct effect and indirect effect. This can be expressed in the form of three regression equations as adapted from Fritz and MacKinnon (2007) and Sekaran and Bougie (2010):

$$Y = a_1 + bX + \varepsilon_1 \qquad \qquad (1)$$

$$Y = a_2 + b^1X + \beta M + \varepsilon_2 \qquad \qquad (2)$$

$$M = a_3 + \alpha X + \varepsilon_3 \qquad \qquad (3)$$

Where

b is the estimate of the total effect of X on Y

b^1 is the estimate of the direct effect of X on Y adjusted for M

β is the estimate of the effect of M on Y adjusted for X

α is the estimate of the effect of X on M.

a_1, a_2, a_3 are the intercepts, and

ε_1, ε_2, ε_3 are the error in prediction or the difference between the estimated Y and the

actual Y.

The product $\alpha\beta$ is referred to as "the mediated or indirect effect."

4.6.2 Multiple Regression Analysis

However, in a case where the independent variable is more than one, multiple regression analyses will be ideal for the study. Multiple regression analysis is a multivariate technique which is used most often in business research, and it starts

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from the conceptual model and the hypotheses derived from the model of study (Sekaran & Bougie, 2010). According to Sekaran and Bougie (2010), multiple regression analysis provides "a method of assessing in an objective manner the degree and the character of the relationship between the independent variables and the dependent variable; the regression coefficients indicate the relative importance of each of the independent variables in the prediction of the dependent variable."

For this study, which has three independent variables, the multiple regression formulae adapted from Fritz and MacKinnon (2007) are as follows:

$$Y = a_1 + bX_1 + bX_2 + bX_3 \qquad \ldots \qquad \ldots \qquad (1)$$

$$Y = a_2 + b^1X_1 + b^1X_2 + b^1X_3 + \beta M \qquad \ldots \qquad \ldots \qquad (2)$$

$$M = a_3 + \alpha X_1 + \alpha X_2 + \alpha X_3 \qquad \ldots \qquad \ldots \qquad (3)$$

By substitution, in accordance with the research study, the multiple regression formula is as follows:

Equation 1: Direct Relationship

$$TPFRA(Y) = a_1 + MINDSET (bX_1) + SKILLS (bX_2) + KNOWLEDGE (bX_3)$$

Where

TPFRA (Y)	is the dependent variable
MINDSET (bX_1)	is the independent variable
SKILLS (bX_2)	is the independent variable
KNOWLEDGE (bX_3)	is the independent variable

Equation 2: Indirect Relationship

TPFRA(Y) = a_2 + MINDSET (b^1X_1) + SKILLS (b^1X_2) + KNOWLEDGE (b^1X_3) +

$\qquad$ FRAUD RELATED PROBLEM REPRESENTATIONS (βM)

Where:

TPFRA (Y)	is the dependent variable
MINDSET (bX_1)	is the independent variable
SKILLS (bX_2)	is the independent variable
KNOWLEDGE (bX_3)	is the independent variable
FRPR (βM)	is the mediating variable.

Equation 3:

FRPR (M) = a_3 + MINDSET (αX_1) + SKILLS (αX_2) + KNOWLEDGE (αX_3).

Where:

b represents the total effect of MINDSET, SKILLS AND KNOWLEDGE on TASK

$\qquad$ PERFORMANCE FRAUD RISK ASSESSMENT.

b^1 represents the estimate of the direct effect of MINDSET, SKILLS AND

$\qquad$ KNOWLEDGE on TASK PERFORMANCE FRAUD RISK ASSESSMENT

$\qquad$ adjusted for FRAUD RELATED PROBLEM REPRESENTATION

β is the estimate of the effect of Fraud Related Problem Representations on Task

$\qquad$ Performance Fraud Risk Assessment adjusted for MINDSET, SKILLS AND

$\qquad$ KNOWLEDGE

α is the estimate of the effect of MINDSET, SKILLS AND KNOWLEDGE on

$\qquad$ FRAUD RELATED PROBLEM REPRESENTATION

a_1, a_2, a_3 represent the intercepts.

4.7   Population and Sampling Techniques, Sample Size, Sample Size Determination, Unit of Analysis and Expected Response Rate

This section 4.7 discusses subsections 4.7.1 to 4.7.7 that consist of population of the study, sampling, sampling frame, sample size, sample size determination, unit of analysis and expected response rate.

4.7.1   Population of the Study

Population can be defined as "the complete collection of the subject of interest to be studied in the research" (Cavana, Delahaye, & Sekaran, 2001). According to Hair, Black, Babin, Anderson and Tatham (2010), a research population consists of a group of data and information of which its properties are to be analysed in a given study. The position of Cavana, Delahaye, and Sekaran (2001) is, however, supported by Hair, Black, Babin, Anderson and Tatham (2010). According to Sekaran and Bougie (2010), the population refers to the entire group of people, events, or things of interest that the researcher wishes to investigate or make inferences based on sample statistics.

This study focuses on the forensic accountants, accountants and auditors in the offices of the Accountant General of the federation and the Auditor General for the federation both at the Headquarters, the thirty six State offices of the Federation, and the Federal Capital Territory, Abuja office constitute the population of this study.

The population of the study consists of 10,196 forensic accountants, accountants and auditors in the two offices under consideration.

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4.7.2 Sampling

Specifically, sampling is a process through which any group of representative elements or individuals are selected from a given population for the purpose of statistical analysis. Granting the importance of population to any research in social science, all the forensic accountants, accountants and auditors in the office of the Accountant General of the federation and the Auditor General for the federation serving in the public sector in Nigeria constitute the population of this study.

Previous research has shown that there are two types of sampling methods: (1) probability sampling - simple random sampling, systematic sampling, stratified sampling, cluster sampling, proportional versus disproportional sampling, multi-staged area sampling; and (2) non-probabilistic sampling - convenience sampling, quota sampling, and snowball sampling (Creswell, 2010; Hair *et al.*, 2010; Sekaran & Bougie, 2010; Denscombe, 2010; Zikmund, 2003).

This study used probability sampling with an emphasis on simple random sampling method as it enables respondents (forensic accountants, accountants, and auditors) in the population to have an equal chance of being selected as the sample objects (Sekaran, 2003). The value of this sampling technique to the study is to ensure lack of bias by the researcher against the choice of sample objects (Salkind, 2003) and for true representativeness and generalisation of results (Cavana, Delahaye, & Sekaran, 2001).

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4.7.3 Sampling Frame

It consists of an element or a set of elements which are available for selection in some stage of the sampling process (Sekaran & Bougie, 2010). Babatunde (2014) explains that the sample frame is the list of the entire element in the population wherein the sample is drawn. For example, the Civil Service Commission registry contains a listing of all the civil servants, engineers, accountants, forensic accountants, auditors, administrators and support staff in the Nigerian public sector during a particular period. Table 4.8 shows all the public sector accountants and auditors in the Headquarters, Abuja, the FCT office and the 36 State offices in alphabetical order.

Table 4.8
Service wide Staff Position as at December 31, 2009

S/No	Cadre	Grade Level	Number
1	Directors (Accounts)	17	43
2	Deputy Directors (Accounts	16	70
3	Assistant Directors (Accounts)	15	261
4	Chief Accountants	14	302
5	Assistant Chief Accountants	13	320
6	Principal Accountants	12	207
7	Senior Accountants	10	404
8	Accountants I	09	397
9	Accountants II	08	302
10	Chief Executive officer (Accounts)	14	144
11	Assistant Chief Executive Officer (Accounts	13	253
12	Principal Executive Officer I (Accounts)	12	766
13	Principal Executive Officer II (Accounts)	10	1297
14	Senior Executive Officer (Accounts)	09	1800
15	Higher Executive Officer (Accounts)	08	1900
16	Executive Officer (Accounts)	07	1730
			10196

* Professional cadre staff deployed to Ministries, Departments and Agencies (S/No.1-9)

** Executive cadre staff deployed to Ministries, Departments and Agencies (S/No. 10 – 16)

Source: Office of the Accountant General of the federation: Annual report & financial statements (FGN, 2009 p.10-11)

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It can also serve as the sampling frame for the study of the accountants and auditors in the office of the Accountant General of the federation and the Auditor General for the federation. Because using inferential statistics in this study is to use information acquired from the selected sample out of the 10,196 forensic accountants, accountants and auditors in the Nigerian public sector (Federal Government of Nigeria: 2009 Financial Statements) and to investigate through inferences the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor).

4.7.4   Sample size

Sample size, on the other hand, is an integral part of the target population of interest to be studied (Abdullateef, 2011). Abdullateef (2011) explains further that the sample represents a sub-collection that is selected from a population of interest for the purpose of the survey. In essence, some but not all elements of the population form the sample according to Sekaran and Bougie (2010). Prior literature agreed that an adequate sample size is important to improve overall estimates and reduce standard errors in the model (Marcoulides & Sanders, 2006; Hui & Wold, 1982).

According to Chin and Newsted (1999), if small sample sizes (N=20) were used in large complex models, it would not isolate low valued structural path coefficients (β = 0.20) until large sample sizes (N = 50) are employed.

According to Salkind (2003), an appropriate sample size is necessary for any research majorly because too small sample size is not a good representative of the population as this may lead to committing a Type I error. In essence, Type I error represents the

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probability of accepting a wrong finding instead of rejecting it (Sekaran, 2003). On the contrary, as noted by Sekaran (2003), too large sample size not appropriate as it poses a problem relating to Type II error which may lead to accepting a particular finding rather than rejecting it.

For this study, 404 numbers are drawn from a population of 10,196 forensic accountants, accountants and auditors, and hence, forms the sample size of the study. It, therefore, follows that, from the study of the 404 accountants, forensic accountants and auditors, the researcher makes conclusions that are generalisable to the entire population of 10,196 forensic accountants, accountants and auditors in the Nigerian public sector.

4.7.5 Sample Size Determination

A prior study by Ticehurst and Veal (1999) emphasises the importance of determining an absolute sample size that is independent of the population under study. In the determination of sample size, Abdullateef (2011) and Bartlett, Kotrlik, and Huggins (2001) explain two major flaws in any sample selection. These are: (1) researchers disregard for any problems arising from sampling error when determining their sample size; and (2) researchers disregard for problems arising from the response and non-response biases.

Previous research has established that the general objective of conducting quantitative research is to collect data that is representative of the entire population to be studied (Sekaran & Bougie, 2010; Hau & Marsh, 2004; Van *et al*, 2002; Cavana, Delahaye, & Sekaran, 2001; Bartlett, Kotrlik, & Huggins, 2001; Krejcie & Morgan, 1970). As a

result, many researchers have used information gathered from many experiments or surveys to generalise the findings drawn from a population sample, especially within the acceptable limit of a given random error (Sekaran & Bougie, 2010; Fritz & MacKinnon, 2007; Cavana, Delahaye, & Sekaran, 2001; Bartlett, Kotrlik, & Huggins, 2001).

Similarly, in many cross sectional designs, the size of the overall number of respondents is dictated by the practical issues related to the number of respondents (forensic accountant and auditor) who are available to the researcher (Creswell, 2012).

In furtherance of the sample size determination, Stevens (1996) recommended for social science research a sample size of 15 participants per predictor in order to ensure reliability of the equation. Thus:

$$N = 15 * (\text{No. of predictors}) \qquad .. \qquad \text{Equation (1)}$$
$$= 15 * (3)$$
$$= 45$$

However, Sekaran (2003) argued that the sample size of thirty to five hundred should be sufficient since it depends on the sampling technique and research question that is under investigation.

As noted by Krejcie and Morgan (1970), the ever increasing demand for research has created a niche to determine an efficient method of sample size required to be a representative of the population under study. A table was generated from the formula

in a publication titled "Small-Sample Techniques by the Research division of the National Education Association (1960, p.99) thus:

$$s = X^2 \, NP \, (1 - P) \, / \, d^2 \, (N - 1) + X^2 \, P \, (1 - P) \qquad .. \qquad \text{Equation (2)}$$

Where

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence
   level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the
   maximum sample size)

d = the degree of accuracy expressed as a proportion (.05).

Most importantly, in order to obtain the required sample size (s) from the population (N) of 10,196 forensic accountants, accountants and auditors in the office of the Accountant General of the federation and the Auditor General for the federation in Nigeria from the predefined table; the figure of 370 is arrived at for this study.

Similarly, Tabachnick and Fidell (2007) gave a formula for calculating sample size requirements, taking into account the number of independent variables in the study. The formula is reproduced thus:

$$n = N > 50 + 8m \qquad .. \qquad .. \qquad \text{Equation (3)}$$

Where

m = number of independent variables

Therefore,   50 + 8 (3)

= 74

Similarly, Dillman (2000) recommended method to determine the sample size for social science research which is considered in this study, all in a bid to ensure the accuracy of a representative sample size. The formula is:

$$n = \frac{(N)\,(p)\,(1-p)}{(N-1)\,(b/c)^2 + (p)\,(1-p)} \quad .. \quad \text{Equation (4)}$$

Where

n = required sample size for the desired level of precision

N = population size

p = proportion of population expected (assume to be 0.50 for maximum sample size)

b = acceptable amount of sampling error (this can be set at 0.10, 0.05, or 0.03 which represent 10%, 5%, or 3% respectively)

c = z-statistic associated with the confidence level of 1.96 which corresponds to 95% level.

For this study, the proportion of 5% was applied rather than 3% for a homogenous sample (Dillman, 2000), and this is consistent with Biemer and Lyberg (2003) in relation to the provision of adequate sample size for smaller or larger population. Therefore,

N = 10196; p = 0.5; b = 0.05; and c = 1.96

n = [(10196) (0.5) (1 – 0.5)] ÷ [(10196 – 1) (0.05/1.96)^2] + [(0.5)(1 – 0.5)]

n = (10196 * 0.5 * 0.5) ÷ [(10195 * 0.000651) + (0.5 *0.5)]

n = 2549 ÷ (6.634605 + 0.25)

n = 2549 ÷ 6.884605

n = 370

It is evident from the results computed using Dillman (2000) method that there is no difference between the sample size determined as compared with when the Krejcie and Morgan (1970) method was used. The two approaches yielded the same sample size of 370.

Furthermore, Fritz and MacKinnon (2007) in their study of the required sample size to detect the mediated effect suggested three methods. These are the joint significance test, the Prodclin asymmetric confidence interval test, and bias corrected bootstrap test to be used for testing mediation, provided it is known that the direct path is large. However, if the path is large, Fritz and MacKinnon (2007) agree that Baron and Kenny (1986) analysis have the same power as the joint significance test and suggest that researchers use the empirical sample sizes from the study as a lower limit of the number of subjects needed for 0.80 power, not as a guarantee of 0.80 statistical power.

However, if variables are measured with error (Hoyle & Kenny, 1999), larger sample sizes will be needed to achieve power in Partial Least Squares (PLS) based estimates in order to ensure rigour in complex modeling (Joreskog & Wold, 1982). Complex model refers to a larger model with many latent variables and indicators, such as a model with 10 or more constructs and 50 or more items of observation (Akter, D'Ambra & Ray, 2011; Chin, 2010). In essence, this study qualifies to be a complex model as it possesses 70 indicators that are higher than the standard of 50 indicators.

A better approach is to use the "power analysis, which is a method of identifying the appropriate sample size for group comparisons by taking into consideration the level

of statistical significance (alpha) of the analysis, the number of power desired in a study (that is, the sample size), and the effect size of the population" (Creswell, 2012; Sekaran & Bougie, 2010; Fritz & MacKinnon, 2007; Cohen, 1998; Lipsey, 1990).

To further this course of action, this study utilised Cohen, Cohen, West and Aiken (2003) method for computing power for regression coefficients, which was in agreement with the recommendation by Fritz and MacKinnon (2007) on statistical power analysis for determining appropriate and sufficient sample size in social science research especially when mediation is involved. The formula is as follows:

$$ n \quad = \quad \frac{L}{f2} + k + 1 \qquad \ldots \qquad \text{Equation 5} $$

Where

n   is the sample size

k   is the number of predictors in the regression equation

f   is an effect size measure for ordinary least squares regression (that is, 0.14, 0.26, 0.39, and 0.59 (Cohen, 1988).

L   is a tabled value corresponding to a specific power value. For a one predictor ordinary least squares regression with a Type I error of .05 and power of 0.80, L is equal to 7.85.

Using the formula in equation (4), the sample size for this study is arrived at as follows:

$$ n \quad = \quad \frac{7.85}{0.14^2} + 3 + 1 $$

$$ = \quad 400 + 3 + 1 $$

$$ = \quad 404 \text{ forensic accountants and auditors} $$

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This study adopted the sample size determination of 404 under the power analysis computation of Cohen, Cohen, West and Aiken (2003) as it generates much larger sample size than that of Sekaran and Bougie (2010, p. 295); Krejcie and Morgan (1970), as well as Dillman, (2000) since high power (> 0.80) shows the existence of high level of probability of producing significant results when the relationship is truly significant and also proves the study has adequacy of confidence on the hypothesized relationship in the study model (Akter, D'Ambra & Ray, 2011).

4.7.6 Unit of Analysis

Sekaran and Bougie (2010) describe the unit of analysis as "the level of aggregation of the data collected during the subsequent data analysis state." According to De Vaus (2011, p. 18), the unit of analysis is the "thing about which we collect information and from which we draw conclusions." For example, if the research questions under the study are on the individuals, groups, industries, organisations, and countries, the unit of analysis will be individuals, groups, industries, organisations, and countries.

For this study, the emphasis is on the task performance fraud risk assessment of forensic accountants and auditors in the office of the Accountant General of the federation and the Auditor General for the federation of Nigeria, and hence, the unit of analysis is individual.

4.7.7 Estimating Expected Response Rate

For this study, a total of 550 survey questionnaires were distributed to the respondents in the office of the Accountant General of the federation and the Auditor General for

the federation. The oversampling of additional 146 survey questionnaires instead of the required sample size of 404 survey questionnaires is to take care of the loss due to damages and non-challant respondents (Salkind, 1997) in the first instance.

The second reason for oversampling is to ensure that non-response bias and non-response rate will by no means affect the results from the survey (Ringim, Razalli, & Hasnan, 2012; Phokhwang, 2008; Sindhu & Pookboonmee, 2001). The distribution ratio is 50:50 to the office of Accountant General of the federation and the Auditor General for the federation.

Previous study has set the acceptable standard of 50% response rate in social science research survey (Babbie, 1973) and hence, this study is set out to achieve a higher response rate with the able assistance of the Institute of Chartered Accountants of Nigeria introduction and commending support letter to the top hierarchy in charge of public sector accounting, that is, the Accountant General of the federation and the Auditor General for the federation (ICAN, 2013).

4.8 Research Activities

In this section, the focus of the study is the research activities which comprise the research instrument development, primary data collection and data analysis techniques. The discussions on the research activities are provided in subsections 4.8.1 to 4.8.3.

4.8.1 Research Instrument Development

In cross-sectional design, there are various methods of data collection. These include (1) questionnaire, (2) interview (structured or loosely structured), (3) observation, (4) study of documents, and (5) unobtrusive techniques (De Vaus, 2011). A questionnaire is "a pre-formulated written set of questions to which respondents record their answers, usually within rather closely defined alternatives" (Sekaran & Bougie, 2010). Previous research has shown that questionnaires can be administered personally, mailed to the respondents, or electronically distributed; each method of communication has its advantages and disadvantages with respect to ease, reach, time, cost, response rate and computer literacy (Babatunde, 2014; Sekaran & Bougie, 2010; Sekaran, 2003).

4.8.1.1 Survey Questionnaire Design

This study adapts survey questionnaire because developing a new questionnaire needs to be validated through reliability test to confirm the reliability of the measures (Straub *et al.*, 2004). Researchers widely use survey questionnaires, especially researchers in accounting (De Vaus, 2011; Straub *et al.*, 2004). Prior research has recognised three goals in questionnaire design. These include: (1) to write questions that convey the meaning of the enquiry exactly as the research intended; (2) to provide the correct manner in gaining information from respondents that are designed to generate the most accurate responses possible; and (3) to minimise the time burden on respondents in proportion to the analytical requirements of the survey (Biemer & Lyberg, 2003).

This study used self-administered structured questionnaire which consists of seventy closed ended multiple choice questions. The instrument comprises sixty-one questions that relate to the five constructs of this study. In addition, there are nine questions for demographic categorical variables. The mode of preparation of the questions is in English language. In Nigeria, the medium for official information is English language and; therefore, it is used in the survey instrument distributed to the respondents.

The constructs for this study entail knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment. All the five constructs (knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment) are multi-dimensional.

For this study, the survey questionnaire instruments comprise two parts of six sections. Part one is made up of nine demographic questions tailored specifically to secure information regarding the respondents organisation, position or title, gender, highest academic education, highest professional education, certificate in forensic accounting, role in forensic accounting task, forensic accounting functions by organisation, and organisation involvement in fraud investigation. Part two consists of five sections of sixty-one questions to measure knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment. The details include: Section A comprises seven questions to measure knowledge requirement (forensic accountant and auditor); Section B is made up of nine questions to measure skills requirement (forensic accountant and auditor); Section C consists of twenty-five questions to measure mindset requirement (forensic accountant and

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auditor); Section D comprises sixteen questions with the primary responsibility of measuring fraud related problem representation (forensic accountant and auditor), and Section E is made up of four questions to measure task performance fraud risk assessment (forensic accountant and auditor).

Prior literature has shown that a well-designed and carefully crafted questionnaire facilitates the collation and analysis of data collected and in addition, to increase the response rate (Cone, 2001). Based on Cone's (2001) observation, a questionnaire for this study was graphically designed, printed and stitched on eighty grammes m.f. Bond white paper so as to make it easy and simple for the respondents to complete without intervention from the researcher. This position is supported by Creswell (2003) when he argued that the questionnaire format, physical arrangement of items and general appearance is a sine qua non to attracting respondents, thereby ensuring the success of the study.

4.8.1.2   Constructs Operationalisation: Rating Scales for the Response

For this study, the researcher employed rating scales for measuring latent constructs in social science research (Dawes, 2008; Churchill & Peter, 1984; Likert, 1932). The constructs in the study are to be measured as follows: (1) 5 point Likert scales for independent variables of knowledge, skills and mindset (strongly disagree, disagree, sometimes, agree and strongly agree) with 5 being a positive response; (2) 5 point Likert scales for mediating variable of fraud related problem representation (not at all, rarely, sometimes, often and very often) with 5 being a positive response; and (3) 5 point Likert scales with 5 being a positive response for dependent variable of task performance fraud risk assessment (strongly disagree, disagree, neutral, agree and

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strongly agree). The rating scale adopted is intended to get a response from the forensic accountants and auditors within the office of the Accountant General of the federation and the Auditor General for the federation in Nigeria, in the realisation of the objectives of the study.

The Likert scales were selected since they take less time, and are easy to answer (Frazer & Lawley, 2000; Churchill, 1995; McCelland, 1994). Prior research has shown that the use of 5-point and 7-point Likert scales produces same mean score as each other, relative to possible highest attainable score and very little difference between the scales in terms of mean, skewness and kurtosis (Dawes, 2008; Malhotra & Peterson, 2006; Churchill & Peter, 1984; Likert, 1932). In addition, it is easy for the respondents to capture the numerals from 1 to 5 for 5 point Likert scales (Dawes, 2008). Although, the use of 1 to 10 and 1 to 11 for 10-point and 11-point Likert scales is also suggested by Loken, Pirie, *et al.* (1987), yet they have drawbacks such as having lower mean score and also a challenge to the respondents in counting the numerals for scoring.

Although, there is a serious setback in the use of the Likert scale that has to do with its lack of reproducibility as noted by Oppenheim (1992). For this study, the researcher has a preference for the use of Likert scale to operationalise the constructs because it is greatly necessary for numerically ordering respondents, particularly in describing attitudes (Davis & Cosenza, 1993). More specifically, the 5 point Likert scales is commonly used in social science research as it allows greater discrimination and finer differences between people (De Vaus, 2011).

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4.8.2 Data Collection Method

This study used cross-sectional study design through the field study. Prior study under cross sectional design has shown that data are collected for a particular study at a time so as to meet the objectives of the study (Cavana *et al.*, 2001). In addition, this study adopted the use of cross sectional design because of its uniqueness in avoiding long time consumption as in the case of longitudinal design (Sekaran & Bougie, 2010).

Data collection process is an integral part of the research design. Data can be collected in a variety of ways, in different settings such as field or laboratory and from different sources - primary and secondary (De Vaus, 2011; Sekaran & Bougie, 2010). Primary data refer to information the researcher obtained at first hand on the variables of concern for the particular purpose of the study. Similarly, secondary data are indispensable for most organisational research (Sekaran & Bougie, 2010; Creswell, 2010; Denscombe, 2007).

Previous research has shown that the field study process allows the researcher to have personal contact with the respondents, and thus, the interaction enhances the administration of the questionnaire as well as solving any grey areas arising from the study and research instruments (DeVaus, 2011; Sekaran & Bougie, 2010; Sekaran, 2003; Straub *et al.*, 2004).

This study obtained the primary data with the help of the Institute of Chartered Accountants of Nigeria (ICAN) and four research assistants from the forensic accountants and auditors in the office of the Accountant General of the federation and

the Auditor General for the federation in Nigeria being the repository of accountants and auditors in the public sector.

Most importantly, the ICAN through its Registrar/Chief Executive, Rotimi O. Omotosho, FCA facilitated the follow up through contact in writing a request for data collection support to the Accountant General of the federation, Mr. Jonah Ogunniyi Otunla, FCA and the Auditor General for the federation, Mr. Samuel T. Ukura, FCA (ICAN, 2013). Consequently, the researcher and four research assistants went to the field and distributed a survey questionnaire to the respondents. Specifically and in addition, many follow-ups were made through physical contact/visit and telephone calls to the four coordinators who represented the ICAN and the ANAN members in the office of the Accountant General of the federation and the Auditor General for the federation since more than seventy-five percent of the respondents are domiciled in 36 states of the federation and Federal capital territory, Abuja. The remaining twenty-five percent respondents are deployed to the Headquarters of the offices of Accountant General of the federation and Auditor General for the federation.

More importantly and in the case of this study, no inducement by way of gift for a quick response was given to the respondents other than the persuasion letter of support from the ICAN (Appendices 6-7, p.361-362). According to ICAN (2013), "the findings of the research bear not only to broaden the frontier of knowledge into the novel area of forensic accounting but the positive impact on task performance in the public sector and value creation in Nigeria." It was the tonic that engenders the unimaginable support for the study from the respondents whose headship of the two offices is fellow members of the ICAN.

4.8.3   Data Collection Technique

The main data collection technique used by this study is a questionnaire. According to Sekaran and Bougie (2010) and Creswell (2010), this data collection technique that involves asking individuals specific behavioural questions are commonly used in social science research.

Similarly, the Othman Yeop Abdullah Graduate of Business, Universiti Utara Malaysia upon a request issued an introduction letter to the researcher for the purpose of data collection only. The letter certified the researcher and sought for support from the participating offices about the conduct of the study (Appendices 3-5, p.358-360). In addition, the Institute of Chartered accountants of Nigeria (ICAN) wrote the top hierarchy (Appendices 6-7, p.361-362) in the office of Accountant General of the federation and the Auditor General for the federation (ICAN, 2013). These two letters greatly assisted in enhancing the conduct of the study by building confidence and trust in the headship minds which culminated into the drafting of senior management cadre at directorate level to oversee jointly with the researcher, and the research assistants the distribution and collection of the questionnaires to the forensic accountants and auditors responsible for public sector accounting.

Despite the top management in the office of AGF, AudGF, and ICAN support, the data collection process suffers a drawback in terms of logistics, that is, the distribution of the questionnaires was slow and return of the completed questionnaires was epileptic. The perception of the researcher at the beginning of the data collection exercise was that, within four weeks, the whole exercise would have been concluded.

However, this was not the case at it took a period of ten weeks before the collection of completed survey was finalised.

4.8.4   Pilot Study

Pilot study refers to a small scale initial research carried out for the purposes of evaluating feasibility, cost, organisation and time as well as predicting the required or appropriate sample size meant to improve upon the study design prior to carrying out a full scale study (Hulley, 2007). Pilot study can be described as a process in which a researcher make changes to an instrument based on feedback from a small number of individuals who complete and evaluate the instrument (Creswell, 2012).

The significance of a pilot study to a full scale study cannot be overemphasised. The reason being that a pilot study usually unveil drawbacks in the design of the proposed survey or procedure, which require the researcher's attention before committing time and resources to a large scale study (Doug *et al.*, 2006). In essence, a pilot study enhances the review on the survey questionnaire with respect to technicality, interpretation of questions and ambiguity avoidance (Hair *et al.*, 2006; Hunt *et al.*, 1982). Other benefits of the pilot study include (1) determination of validity and reliability of items in the survey questionnaire; (2) evaluation of questions for better response; (3) evaluation of the respondents ability to supply the needed data; and (4) assessment of the adequacy of item wording, phrasing and the construction of questions for accurate and reliable results (Bambale, 2013).

The validity of the questionnaire means that the indicators or items measure the idea that they are supposed to do and not something else (De Vaus, 2011). Reliability, on

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the other hand, is defined as the degree to which the indicators or items consistently come up with the same measurement (De Vaus, 2011). Reliability of the questionnaire differs from validity in that it relates not to what should be measured, but instead to how it is measured (Hair, Black, Babin & Anderson, 2010).

For this study, the content validity of the instrument was tested before carrying out a pilot study. By content validity, it means the extent to which an instrument covers the meaning entrenched in a particular concept (Bambale, 2013; Babbie, 2004). Similarly, previous study described content validity to involve conducting consultation with a small number of possible respondents or panel of specialists for their opinion over the items, wordings and phrases exhibited in the survey questionnaire (Sekaran & Bougie, 2010; Hair *et al.*, 2007).

Table 4.9
Panel of Experts Composition on Pilot Study

S/N	Expert	Title/Position	Academic/Professional Education	Experience (Years)
1	Forensic/Fraud	Managing Consultant: Forensic Consulting	HND, ACA, CFA	15
2	Forensic Accounting	Managing Consultant: SOA Consulting	B.Sc., ACA, CFA	10
3	Fraud Investigation	Director: Accountant General Office	B.Sc., M.Sc., FCA	16
4	Auditing	Partner: Audit & Assurance	B.Sc., FCTI, FCA	11
5	Auditing/Investigation	Auditor General	B.Sc., M.Sc., FCA, CFA	15
6	Forensic/Audit & Assurance	Deputy Registrar Technical (ICAN Forensic, Audit, Investigation Faculty	B.Sc., ACCA, CFE	15
7	Accounting	Professor	PhD, FCA, FCTI, CFA	6
8	Auditing & Assurance	Deputy Director: Auditor General Office	B.Sc., M.Sc., FCNA	20
9	Forensic Auditing	Director: Auditor General Office	PhD, M.Sc., FCA	25
10	Accounting	Professor	PhD, FCA, CFE	10
11	Forensic/Fraud	Senior Consultant	MBA, FCTI, FCA, CFA	22
12	Auditing/IT	Senior Consultant	B.Sc., ACA, CISA	5

Source: The Researcher

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Consequently, a panel of twelve experts who are familiar with the constructs carried out a review of the original draft of the survey questionnaire for this study. The panel of experts' composition is represented in Table 4.9.

In addition, since the instruments upon which the five constructs that made up this study were adopted from previous studies conducted in developed countries, there was a need to reword or rephrase the items for clarity purposes. To buttress, four items of categorical variable (demographic information) were reworded and/or rephrased based on the advice of two professionals that carried out the review/comment on the questionnaire before the actual survey. These items were: (1) item 5 which states "what is/are your professional education" is replaced by "what is your highest professional education"; (2) item 6 which read "what is your involvement with forensic accounting? I consider myself a forensic accountant, and I have no involvement" is replaced by 2 items: item 6 which read "are you a Certified Forensic Accountant?" and item 7 which states "what is your role about Forensic Accounting?"

Similarly, one item on the continuous variables in Part 2 sections A – E was dropped according to the advice from one of the experts, which examined the questionnaire as the item does not constitute an indicator for measurement. This item reads "please identify your role about forensic accounting. Circle only one choice. Forensic Accountant (FA), Auditor (AUD)."

Having gone through the experts' scrutiny of the instruments for this study and consequent upon the foundation that preceding studies have tested these instruments

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at different times and contexts, the instruments are considered to be adequate, robust and appropriate for this study. Specifically, knowledge requirement instruments have proved to be valid and reliable after being used at different times (Davis, Farrel & Ogilby, 2010).

Similarly, skills requirement instruments have been satisfactorily certified to be reliable and valid in different numbers of research conducted in the developed countries (DiGabrielle, 2008; Ramaswamy, 2007; 2005). More especially, mindset requirement instruments have demonstrated signs of robustness and validity in different studies at different times (Falconer, 2012; Chui, 2010; Frank, 2010; Torelli & Kaikati, 2009; Boritz *et al.*, 2008; Dweck, 2006; Feder, 2000).

Prior literature confirms fraud related problem representation instruments to be valid and reliable after being used at different times and contexts (Christ, 1993; Koonce, 1993; Pitz & Sachs, 1984; Mani & Johnson-Laird, 1982; Chi *et al.*, 1981; Greeno, 1977) and more especially task performance fraud risk assessment instruments were used and found appropriate having proved to be reliable and valid in different situations and contexts (Owens, 2012; Wuerges, 2011; Chui, 2010; ACFE, 2009; Asare & Wright, 2004; Wilks & Zimbelman, 2004; Knapp & Knapp, 2001; Hackenbrack, 1992).

According to Malhotra (1999), a sample size purposely for a pilot study is smaller and most often consists of fifteen to thirty elements, subject to increase substantially depending on peculiarities. Seventy five survey questionnaires were distributed

among the accountants, auditors and forensic accountants in the office of the Accountant General of the federation and the Auditor General for the federation.

The seventy-five questionnaires distributed among the respondents were far beyond the recommended number of questionnaires by Malhotra (1999). The justification for this is to avoid low response rate. However, sixty four questionnaires were completed and returned, but on scrutiny only fifty nine questionnaires were retained as usable, whilst five questionnaires were dropped for some explainable flaws. Therefore, the response rate of eight five per cent was achieved.

The pilot study commenced in the month of August 2013 and lasted till the third week of the same month; that is 3 weeks duration. In testing for reliability, this study adopted the internal consistency reliability test of Litwin (1995). The internal consistency reliability test is defined as "the extent to which indicators of a particular construct converge together and possess the capability of independent measurement of the same construct, and at the same time the items are correlated with each other."

This study employed the Cronbachs alpha coefficient (Sekaran & Bougie, 2010) and composite reliability (Hair *et al.*, 2014) as its internal consistency reliability measures. However, composite reliability (CR) for items or indicators and average variance extracted (AVE) for constructs are the most preferred measures of internal consistency reliability.

Specifically, they provide support for their inclusion in the path model due to the limitation inherent in the Cronbachs alpha as a measure of internal consistency

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reliability. For instance, Cronbachs alpha assumes that all indicators are equally reliable, (that is, all the indicators have equal outer loadings on the construct). However PLS-SEM prioritises the indicators according to their individual reliability. In addition, Cronbachs alpha is sensitive to the number of items in the scale and tends to underestimate the internal consistency reliability (Hair, Hult, Ringle & Sarstedt, 2014). According to Mooi & Sarstedt (2011), an unreliable measure can never be valid as there are no means of distinguishing between the systematic error and random error.

Previous studies considered a reliability coefficient of 0.60 to 0.70 as acceptable in exploratory research, while, in more advanced stages of study, values between 0.70 and 0.90 can be regarded as satisfactory (Hair, Hult, Ringle & Sarstedt, 2014; Pallant, 2010; Tenenhaus *et al.*, 2005; Nunally & Bernstein, 1994).

Previous research agreed that values above 0.90 (and > 0.95) are not desirable because they indicate that all the indicator variables are measuring the same phenomenon and are, therefore, unlikely to be a valid measure of the construct (Hayduk & Littvay, 2012; Rossiter, 2002; Drolet & Morrison, 2001).

Table 4.10 demonstrated the results that all measures attained satisfactory reliability coefficient ranging from 0.70 to 0.90 for indicators or items internal consistency reliability.

Table 4.10
Pilot study Reliability and Validity Test

S/N	Construct	No. of Items	Cronbach's Alpha	Composite Reliability	AVE
1	Knowledge (Forensic Accountant and Auditor	6	0.864	0.898	0.596
2	Skills (Forensic Accountant and Auditor	5	0.832	0.881	0.599
3	Mindset (Forensic Accountant and Auditor	9	0.885	0.909	0.5287
4	Fraud Related Problem Representation	8	0.876	0.904	0.5452
5	Task Performance Fraud Risk Assessment	3	0.810	0.889	0.7291

Source: The Researcher

4.9   Data Analysis

Having completed data collection for this study, descriptive and inferential statistics were used as methods of data analysis. Specifically, this study used Statistical Packages for Social Sciences (IBM SPSS) for Windows Version 20.0 (Coakes, 2013; Pallant, 2010; Shammout, 2007; Zikmund, 2003) and PLS-SEM (SmartPLS) software Version 2.0 3M (Ringle *et al.*, 2005; 2004) in addition to PLS-Graph (Chin, 2003) in the analysis of the data.

For this study, twelve negatively worded scale items under the mindset requirement construct were recoded in the IBM SPSS. These items which have the response format as 1 = strongly disagree, 2 = disagree, 3 = sometimes, 4 = agree, and 5 = strongly agree are: 5, 6, 10, 12, 13, 15, 16, 19, 20, 22, 24, and 25. The twelve manifest variables have been recoded to allow computation of composite variables.

Similarly, the analysis and presentation of results are in accordance with PLS-SEM (Hair, Hult, Ringle, & Sarstedt, 2014).

4.9.1 Descriptive Analysis

For this study, a descriptive analysis that is associated with the description of phenomena of interest (Sekaran & Bougie, 2010) was used in the analysis, interpretation and presentation. Specifically, descriptive analysis describes the characteristics of the sample, addresses specific research questions, and checks the variables for any violation of the assumptions underlying the statistical techniques in all the constructs were employed in this study (Coakes, 2013; Pallant, 2010). In this study, descriptive information is analysed statistically in terms of frequency of a particular aspect of interest, the average score, or measures of central tendency (mean, median and mode) and the range of variability (standard deviation).

In addition to the descriptive analysis, non-parametric statistical technique was used in this study. There are two types of statistical technique: parametric and non-parametric. The word "parametric" comes from "parameter," or characteristics of the population. This statistical technique makes the assumption about the population from which the sample has been drawn (e.g. normality). The parametric tests include t-tests, and analysis of variance.

On the contrary, non-parametric statistical technique does not have such stringent requirements and does not make assumptions about normality of the population. Non-parametric technique is ideal for use when data are to be measured on nominal (categorical) and ordinal (ranked) scales, but also very useful for very small samples.

The non-parametric tests include chi-square for independence, Mann-Whitney U Test, Friedman test, Cochran's test, amongst others. Assumptions of non-parametric technique included random samples and independent observations, which are highly adopted in this study.

4.9.2 Partial Least Square (PLS-SEM) Technique: Structural Equation Modeling

PLS-SEM is an offshoot of the first generation statistical methods which dominated the research landscape through the 1980s. However, since the early 1990s, this second generation methods have expanded rapidly to the extent that they account for over fifty percent of statistical tools applied in the empirical research (Hair, Hult, Ringle, & Sarstedt, 2014). As noted by Hair, Hult, Ringle and Sarstedt (2014), this second generation statistical method, as an emerging second generation tools, is referred to as partial least squares structural equation modeling (PLS-SEM).

Prior literature has shown that there are two types of structural equation modeling, namely: (1) Covariance based SEM (CB-SEM), which is used to confirm or reject theories (that is, a set of the systematic relationship between multiple variables that can be tested empirically). On the contrary, (2) Variance based SEM (PLS-SEM) also called "PLS Path Modeling" is primarily employed to develop theories in exploratory research. It is done by focusing on explaining the variance in the dependent variables when examining the model (Hair, Hult, Ringle, & Sarstedt, 2013).

Based on the features and objectives that distinguish these two methods of second generation statistical tools, CB-SEM and PLS-SEM (Hair *et al.*, 2012b), this study

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adopted PLS-SEM because the objective of applying structural equation modeling is theory development and explanation of variance (prediction of target constructs). While the estimation procedure for PLS-SEM is an ordinary least squares (OLS) regression-based method, CB-SEM uses the maximum likelihood (ML) estimation procedure (Hair, Hult, Ringle, & Sarstedt, 2014).

As noted by Chin (1998), "ML is theory-oriented that also emphasises the transition from exploratory to confirmatory analysis. Whereas, PLS is primarily intended for causal-predictive analysis in situations of high complexity but low theoretical information." Based on the analyses of the previous studies (Hair *et al.*, 2014; Chin, 1998), the task performance fraud risk assessment on knowledge, skills and mindset (forensic accountant and auditor) in the Nigerian public sector are best analysed with PLS-SEM. In addition, the mediating influence of fraud related problem representation on task performance fraud risk assessment study cannot be flawed under PLS-SEM.

For this study, there are four significant features or issues considered before the adoption of PLS-SEM application. These are: (1) the data, (2) model properties, (3) the PLS-SEM algorithm, and (4) model evaluation (Hair *et al.*, 2012a; Hair *et al.*, 2012b; Ringle, Sarstedt & Straub, 2012; Hair, Ringle & Sarstedt, 2011). These critical qualities are presented in Table 4.11(a-d).

Table 4.11a
Key Characteristics of PLS-SEM – Data Characteristics

Sample Sizes	• No identification issues with small sample sizes
	• Generally achieves high levels of statistical power with small sample sizes
	• Larger sample sizes increase the precision (i.e. consistency) of PLS-SEM estimations
Distribution	• No distribution assumptions; PLS-SEM is a non-parametric method
Missing Values	• Highly robust as long as missing values are below a reasonable level
Scale of Measurement	• Works with metric data, quasi-metric (ordinal) scaled data, and binary coded variables (with certain restrictions)
	• Some limitations when using categorical data to measure endogenous latent variables

Source: Adapted from Hair, Hult, Ringle, & Sarstedt (2014, p.16-17)

Table 4.11b
Key Characteristics of PLS-SEM – Model Characteristics

Number of items in each construct measurement model	• Handles constructs measured with single and multi-item measures
Relationships between constructs and their indicators	• Easily incorporates reflective and formative measurement models
Model complexity	• Handles complex models with many structural model relations
	• Large numbers of indicators are helpful in reducing the PLS-SEM bias
Model setup	• No causal loops allowed in the structural model (only recursive models)

Source: Adapted from Hair, Hult, Ringle, & Sarstedt (2014, p.16-17)

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Table 4.11c
Key Characteristics of PLS-SEM – Algorithm Properties

Objective	• Minimises the amount of unexplained variance (i.e. maximises the R^2 values)
Efficiency	• Converges after a few iterations (even in situations with complex models and/or large sets of data) to the optimum solution; efficient algorithm
Construct scores	• Estimated as linear combinations of their indicators • Use for predictive purposes • Can be used as input for subsequent analyses • Not affected by data inaccuracies
Parameter estimates	• Structural model relationships are generally underestimated (PLS-SEM bias) • Measurement model relationships are usually overestimated (PLS-SEM bias) • Consistency at large • High levels of statistical power

Source: Adapted from Hair, Hult, Ringle, & Sarstedt (2014, p.16-17)

Table 4.11d
Key Characteristics of PLS-SEM – Model Evaluation Issues

Evaluation of the overall model	• No global goodness-of-fit criterion
Evaluation of the measurement models	• Reflective measurement models: reliability and validity assessments by multiple criteria • Formative measurement models: validity assessment, importance and relevance of indicator weights, indicator collinearity
Evaluation of the structural models	• Collinearity among sets of constructs, significance of path coefficients, coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2 and q^2 effect size)
Additional analyses	• Impact performance matrix analysis • Mediating effects • Hierarchical component models • Multigroup analysis • Uncovering and treating unobserved heterogeneity • Measurement model invariance • Moderating effects

Source: Adapted from Hair, Hult, Ringle, & Sarstedt (2014, p.16-17)

4.10 Ethical Considerations

This study rigidly adhered to Universiti Utara Malaysia Thesis guideline research ethics (2014, p.7), the Institute of Chartered Accountants of Nigeria (ICAN) 2009 Code of conduct for members, and ethics and the researcher as noted by Sekaran and Bougie (2010). The Chambers Dictionary (Chambers, Emberley, & Chambers, 2011) defines ethics as "the science of morals that branch of philosophy that is concerned with human character and conduct, a system of morals or rules of behaviour, and a treatise on morals."

Most importantly, having considered the use of cross-sectional design in this study, the issue of harm to respondents as a result of the intervention to avoid the potential ethical concerns may not be necessary since the design relies on existing variations rather than the introduction of the intervention. Similarly, it is an added advantage to the adopted cross-sectional design which seeks to avoid ethical issues prevalent to random allocation as in experimental and control group.

The first issue to be addressed is minimization of harm (unauthorised act) to the Office of Accountant General of the federation and the Auditor General for the federation during the access and acceptance stage of the exercise (Cohen *et al.*, 2007). This was done through the Institute of Chartered Accountants of Nigeria, followed by seeking official permission in the target setting before the commencement of the study. The researcher presented his "credentials as a serious investigator and established personal moral position with respect to the proposed research."

In this study, informal and formal approval was gained by explaining the objectives and the nature of the proposed research, nature and procedures involved in the study. In addition, the researcher did protect the integrity and reputation of the Office of Accountant General of the federation and the Auditor General for the federation, and the forensic accountants and auditors. Anonymity of the respondents was also maintained and protected. Adequate measures were taken to uphold and meet the ethical requirements of the Universiti Utara Malaysia and the office of the Accountant General of the federation and the Auditor General for the federation in Nigeria.

In the context of the forensic accountants and auditors, the problem of minimization of harm requires consideration of how the respondents could benefit from the study. Dornyei (2007) argues "an effort needs to be made to ensure the respondents benefit from the research in some way." In this study, forensic accountants and auditors reflect on their experiences and exposure on task performance fraud risk assessment and the relationship with knowledge, skills and mindset as competency and capability requirements.

Prior literature suggests that those who are clear about their self-concept, and who are able to describe who they are as forensic accountants and auditors, have greater control of their assignment (Marsh & Martin, 2011; Mercer, 2011). An understanding of the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) is required to facilitate respondents understanding of the mechanisms of fraud detection, prevention and response.

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Similarly, the understanding of the mechanisms of fraud detection, prevention and response is equally beneficial to the public sector accounting activities and practices in Nigeria. It is likely right to say that information from the study may provide an opportunity for improvement of the current practice in public sector accounting.

This study, in addition, considers other ethical issues such as integrity, skill and fairness, anonymity and confidentiality, compliance with laws and guidelines, informed and voluntary consent, and data handling.

4.10.1 Integrity, skills and fairness

The researcher's ability to comport himself with dignity is vital to the study. Ability to demonstrate integrity and fairness and by placing others in his place cannot be over-emphasised especially with human respondents. In this study, the researcher demonstrates these traits and qualities before, during, and after the data collection processes.

4.10.2 Anonymity and confidentiality

In this study, the preservation of confidential information acquired during the research duties is maintained and to ensure its non-disclosure to third party except the researcher and the supervisor who have the need for the data collected and the results. Anonymity of the respondents is given its pre-eminence as none of the respondents are asked to input their names, signature or show any identification to suggest through inference the identity of the individual respondents. According to Wiles *et al.*, (2006), anonymity has been described as "a vehicle through which confidentiality is

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operationalised." In essence, the respondent's privacy with regards to the information supplied so that both name and authorship is unknown is rigidly adhered to.

4.10.3 Informed and voluntary consent

Most importantly, the underlying principle of informed consent which emerges from Howe and Moses (1999) states "it is up to research respondents to weigh the risks and benefits associated with participating in a research project and up to them to then decide whether to take part." The decision to adhere to this principle could be justifiable only when the respondents have been informed and understood what their involvement in the research entails (Howe & Moses, 1999).

To ensure that the forensic accountants and auditors were sufficiently informed, the survey questionnaire was nicely designed and written with simple and clear language to stimulate interest and to ensure prompt compliance to early completion and submission of the questionnaire to the researcher.

4.10.4 Data Handling

The researcher takes adequate measures to ensure security of storing the hard data in the completed and returned Survey questionnaire in accordance with ethical guidelines. Only the researcher and the Supervisors were accessible to the returned survey questionnaire. The returned survey questionnaire is to be kept in accordance with the accepted principle of storage for five years, after which the survey questionnaire becomes destroyed.

4.10.5 Compliance with applicable laws

In the course of data collection process, the researcher is required to direct his affairs with courtesy, uphold objectivity and display competence and due diligent both with the institutions, respondents and the research assistants in order to ensure the success of the exercise. In this study, adequate measures are taken rigidly to ensure compliance with all relevant research laws and guidelines by the researcher.

4.11   Chapter Summary

This chapter has discussed and justified the application of positivist ontology, empirical epistemology and quantitative methodology for this study. It described the design, methods and techniques that were used in this study. Specifically, this chapter discussed the research design, operational definition of variables, and measurement of variables, research equations, population of the study, sample size and sampling techniques, unit of analysis, data collection and data analysis techniques.

In addition, this chapter discussed the instrument used for this study as well as the reliability and validity of the instrument.   Similarly, the chapter addressed issues relating to the method of data analysis adopted for this study and the reasons for such action. On the final note, this chapter has explained the pilot study conducted in the month of August, 2013 and its result, and the ethical issues applied in the study were outlined. The following chapter presents the quantitative results of the study.

CHAPTER FIVE

RESULTS

5.1 Introduction

This chapter explains the analysis conducted and in addition presents the empirical results to test the research hypotheses. This chapter consists of twenty two main sections that include the summary. First, section 5.1 deals with the introduction of the chapter. Second, sections 5.2 and 5.3 present an overview of data process and preliminary data analysis. Here, procedures used to purify the data are described. Third, sections 5.4 – 5.6 provide a detailed discussion on the analysis of survey response, common method bias and profile of respondents. Fourth, the next sections 5.7 – 5.9 provide an evaluation of PLS-SEM results, descriptive analysis of the constructs, and measurement scale on research variables.

Similarly and fifth, sections 5.10 and 5.11 provide a general description of the analysis and results of PLS-SEM reflective measurement models, which include the uni-dimensionality, reliability and validity of the constructs. Sixth, sections 5.12 and 5.13 present an overview of revised theoretical model and goodness of fit measure. Seventh, sections 5.14 – 5.20 present a report of the analysis and results of PLS-SEM structural model with reference to the hypotheses developed and explicated in Chapter Three to answer the research questions in Chapter One. Eighth, section 5.21 presents the summary of the 15 hypotheses tested and empirically validated. Ninth and final, section 5.22 provides a short chapter summary, thus concludes all the twenty two main sections of chapter five of this study.

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5.2   An overview of Data Analysis

For this study, the IBM Statistical Package for Social Science (IBM SPSS Statistics) version 20.0 for windows was used to analyse the data in the first phase. According to Coakes (2013) and Zikmund (2003), this software is widely deployed for data analysis technique by many researchers. In this study, the software was used to prepare the data file, and to carry out data screening and transformation in the form of data entry, insertions and deletions of cases and variables, missing values and outliers, data recoding and selection. Furthermore, the software was used to carry out descriptive analysis by computing the missing values, frequencies, means, standard deviations, and performing the non-response and common method variance tests.

Following the first phase, Partial least square-Structural equation modeling (PLS-SEM) was employed to test the hypotheses (Chapter three) in this study. Structural equation modeling (SEM) is among the most useful advanced statistical analysis techniques that have emerged in the social science research in recent decades. It belongs to the class of multivariate techniques, which combine the aspects of factor analysis and regression. Thus, it enables the researcher to simultaneously examine relationships among measured variables and latent variables as well as between latent variables (Kline, 2005; Hair *et al.*, 1998).

Most specifically, it is not surprising that SEM has become one of the most prominent statistical analysis techniques because of the ever increasing importance of understanding latent phenomena such as attitudes, attributes, consumer perceptions, or intentions as well as their impact on organisational performance measures (Hair *et al.*, 2014; Kline, 2005; Hershberger, 2003; Bryne, 2001; Anderson & Gerbing, 1988).

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Based on this view-point, there is no other substitute of statistical analysis technique that meets the objectives of this study which is the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in the Nigerian public sector than SEM.

In the adoption of SEM as a statistical analysis technique, researchers are exposed to two main alternatives, CB-SEM (co-variance based SEM), and PLS-SEM (variance based partial least squares SEM). For the CB-SEM, the analysis is done predominantly through LISREL and AMOS software tools. On the other hand, PLS-SEM carries out analyses through SmartPLS and WarpPLS software tools. Previous study has shown that co-variance based SEM is best suited for theory testing and development while variance based SEM is best applied for causal-predictive analysis especially in the condition of high complexity and low theoretical information (Barclay, Higgins, & Thompson, 1995). Accordingly, Hair, Hult, Ringle and Sarstedt (2014) state that

> "PLS-SEM has several advantages over CB-SEM in many situations commonly encountered in social sciences research. For example, when sample sizes are small, the data are non-normally distributed, or when complex models with many indicators and model relationships are estimated".

Similarly, Hair, Sarstedt and Ringle (2011) argue that "if applied correctly, PLS-SEM can indeed be a silver bullet in many research situations".

More importantly, the premise of this research is geared towards causal-predictive analysis and less emphasis on theory development; therefore PLS-SEM is most

appropriate. Specifically, since the method is exploratory in nature, the primary purpose of applying structural equation modeling is prediction and explanation of target constructs. As such, the conceptual model in this research could not be classified as theory development and non-prediction oriented modeling. Therefore, the variance based SEM (PLS-SEM) which uses available data to estimate the path relationships in the model with the objective of minimising the error terms (that is, the residual variance) of the endogenous constructs is especially preferred and adopted by this study.

5.3 Preliminary Data Analysis

This stage in the process of data analysis for the study is vital to the researcher as "garbage in is garbage out". It, therefore, follows that careful and adequate planning of the data analysis stage is essential. The researcher consequently adopts a measure of a flow chart of the data analysis process as represented by Figure 5.1 to ensure accurate data analysis.

Specifically, the data analysis process involves data preparation, editing and coding, data screening and transformation, data analysis by exploring descriptive statistics, and data analysis by modifying variables for further analysis as presented in subsections 5.3.1 to 5.3.3.

5.3.1 Data Preparation, Editing and Coding

Following the conclusion of the data collection process for this study, the next stage in the process of setting up a data file and analysing the data involves data preparation, editing and coding. In preparing the data file, three key steps are rigidly

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complied with in this study. These are: 1) check and modify (where necessary) the options IBM SPSS adopts to display the data and the output that is produced; 2) set up the data file by defining the variables, and 3) enter the data, that is, the values obtained from each of the respondents for each variable (Coakes, 2013; Pallant, 2010).
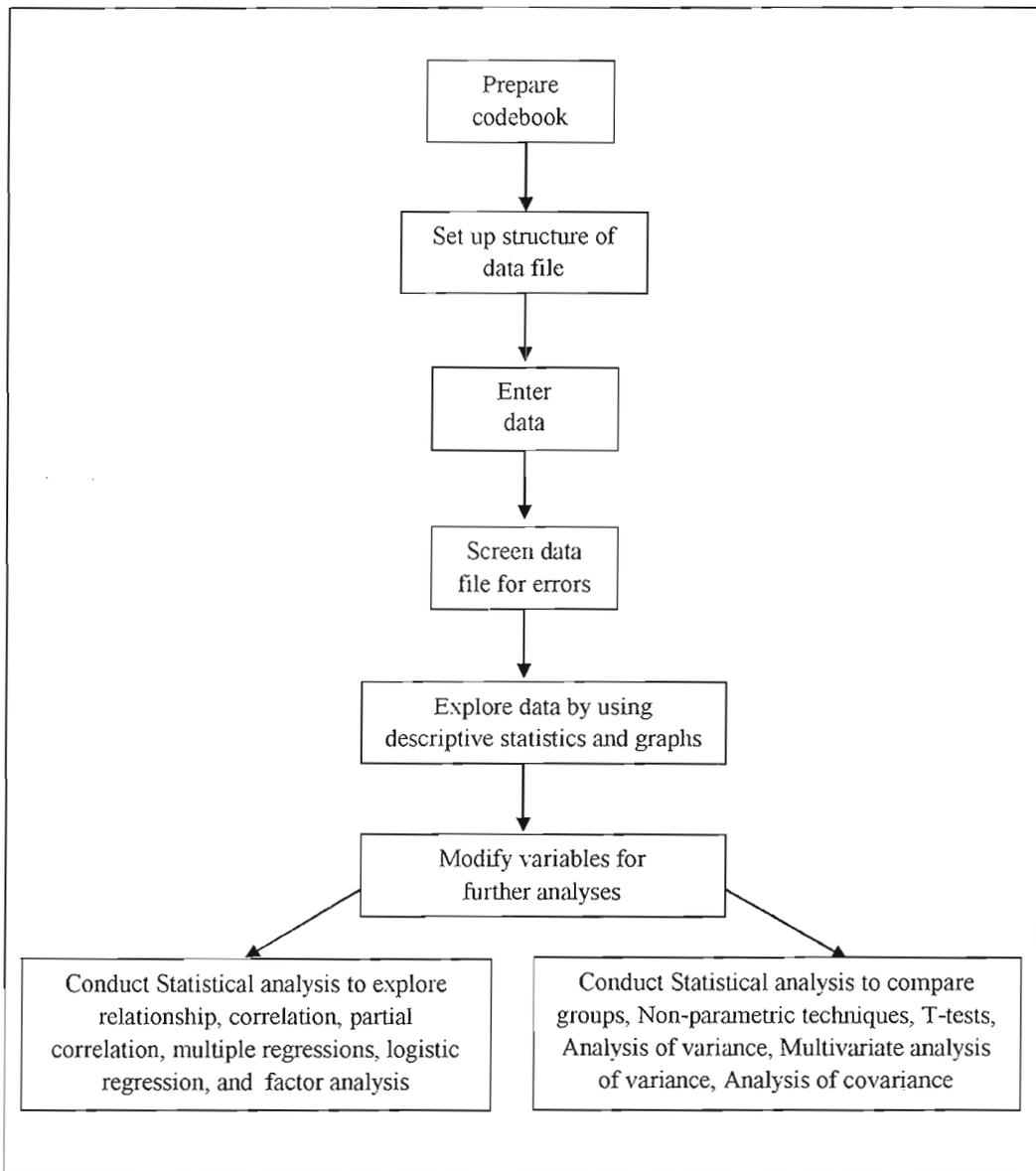
Figure 5.1
Flow Chart of Data Analysis Process
Source: Adapted from Julie Pallant (2010), "A step by step guide to data analysis using SPSS program: Survival Manual", 4th Ed., p.28

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Editing of the raw data follows, which is meant to ensure accuracy and completeness of the data for this study. By editing, it is a process that involves checking the completed and returned the survey questionnaire for omissions, legibility, and consistency in classification (Zikmund, 1994).

The raw data from the survey questionnaire were manually entered and coded into an IBM SPSS Statistics version 20.0 data workbook by using pre-coding process (De Vaus, 2011; 1995) whereby all items are pre-coded with numerical values.

For this study, respondents who answered at least 30 percent of the survey questionnaire as suggested by Sekaran and Bougie (2010, p. 197; 2003) are considered acceptable for sampling purposes in this study. This study recorded 77 per cent of the respondents who answered the survey questionnaire, and therefore, this is obviously higher than the minimum standard of respondents recommended by Sekaran and Bougie (2010, p.197; 2003).

5.3.2 Data Screening and Transformation

In order not to ignore or circumvent the assumption of psychometric properties prior to applying appropriate data analysis techniques, this study used a series of data screening approach which include detection and treatment of missing data, outliers, and linearity. The reason is to ensure that the chosen sample size has a direct impact on the choice of data analysis techniques and tests that are selected (Bryne, 2010). This study does not consider any distributional assumptions as PLS-SEM is non-parametric method of statistical analysis techniques (Hair *et al.*, 2013).

5.3.2.1 Missing data

Prior study has established that missing data constitutes a major concern to researchers and, therefore, has the capacity to affect negatively the results of any empirical study (Cavana *et al.*, 2001). Missing data occurs when there are one or more items of omissions in a survey. In this study, the screening of the data shows that there is a minimal amount of missing data (i.e. 5 items). According to Cohen and Cohen (1983) missing data up to 10 per cent may not pose as a threat in the interpretation of the findings.

With regard to the treatment of missing data, the mean substitution method which is general (Schwab, 2005) and widely employed (Hair *et al.*, 1998) in social science research was adopted in this study. In essence, its use is based on valid responses which make the mean substitution the best single replacement of missing data. However, there are other methods of treating missing data such as expected maximisation (EM), and list-wise deletion (Graham *et al.*, 1997).

5.3.2.2 Outliers

Outliers are defined as any observations which are numerically distant if compared to the rest of the dataset (Abdullateef, 2011; Bryne, 2010). Previous studies on the detection of outliers have identified univariate (i.e. histograms, box-plots and standardised z-score) and multivariate (Mahalanobis D^2 distance) detection methods (Hair *et al.*, 2010; Hau & Marsh, 2004). One significant reason in favour of Mahalanobis method of treating outliers is in its effectiveness through the settings of some predetermined threshold that helps in defining whether a point could be categorised as outlier or not (Gerrit *et al.*, 2002).

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Mahalanobis D^2 distance is generated for each case using IBM SPSS version 20.0 by clicking Analyse, Regression and linear. A dialogue box "linear regression" emerges. Click on Save. Following the click, a dialogue box appears. Click on Mahalanobis and Click Ok. Drag "id" (i.e. the newly created response number) to the dependent variable and all continuous variables to the independent variable dialogue box. Click Ok. Check the Data view for each case that is higher than the critical value obtained using the Chi square table at 0.001 based on the number of observed measured items.

This study identifies 31 out of the total of 359 respondents to be affected by the outliers' syndrome because their Mah_2 is greater than the threshold value seen in the Chi square table, which relates to the 61 measurement items in the independent variable of this study. All the 31 items were subsequently deleted from the dataset. Consequent upon the treatment of outliers, the final regressions in this study consist of 328 samples in the dataset.

5.4   Analysis of Survey Response

5.4.1   Response Rate

Following the distribution of 550 questionnaires to randomly selected forensic accountants and auditors in the office of the Accountant General of the federation and the Auditor General for the federation in Nigeria, a total of 422 questionnaires was completed and returned within a period of 10 weeks the exercise lasted (that is, August 22, 2013 to November 06, 2013). However, as shown in Table 5.1 of this study, a total of 328 questionnaires are deemed to be retained and used for the purposes of study.

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Specifically, a total of 94 questionnaires were rejected and unusable for two major reasons. First, a total of 63 questionnaires suffer rejection due to unanswered manifest variables from further analysis in this study because of their incompleteness and non-eligibility (double ticking of items). Second, univariate and multivariate outliers also manifested in some questionnaires, and hence, suffer rejection. For this reason, 31 questionnaires were expunged from the analysis. Previous studies confirm that the exclusion of such number of questionnaires is necessary as they do not represent the sample (Meyers *et al.*, 2006; Hair *et al.*, 1998). A summary of the response rate of the survey questionnaires is illustrated in Table 5.1.

Table 5.1
Summary of the Response Rate of Questionnaires

Item	Frequency	Per cent (%)
Distributed questionnaires	550	100
Completed and returned questionnaires	422	77
Unusable questionnaires:		
• Incompleteness and non-eligibility	63	11
• Univariate and multivariate outliers	31	6
Retained/Used questionnaires	328	60

Source: The Researcher

This total of 328 respondents reflects the sample for this study. It also gives an effective response rate of 60 percent and covers a broad range of forensic accountants and auditors in the office of the Accountant General of the federation and the Auditor General for the federation in the Nigerian public sector. The rate of 60 per cent is considered adequate and sufficient for this research considering Sekaran's (2003), and Sekaran and Bougie's (2013; 2010) argument that response rate of 30 per cent is acceptable for surveys. More specifically, the current response rate is sufficient going by the previous studies suggestion that a sample size should be between 5 and 10

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times the number of construct variables in the study (Hair *et al.*, 2010; Bartlett, Kotrilik, & Higgins, 2001). Granting the number of construct variables is 5; a sample of 50 is sufficient for analysis. More importantly, PLS-SEM, which is the statistical analysis tool for this study, requires a minimum of only 30 responses (Chin, 1998b); thus a total of 328 response rate for this study is adequate and sufficient for analysis. According to Linus (2001), the range of general response rate suggested for social science research in Nigeria falls between 40 to 50 percent, and therefore, 328 response rate (60%) for this study is higher than the standard set for response rate in Nigeria.

5.4.2 Analysis of Non-response Bias

According to Armstrong and Overton (1977), non-response bias underscores serious concern especially when dealing with surveys. Tse *et al.*, (2003) asserts that non-response bias could threaten the validity of the survey. Prior literature defines non-response bias as the mistake a researcher expects to make in the process of estimating a sample characteristic because some types of survey respondents are under-represented due to non-response (Bambale, 2013; Berg, 2002). As noted by Singer (2006) "there is no minimum response rate below which a survey estimate is necessarily biased and, conversely, no response rate above which it is never biased". In essence, no matter how small the non-response, there is a possible bias; and this has to be investigated (Pearl & Fairley, 1985; Sheikh, 1981). So, there is a necessity to conduct the non-response bias analysis for this study.

For the analysis of non-response bias in this study, respondents were divided into two independent samples based on their response to survey questionnaires in relation to

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the five main construct variables (task performance fraud risk assessment, fraud related problem representation, knowledge, skills, and mindset (forensic accountant and auditor)). Similarly, the researcher compares the responses of those who responded to the questionnaires distributed between August to September 2013 (early) and those who responded by November 2013 (late). In effect, those who responded to questionnaires by November 2013 are regarded as an integral sample of non-respondents to the early respondents of September 2013. Previous studies have shown that late respondents are often similar to non-respondents (Miller & Smith, 1983; Oppenheim, 1966). The descriptive statistics for early and late respondents is illustrated in Table 5.2.

Table 5.2
Descriptive Statistics for Early and Late respondents

Construct	Response	N	Mean	Standard Deviation	Standard Error Mean
KR_meanfinal	Early before October 2013	219	4.53	0.474	0.032
	Late before November 2013	109	4.72	0.486	0.047
SR_meanfinal	Early before October 2013	219	4.83	0.383	0.026
	Late before November 2013	109	4.86	0.440	0.042
MR_meanfinal	Early before October 2013	219	4.18	0.605	0.041
	Late before November 2013	109	4.53	0.643	0.062
FRPR_meanfinal	Early before October 2013	219	4.45	0.429	0.029
	Late before November 2013	109	4.64	0.457	0.044
TPFRA_meanfinal	Early before October 2013	219	4.31	0.534	0.036
	Late before November 2013	109	4.62	0.569	0.054

Source: The Researcher

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Following the computation of the independent samples t-test for equality of means, the results show that the group mean and standard deviation for early responses and late responses are apparently not different. As represented in Table 5.3, there is no significant difference between early responses and late responses based on the items in the constructs. For example, the constructs of knowledge requirement (t = -3.264, p < 0.001); skills requirement (t = -0.735, p < 0.463); mindset requirement (t = -4.843, p < 0.000); fraud related problem representation requirement (t = -3.701, p < 0.000); and task performance fraud risk assessment (t = -4.898, p < 0.000). Thus, the results show that while these items are statistically different, the differences are quite small and insignificant to affect the overall results of the study. Table 5.3 summarises the independent samples t-test for equality of means of this study.

5.5 Common Method Bias

The measurement of the research constructs in this study is solely based on the perceptual judgement of a single individual, that is, the public sector forensic accountant and auditor in the Office of the Accountant General of the federation and Auditor General for the federation in Nigeria. Podsakoff, MacKenzie, Lee and Podsakoff (2003) define common method bias as "variance that is attributable to the measurement method, rather than to the constructs the measure represent". This common method could be problematic to any research; hence, the researcher considers its effect on the present study.

This study has employed self-reported data from forensic accountants and auditors in the public sector accounting institutions in Nigeria, which produces the potential for common method variance (CMV). Granting the fact that the predictor variables

(knowledge, skills and mindset – forensic accountant and auditor), and criterion variables (fraud related problem representation and task performance fraud risk assessment) are obtained from the same single source.

Table 5.3
Independent Samples T-Test for Equality of Means

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Knowledge	Equal variances assumed	2.236	.136	-3.264	326	.001	-.183	.056	-.293	-.073
	Equal var. not assumed			-3.236	210.972	.001	-.183	.057	-.294	-.071
Skills	Equal variances assumed	.114	.736	-.735	326	.463	-.035	.047	-.128	.058
	Equal var. not assumed			-.702	191.425	.483	-.035	.049	-.132	.063
Mindset	Equal variances assumed	1.039	.309	-4.843	326	.000	-.351	.072	-.493	-.208
	Equal var. not assumed			-4.744	204.465	.000	-.351	.074	-.497	-.205
Fraud Related Problem Representation	Equal variances assumed	4.109	.043	-3.701	326	.000	-.190	.051	-.291	-.089
	Equal var. not assumed			-3.624	204.226	.000	-.190	.052	-.294	-.087
Task Performance Fraud Risk Assessment	Equal variances assumed	.402	.526	-4.898	326	.000	-.313	.064	-.439	-.188
	Equal var. not assumed			-4.795	204.012	.000	-.313	.065	-.442	-.185

Source: The Researcher

This study adopts procedural and statistical measures in the research process to address the concern of common method variance. These procedural and statistical measures are reversal of negatively worded variables, elimination of the item ambiguity, enhancing informed and voluntary consent, respecting respondents' anonymity and maintenance of confidentiality of information acquired, and Harman's single factor analysis as recommended by Podsakoff *et al.* (2003).

Harman's single factor analysis (Podsakoff & Organ, 1986) is used in this study being one of the most recognised techniques adopted by researchers to address common method variance concerns. The procedure entails the loading simultaneously all the constructs' variables into an exploratory factor analysis and examining the un-rotated factor solution to establish the number of factors that are necessary to account for the variance in the variables. In determining the existence of CMV, the primary assumption states that "if a substantial amount of CMV exists, the results of the factor analysis could either be a single factor, or that a single factor causes the majority of the covariance in the dependent and independent variables" (Podsakoff *et al.*, 2003).

Following, an un-rotated exploratory factor analysis of all the study items exhibited 7 component factors in total which explains 82.2 per cent of the variance. The result of the total variance extracted is presented in Table 5.4. Granting that a single factor solution did not emerge, and a general factor is not reflected for most of the variance, common method variance is not regarded as a significant threat in this research (Podsakoff & Organ, 1986).

Table 5.4

Summary of Factor Analysis for Common Method Bias

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	33.685	55.222	55.222	33.685	55.222	55.222
2	7.928	12.997	68.219	7.928	12.997	68.219
3	3.241	5.313	73.532	3.241	5.313	73.532
4	1.605	2.632	76.164	1.605	2.632	76.164
5	1.403	2.300	78.464	1.403	2.300	78.464
6	1.253	2.054	80.518	1.253	2.054	80.518
7	1.013	1.661	82.179	1.013	1.661	82.179
8	.849	1.392	83.572			
9	.810	1.328	84.900			
10	.758	1.242	86.142			
11	.680	1.115	87.257			
12	.614	1.007	88.264			
13	.517	.848	89.113			
14	.479	.785	89.898			
15	.449	.736	90.634			
16	.422	.693	91.327			
17	.399	.654	91.980			
18	.345	.566	92.546			
19	.338	.553	93.100			
20	.306	.502	93.601			
21	.290	.475	94.077			
22	.255	.419	94.495			
23	.247	.405	94.901			
24	.226	.371	95.272			
25	.208	.341	95.613			
26	.195	.319	95.932			
27	.187	.306	96.238			
28	.179	.293	96.531			
29	.171	.280	96.810			
30	.164	.269	97.079			
31	.151	.248	97.327			
32	.148	.242	97.570			
33	.126	.207	97.777			
34	.119	.194	97.971			
35	.113	.186	98.157			
36	.108	.178	98.335			
37	.100	.163	98.498			
38	.092	.151	98.649			
39	.082	.135	98.784			
40	.081	.133	98.917			
41	.074	.122	99.039			
42	.068	.111	99.150			
43	.061	.100	99.250			
44	.053	.087	99.337			
45	.052	.085	99.422			
46	.045	.074	99.496			
47	.043	.070	99.566			
48	.040	.066	99.632			
49	.035	.057	99.689			
50	.034	.056	99.744			
51	.025	.041	99.786			
52	.024	.039	99.824			

Table 5.4 (Continued)

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
53	.020	.033	99.858			
54	.020	.032	99.890			
55	.015	.025	99.915			
56	.013	.021	99.936			
57	.011	.019	99.955			
58	.010	.017	99.972			
59	.008	.013	99.985			
60	.005	.009	99.993			
61	.004	.007	100.000			

Source: The Researcher

5.6   Profile of Respondents

For clarity of understanding this section of the study that deals with the profile of respondents, the researcher presents the background information in actual figures and percentages for ease of interpretation.   The sample as represented in Table 5.5 comprises a total of 328 respondents in the two organizations that demonstrate Nigerian public sector accounting. All the respondents are Nigerians. More than two-thirds of the respondents are male (67%) and the remaining (33%) are female. According to Bambale (2013), the disparity in the gender structure in Nigeria may be linked to population structure where the proportion of male's respondents accounted for over 60 percent and the rest female. All the respondents are proficient in understanding English Language, thus showing that they should not have major problems in understanding the questionnaires.

Table 5.5
Profile of Respondents

	Demographic Profile/Item	No. of Respondents (N= 328)	Valid percentage (%)
1	Organisation:		
	Accountant General Office	174	53.0
	Auditor General Office	154	47.0
2	Position:		
	Forensic Accountant	162	49.4
	Auditor	166	50.6
3	Gender:		
	Male	221	67.4
	Female	107	32.6
4	Academic Education:		
	B.Sc./HND	137	41.8
	Postgraduate	79	24.1
	Master	70	21.3
	PhD	42	12.8
5	Professional Qualification:		
	ACA	104	31.7
	FCA	96	29.3
	CNA	75	22.9
	FCNA	25	7.6
	OTHERS	28	8.5
6	Certified Forensic Accountant:		
	Yes	177	54.0
	No	151	46.0
7	Role to Forensic Accounting:		
	Forensic Accountant	181	55.2
	Auditor	147	44.8
8	Forensic Accounting Function:		
	Yes	270	82.3
	No	58	17.7
9	Fraud Investigation:		
	Yes	317	96.6
	No	11	3.4

Source: The Researcher

The highest academic education attained by the respondents: First degree constitutes (42%), Postgraduate diploma (24%), Master (21%), and Doctor of Philosophy (13%). 54 percent of the respondents are Certified Forensic Accountants. The capability structure of the respondents is significant to this study because this research is majorly

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centred on the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in the Nigerian public sector.

Fifty five percent of the forensic accountants perform forensic accounting role, the remaining forty five percent auditors perform auditing role. Eighty two percent and ninety seven percent of the respondents perform forensic accounting and fraud investigation functions. The profile of the respondents in this study is found to be in conformity with the characteristics of respondents in the previous study using the same sample frame (Kasum, 2010; Okoye & Jugu, 2010; Okunbor & Obaretin, 2010; Owojori & Asaolu, 2009). Thus, the sample in this research indicates a true representative of the wider community of forensic accountants and auditors in the public sector accounting organisations in Nigeria.

5.7   Assessing PLS-SEM Results

For this study, partial least square structural equation modeling (PLS-SEM) is used to estimate the theoretical model, specifically developed software application SmartPLS 2.0 3M – next generation path modeling (Ringle, Christian, Wende, Sven, Will & Alexander, 2005; 2004). As noted by Hair *et al.* (2010), PLS-SEM lies on two significant multivariate statistical techniques, which also include factor analysis and multiple regressions. PLS-SEM focuses on the discrepancy between the observed (i.e. manifest variables) or approximated (i.e. latent variables) values of the dependent variables and the values predicted by the model in question. As a consequence, researchers using PLS-SEM rely on measures indicating the model's predictive capabilities to judge the model's quality. Specifically, the evaluation of the

measurement and structural model results in PLS-SEM builds on a set of non-parametric evaluation criteria and uses procedures such as bootstrapping and blindfolding and algorithm.

Consequently, PLS-SEM statistical analysis tool is used to analyse the main, mediating, and differences in the group (forensic accountant and auditor) results of this study.

5.7.1 Key PLS-SEM Process

Using PLS-SEM application in any social science research involves a two-step process. This process deals with a separate procedure for the assessments of the measurement models (reflective and formative) and the structural model. The PLS-SEM process is illustrated in Table 5.6.

Table 5.6
Systematic Evaluation Process of PLS-SEM Results

Evaluation of the Measurement Models	Evaluation of the Structural Model
Reflective Measurement Models (Mode A): • Internal consistency (composite reliability) • Indicator reliability • Convergent validity (average variance extracted) • Discriminant validity **Formative Measurement Models (Mode B):** • Convergent validity • Collinearity among indicators • Significance and relevance of outer weights	• Coefficient of determination (R^2) • Predictive relevance (Q^2) • Size and significance of path coefficients • f^2 effect sizes • q^2 effect sizes

Source: Hair, Hult, Ringle & Sarstedt (2014). A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), p.97

5.7.2 The Measurement Model

According to Hair *et al.* (2013), the measurement model represents the relationship between the constructs and their corresponding indicator variables (i.e. the outer models in PLS-SEM. The basis for determining these relationships is called "measurement theory". There are two categories of the measurement model. These are reflective measurement model and formative measurement model.

The reflective measurement model (i.e. Mode A measurement in PLS-SEM) is based on classical test theory. This theory shows "measures represent the effects (or manifestations) of the underlying construct". In essence, causality is from the construct to the measures. Reflective indicators can be viewed as a representative sample of all the items available within the conceptual domain of the construct. Similarly, indicators associated with a particular construct should be highly correlated with each other, individual items must be interchangeable, and any single item can be left without changing the meaning of the construct as long as the construct has sufficient reliability.

In contrast, formative measurement model (i.e. Mode B measurement in PLS-SEM) is based on the assumption that the indicators cause the construct. This type of a measurement model is also referred to as "being a formative index". This means that the indicators are not interchangeable, and each indicator captures a specific aspect of the construct's domain. In addition, the items determine the meaning of the construct, which implies that omitting an indicator potentially alters the nature of the construct (Diamantopoulos & Winklhofer, 2001).

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The question that readily comes to mind is "when do we measure a construct reflectively or formatively?" The answer is based on the specification which depends on the construct conceptualisation and the objective of the study. In choosing the reflective measurement model, the decision must be founded on: 1) causal priority from the construct to the indicators (Diamantopoulos & Winklhofer, 2001); 2) the construct is a trait explaining the indicators (Fornell & Bookstein, 1982); 3) indicators represent consequences of the construct (Rossiter, 2002); 4) in case the assessment of the trait changes, all items will change in a similar manner (Chin, 1998), and 5) the items are mutually interchangeable (Jarvis, MacKenzie & Podsakoff, 2003).

In contrast, these five guidelines are applicable to the formative measurement model (i.e. a reversal of all the guidelines in the reflective measurement model). These are: 1) causal priority from the indicators to the construct (Diamantopoulos & Winklhofer, 2001); 2) the construct is a combination of the indicators (Fornell & Bookstein, 1982); 3) indicators represent causes of the construct (Rossiter, 2002); 4) in case the assessment of the trait changes, all items will not change in a similar manner (Chin, 1998); and 5) the items are not mutually interchangeable (Jarvis, MacKenzie & Podsakoff, 2003).

For this study, reflective measurement model is the choice for the analysis as "measures represent the effects (or manifestations) of the underlying construct".

In PLS-SEM analysis, there are two major criteria, which are used to assess the measurement model or alternatively called "outer model" that include validity and reliability (Ramayah, Lee, & In, 2011). Reliability test seeks to determine how

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consistent a measuring instrument measures the concept it is supposed to measure. Validity, on the other hand, seeks to find out how well the instrument measures a particular concept it is purposed to measure (Bambale, 2013; Sekaran & Bougie, 2013; 2010). The reflective outer model (reflective measurement model) is assessed as summarised in Table 5.6 of this study (Hair *et al.*, 2014; Fornell & Larcker, 1981). The structural model (i.e. inner model) is next to the reflective measurement model. The structural model is evaluated as summarised in Table 5.6 of this study (Hair *et al.*, 2014; Chin, 1998b; Barclay *et al.*, 1995).

As noted by Chin (2010), the old-fashioned parametric-based techniques for significance testing are not appropriate in PLS-SEM as its model does not follow distributional normality assumption of the observations in the procedure for estimating parameters. The bootstrap and the jackknife (algorithm) techniques are widely used for evaluating statistical significance in PLS-SEM analysis. While, the bootstrap technique represents a more accurate and exact calculation of measures (Mooney, 1996), the jack-knife technique saves resources and reduces execution time for large data sets (Chin, 2010).

The jack-knife technique is an algorithm of 300 maximum iterations with an initial weight of 1.0, and the hypothesis is tested by evaluating statistical significance of the path coefficients. This is mostly used to test internal consistency reliability that consists of Average variance extracted (AVE), Composite reliability (CR), Cronbachs Alpha, Communality, Redundancy and R square. The bootstrap technique (Bontis *et al.*, 2007; Andrews & Buchinsky, 2002; Good, 2000; Chin, 1998b; Efron & Tibshirani, 1993; Rasmussen, 1988) is involved in the determination of the structural

model that encompasses the inner loadings run on a parameter of 5000 sample and include the actual number of cases being studied (Chin, 2010). It is mostly used in the evaluation of the predictive power, effect size, and the importance of path coefficients as summarised in Table 5.6.

5.8 Descriptive Analysis of the Constructs

In this study, the general statistical description of the constructs adopted is the descriptive analysis. The statistical values such as means, standard deviation, minimum and maximum of independent, mediating and dependent construct variables were calculated. The constructs in this study were measured on a 5-point scale, and the results of the statistical values are shown in Table 5.7.

Table 5.7
Descriptive Statistical Analysis of the Constructs

Construct	N	Mean	Standard Deviation	Min.	Max.
Knowledge	328	4.59	0.49	3	5
Skills	328	4.84	0.40	3	5
Mindset	328	4.30	0.64	3	5
Fraud Related Problem Representation	328	4.51	0.45	3	5
Task Performance Fraud Risk Assessment	328	4.41	0.57	3	5

Source: The Researcher

The descriptive statistics of the skills, which reveals a mean value of 4.84, is the highest of the remaining four constructs' mean. In addition, the descriptive analysis shows that the mindset has the lowest mean value of 4.30 in comparison with other independent construct variables. As presented in Table 5.7, task performance fraud

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risk assessment, which is the dependent variable, has a mean value of 4.41 as against the mediating variable of fraud related problem representation that has a mean score of 4.51. Following the presentation of the descriptive analysis of the respondents and the respective constructs, the next section introduces the measurement scale of the research variables.

5.9   Measurement Scale of the Research Variables

This section of the research provides analysis of the measurement scale of the research variables. A measurement scale is described as "a tool with a predetermined number of close-ended responses that can be used to obtain an answer to the question" (Hair *et al.*, 2014). Cavana *et al.* (2001) define a scale as "a tool used to distinguish individuals in relation to differences of perception by using some selected variables". There are four categories of measurement scales used in social science research, each representing a different level of measurement – nominal, ordinal, interval and ratio (Bambale, 2013; Sekaran & Bougie, 2013; Hair *et al.*, 2010; Creswell, 2010; Zikmund, 2003).

First, a nominal scale (also called categorical scale) assigns numbers that can be used to identify and classify objects. For example with respect to variable of gender, respondents can be classified into two categories – male and female. These two groups can be assigned code numbers 1 and 2. It is the lowest and simplest level of scales because they are the most restrictive in terms of the type of analysis that can be carried out (Hair *et al.*, 2014; Sekaran & Bougie, 2013; Zikmund, 2003).

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Second, the next level of scale following nominal scale is known as "ordinal scale". An ordinal scale according to Bambale (2013) is a scale that includes categorisation of subjects into certain groups, defines or rank-orders the subjects' categories in some meaningful ways. As noted by Zikmund (2003), "an ordinal scale arranges objects or alternatives according to their magnitude in an ordered relationship". In essence, something measured on an ordinal scale provides information about the order of observations and could not assume that the differences in the order are equally spaced (e.g. non-user, light user, heavy user with values of 0, 1, and 2 respectively).

Third, the next level of measurement scale which follows ordinal scale is called "interval scale or rating scales or continuous scales" (Creswell, 2010). This scale (Hair *et al.*, 2014) has precise information on the rank order at which something is measured, and in addition, the researcher could interpret the magnitude of the differences in value terms directly. Interval scale does not give an absolute zero point (Mooi & Sarstedt, 2011). With an interval scale, almost any type of mathematical computations could be carried out, including the mean and the standard deviation.

The fourth and final measurement scale is "ratio scale". This scale measures not only the magnitude of the differences in values directly, but it measures the extent of the differences (Sekaran & Bougie, 2010; Creswell, 2010; Zikmund, 2003). It is, therefore, considered as the most powerful among all the scales since it has a unique absolute zero point.

In the literature, there are arguments for and against the measuring of the widely acclaimed Likert scale as an interval scale or ordinal scale or a combination of both

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scales (Creswell, 2010). For example, the popular Likert scale ("strongly agree" to "strongly disagree"), which is used in this particular study, demonstrates a scale with theoretically equal intervals amongst responses.

Prior literature agrees that Likert scale ("strongly agree" to "strongly disagree") of this nature should be treated as a rating scale, and it assumes that an equal interval holds between the response categories (Blaikie, 2003). However, this position is well contested by Creswell (2010) that there is no assurance of having equal intervals. Hence, Creswell (2010) advocates that Likert scale ("strongly agree" to "strongly disagree") be treated as both ordinal and interval data in educational research, hence "quasi-interval scale".

Furthermore, an ordinal scale such as "most often" to "not at all", such as in this study, may seem like an interval scale but there is no assurance that the intervals are equal as in the well-tested Likert scale. Another school of thought stresses the importance of viewing Likert scales as ordinal data (Jamieson, 2004); while Jaccard & Wan (1996) indicate that the errors for treating Likert scale results as interval data are minimal.

Similarly, in consideration of treating Likert data on an interval scale, prior literature educates the researchers to be mindful of the need to develop multiple categories or choices in their scale, determine whether their data are normally distributed, and establish whether the distance between each value on the scale is equal (Creswell, 2010). If these criteria cannot be met (Creswell, 2010) recommends the treatment of

Likert scale and scales like "extent of importance" or "degree of agreement" as ordinal scales for the purposes of data analysis.

In this study, the nominal, and ordinal measurement scales are used because PLS-SEM: the statistical analysis tool for this study does not require distributional normality data since it is a non-parametric technique (Hair *et al.*, 2013; Hair, *et al.*, 2010), and in addition are in conformity with other similar studies in social science research in Nigeria (Babatunde, 2014; Bambale, 2013). Table 5.8 presents the descriptive analysis of the measurement scale on research variables used in this study.

Table 5.8
Descriptive Analysis of the Measurement scale on Research Variables

Variables	Type of Scale
Knowledge (forensic accountant and auditor)	Ordinal
Skills (forensic accountant and auditor)	Ordinal
Mindset (forensic accountant and auditor)	Ordinal
Fraud related problem representation	Ordinal
Task performance fraud risk assessment	Ordinal
Organisation	Nominal
Position or Title	Nominal
Gender	Nominal
Highest academic education	Ordinal
Highest professional education	Ordinal
Certified Forensic Accountant	Nominal
Forensic accounting role	Nominal
Forensic accounting functions for organisations	Nominal
Fraud investigation	Nominal

Source: The Researcher

5.10 Analysis and Results of PLS-SEM Measurement Models (Path Model Analysis)

This section considers a two stage modeling, which is to develop the reflective measurement model and to assess the structural model for this study in line with the recommendation of Anderson and Gerbing (1988). There are two major reasons for utilising this approach. The first reason is related to the fact that this approach has been popular and accepted by researchers in social sciences (Hair, *et al.*, 2006), and second, it has been applied in other similar forensic accounting and financial criminology studies in Nigeria (Okoye & Jugu, 2010; Okunbor & Obaretin, 2010; Kasum, 2010; Owojori & Asaolu, 2009).

In addition, PLS-SEM algorithm (PLS-SEM) is used throughout this study to carry out an analysis and evaluate the results of the measurement model, that is, path model analysis. All the constructs' measurements for this study were adopted from previous authors, and therefore, exploratory data analysis is not essential (Hair *et al.*, 2010). In this study, PLS-SEM algorithm is employed to determine the structure of all the constructs' variables.

Specifically, the knowledge (KR) construct is measured using the Davis, Farrell, and Ogilby (2010), and Ramaswamy's (2007; 2005) 7-item measurement; the skills (SR) construct is measured using Davis, Farrell, and Ogilby (2010) and DiGabrielle's (2008) 9-item measurement; and the mindset (MR) construct is also measured using the Chui (2010) and Mcleod's (2009) 25-item measurement.

Most importantly, the fraud related problem representation (FRPR) construct is measured using the Basadur, Basadur, and Licina (2013), Hester *et al.* (2012), Mumford, Medeiros, and Partlow (2012), Basadur and Basadur (2011), Reiter-Palmon, Herman, and Yammarino (2008), Basadur's (2004, 1995), and Basadur, Runco, and VEGAxy (2000) 16-item measurement; and the task performance fraud risk assessment (TPFRA) is measured using the Dzomira (2014), Owens (2012) and ACFE's (2009) 4-item measurement. After the PLS-SEM algorithm, out of the original 61 items from the original 5 constructs of this study, and as depicted in Table 5.9a to 5.9e, a total of 24 items and 5 constructs were retained for further analysis.

5.10.1 Assessment of the Uni-dimensionality

This study adopts the use of multiple items to measure each underlying path in each of the measurement models. According to Arbuckle (2005), if any items become redundant, the measurement model would need to be restated by simply removing the redundant items. This argument is also supported by previous literature (Hair *et al.*, 2006; Kline, 2005). The result of this removal is bound to achieve mean uni-dimensionality of the constructs (Anderson & Gerbing, 1988).

Prior literature by Anderson and Gerbing (1988) suggest an approach to be undertaken in order to achieve uni-dimensionality of the constructs in any social science study. First, the indicators must have outer loadings above the acceptable standard of 0.5, (Hair, Ringle, & Sarstedt, 2011). Second, the indicators that have loadings above the threshold of 0.5, which their inclusion would have raised the Cronbach alpha and Composite reliability (CR) values above 0.90 (and definitely > 0.95) and AVE (above 0.70) are considered not desirable. Third, no indicator

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variables must measure the same phenomenon in order to be a valid measure of the construct (Rossiter, 2002) and avoid boosting error term correlations (Hayduk & Littvay, 2012; Drolet & Morrison, 2001).

In the next subsection, there is a discussion on the development of each measurement model. The evaluation of the uni-dimensionality of each of the construct: knowledge (forensic accountant and auditor), skills (forensic accountant and auditor), mindset (forensic accountant and auditor), fraud related problem representation, and task performance fraud risk assessment using PLS-SEM algorithm are presented in Table 5.9a to 5.9e.

5.10.2 Knowledge (forensic accountant and auditor)

The first independent variable construct is knowledge (forensic accountant and auditor). This construct was originally measured by Davis, Farrell, and Ogilby (2010), and Ramaswamy (2007; 2005) and comprises 7 items. After the PLS-SEM algorithm, 3 items were retained for further analysis. Table 5.9a summarises the Knowledge (forensic accountant and auditor) items and their description.

The reasons adduced for the deletion of the manifest variables in the independent variable construct of knowledge (forensic accountant and auditor) are twofold. Specifically, only four items (KR1, KR2, KR3 and KR4) were deleted from the knowledge construct variables since outer loadings are below 0.5 (Hair, Ringle, & Sarstedt, 2011) as demonstrated in Table 5.9a. The remaining manifest variables (KR5, KR6, and KR7) recorded higher outer loadings ranging from 0.874 to 0.920. This shows that the meaning of the path model has been preserved by these indicators

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since no indicator is below 0.40 (Hair, Ringle, & Sarstedt, 2011; Hair *et al.*, 2010, Sekaran & Bougie, 2010, Creswell, 2010).

Table 5.9a
Knowledge (forensic accountant and auditor) items and their description

Original Item	Item Label	Decision
There is an increasing need for the forensic accountant to be a more broadly experienced professional.	KR1	Deleted
There is an increasing need for the forensic accountant to be more specialised within the field of fraud detection, prevention and response.	KR2	Deleted
There is an increasing need for the forensic accountant to have more general business knowledge.	KR3	Deleted
There is an increasing need for the forensic accountant to have more technical accounting knowledge.	KR4	Deleted
There is an increasing need for the forensic accountant to have more criminal and civil laws and court proceedings knowledge.	KR5	
There is an increasing need for the forensic accountant to have more information technology knowledge.	KR6	
There is an increasing need for the forensic accountant to have more criminology knowledge.	KR7	

Source: The Researcher

5.10.3 Skills (forensic accountant and auditor)

Similarly, the second independent variable construct is skills (forensic accountant and auditor). This construct was measured by Davis, Farrell, and Ogilby (2010) and DiGabrielle (2008) and consists of 9 items. Consequent upon the PLS-SEM algorithm, 4 items were retained for further analysis. Table 5.9b summarises the Skills (forensic accountant and auditor) items and their description.

Table 5.9b
Skills (forensic accountant and auditor) items and their description

Original Item	Item Label	Decision
An important skill requirement is deductive analysis - the ability to take aim at financial contradictions that do not fit in the normal pattern of an assignment.	SR1	
An important skill requirement is critical thinking - the ability to decipher between opinion and fact.	SR2	
An important skill requirement is unstructured problem solving – the ability to approach each situation (inherently unique) prepared to solve problems with an unstructured approach.	SR3	Deleted
An important skill requirement is investigative flexibility – the ability to move away from standardised audit procedures and thoroughly examine situations for a typical warning signs.	SR4	Deleted
An important skill requirement is analytical proficiency – the ability to examine what should be provided rather than what is provided?	SR5	Deleted
An important skill requirement is oral communication – the ability to effectively communicate in speech via expert testimony and general explanation the basis of opinion.	SR6	Deleted
An important skill requirement is written communication – the ability to effectively communicate in writing via reports, charts, graphs, and schedules the basis of opinion.	SR7	
An important skill requirement is a specific legal knowledge – the ability to understand basic legal processes and legal issues including the rules of evidence.	SR8	
An important skill requirement is composure – the ability to maintain a calm attitude in pressured situations.	SR9	Deleted

Source: The Researcher

The reasons adduced for the deletion of the manifest variable in the independent variable constructs of skills (forensic accountant and auditor) are twofold. First, the indicator SR4 has outer loadings below the acceptable standard of 0.5 (Hair, Ringle, & Sarstedt, 2011). Second, four indicators (SR3, SR5, SR6, and SR9) have loadings above the threshold of 0.5 but their inclusion increased the Cronbachs alpha and Composite reliability (CR) values above 0.90 (and definitely > 0.95) and AVE (above 0.70).

Consequently, only five items (SR3, SR4, SR5, SR6, and SR9) were deleted from the skills construct variables as demonstrated in Table 5.9b. The indicator, SR4, has an outer loading of 0.435 and thus, suffers deletion (Hair, Ringle, & Sarstedt, 2011). In addition, the other four indicators, SR3, SR5, SR6, and SR9 have outer loadings above 0.50, and, therefore, suffered deletion because their inclusion increase the composite reliability above the threshold standard, which are considered not desirable because they show that all the manifest variables are measuring the same phenomenon and are, therefore, not likely to be valid measures of the skills construct (Rossiter, 2002), and thus, may boost error term correlations (Hayduk & Littvay, 2012; Drolet & Morrison, 2001).

Similarly, the remaining manifest variables (SR1, SR2, SR7 and SR8) recorded higher outer loadings ranging from 0.846 to 0.888 and were subsequently retained for further analysis in this study. The retained manifest variables show that the meaning of the path model has been preserved by these indicators since no indicator is below 0.40 (Coakes, 2013; Hair, Ringle, & Sarstedt, 2011; Hair et al., 2010; Pallant, 2010).

5.10.4 Mindset (forensic accountant and auditor)

Next to the skills construct, is the third independent variable construct of mindset (forensic accountant and auditor). This construct was originally measured by Chui (2010) and McLeod (2009) and comprises 25 items. Specifically after the PLS-SEM algorithm, 7 items were retained for further analysis. Table 5.9c summarises the Mindset (forensic accountant and auditor) items and their description.

Table 5.9c

Mindset (forensic accountant and auditor) items and their description

Original Item	Item Label	Decision
I find it hard to imitate the behaviour of other people.	MR1	
My behaviour is usually an expression of my true inner feelings, attitudes, and beliefs.	MR2	Deleted
At parties and social gatherings, I do not attempt to do or say things that others will like.	MR3	Deleted
I can only argue for things that I already believe in.	MR4	Deleted
I can make impromptu speeches - even on topics about which I have almost no information.	MR5	
I guess I put on a show to impress or entertain people.	MR6	Deleted
When I am uncertain how to act in a social situation, I look to the behaviour of others for cues.	MR7	Deleted
I believe what evidence backs up, no matter what I believed previously.	MR8	Deleted
I rarely need the advice of my friends to choose movies, books, or music.	MR9	Deleted
I sometimes appear to others to be experiencing deeper emotions than I actually am.	MR10	Deleted
I am willing to hear both sides before setting my opinion.	MR11	Deleted
In a group of people, I am rarely the centre of attention.	MR12	Deleted
In different situations with different people, I often act like very different persons.	MR13	Deleted
I am not particularly good at making other people like me.	MR14	Deleted
Even if I am not enjoying myself, I often pretend to be having a good time.	MR15	
I am not always the person I appear to be.	MR16	
I would not change my opinions in order to please someone else or win their favour.	MR17	Deleted
I have considered being an entertainer. In a debate, I do not bother to consider the validity of the other side.	MR18	Deleted
In order to get along and be liked, I tend to be what people expect I to be rather than anyone else.	MR19	
When my friends say something is true, and it is against my beliefs, I will change my mind to agree with them.	MR20	
I have trouble changing my behaviour to suit different people and different situations.	MR21	Deleted

Table 5.9c (Continued)

Original Item	Item Label	Decision
At a party, I let others keep the jokes and stories going.	MR22	Deleted
Once an idea is in my head, I stick with it.	MR23	
I can look anyone in the eye and tell a lie with a straight face – if for a good cause.	MR24	Deleted
I may deceive people by being friendly when I really dislike them.	MR25	Deleted

Source: The Researcher

Specifically, only 18 items are deleted from the mindset construct variable as demonstrated in Table 5.9c. The reasons adduced for the deletion of the manifest variables in the independent variable construct of Mindset (forensic accountant and auditor) are twofold. First, five indicators (MR8, MR9, MR12, MR18, and MR25) have outer loadings below the acceptable standard of 0.5 (Hair, Ringle, & Sarstedt, 2011). Second, these thirteen indicators (MR2, MR3, MR4, MR6, MR7, MR10, MR11, MR13, MR14, MR17, MR21, MR22, and MR24) have loadings above the threshold of 0.5 but their inclusion increased the Cronbach alpha and Composite reliability (CR) values above 0.90 (and definitely > 0.95) and AVE (above 0.70).

Consequently, only the eighteen items (MR8, MR9, MR12, MR18, MR25, MR2, MR3, MR4, MR6, MR7, MR10, MR11, MR13, MR14, MR17, MR21, MR22, and MR24) were deleted from the mindset construct variable as demonstrated in Table 5.9c. These indicators (MR8, MR9, MR12, MR18, and MR25) have outer loadings below 0.50 and thus, suffer deletion (Hair, Ringle, & Sarstedt, 2011). Although, these indicators (MR2, MR3, MR4, MR6, MR7, MR10, MR11, MR13, MR14, MR17, MR21, MR22, and MR24) posted outer loadings above 0.50, they were all deleted because they contribute to the increase in the Cronbach alpha and Composite

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reliability values above the desirable level of 0.90 (and definitely > 0.95) and AVE (above 0.70) which are considered not desirable because they show that all the manifest variables are measuring the same phenomenon and are, therefore, not likely to be valid measures of the mindset construct (Rossiter, 2002), and thus, may boost error term correlations (Hayduk & Littvay, 2012; Drolet & Morrison, 2001).

The remaining manifest variables (MR1, MR5, MR15, MR16, MR19, MR20 and MR23) recorded higher outer loadings ranging from 0.751 to 0.900 and were subsequently retained for further analysis. In addition, this shows that the meaning of the path model has been conserved by these indicators since no indicator is below 0.40 (Hair, Ringle, & Sarstedt, 2011).

5.10.5 Fraud Related Problem Representation

Following the independent variable construct of mindset (forensic accountant and auditor), is the mediating variable construct of fraud related problem representation. This construct was originally measured by the Basadur, Basadur, and Licina (2013), Hester *et al.* (2012), Mumford, Medeiros, and Partlow (2012), Basadur and Basadur (2011), Reiter-Palmon, Herman, and Yammarino (2008), and Basadur's (2004, 1995), and Basadur, Runco, and VEGAxy (2000), and consists of 16 items. Specifically after the PLS-SEM algorithm, 6 items were retained for further analysis. Table 5.9d summarises the Fraud related problem representation items and their description.

Table 5.9d

Fraud Related Problem Representation items and their description

Original Item	Item Label	Decision
Once solution is chosen, I develop a plan with the sequence of events necessary for completion.	FRPR1	Deleted
After a solution has been implemented, I immediately look for ways to improve the idea and avoid future problems.	FRPR2	Deleted
To avoid asking the wrong question, I take care to define each problem carefully before trying to solve it.	FRPR3	Deleted
I strive to look at problems from various perspectives and generate multiple solutions.	FRPR4	
I try to address the political issues and other consequences of the change I am proposing so that others will understand and support my solution.	FRPR5	
I evaluate potential solutions carefully and thoroughly against a predefined standard.	FRPR6	
I systematically search for issues that may become problems in the future.	FRPR7	Deleted
When I decide on a solution, I make it happen no matter what opposition I may face.	FRPR8	Deleted
I find that small problems often become much bigger in scope, and thus very difficult to solve.	FRPR9	Deleted
I ask myself lots of different questions about the nature of the problem.	FRPR10	Deleted
After my solution is implemented, I relax and focus again on my regular duties.	FRPR11	Deleted
I focus on keeping current operations running smoothly and hope that problems do not appear.	FRPR12	
I evaluate potential solutions as I think of them.	FRPR13	
I do have all information to solve problems when I am faced with one.	FRPR14	
When evaluating solutions, I take time to think about how I should choose between options.	FRPR15	Deleted
Making a decision is the end of my problem solving process.	FRPR16	Deleted

Source: The Researcher

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Specifically, only ten items are deleted from the fraud related problem representation construct variables as demonstrated in Table 5.9d. The reasons cited for the deletion of the indicators in the mediating variable construct of fraud related problem representation are twofold. First, three indicators (FRPR2, FRPR3, and FRPR16) recorded outer loadings below the acceptable standard of 0.5 (Hair, Ringle, & Sarstedt, 2011). Second, another seven observable measures comprise (FRPR1, FRPR7, FRPR8, FRPR9, FRPR10, FRPR11, and FRPR15) possess loadings above the threshold of 0.5 but their inclusion increased the Cronbach alpha and Composite reliability (CR) values above 0.90 (and definitely > 0.95) and AVE (above 0.70).

Consequently, only the ten items (FRPR2, FRPR3, FRPR16, FRPR1, FRPR7, FRPR8, FRPR9, FRPR10, FRPR11, and FRPR15) were deleted from the fraud related problem representation construct variable as demonstrated in Table 5.9d. These indicators (FRPR2, FRPR3, and FRPR16) recorded outer loadings below 0.50 and thus, suffer deletion (Hair, Ringle, & Sarstedt, 2011). Similarly, these other indicators (FRPR1, FRPR7, FRPR8, FRPR9, FRPR10, FRPR11, and FRPR15) displayed outer loadings above 0.50; hence; they were all deleted because they contribute to the increase in the Cronbach alpha and Composite reliability (CR) values above the desirable level of 0.90 (and definitely > 0.95) and AVE (above 0.70) which are considered not desirable because they show that all the manifest variables are measuring the same phenomenon and are, therefore, not likely to be valid measures of the fraud related problem representation construct (Rossiter, 2002), and thus, may boost error term correlations (Hayduk & Littvay, 2012; Drolet & Morrison, 2001).

The remaining six manifest variables (FRPR4, FRPR5, FRPR6, FRPR12, FRPR13, and FRPR14) recorded higher outer loadings ranging from 0.652 to 0.893 and were subsequently retained for further analysis in this research. In addition, this shows that the meaning of the path model has been well-preserved by these indicators since no indicator is below 0.40 (Hair, Ringle, & Sarstedt, 2011; Pallant, 2010; Hair *et al.*, 2010).

5.10.6 Task Performance Fraud Risk Assessment

This subsection of this study presents the dependent variable construct of task performance fraud risk assessment. This construct was originally measured by the Dzomira (2014), Owens (2012), and ACFE (2009), and comprises 4 items. Specifically after the PLS-SEM algorithm, all the 4 items were retained for further analysis. Table 5.9e summarises the task performance fraud risk assessment indicators and their description.

Specifically, no one of the items is deleted from the task performance fraud risk assessment construct variables as demonstrated in Table 5.9e. The reason cited for the non-deletion of the indicators in the dependent variable construct of task performance fraud risk assessment is that all the indicators (TPFRA1, TPFRA2, TPFRA3 and TPFRA4) possess loadings above the threshold of 0.5, but their inclusion contributed positively to the Cronbachs alpha and Composite reliability (CR) values that are within the acceptable threshold standard for path model internal consistency reliability. (Sekaran & Bougie, 2013; Hair, Ringle, & Sarstedt, 2011; Hair *et al.*, 2010).

Table 5.9e

Task Performance Fraud Risk Assessment items and their description

Original Item	Item Label	Decision
It is mandatory to identify inherent fraud risk – gather information to obtain the population of fraud risks that could apply to the organisation.	TPFRA1	
It is mandatory to assess the likelihood and significance of inherent fraud risk - assess the relative likelihood and potential significance of identified fraud risks based on historical information, known fraud schemes, and interviews with staff, including business process owners.	TPFRA2	
It is mandatory to respond to reasonably likely and significant inherent and residual fraud risk.	TPFRA3	
It is mandatory to perform a cost-benefit analysis to decide what the response should be to address the identified risks.	TPFRA4	

Source: The Researcher

The manifest variables, TPFRA1, TPRARR2, TPFRA3, and TPFRA4, recorded higher outer loadings ranging from 0.840 to 0.907 and were subsequently retained for further analysis. In addition, this shows that the significance of the path model has been well-preserved by these indicators since no indicator is below 0.40 (Coakes, 2013; Hair, Ringle, & Sarstedt, 2011; Pallant, 2010, Hair *et al.*, 2010).

Granting the presentation of the evaluation and results of path model analysis with the use of PLS-SEM algorithm for the respective constructs and their manifest variables, the next section of this study builds upon the foundation of the preceding section discourse by presenting the actual results of the constructs' reliability and validity.

5.11   Reliability and Validity of the Constructs

Granting the achievement of the uni-dimensionality of the constructs in this study, the next phase has to deal with the evaluation of each of the constructs for reliability and

validity measures (DeWulf, Odekerken-Schroder, & Iacobucci, 2001). In this study, reflective measurement models are assessed on their internal consistency reliability and validity. Reliability refers to the consistency of a measure. A measure is reliable (in the sense of test-retest reliability) when it produces consistent outcomes under consistent conditions. Whereas, validity, is in relation to the extent to which a construct's indicators jointly measure what they are supposed to measure.

Specifically, measures such as Composite reliability and Cronbachs alpha (as a means to assess the internal consistency reliability), convergent validity (individual indicator reliability and average variance extracted), and discriminant validity (Fornell-Larcker criterion and cross-loadings) are employed in this study (Hair *et al.*, 2014, p.97).

5.11.1 Internal Consistency Reliability

Internal consistency reliability is described as "a form of reliability used to evaluate the consistency of results across items on the same test. It determines whether the items measuring a construct are similar in their scores (that is, if the correlations between the items are large)" (Hair *et al.*, 2014; Hair *et al.*, 2010; Sekaran & Bougie, 2010; Litwin, 1995). Prior literature has proved Cronbach alpha and Composite reliability as criteria for internal consistency reliability, and this is adopted in the present study (Sekaran & Bougie, 2010; Hair *et al.*, 2010; Creswell, 2010). Cronbach alpha assumes that all indicators are equally reliable but PLS-SEM prioritises the indicators according to their individual reliability, hence the preference for composite reliability which takes into account the different outer loadings of the indicator variables and is calculated thus:

$$\rho_c = \frac{\left(\sum_i li\right)^2}{\left(\sum_i l_i\right)^2 + \left(\sum_i \text{var}(\varepsilon_i)\right)} \qquad .. \text{ Equation (1)}$$

Where

l_i represents the standardized outer loading of the indicator variable i *of a specific construct,*

ε_i is the measurement error of indicator variable i, and

var (ε_i) denote the variance of the measurement error, which is defined as $1 - li^2$.

As a convention, the composite reliability varies between 0 and 1 with higher values indicating higher levels of reliability. Specifically, composite reliability and Cronbachs alpha values of 0.60 to 0.70 are acceptable in exploratory research, while in more advanced stages of research, values between 0.70 and 0.90 are regarded as satisfactory (Nunally & Berstein, 1994), and values above 0.90 (and definitely > 0.95) are undesirable (Hair *et al.*, 2014; Hayduk & Littvay, 2012; Rossiter, 2002; Drolet & Morrison, 2001). In the determination for the reflective measurement models, the estimates for the relationships between the reflective latent variables and their indicators (outer loadings) are crucial, and this is represented in Table 5.10.

In this study, based on the key factor loadings and cross loadings shown in Table 5.10, all outer loadings of the reflective constructs, FRPR, KR, MR, SR, and TPFRA are well above the threshold value of 0.708 except FRPR4 (0.652) that was retained, which if the item is deleted increases the composite reliability (CR) and AVE above the threshold value of 0.70 to 0.90 (and definitely > 0.95) and 0.70 respectively.

Table 5.10
Key Factor loadings and Cross loadings

Latent Variable	Indicators	FRPR	KR	MR	SR	TPFRA
Fraud Related Problem Representation	FRPR12	**0.893**	0.691	0.800	0.434	0.756
	FRPR13	**0.870**	0.746	0.766	0.430	0.811
	FRPR14	**0.876**	0.657	0.833	0.441	0.758
	FRPR4	**0.652**	0.415	0.533	0.385	0.561
	FRPR5	**0.875**	0.676	0.741	0.581	0.729
	FRPR6	**0.730**	0.570	0.621	0.409	0.625
Knowledge	KR5	0.634	**0.920**	0.639	0.346	0.792
	KR6	0.767	**0.874**	0.742	0.429	0.763
	KR7	0.656	**0.879**	0.656	0.374	0.707
Mindset	MR1	0.684	0.634	**0.815**	0.054	0.778
	MR15	0.809	0.642	**0.900**	0.441	0.723
	MR16	0.810	0.652	**0.889**	0.355	0.736
	MR19	0.609	0.527	**0.751**	0.282	0.538
	MR20	0.628	0.520	**0.787**	0.107	0.611
	MR23	0.860	0.792	**0.871**	0.661	0.808
	MR5	0.744	0.689	**0.874**	0.303	0.771
Skills	SR1	0.469	0.343	0.340	**0.888**	0.439
	SR2	0.469	0.342	0.349	**0.868**	0.442
	SR7	0.520	0.413	0.341	**0.884**	0.436
	SR8	0.438	0.406	0.333	**0.846**	0.425
Task Performance Fraud Risk Assessment	TPFRA1	0.765	0.771	0.704	0.619	**0.871**
	TPFRA2	0.712	0.744	0.698	0.473	**0.894**
	TPFRA3	0.849	0.731	0.837	0.546	**0.907**
	TPFRA4	0.712	0.731	0.796	0.097	**0.840**

Source: The Researcher

The indicator, FRPR4 (outer loading: 0.652) has the smallest indicator reliability with a value of 0.425 (0.652^2), while the indicator KR5 (outer loading: 0.920) has the highest indicator reliability with a value of 0.846 (0.920^2). Thus, all of the indicators for the five reflective constructs are well above the minimum acceptable level for outer loadings 0.5 (0.708^2).

Similarly, the composite reliability (as in Table 5.11) values of 0.925 (FRPR), 0.920 (KR), 0.945 (MR), 0.927 (SR), and 0.931 (TPFRA) illustrate that all the five reflective constructs have high levels of internal consistency reliability.

5.11.2 Convergent Validity

In this study and also in compliance with the convention, respective loadings and cross loadings are first to be evaluated for detection of problems with any particular items and for being criteria for establishing convergence validity (Bambale, 2013). In essence, the loadings and cross loadings of indicators in the respective constructs of this study is summarised and presented in Table 5.10.

Convergent validity refers to the extent to which a measure correlates positively with alternative measures of the same construct (Hair *et al.*, 2014; Sekaran & Bougie, 2010). In this study, convergent validity is established by considering the outer loadings of the indicators as well as the average variance extracted (AVE). It is important to state that higher outer loadings on a construct indicator are evident of association communality of indicators and is usually captured by the construct. This characteristic is known as indicator reliability. Indicator reliability is the square of the standardized indicator's outer loading. This demonstrates how much of the variation in the item is explained by the construct, and this is sometimes refers to as the variance extracted from the item, that is, communality (item) (Sekaran & Bougie, 2013; Creswell, 2010; Hair *et al.*, 2010). Table 5.11 indicates the model quality criteria: convergent validity and reliability analysis.

Table 5.11
Model Quality Criteria: Convergent Validity and Reliability Analysis

Latent Variable	Indicators	Loadings	Indicator Reliability	Composite Reliability	AVE[b]
Fraud Related Problem Representation	FRPRR12	0.893	0.797	0.925	0.674
	FRPRR13	0.870	0.757		
	FRPRR14	0.876	0.767		
	FRPRR4	0.652	0.425		
	FRPRR5	0.875	0.766		
	FRPRR6	0.730	0.533		
Knowledge	KR5	0.920	0.846	0.920	0.794
	KR6	0.874	0.764		
	KR7	0.879	0.773		
Mindset	MR1	0.815	0.664	0.945	0.710
	MR15	0.900	0.810		
	MR16	0.889	0.790		
	MR19	0.751	0.564		
	MR20	0.787	0.619		
	MR23	0.871	0.759		
	MR5	0.874	0.764		
Skills	SR1	0.888	0.789	0.927	0.760
	SR2	0.868	0.753		
	SR7	0.884	0.781		
	SR8	0.846	0.716		
Task Performance Fraud Risk Assessment	TPFRAR1	0.871	0.759	0.931	0.772
	TPFRAR2	0.894	0.799		
	TPFRAR3	0.907	0.823		
	TPFRAR4	0.840	0.706		

Source: The Researcher

According to Hair, Hult, Ringle, and Sarstedt (2014), convergent validity builds on the AVE value as an evaluation criterion. In this study, the AVE values of FRPR (0.674), KR (0.794), MR (0.710), SR (0.760), and TPFRA (0.772) are well above the minimum level of 0.50. Hence, the measures of the five reflective constructs have a high level of convergent validity.

5.11.3 Discriminant Validity

Prior literature describes discriminant validity as the "extent to which a construct is truly distinct from other constructs by empirical standards (Hair *et al.*, 2010; Sekaran & Bougie, 2010, Creswell, 2010). By establishing discriminant validity means that the construct is unique and captures phenomena, which is not represented by other constructs in the reflective model.

Specifically, there are two measures of discriminant validity. First, examine the cross loadings of the indicators as in Table 5.10 by confirming an indicator's outer loading on the associated construct is greater than all of its loadings on other constructs, that is, cross loadings (Hair, Ringle, & Sarstedt, 2011). If there is any cross loadings that exceed the indicators' outer loadings, this portends a discriminant validity problem. Considering Table 5.10 of this study, for example, the outer loadings of FRPR12 (0.893), KR5 (0.920), MR15 (0.900), SR7 (0.884), and TPFRA3 (0.907) demonstrate greater loadings than all of their loadings on other constructs (that is, the cross loadings).

Second, compare the square root of the AVE values with the latent variable correlations. This implies that the square root of each construct's AVE as a rule must be greater than its highest correlation with any other construct in accordance with the Fornell-Lacker (1981) criterion (Hair *et al.*, 2010; Sekaran & Bougie, 2010). The logic behind this conservative approach focuses on the idea that a construct shares more variance with its associated indicators than with any other construct. This principle as noted by Hair *et al.* (2014) applies only to reflective constructs. Table 5.12 illustrates the correlations and discriminant validity of this study.

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Table 5.12
Correlations and Discriminant Validity

Latent Variable	FRPR	KR	MR	SR	TPFRA
FRPR	**0.821**				
KR	0.772	**0.891**			
MR	0.781	0.764	**0.843**		
SR	0.545	0.431	0.391	**0.872**	
TPFRA	0.767	0.847	0.765	0.499	**0.879**

Source: The Researcher
Note: Diagonals that displayed in bold represent the square average variance extracted (AVE) while the values, not in bold represent the correlations.

5.11.4 Summary of Results for Reflective Measurement Models

Granting the importance of the reflective measurement models evaluation criteria to this study, the researcher presents in Table 5.13 and Figure 5.2 the summaries of the results of the reflective measurement model assessment (in three decimal places) and the pictorial representation of the results of the study.

Following the presentation of Table 5.13 and Figure 5.2, the researcher has demonstrated that all the models evaluation criteria have been met (i.e. conforms to the requirements of Table 5.6 Systematic Evaluation Process of PLS-SEM Results, subsection 5.7.1), thereby providing rigid support for the measures' reliability and validity in this study.

Table 5.13

Summary of Results for Reflective Measurement Models

Latent Variable	Indicators	Loadings	Indicator Reliability	Cronbach 's Alpha	Composite Reliability	AVE[b]	Discriminant Validity?
Fraud Related Problem Representation	FRPRR12	0.893	0.797	0.900	0.925	0.674	Yes
	FRPRR13	0.870	0.757				
	FRPRR14	0.876	0.767				
	FRPRR4	0.652	0.425				
	FRPRR5	0.875	0.766				
	FRPRR6	0.730	0.533				
Knowledge	KR5	0.920	0.846	0.870	0.920	0.794	Yes
	KR6	0.874	0.764				
	KR7	0.879	0.773				
Mindset	MR1	0.815	0.664	0.931	0.945	0.710	Yes
	MR15	0.900	0.810				
	MR16	0.889	0.790				
	MR19	0.751	0.564				
	MR20	0.787	0.619				
	MR23	0.871	0.759				
	MR5	0.874	0.764				
Skills	SR1	0.888	0.789	0.895	0.927	0.760	Yes
	SR2	0.868	0.753				
	SR7	0.884	0.781				
	SR8	0.846	0.716				
Task Performance Fraud Risk Assessment	TPFRAR1	0.871	0.759	0.901	0.931	0.772	Yes
	TPFRAR2	0.894	0.799				
	TPFRAR3	0.907	0.823				
	TPFRAR4	0.840	0.706				

Source: The Researcher

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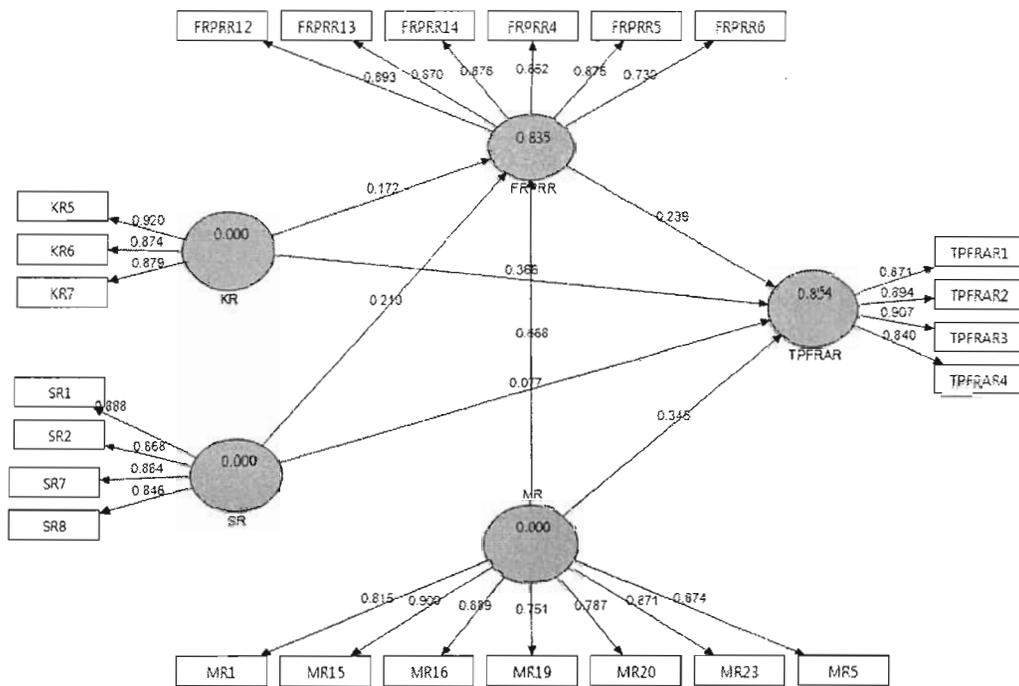
Figure 5.2
Results for the Reflective Measurement Model

Similarly, the researcher presents the structural model's results and the revised model
for this study in the next section.

5.12 Overview of the Revised Theoretical Model

This section of the study presents the revised theoretical model, which is a result of
the modification exhibited in the evaluation of the reflective measurement model.
The initial model for the study has been improved upon because of the measures of
internal consistency reliability using PLS-SEM algorithm for path models.

In the initial theoretical model, there are five constructs depicting the three exogenous
variable constructs (i.e. knowledge, skills and mindset: forensic accountant and
auditor), and two endogenous variable constructs (i.e. task performance fraud risk

assessment and fraud related problem representation). These five constructs comprise 61 indicators, out of which 37 indicators or manifest variables suffer deletions. The initial knowledge (forensic accountant and auditor) latent variable adapted from Davis, Farrell and Ogilby (2010) and Ramaswamy (2007, 2005) of 7 indicators, only 3 indicators, were retained and used in this study. Specifically, in relation to the initial skills (forensic accountant and auditor) latent variable adapted from DiGabrielle (2008) and Davis, Farrell and Ogilby (2010) that consists of 9 indicators, only 4 indicators were retained and used in this study.

Similarly, the mindset (forensic accountant and auditor) latent variable adapted from Chui (2010) and McLeod (2009) of 25 items, only 7 items were retained. More importantly, the mediating variable of fraud related problem representation which comprises 16 indicators adapted from Basadur, Basadur, and Licina (2013), Hester *et al.* (2012), Mumford, Medeiros, and Partlow (2012), Basadur and Basadur (2011), Reiter-Palmon, Herman, and Yammarino (2008), Basadur, Runco, and VEGAxy (2000), and Basadur's (2004, 1995), only 6 indicators were retained and employed in this study. Similarly, the last dependent variable of task performance fraud risk assessment adapted from Dzomira (2014), Owens (2012), and ACFE (2009) that consists of 4 indicators were retained and used in this study.

By this revised theoretical model illustrated in Figure 5.2, there exists a first order constructs of knowledge (KR) forensic accountants and auditors, skills (SR) forensic accountants and auditors, and mindset (MR) forensic accountants and auditors. In addition, KR is reflected with 3 indicators, SR has 4 indicators and MR possesses 7 indicators. Similarly, fraud related problem representation (FRPR) consists of 6

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manifest variables and the last construct of task performance fraud risk assessment (TPFRA) comprises 4 indicators. Thus, the revised theoretical model reflects three exogenous variables (KR, SR, and MR) and two endogenous variables (TPFRA, and FRPR). The revised theoretical model is presented in Figure 5.3 of this study.
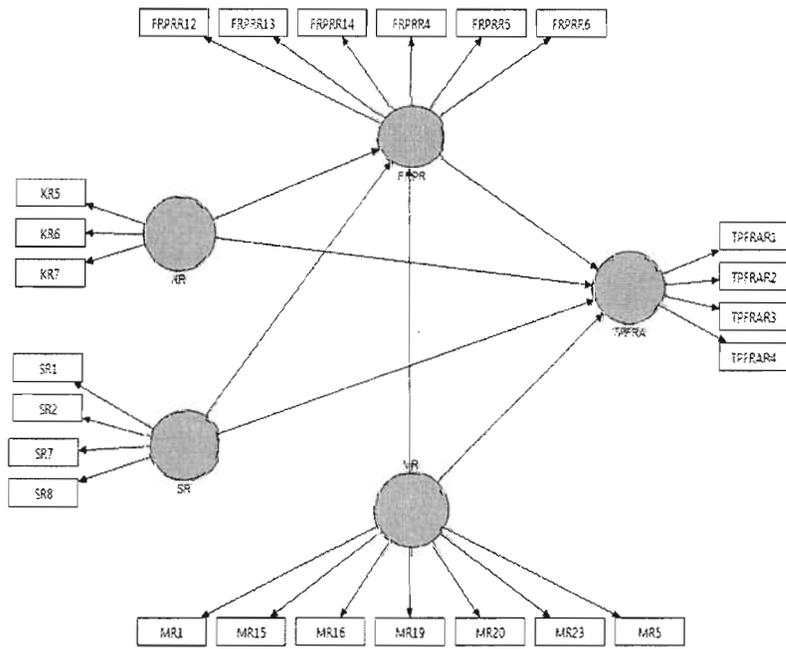
Figure 5.3
Revised theoretical model on Forensic accountants, Auditors and Fraud: Capability and Competence requirements

5.13   Global Fit Measure (GoF)

Goodness-of-fit index, also called "global fit measure, was developed for the purpose of measuring the overall model fit for PLS-SEM (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). GoF ($0 \leq$ GoF ≤ 1) is defined as the geometric mean of the average communality or AVE and average R^2 for endogenous constructs. However, the study

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by Tenenhaus *et al.* (2005) was challenged by Henseler and Sarstedt (2012) on the usefulness of GoF in terms of conceptual and empirical study. Their research (Henseler & Sarstedt, 2012) indicates that GoF does not represent a goodness-of-fit criterion for PLS-SEM as it "fails to separate valid models from invalid ones and to penalise over-parameterisation efforts".

Similarly, Hair, Sarstedt, Pieper, and Ringle (2012a) argued that the term "fit" has different meanings in the contexts of CB-SEM and PLS-SEM. As noted in their study, "fit statistics for CB-SEM are derived from the discrepancy between the empirical and the model-implied (theoretical) covariance matrix, whereas PLS-SEM focuses on the discrepancy between the observed (manifest variables) or approximated (latent variables) values of the dependent variables and the values predicted by the model in question".

Notwithstanding the arguments for or against the use of GoF as a validating criterion for inner model evaluation (structural model evaluation), this study presents in Table 5.14 the global fit measure (GoF) from which an informed conclusions could be made. In order to arrive at the GoF estimating value, this study follows the guidelines suggested by Wetzels, Odekerken-Schroder, and Oppen (2009) using the following formula:

$$\text{GoF} = 3\sqrt{(R^2) * (\text{AVE})}$$

From the table 5.14,

$$R^2 = 0.844, \text{ and } \text{AVE} = 0.742$$

$$= \sqrt[3]{0.844 * 0.742}$$

$$\text{GoF} = 0.627$$

Table 5.14
Global Fit Measure (GoF)

Constructs	R Square	AVE
FRPR	0.835	0.674
KR		0.794
MR		0.710
SR		0.760
TPFRA	0.854	0.772
	0.844	0.742
GoF		**0.627**

Source: The Researcher

In ascertaining the adequacy of the GoF, the baseline values provided by Wetzels *et al.* (2009) are considered: 1) 0.1 (small), 2) 0.25 (medium), and 3) 0.36 (large). Based on the GoF value of 0.627 that exceeds the cut-off value of 0.36 for large effect sizes of R^2, this allows a conclusion that the model performs well compared to the baseline values defined above.

5.14 Analysis and Results of PLS-SEM Structural Model (Path Coefficient Analysis)

In this section, the researcher presents the assessment of the structural model results to determine whether the empirical data support the concept, and to decide if the concept has been empirically confirmed. Prior literature confirms that PLS-SEM fits the model to the sample data to obtain the best parameter estimates by maximising the explained variance of the endogenous latent variable(s) (Hair *et al.*, 2014). Whereas, the CB-SEM estimates parameters in order that the differences between the sample covariance and those predicted by the conceptual or theoretical model are minimised (Rigdon, 2012).

Following, there are fifteen hypotheses which were formulated to answer the research questions highlighted in chapter 1.3 of this study. Similarly, all exogenous constructs (knowledge, skills, and mindset (forensic accountant and auditor) necessitate to be correlated, but no correlations are hypothesised (Kline, 2005; Saidon, 2012) in this study. Figure 5.4 represents the structural model of this study upon which key criteria for assessment are based.
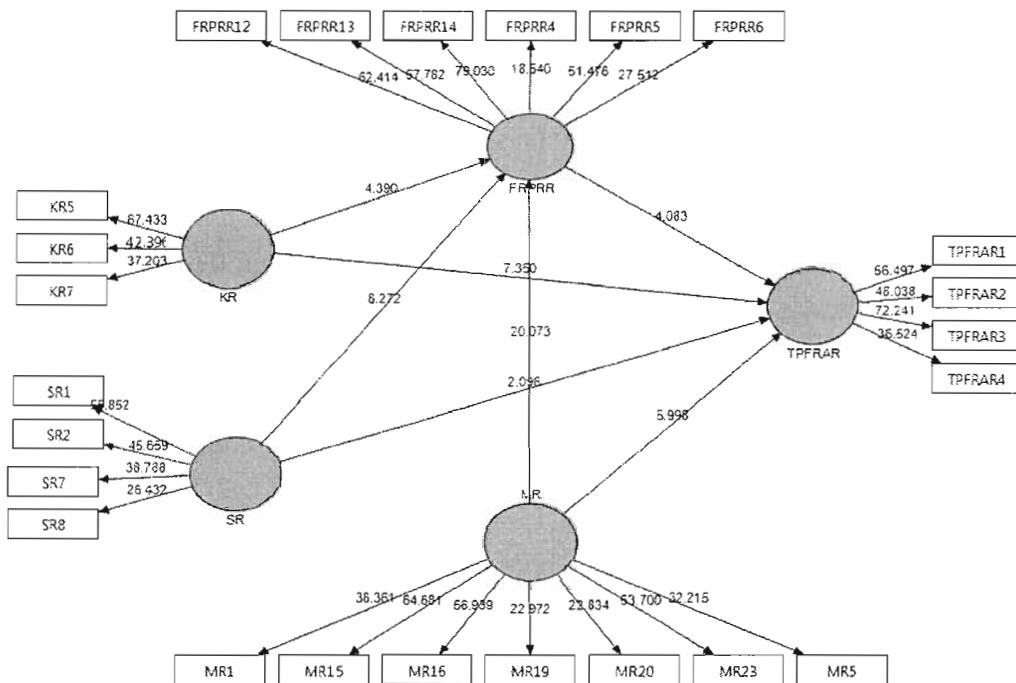
Figure 5.4
Results of the Bootstrapping Structural Model
Source: The Researcher

Since this study adopts the use of PLS-SEM as statistical analysis tool, the key criteria for assessing the structural model are: 1) the significance of the path coefficients, the level of the R^2 values, the f^2 effect size, the predictive relevance (Q^2), and the q^2 effect size (Ringle, Sarstedt, & Straub, 2012; Hair, Sarstedt, Pieper, & Ringle, 2012a; Chin, 2010; Albers, 2010).

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5.14.1 Collinearity Assessment

Collinearity occurs when two constructs are highly correlated in the context of structural model evaluation (Sekaran & Bougie, 2010). Literature has shown that high levels of collinearity between formative indicators are a crucial issue because of their impact on the estimation of weights and their statistical significance (Hair *et al.*, 2012). Contrasting, reflective indicators which are essentially interchangeable, high correlations are expected and thus, pose no threat on the estimation parameters and statistical significance (Hair *et al.*, 2014; Chin, 2010; Albers, 2010). This research is solely conducted using reflective indicators for measurement model and structural model evaluation, and hence, rigidly aligns with the position of Hair *et al.* (2014) as no threat is expected on the estimation parameters and statistical significance.

5.14.2 Assessment of the Path Coefficients in the Structural Model

Having confirmed that the construct measures are reliable and valid, the next step requires the assessment of the structural model results. Specifically, in the process of assessing the PLS-SEM results for the structural model, two important issues require adequate consideration. These are: 1) the significance of the constructs relationships and 2) the relevance of coefficients in the structural model (Hair *et al.*, 2013; Hair *et al.*, 2012)

In testing for the significance, the application of bootstrapping routine and examination of t values, p values, or bootstrapping confidence intervals is adopted in this study. In addition, the relative sizes of path coefficients are compared as well as the total effects, f^2 effect sizes, and q^2 effect size are considered. The significance of this is to enhance the interpretation of results by identifying key constructs with the

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highest relevance and to explaining the endogenous latent variables of fraud related problem representation and task performance fraud risk assessment in the structural model.

5.14.3 Evaluation of the Coefficients of Determination (R^2 values) in the Structural Model

The purpose of adopting PLS-SEM as statistical analysis tool in this study is based on its prediction capabilities. The R^2 represents the amount of explained variance of the endogenous constructs (that is, fraud related problem representation and task performance fraud risk assessment) in the structural model. Prior literature has indicated that a well-developed path model to explain certain key constructs such as knowledge, skills and mindset (forensic accountant and auditor) should deliver sufficiently high R^2 values. As noted by Chin (2010) and Albers (2010), the baseline for interpreting R^2 values of target constructs are 0.25 (weak), 0.50 (medium), and 0.75 (substantial).

Hair *et al.* (2012) agreed with the R^2 values baseline for interpretation purposes and this study; the R^2 value for the mediating variable (endogenous variable) of "fraud related problem representation" is 0.835, and this confirms substantial amount of explained variance in the construct. Similarly, the R^2 value for the dependent variable (endogenous variable) of "task performance fraud risk assessment" is 0.854, and this also confirms substantial amount of explained variance in the construct. The researcher has demonstrated that R^2 values evaluation criteria have been met by providing high values above the required minimum, thereby providing rigid support for them in this study.

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5.14.4 Evaluation of the Effect size (f^2 values) in the Structural Model

In this study, the f^2 effect size is used to analyse the constructs in explaining the selected endogenous latent constructs (fraud related problem representation and task performance fraud risk assessment). More specifically, the f^2 effect size captures the contribution of each exogenous variable (that is, knowledge, skills and mindset – forensic accountants and auditors) to the R^2 value of the target construct of fraud related problem representation, and task performance fraud risk assessment in the structural model. The guidelines for assessing f^2 are that values of 0.02, 0.15, and 0.35 respectively represent small, medium, and large effects (Cohen, 1988) of the endogenous latent variable. Table 5.15 represents the evaluation of f^2 effect size on the structural model of this study.

Table 5.15
Evaluation of f^2 effect size on the structural model

Fraud Related Problem Representation (FRPR)

Endogenous Construct	R^2incl	R^2excl	R^2incl-R^2excl	1-R^2incl	Effect Size
Knowledge (KR)	0.835	0.823	0.012	0.165	0.070
Skills (SR)	0.835	0.800	0.035	0.165	0.209
Mindset (MR)	0.835	0.753	0.082	0.165	0.493

Task Performance Fraud Risk Assessment (TPFRA)

Endogenous Construct	R^2incl	R^2excl	R^2incl-R^2excl	1-R^2incl	Effect Size
Knowledge (KR)	0.854	0.807	0.047	0.146	0.322
Skills (SR)	0.854	0.85	0.004	0.146	0.027
Mindset (MR)	0.854	0.831	0.023	0.146	0.158

Source: The Researcher

From the Table 5.15, the f^2 effect size on the structural model for this study is assessed. First, the fraud related problem representation (endogenous construct – mediating construct) evaluation indicates f^2 effect size of KR (0.07), SR (0.21), and MR (0.49) as falling within the small, medium and large effect sizes, thus confirming the evaluation criteria to have been met, and thus demonstrating the contribution of each of the exogenous constructs of knowledge, skills and mindset (forensic accountant and auditor) to the target endogenous construct of fraud related problem representation.

Second, the task performance fraud risk assessment (endogenous construct – dependent variable) evaluation specifies f^2 effect size of KR (0.32), SR (0.03), and MR (0.16) as belonging to the medium, small and medium effect sizes, thereby confirming the evaluation criteria to have been met, and demonstrating the contribution of each of the exogenous constructs of knowledge, skills and mindset (forensic accountant and auditor) to the target endogenous construct of task performance fraud risk assessment.

5.14.5 Evaluating the Blindfolding and Predictive Relevance Q^2 and q^2 in the Structural Model

Further to assessing the magnitude of the R^2 values as a criterion of predictive accuracy, the researcher also examines Stone-Geisser's Q^2 value (Geisser, 1974; Stone, 1974). This measure is an indicator to demonstrate the model's predictive importance. Specifically, when the SEM-PLS exhibits predictive significance, it accurately predicts the data points of indicators in reflective measurement model of endogenous constructs (Hair *et al.*, 2014). Similarly, the Q^2 values larger than zero shows the path model's predictive relevance for fraud related problem representation

and task performance fraud risk assessment. In this study, the Q^2 value is obtained by employing the blindfolding procedure for a set distance D of 7, though a distance figure of 5 to 10 is permissible (Hair *et al.*, 2014).

According to Henseler *et al.*, (2009), blindfolding is a sample reuse technique that omits data every nth data point in the endogenous construct's indicators and estimates the parameters with the remaining data points. The guideline for evaluating q^2 is similar to f^2 with the values of 0.02, 0.15, and 0.35 respectively represent small, medium, and large effects (Cohen, 1988) of the endogenous latent variable. Table 5.16 represents the predictive assessment of q^2 values on the structural model of this study.

Table 5.16
The Predictive assessment of q^2 values in the Structural Model

Fraud Related Problem Representation (FRPR)					
Endogenous Construct	Q^2incl	Q^2excl	Q^2incl-Q^2excl	1-Q^2incl	Effect Size
KR	0.558	0.550	0.008	0.442	0.02
SR	0.558	0.535	0.023	0.442	0.05
MR	0.558	0.439	0.119	0.442	0.27
Task Performance Fraud Risk Assessment (TPFRA)					
Endogenous Construct	Q^2incl	Q^2excl	Q^2incl-Q2excl	1-Q^2incl	Effect Size
KR	0.645	0.605	0.040	0.355	0.11
SR	0.645	0.641	0.004	0.355	0.01
MR	0.645	0.565	0.080	0.355	0.23

Source: The Researcher

First and most importantly with respect to FRPR and TPFRA, the researcher obtain the sum of the squared observations (SSO) and the sum of prediction errors (SSE). The result in the last column (i.e. 1 – SSE/SSO) is the value of the predictive

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importance Q^2. In the path model, the predictive quality Q^2 of FRPR and TPFRA have values of 0.56 and 0.65 respectively, which present larger predictive importance than the baseline criteria of Cohen (1988). Therefore, it implies that the model has predictive relevance for the endogenous constructs of FRPR and TPFRA since their resulting Q^2 values are larger than zero.

Second and specifically, the fraud related problem representation (i.e. endogenous construct – mediating construct) assessment indicates q^2 values of the exogenous constructs of KR (0.02), SR (0.05), and MR (0.27) as falling within the small, small and medium effect sizes. Therefore, the results confirm the evaluation criteria to have met the predictive significance of the endogenous construct in the structural model based on the Cohen's (1988) criteria.

Third and lastly, the Task performance fraud risk assessment (i.e. endogenous construct) assessment indicates q^2 values of the exogenous constructs of KR (0.11), SR (0.01), and MR (0.23) of forensic accountant and auditor as falling within the small, small and medium effect sizes. In essence, the results confirm the evaluation criteria to have met the predictive relevance of the endogenous construct in the structural model based on the Cohen's (1988) criteria.

5.15   Direct Effects' Hypotheses

In this study, there are seven direct effect hypotheses which have been formulated to answer the research questions. The articulated hypotheses encompass the relationship between knowledge, skills, and mindset (forensic accountant and auditor) as the exogenous constructs (independent constructs), fraud related problem representation

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as the second endogenous construct (mediating construct), and task performance fraud risk assessment as the first endogenous construct (dependent construct). These hypotheses include:

Hypothesis 1a: Knowledge - forensic accountant and auditor (KR) is positively related to task performance fraud risk assessment (TPFRA).

Hypothesis 1b: Skills - forensic accountant and auditor (SR) is positively related to task performance fraud risk assessment (TPFRA).

Hypothesis 1c: Mindset - forensic accountant and auditor (MR) is positively related to task performance fraud risk assessment (TPFRA).

Hypothesis 2a: Knowledge - forensic accountant and auditor (KR) is positively related to fraud related problem representation (FRPR).

Hypothesis 2b: Skills - forensic accountant and auditor (SR) is positively related to fraud related problem representation (FRPR)

Hypothesis 2c: Mindset - forensic accountant and auditor (MR) is positively related to fraud related problem representation (FRPR).

Hypothesis 3a: Fraud related problem representation (FRPR) is positively related to task performance fraud risk assessment (TPFRA).

5.16 Mediating Effects' Hypotheses

This section presents the mediating effects' hypotheses which have been formulated for this study. Most importantly, there are three hypotheses under consideration. These hypotheses are associated with the mediating effects of fraud related problem representation (FRPR) on the relationship between knowledge, skills, and mindset (forensic accountant and auditor) and the endogenous construct of task performance fraud risk assessment (TPFRA). The hypotheses are presented thus:

Hypothesis 4a: Fraud related problem representation (FRPR) positively mediates the relationship between knowledge - forensic accountants and auditors (KR) and task performance fraud risk assessment (TPFRA).

Hypothesis 4b: Fraud related problem representation (FRPR) positively mediates the relationship between skills - forensic accountants and auditors (SR) and task performance fraud risk assessment (TPFRA).

Hypothesis 4c: Fraud related problem representation (FRPR) positively mediates the relationship between mindset - forensic accountants and auditors (MR) and task performance fraud risk assessment (TPFRA).

5.17 Differences in groups Hypotheses (Forensic Accountant and Auditor)

In this section of the study, differences in group hypotheses were formulated in answering the research questions identified in chapter 1.3. More specifically, there

are five hypotheses under consideration. These hypotheses are associated with the differences between forensic accountants (FA) and auditors (Aud) in terms of their levels on knowledge (KR), skills (SR), and mindset (MR), fraud related problem representation (FRPR) task performance fraud risk assessment (TPFRA). The hypotheses are presented thus:

Hypothesis 5a: Forensic accountants have significant higher levels of the knowledge requirement than auditors.

Hypothesis 5b: Forensic accountants have significant higher levels of skills requirement than auditors.

Hypothesis 5c: Forensic accountants have significant higher levels of mindset requirement than auditors.

Hypothesis 5d: Forensic accountants have significant higher levels of fraud related problem representation requirement than auditors.

Hypothesis 5e: Forensic accountants have significant higher levels of task performance fraud risk assessment requirement than auditors.

5.18   Direct Effects

In this section of the study, the researcher presents the direct relationship effects between the exogenous constructs of knowledge (KR), skills (SR), and mindset (MR) - forensic accountants and auditors on task performance fraud risk assessment

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(TPFRA). According to Chin (1998b), the contribution of each exogenous construct is made manifest by the path coefficient (standardised beta values), the t values and the p values of the PLS-SEM structural model. Specifically, the study is basically on the mediating influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills, and mindset (forensic accountant and auditor) in the Nigerian public sector.

Similarly, subsection 1 of the main section deals with the direct relationships between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment. Next, subsection 2 presents the direct relationships between knowledge, skills, and mindset (forensic accountant and auditor) and fraud related problem representation, and following subsection 2 is the last and the concluding subsection 3 which highlights the direct relationship between fraud related problem representation and task performance fraud risk assessment. This study adopts the selection of significance levels at $p < 0.05$ and $p < 0.01$ (Hair *et al.*, 2010).

5.18.1 Knowledge, Skills and Mindset and Task Performance Fraud Risk Assessment

This subsection highlights the direct effect results of knowledge, skills, mindset (forensic accountant and auditor) and the task performance fraud risk assessment based on the hypothesised relationships. Table 5.17 demonstrates the path coefficient (standardised beta values), the standard error, the t values, the p values of the PLS-SEM structural model and the decision adopted.

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Table 5.17

Direct relationship effects of Knowledge (KR), Skills (SR) and Mindset (MR) on Task Performance Fraud Risk Assessment (TPFRA)

No	Hypothesis	Path Coefficient	Standard Error	T Value	P Value	Decision
1a	**KR -> TPFRA**	0.402	0.046	8.687	0.000***	**Support**
1b	**SR -> TPFRA**	0.129	0.030	4.328	0.000***	**Support**
1c	**MR -> TPFRA**	0.511	0.049	10.492	0.000***	**Support**

Source: The Researcher

Note: ***Shows the item is significant at the $p < 0.01$ (1% level)

This table of direct relationships between knowledge, skills and mindset, and task performance fraud risk assessment portends three scenarios. First, the result shows that knowledge, as an attribute, maintained significant relationship with task performance fraud risk assessment (competency). In essence, task performance fraud risk assessment in the public sector requires specialised knowledge of forensic accountants and auditors (beta = 0.402; t = 8.687; p = 0.000).

Second, forensic accountants and auditors skill recorded significant relationship with task performance fraud risk assessment. This indicates that skills, as an attribute are held by individuals, which enable them to perform their roles competently in the workplace relevant to task performance fraud risk assessment, most especially in the public sector accounting environment (beta = 0.129; t = 4.328; p = 0.000).

Third, mindset of forensic accountants and auditors as an attitude enhances the behaviour and reasoning of individuals towards the discharge of their roles with specific emphasises on task performance fraud risk assessment. The results from the

PLS-SEM indicates a very strong relationship between mindset and task performance fraud risk assessment (beta = 0.511; t = 10.492; p = 0.000).

Most importantly, Figures 5.5 and 5.6 pictorially illustrate the path coefficient (standardised beta values), the standard error, and the *t* values for the hypothesised relationships.
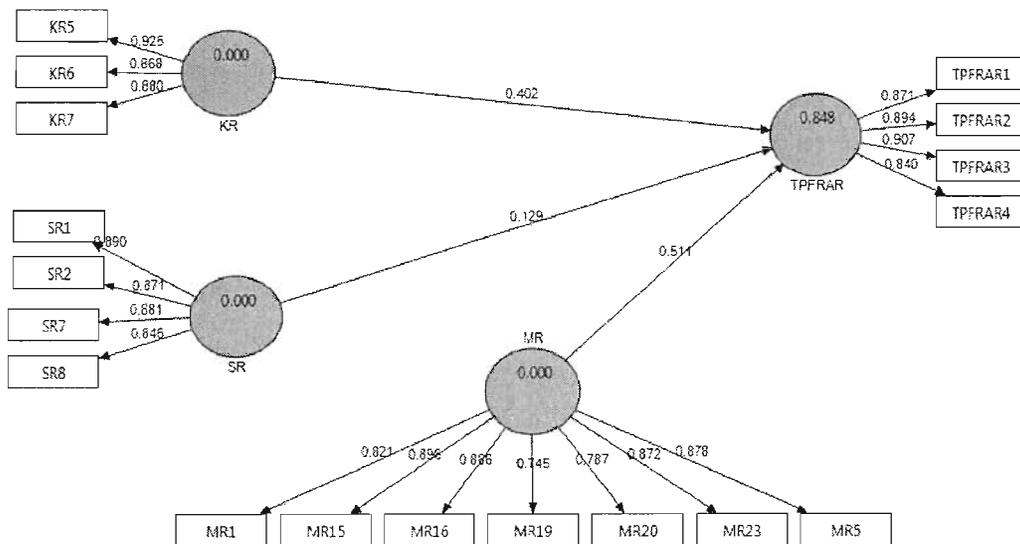
Figure 5.5
Results of the PLS-SEM Algorithm Direct Effects: KR, SR, MR and TPFRA
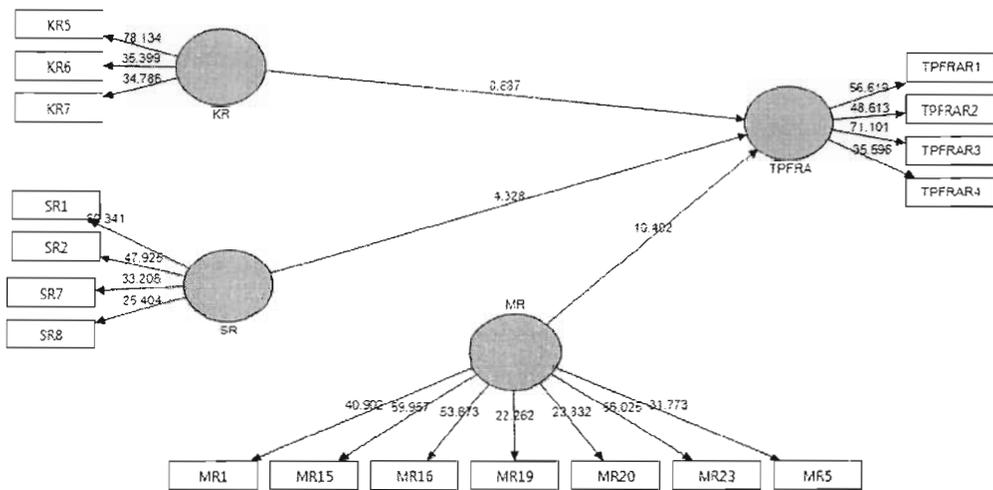
Figure 5.6
Results of the PLS-SEM Bootstrapping Direct Effects: KR, SR, MR and TPFRA

Most specifically, the results highlights that among the three predictors of TPFRA, Mindset (MR) requirement of forensic accountants and auditors recorded the highest significant path coefficient (beta = 0.511). Thus, it indicates the significant contribution of SR as the most important predictor of task performance fraud risk assessment by forensic accountants and auditors in the Nigerian public sector.

Similarly, SR recorded the lowest path coefficient (beta = 0.129) among the three predictors of TPFRA. Although, significant at p = 0.000), the results of the relationship between forensic accountants and auditors skills and task performance fraud risk assessment is somehow surprising. This is more so when considering the influence of enhanced skills to forensic accountants and auditors in assessing task performance fraud risk in the era of globalisation that is characterised with information technology as a business enabler, and coupled with new and complex legislation, thereby creating opportunities to perpetrate fraud and high demand for

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forensic accountants. The results achieved on the significant direct relationships between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment are reliable and valid, and also consistent with previous studies (Chui, 2010; Kasum, 2010; Davis *et al.*, 2010; DiGabrielle, 2008; Ramaswamy, 2007). In addition, all the three hypotheses - H1a, H1b, and H1c are well supported, and, therefore, consequently accepted by this study.

5.18.2 Knowledge, Skills and Mindset and Fraud Related Problem Representation

In this subsection of the study, the focus is made on the direct effects between knowledge (KR), skills (SR), and mindset (MR) of forensic accountants and the auditors, and the fraud related problem representation (FRPR) based on extant hypotheses formulated. The results as presented in Table 5.18 reveal that significant direct relationship exists between the exogenous variable of knowledge, skills and mindset, and the endogenous construct of fraud related problem representation. Table 5.17 demonstrates the path coefficient (standardised beta values), the standard error, the *t* values, the *p* values of the PLS-SEM structural model and the decision adopted.

Table 5.18
Direct relationship effects of Knowledge (KR), Skills (SR) and Mindset (MR) on Fraud Related Problem Representation (FRPR)

No	Hypothesis	Path Coefficient	Standard Error	T Value	P Value	Decision
2a	KR -> FRPR	0.178	0.038	4.693	0.000***	Support
2b	SR -> FRPR	0.207	0.024	8.696	0.000***	Support
2c	MR -> FRPR	0.663	0.033	19.865	0.000***	Support

Source: The Researcher
Note: ***Shows the item is significant at the $p < 0.01$ (1% level)

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Specifically, the table 5.18 takes cognisance of the direct relationships between knowledge, skills and mindset, and the fraud related problem representation signifies three scenarios. First, the result shows that knowledge as an attribute, maintained significant relationship with fraud related problem representation (beta = 0.178; t = 4.693; p = 0.000). In essence, forensic accountants and auditors in the public sector require unique knowledge towards understanding and interpretation of fraud related problem representation situations (Davis et al., 2010; Christ, 1993; Chi *et al.*, 1981; Greeno, 1977).

Second, forensic accountants and auditors skills posted significant relationship with fraud related problem representation. This indicates that skills, as an attribute are held by individuals, which enable them to understand and interpret fraud related problem competently in the workplace most especially in the public sector accounting environment (beta = 0.207; t = 8.696; p = 0.000).

Third, mindset as mental attitude or state of mind enhances the behaviour and thinking of forensic accountants and auditors towards the discharge of their roles with specific emphases on fraud related problem representation situations. The results from the PLS-SEM indicates a very strong relationship between mindset and fraud related problem representation (beta = 0.663; t = 19.865; p = 0.000).

Most importantly, Figures 5.7 and 5.8 pictorially illustrate the path coefficient (standardised beta values), the standard error, and the *t* values for the hypothesized relationships.
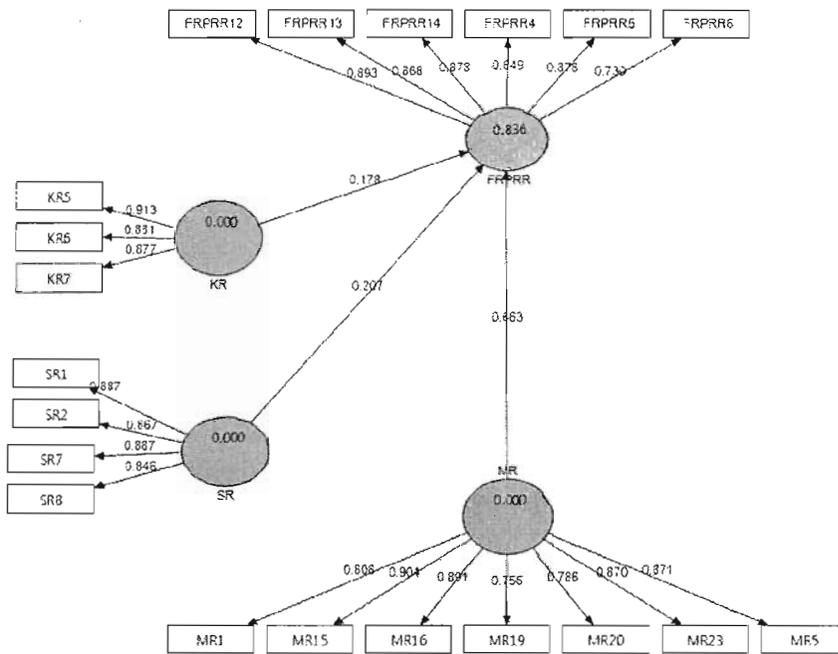
Figure 5.7
*Results of the PLS-SEM Algorithm Direct Effects: KR, SR, MR and FRPR*
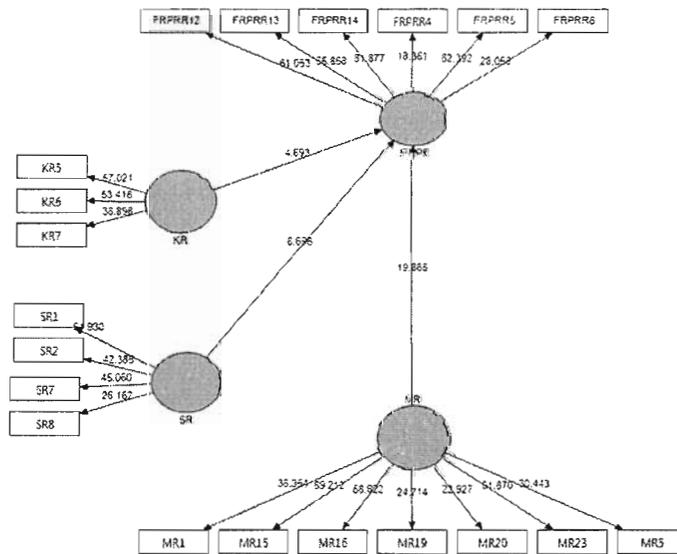
Figure 5.8
Results of the PLS-SEM Bootstrapping Direct Effects: KR, SR, MR and FRPR

Most importantly, the results depict that among the three predictors of FRPR, mindset (MR) requirement of forensic accountants and auditors recorded the highest significant path coefficient (beta = 0.663). Thus, it indicates the significant contribution of MR as the most important predictor of fraud related problem representation by forensic accountants and auditors in the Nigerian public sector. Similarly, KR recorded the lowest path coefficient (beta = 0.178) among the three predictors of FRPR.

Although, SR recorded a significant showing next to mindset with a path coefficient of beta = 0.207. This clearly indicates that in understanding and solving fraud related problem, forensic accountants and auditors require strong analytical proficiency, deductive analysis, critical thinking, investigative flexibility, specific legal knowledge, written and oral communication skills to be able to excel in the workplace.

The results attained on the significant direct relationships between knowledge, skills and mindset (forensic accountant and auditor) and fraud related problem representation are reliable and valid, and also consistent with previous studies (Chui, 2010; McLeod, 2009; Basadur, 1997). Consequently, all the three hypotheses – H2a, H2b, and H2c are well supported, and, therefore, accepted by this study.

5.18.3 Fraud Related Problem Representation and Task Performance Fraud Risk Assessment

This subsection of the study focuses on the direct effect of fraud related problem representation (FRPR) and the task performance fraud risk assessment constructed on formulated hypothesis. The result as presented in Table 5.19 reveals that significant

direct relationship exists between the endogenous variable of fraud related problem representation, and the endogenous construct of task performance fraud risk assessment. Table 5.19 demonstrates the path coefficient (standardised beta values), the standard error, the t values, the p values of the PLS-SEM structural model and the decision taken.

Table 5.19
Direct relationship effect of Fraud Related Problem Representation (FRPR) on Task Performance Fraud Risk Assessment (TPFRA)

No	Hypothesis	Path Coefficient	Standard Error	T Value	P Value	Decision
3a	**FRPR -> TPFRA**	0.869	0.011	76.456	0.000***	**Support**

Note: ***Shows the item is significant at the $p < 0.01$ (1% level)
Source: The Researcher

More importantly, the table 5.19 considers the direct relationship between fraud related problem representation and task performance fraud risk assessment of forensic accountants and auditors in the Nigerian public sector. Similarly, the result shows that fraud related problem representation maintained high significant relationship with task performance fraud risk assessment (beta = 0.869; t = 76.456; p = 0.000). In essence, forensic accountants and auditors in the public sector require dynamic and purposeful behavioural problem understanding and problem solving attitude in respect of task performance fraud risk assessment in their workplace. The results from the PLS-SEM indicate a very strong relationship between fraud related problem representation and task performance fraud risk assessment (beta = 0.869). Specifically, Figures 5.9 and 5.10 pictorially demonstrate the path coefficient (standardised beta values), the standard error, and the t values for the hypothesised relationships.

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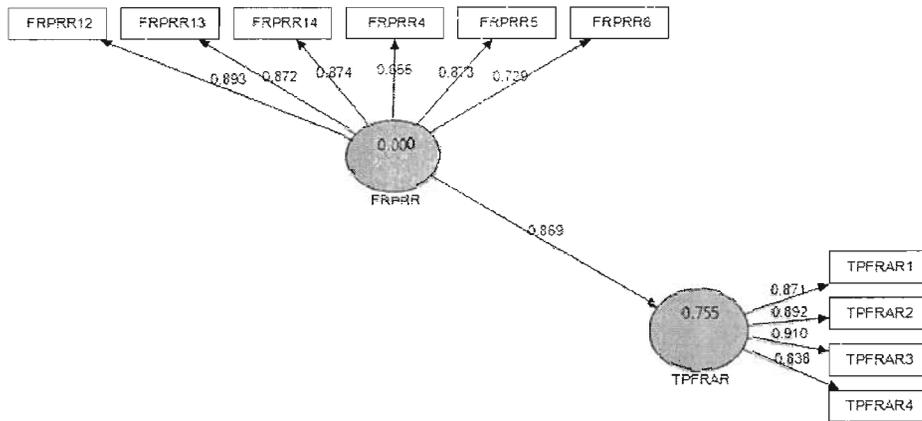
Figure 5.9
Results of the PLS-SEM Algorithm Direct Effect: FRPR and TPFRA
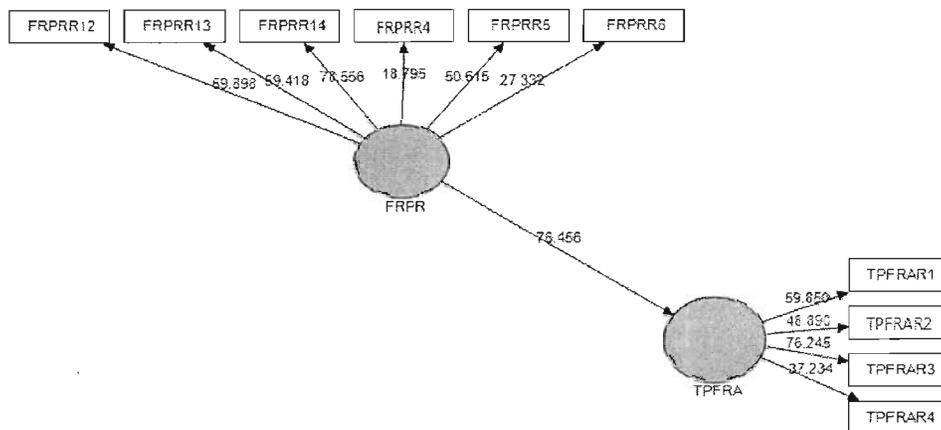
Figure 5.10
Results of the PLS-SEM Bootstrapping Direct Effect: FRPR and TPFRA

The results accomplished indicate the significant direct relationship between fraud related problem representation and task performance fraud risk assessment of forensic accountants and auditors in the Nigerian public sector is reliable and valid, and also consistent with previous studies (Dzomira, 2014; Owens, 2012; Chui, 2010; ACFE, 2009). Consequently, the hypothesis – H3a is well supported, and, therefore, accepted by this study.

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5.19 Mediation Effects

In this section, the researcher presents the mediation effects (or indirect effects) of the study. Specifically, mediation occurs when the causal effect of the independent variable (X) on the dependent variable (Y) is transmitted through a third intervening, or mediating, variable (M) as depicted in Figure 5.11. In essence, X causes M, and M causes Y. Similarly, the total effect is represented by X on Y, and the indirect effect by X on Y through M and the direct effect by X on Y controlling for M. It, therefore, follows that if M is held constant in a model in which the mediator explains all of the variation between X and Y (that is, a model in which there is complete mediation), then the relationship between X and Y is zero (MacKinnon & Fritz, 2007).

More importantly, the variable is called a mediator in so far as it influences the relationship between the predictor and the criterion (Baron & Kenny, 1986). Ramayah *et al.* (2011) asserted "mediation test is conducted to discover if a mediator variable can significantly carry the influence of the independent variable to a dependent variable". Figure 5.11 demonstrates the mediation design whereby X affects Y through M.
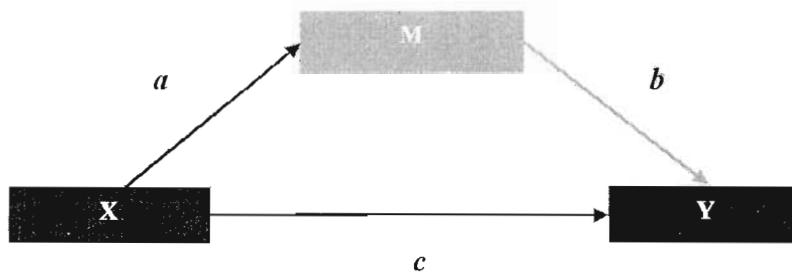
Figure 5.11
Depiction of a Mediation Design: X affects Y through M

A review of Baron and Kenny (1986) study indicates four conditions of mediation to occur, one of which is "a predictor variable (X) and criterion (Y) must possess significant relationship in order for mediation effect to occur" has been relegated by recent literature (MacKinnon et al., 2002; Shrout & Bolger, 2002). Consequently, this research took a bold step to test the mediation effect of fraud related problem representation in the relationship between knowledge, skills and mindset, and task performance fraud risk assessment of forensic accountants and auditors in the Nigerian public sector.

As noted by Preachers and Hayes (2008), mediation test in multivariate analysis is best carried out through many techniques. These are: 1) simple techniques that comprise the causal steps approach (Baron & Kenny, 1986) or the Sobel test (Sobel, 1982); and 2) newer approaches that demand just fewer unrealistic assumptions such as the distribution of the product method (MacKinnon, Lockwood, & Williams, 2004) and the resampling technique of bootstrapping (Preachers & Hayes, 2008, 2004; MacKinnon et al., 2007, 2004; Shrout & Bolger, 2002; Bollen & Stine, 1990).

Most specifically, the SEM statistical analysis tool is claimed to be more preferred to regression techniques for testing mediation, more so SEM permits modeling of both measurement and structural relationships and hence, yield overall fit indices (James, Mulak & Brett, 2006; Baron & Kenny, 1986). This study used the bootstrapping approach (Arbuckle & Wothke, 1999) to evaluate the mediating effect of fraud related problem representation on the relationship between task performance fraud risk assessment and knowledge, skills, and mindset (forensic accountant and auditor) in the Nigerian public sector. This method conforms to the recommendation of many

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studies in assessing indirect effects (Hayes, 2009; MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2004; Shrout & Bolger, 2002; Bollen & Stine, 1990). According to the recommendation of Hayes (2008), the bootstrap results possess accurate probability estimates in a situation where the mediator and outcome variables are not normally distributed. Hayes (2008) recommendation is an offshoot to the earlier study of Shrout and Bolger (2002).

In addition, MacKinnon, Fairchild, and Fritz (2007) identified two good reasons for applying the bootstrap approach for mediation analysis. First, the method provides a general means to test significance and confidence intervals in a wide variety of situations. Second, the method does not require many assumptions and, as a result, makes the result more accurate. Chin (2010) agrees with MacKinnon, Fairchild, and Fritz (2007) by asserting that in PLS-SEM analysis, "bootstrapping represents a more exact calculation of measures".

In this research, hypotheses 4a, 4b, and 4c were developed to test the fraud related problem representation as a mediator. In order to test the significance level of each mediating effect for the hypotheses, the bootstrapping method with 5000 bootstrap resampling and bias-corrected confidence intervals was utilised (Hair, Ringle, & Sarstedt, 2013; Preacher & Hayes, 2008; Cheung & Lau, 2008). Specifically, bootstrap samples are derived through repeatedly estimating the path coefficients with a minimum of 5000 bootstrap samples, each of which consists of N cases randomly sampled with replacement from the original sample ($N = 328$) and based on two parameters: 1) direct without a mediator, and 2) direct with a mediator.

In order to arrive at the t-value of each mediating effect for the hypotheses, the Preacher and Hayes (2008) Multiple Mediation (Indirect) was employed in this study (Appendices 12-16, p.368-372). However, Soper (2014) Sobel Test Calculator for the significance of Mediation (Appendix 17, p.373) served as alternative method to assess the hypothesised path of this study. Table 5.20 represents the PLS-SEM Mediation and Bootstrap of the hypothesised path.

Table 5.20

PLS-SEM Mediation and Bootstrap of the Indirect hypothesised path

| No. | Hypothesis | Path Coefficients | | | | | | | | | Support |
| | | a | | | b | | | c | | | |
		Path Coef	t-value	p-value	Path Coef	t-value	p-value	Path Coef	t-value	p-value	
4a	KR --> FRPR-> TPFRA	0.704	21.419	0.000	0.648	14.248	0.000	0.985	28.698	0.000**	Yes
4b	SR --> FRPR-> TPFRA	0.607	11.798	0.000	0.844	25.880	0.000	0.633	9.149	0.000**	Yes
4c	MR --> FRPR ->TPFRA	0.602	30.525	0.000	0.489	8.322	0.000	0.780	33.901	0.000**	Yes

Note: ** $p < .01$; N = 328; N = 326, 2-tailed; KR = Knowledge; SR = Skills; MR = Mindset; FRPR = Fraud Related Problem Representation; and TPFRA = Task Performance Fraud Risk Assessment
Source: The Researcher

5.19.1 Significance of Mediation (FRPR) on the influence of KR and TPFRA

Specifically, multiple regression analyses were conducted to assess each component of the proposed mediation model. First, it was found that KR was positively associated with TPFRA (beta = .98, t (326) = 28.698, p = .000). Second, it was also established that KR was positively related to FRPR (beta = .70, t (326) = 21.419, p = .000). Third and last, the results indicated that the mediator, FRPR was positively related to TPFRA (beta = .65, t (326) = 14.248, p = .000).

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Because both the a-path and the b-path were significant, mediation analyses were tested using the bootstrapping method with bias-corrected confidence estimates (Soper, 2014; MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2009, 2004; Sobel, 1982). In the present study, the 95 percent confidence interval of the indirect effect was obtained with 5000 bootstrap resamples (Preachers & Hayes, 2008). Results of the mediation analysis confirmed the mediating role of FRPR in the relation between KR and TPFRA (beta = .46, CI = .38 to .54).

Furthermore, the results indicated that the direct effect of KR on TPFRA became significant (beta = .53, t (326) = 12.646, p = .000) when controlling for FRPR. This, therefore, suggests partial mediation. Thus, hypothesis 4a and as demonstrated in Table 5.20, Table 5.21 and Figure 5.14a of this study is rigidly supported.

Figure 5.12a demonstrates the pictorial significance of mediation, fraud related problem representation (FRPR) on the influence of Knowledge (KR) and Task Performance Fraud Risk Assessment (TPFRA).
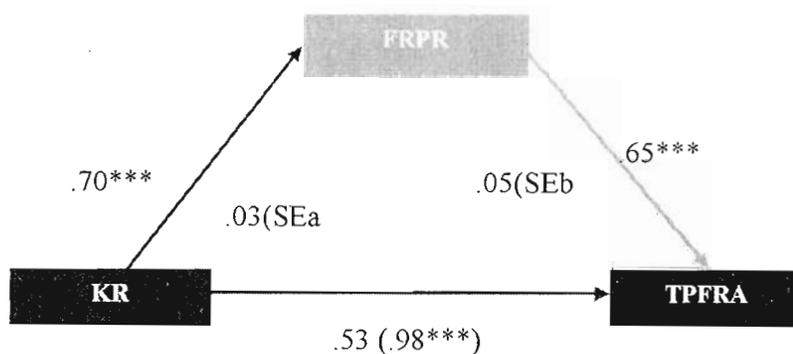
Figure 5.12a
Significance of Mediation (FRPR) on the influence of KR and TPFRA
Note: *** p < .001; N = 328; N = 326, 2-tailed; KR = Knowledge; SR = Skills; MR = Mindset; FRPR = Fraud Related Problem Representation; and TPFRA = Task Performance Fraud Risk Assessment
Source: The Researcher

5.19.2 Significance of Mediation (FRPR) on the influence of SR and TPFRA

Multiple regression analyses were conducted to evaluate each constituent of the suggested mediation model. First, it was discovered that SR was positively associated with TPFRA (beta = .63, t (326) = 9.149, p = .000). Second, it was also established that SR was positively related to FRPR (beta = .61, t (326) = 11.798, p = .000). Third and last, the results indicated that the mediator, FRPR was positively related to TPFRA (beta = .84, t (326) = 25.880, p = .000).

As a result of the fact that both the a-path and the b-path were significant, mediation analyses were tested using the bootstrapping method with bias-corrected confidence estimates (Soper, 2014; MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2009, 2004; Sobel, 1982). In this study, the 95 percent confidence interval of the indirect effect was obtained with 5000 bootstrap resamples (Preachers & Hayes, 2008). Results of the mediation analysis confirmed the mediating role of FRPR in the relation between SR and TPFRA (beta = .67, CI = .59 to .79).

Moreover, the results indicated that the direct effect of SR on TPFRA became non-significant (beta = -.04, t (326) = -0.776, p = .438) when controlling for FRPR. This, therefore, suggests full mediation. Thus, hypothesis 4b and as demonstrated in Table 5.20, Table 5.21 and Figure 5.14b of this study is rigidly supported. Figure 5.12b illustrates the pictorial significance of mediation, fraud related problem representation (FRPR) on the influence of Skills (SR) and Task Performance Fraud Risk Assessment (TPFRA).
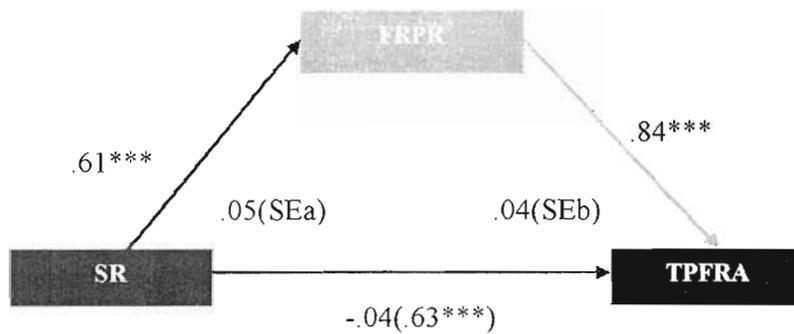
Figure 5.12b
Significance of Mediation (FRPR) on the influence of SR and TPFRA
Note: *** p < .00; N = 328; N = 326. 2-tailed; KR = Knowledge; SR = Skills; MR = Mindset; FRPR = Fraud Related Problem Representation; and TPFRA = Task Performance Fraud Risk Assessment
Source: The Researcher

5.19.3 Significance Influence of Mediator, FRPR on the MR and TPFRA

PLS-SEM multiple regression analyses were conducted to appraise each constituent of the recommended mediation model. First, it was revealed that MR was positively associated with TPFRA (beta = .78, t (326) = 33.901, p = .000). Second, it was also established that MR was positively related to FRPR (beta = .60, t (326) = 30.525, p = .000). Third and last, the results indicated that the mediator, FRPR was positively related to TPFRA (beta = .49, t (326) = 8.322, p = .000).

As a result of the fact that both the a-path and the b-path were significant, mediation analyses were tested using the bootstrapping method with bias-corrected confidence estimates (Soper, 2014; MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2009, 2004; Sobel, 1982). In this study, the 95 percent confidence interval of the indirect effect was obtained with 5000 bootstrap resamples (Preachers & Hayes, 2008). Results of the mediation analysis confirmed the mediating role of FRPR in the relation between MR and TPFRA (beta = .03, CI = .21 to .38).

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Moreover, the results indicated that the direct effect of MR on TPFRA became significant (beta = .49, t (326) = 11.818, p = .000) when controlling for FRPR. This, therefore, suggests partial mediation. Thus, hypothesis 4c and as demonstrated in Table 5.20, Table 5.21 and Figure 5.12c of this study is rigidly supported.

Consequently, Figure 5.12c illustrates the pictorial significance of mediation, Fraud related problem representation (FRPR) on the influence of Mindset (MR) and Task performance fraud risk assessment (TPFRA).
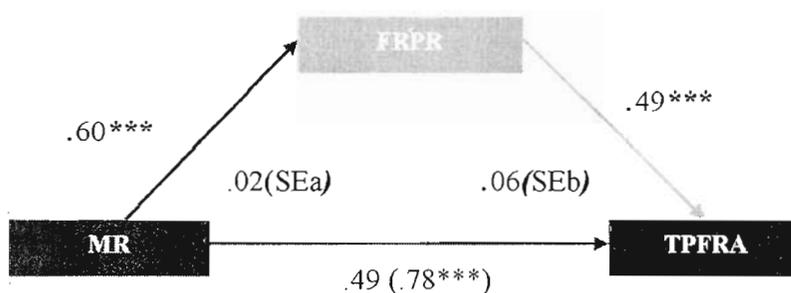
Figure 5.12c
Significance of Mediation (FRPR) on the influence of MR and TPFRA
Note: *** p < .01; N = 328; N = 326. 2-tailed; KR = Knowledge; SR = Skills; MR = Mindset; FRPR = Fraud Related Problem Representation; and TPFRA = Task Performance Fraud Risk Assessment
Source: The Researcher

5.19.4 Direct, Indirect and Total Effects

In order to assess the mediation effect of each of the hypothesised path, the total effect, the direct effect and the indirect effect were considered. First, total effect is the extent to which any change in the predictor variable (IV) is related to the criterion variable (DV). Second, the direct effect is the extent to which a change in the predictor variable (IV) is directly related to the criterion variable (DV) by avoiding the mediator variable. Third and the last, the indirect effect is the extent to which a change in the predictor variable produces a change in the criterion variable by passing

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through the mediator variable. Mathieu and Taylor (2006) suggest an approach to be employed in determining the degree of mediation – partial or full for any social science study. For example, if both the indirect effect and the direct effect are significant, partial mediation has occurred. Conversely, if the indirect effect and the total effect are significant, but the direct effect is not significant, full mediation has occurred. Table 5.20 shows the degree of mediation, (that is, the direct effect, the indirect effect and the total effect) of this study.

Table 5.21
Degree of Mediation

| No. | Hypothesis | Path Coefficients | | | | | | | Decision |
| | | a*b | | c | | c' | | P-Value | |
		Path Coeff.	Std Error	Path Coeff.	Std Error	Path Coeff.	Std Error		
4a	KR --> FRPR-> TPFRA	0.456	0.001	0.985	0.034	0.529	0.042	0.000	Partial Mediation
4b	SR --> FRPR-> TPFRA	0.512	0.002	0.633	0.069	-0.037	0.047	0.438	Full Mediation
4c	MR --> FRPR ->TPFRA	0.294	0.001	0.780	0.023	0.486	0.041	0.000	Partial Mediation

Source: The Researcher

5.20 Differences between Group Hypotheses (Forensic Accountant and Auditor)

In this section of the study, Mann-Whitney U Test is employed to test the hypotheses, which were formulated in answering the research questions identified in chapter 1.3.3. Most specifically, there are five hypotheses under consideration. These hypotheses are associated with differences between two independent groups (forensic accountant and auditor) on a continuous measure. This test according to Pallant (2010) is the non-parametric alternative to the t-test for independent samples. The Mann-Whitney U Test specifically compares medians as against t-test for independent samples that

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compare means of two groups. Following the comparison of the independent groups, the Mann-Whitney U Test evaluates the ranks for the two groups in terms of the constructs statistical significance describes the direction of the differences between the two groups and determines the effect sizes (Coakes, 2013; Pallant, 2010). This study explores whether forensic accountants have significant higher levels of knowledge (KR), skills (SR), and mindset (MR), fraud related problem representation (FRPR), and task performance fraud risk assessment (TPFRA) requirements than auditors. Table 5.21 represents the Mann-Whitney U Test for differences between Forensic Accountants and Auditors as hypothesised in 5a – 5e.

5.20.1 Forensic accountants and Auditors Differ in terms of Knowledge Requirement

In this subsection, the Mann-Whitney U test is employed to test for differences between forensic accountants and auditors on a continuous measure. Table 5.22 highlights the result of the hypotheses. Specifically, this subsection deals with hypothesis 5a which states: "Forensic accountants have significant higher levels of the knowledge requirement than auditors". Since there is a statistically significant difference between forensic accountants and auditors, it is necessary to describe the direction of the difference, which incorporates the median values for each group.

Table 5.22
Mann-Whitney U Test for differences between Forensic Accountants and Auditors

Hypo-Thesis No.	Latent Variable	Role to Forensic Accounting	N	Test Statistics			Means	
				Mann-Whitney U Test	Z-Score	Asymp. Sig. (2-tailed)	Median	Decision
5a	Knowledge	1 FA	181				5.00	
		2 Auditor	147	2784.000	-13.645	.000	4.00	Support
		Total	328				5.00	
5b	Skills	1 FA	181				5.00	
		2 Auditor	147				5.00	Support
		Total	328	11436.000	-3.143	.002	5.00	
5c	Mindset	1 FA	181				5.00	
		2 Auditor	147				3.57	Support
		Total	328	28.000	-15.903	.000	4.43	
5d	Fraud Related Problem Representation	1 FA	181				5.00	
		2 Auditor	147				4.17	Support
		Total	328	1440.500	-14.264	.000	4.50	
5e	Task Performance Fraud Risk Assessment	1 FA	181				5.00	
		2 Auditor	147				3.75	Support
		Total	328	509.000	-15.585	.000	4.50	

Source: The Researcher

The result of the Mann-Whitney U Test revealed a significant difference in the levels of knowledge requirement of forensic accountants (Md = 5, n = 181) and auditors (Md = 4, n = 147), U = 2784.000, z = -13.645, p = .000, r = .8.

The effect size statistic (r) is calculated by using the z value reported in the output and depicted in Table 5.22.

r = z / square root of N, where N = total number of cases.

In the Table 5.22, z = -13.645 and N = 328; therefore the r value is 0.8. This would be considered a large effect size using Cohen (1988) criteria of 0.1 = small effect, 0.3 = medium effect, and 0.5 = large effect.

Most importantly, the result of the statistical significant of forensic accountants possessing higher levels of the knowledge requirement than auditors was also confirmed and supported through a hypothesis test summary of independent samples from the non-parametric tests option in the Analyse menu. The result is shown in Figure 5.13.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of KR_meanfinal is the same across categories of Role to Forensic Accounting.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure 5.13
Hypothesis Test Summary of Forensic accountants and Auditors Differences in terms of Knowledge Requirement

5.20.2 Forensic accountants and Auditors Differ in terms of Skills Requirement

In this subsection, the Mann-Whitney U test is employed to test for differences between forensic accountants and auditors on a continuous measure. Table 5.22 highlights the result of the hypotheses. Specifically, this subsection deals with hypothesis 5b which states: "Forensic accountants have significant higher levels of skills requirement than auditors". Since there is a statistically significant difference between forensic accountants and auditors, it is necessary to describe the direction of the difference, which incorporates the median values for each group.

The result of the Mann-Whitney U Test revealed a significant difference in the skills

levels of forensic accountants (Md = 5, n = 181) and auditors (Md = 5, n = 147), U =

11436.000, z = -3.143, p = .002, r = .2.

The effect size statistic (r) is calculated by using the z value reported in the output and

depicted in Table 5.22.

r = z / square root of N, where N = total number of cases.

In the Table 5.22, z = -3.143 and N = 328; therefore the r value is 0.2. This would be

considered a medium effect size using Cohen (1988) criteria of .1 = small effect, .3 =

medium effect, and .5 = large effect. Most importantly, the result of the statistical

significant of forensic accountants possessing higher levels of skills requirement than

auditors was also confirmed through a hypothesis test summary of independent

samples from the nonparametric tests option in the Analyse menu. The result is

represented in Figure 5.14.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of SR_meanfinal is the same across categories of Role to Forensic Accounting.	Independent-Samples Mann-Whitney U Test	.002	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure 5.14
Hypothesis Test Summary of Forensic accountants and Auditors Differences in terms of Skills Requirement

5.20.3 Forensic accountants and Auditors Differ in terms of Mindset Requirement

In this subsection, the Mann-Whitney U test is employed to test for differences between forensic accountants and auditors on a continuous measure. Table 5.22 presents the result of the hypotheses. Specifically, this subsection deals with hypothesis 5c which states: "Forensic accountants have significant higher levels of mindset requirement than auditors". Since there is a statistically significant difference between forensic accountants and auditors as in Table 5.22, it is necessary to describe the direction of the difference, which incorporates the median values for each group.

The result of the Mann-Whitney U Test revealed a significant difference in the mindset levels of forensic accountants (Md = 5, n = 181) and auditors (Md = 3.57, n = 147), U = 28.000, z = -15.903, p = .000, r = .9.

The effect size statistic (r) is calculated by using the z value reported in the output and depicted in Table 5.22.

r = z / square root of N, where N = total number of cases.

In the Table 5.22, z = -15.903 and N = 328; therefore the r value is 0.9. This would be considered a large effect size using Cohen (1988) criteria of .1 = small effect, .3 = medium effect, and .5 = large effect. Most importantly, the result of the statistical significant of forensic accountants possessing higher levels of mindset requirement than auditors was also confirmed through a hypothesis test summary of independent samples from the nonparametric tests option in the Analyse menu. The result is represented in Figure 5.15.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of MR_meanfinal is the same across categories of Role to Forensic Accounting.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure 5.15
Hypothesis Test Summary of Forensic accountants and Auditors Differences in terms of Mindset Requirement

5.20.4 Forensic accountants and Auditors Differ in terms of Fraud Related Problem Representation Requirement

For this study, the Mann-Whitney U test is employed to test for differences between forensic accountants and auditors on a continuous measure. Table 5.22 presents the result of the hypotheses, especially Hypothesis 5d. Specifically, this subsection deals with hypothesis 5d which states: "Forensic accountants have significant higher levels of fraud related problem representation requirement than auditors". Since there is a statistically significant difference between forensic accountants and auditors as in Table 5.22, it is appropriate to describe the direction of the difference, which incorporates the median values for each group.

The result of the Mann-Whitney U Test revealed a significant difference in the fraud related problem representation levels of forensic accountants (Md = 5, n = 181) and auditors (Md = 4.17, n = 147), U = 1440.500, z = -14.264, p = .000, r = .8.
The effect size statistic (r) is calculated by using the z value reported in the output and this is illustrated in Table 5.22.

r = z / square root of N, where N = total number of cases.

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According to the Table 5.22, z = -14.264 and N = 328; therefore the r value is 0.8. This would be considered a large effect size using Cohen (1988) criteria of .1 = small effect, .3 = medium effect, and .5 = large effect. Most importantly, the result of the statistical significant of forensic accountants possessing higher levels of fraud related problem representation requirement than auditors was also confirmed through a hypothesis test summary of independent samples from the nonparametric tests option in the Analyse menu. The result is represented in Figure 5.16.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of FRPR_meanfinal is the same across categories of Role to Forensic Accounting.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure 5.16
Hypothesis Test Summary of Forensic accountants and Auditors Differences in terms of Fraud Related Problem Representation Requirement

5.20.5 Forensic accountants and Auditors Differ in terms of Task Performance Fraud Risk Assessment Requirement

For this study, the Mann-Whitney U test is adopted to test for differences between forensic accountants and auditors on a continuous measure. Table 5.22 presents the result of the hypotheses, especially Hypothesis 5e. Specifically, this subsection deals with hypothesis 5e which reads: "Forensic accountants have significant higher levels of task performance fraud risk assessment requirement than auditors". Since there is a statistically significant difference between forensic accountants and auditors as in Table 5.22, it is appropriate to describe the direction of the difference, which incorporates the median values for each group.

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The result of the Mann-Whitney U Test revealed a significant difference in the task performance fraud risk assessment levels of forensic accountants (Md = 5, n = 181) and auditors (Md = 3.75, n = 147), U = 509.000, z = -15.585, p = .000, r = .9.

The effect size statistic (r) is calculated by using the z value reported in the output and this is illustrated in Table 5.22.

$r = z /$ square root of N, where N = total number of cases.

According to the Table 5.22, z = -15.585 and N = 328; therefore the r value is 0.9. This would be considered a large effect size using Cohen (1988) criteria of .1 = small effect, .3 = medium effect, and .5 = large effect. Most importantly, the result of the statistical significant of forensic accountants possessing higher levels of task performance fraud risk assessment requirement than auditors was also confirmed through a hypothesis test summary of independent samples from the nonparametric tests option in the Analyse menu. The result is represented in Figure 5.17.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of TPFRA_meanfinal is the same across categories of Role to Forensic Accounting.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure 5.17
Hypothesis Test Summary of Forensic accountants and Auditors Differences in terms of Task Performance Fraud Risk Assessment Requirement

Accordingly, Table 5.18 and Figures 5.12 to 5.17 demonstrate the key summary of the findings and confirm the results of the five Hypotheses (Hypotheses 5a – 5e) which states that forensic accountants possess significant higher levels of knowledge, skills, mindset, fraud related problem representation, and task performance fraud risk assessment than auditors. In essence, hypotheses 5a – 5e of this study, having been tested are supported empirically.

Granting the presentation of all the results which include the main effects, the mediating effects and the differences in each group (forensic accountant and auditor), following and the next section of this chapter highlights key summary of the hypotheses testing.

5.21   Summary of Hypotheses Testing

This section of the study presents a summary of the results in relation to tested hypotheses in accordance with research questions in Chapter One. A total of fifteen hypothesised relationships are tested in this research. All the fifteen hypotheses were empirically supported. Table 5.23 summarises the results, and the implications of these results are discussed further in the next chapter.

Table 5.23
Summary of Results of Hypotheses Testing

No	Hypotheses	Result
	Direct effect on task performance fraud risk assessment	
H1a	Knowledge - forensic accountant and auditor (KR) is positively related to task performance fraud risk assessment (TPFRA).	Supported
H1b	Skills - forensic accountant and auditor (SR) is positively related to task performance fraud risk assessment (TPFRA).	Supported
H1c	Mindset - forensic accountant and auditor (MR) is positively related to task performance fraud risk assessment (TPFRA).	Supported
	Direct effect on fraud related problem representation (FRPR)	
H2a	Knowledge - forensic accountant and auditor (KR) is positively related to fraud related problem representation (FRPR).	Supported
H2b	Skills - forensic accountant and auditor (SR) is positively related to fraud related problem representation (FRPR).	Supported
H2c	Mindset - forensic accountant and auditor (MR) is positively related to fraud related problem representation (FRPR).	Supported
	Direct effect from mediating (FRPR) to dependent (TPFRA) variable	
H3a	Fraud related problem representation (FRPR) is positively related to task performance fraud risk assessment (TPFRA).	Supported
	The mediating effect of Fraud Related Problem representation	
H4a	Fraud related problem representation (FRPR) positively mediates the relationship between knowledge (KR) - forensic accountants and auditors and task performance fraud risk assessment (TPFRA).	Supported
H4b	Fraud related problem representation (FRPR) positively mediates the relationship between skills (SR) - forensic accountants and auditors and task performance fraud risk assessment (TPFRA).	Supported
H4c	Fraud related problem representation (FRPR) positively mediates the relationship between mindset (MR) - forensic accountants and auditors and task performance fraud risk assessment (TPFRA).	Supported
	Differences between groups – Forensic accountants and Auditors	
H5a	Forensic accountants have significant higher levels of knowledge (KR) requirement than auditors.	Supported
H5b	Forensic accountants have significant higher levels of skills (SR) requirement than auditors.	Supported
H5c	Forensic accountants have significant higher levels of mindset (MR) requirement than auditors.	Supported
H5d	Forensic accountants have significant higher levels of fraud related problem representation (FRPR) requirement than auditors.	Supported
H5e	Forensic accountants have significant higher levels of task performance fraud risk assessment (TPFRA) requirement than auditors.	Supported

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5.22   Chapter Summary

Specifically, this study carries out data analysis in two rigorous processes. First, this involves preliminary analysis of the data. This process is crucial to the data analysis by ensuring that the data meet the basic characteristics in adopting PLS-SEM for testing research hypotheses. These key data characteristics include sample sizes, distribution, missing values, and scale of measurement (Hair *et al.*, 2012b, Hair *et al.*, 2011; Hair *et al.*, 2010; Henseler *et al.*, 2009).

Second, the two stages of PLS-SEM evaluation criteria such as measurement models and structural models were employed. The type of measurement models used in this study comprises reflective measurement models and the key evaluation criteria include internal consistency reliability (composite reliability and cronbach's alpha), convergent validity (indicator reliability and average variance extracted) and discriminant validity. Similarly, the structural model served the purposes of testing the hypotheses developed and reflected in Chapter Three of this study. The key evaluation criteria consist of coefficients of determination (R^2), size and significance of path coefficients, f^2 effect sizes, q^2 effect sizes, and predictive relevance (Q^2).

Third, the initial hypothesised model was tested and compared with several models using PLS-SEM algorithm and bootstrapping techniques of statistical analysis tools. The first part of hypothesis testing relates to the relationship between the knowledge, skills, and mindset (forensic accountant and auditor) and task performance fraud risk assessment. In addition, the relationship between knowledge, skills, and mindset (forensic accountant and auditor) and fraud related problem representation, and

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finally, the relationship between fraud related problem representation and task performance fraud risk assessment.

The second part of the hypotheses testing involves the mediating influence of fraud related problem representation on knowledge, skills, mindset (forensic accountant and auditor) and task performance fraud risk assessment. The concluding and third part of the hypotheses testing concerns the differences in group – forensic accountants and auditors in terms of their levels of knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment requirements. Both first and second parts of the hypotheses testing were carried out through PLS-SEM bootstrapping technique whilst the third part was tested through Mann-Whitney U Test nonparametric technique.

The next chapter focuses on the results in detail for the purposes of achieving the objectives of this study, discusses the limitation of the study, make conclusions and recommendations for future research and note theoretical and practical implication of the findings.

CHAPTER SIX

DISCUSSIONS

6.1   Introduction

In the preceding chapter, the results of this study were presented. This final chapter discusses the results derived from Chapter Five in the context of the research questions, hypotheses and literature review. It also presents the implications and conclusion from this doctoral research. The chapter is organised into six sections. Following this section, the second section presents an overview of the research. The third section discussed the results in accordance with the literature review and tested hypotheses. The fourth section presents a discussion on the theoretical, methodological and managerial implications of this doctoral research. The fifth section spotlights the limitation of this study and signposts future research directions. Finally, the sixth section discusses conclusion of the study, thus concludes all the six main sections of chapter six of this study.

6.2   An Overview of the Doctoral Research

The concept of task performance fraud risk assessment is carefully chosen as a special area for this study because every ministry, department, and agency of government is not immune to the multiplicity of risks from internal and external sources. Fraud risk assessment comprises a vibrant and iterative course for identifying and assessing risks to the achievement of organisational objectives. Most importantly, there are divergent observations on the ability of the auditors to assess the risk of fraud in organisational settings from the scholars (Allen *et al.*, 2006; Knapp & Knapp, 2001; Nieschwietz *et al.*, 2000; Hackenbrack, 1992), and similarly, from the regulators (FRC, 2014; ACFE,

2009, 2008, 2006, 2004, 2002; PCAOB, 2008; ICAN, 2005; AICPA, 2002; POB, 2000).

Task performance fraud risk assessment is the bedrock of an audit assignment with respect to fraud detection, prevention and responses in the public sector environment. It is an integral part of competence requirements for professionals in the audit of financial statement. The term "Competence" refers to the ability of forensic accountant and auditor to perform work roles to a defined standard with reference to the real working environment (IFAC-IES, 2006).

The literature has shown that fraud by definition involves intentional misconduct that is primarily planned to escape any detection (Wells, 2005; Crumbley, 2005). Management of every organisation should initiate fraud risk assessment framework in anticipation of the behaviour of a potential fraud perpetrator. Due to the impact of fraud in any organisation and in order to design procedures meant to detect fraud that may be difficult for any fraud perpetrator to penetrate requires knowledge, skills and mindset, and involves asking questions such as: (1) how might a fraud perpetrator exploit weaknesses in the system of controls?; (2) how could a perpetrator override or circumvent controls?; and (3) what could a perpetrator do to conceal the fraud?

With these questions in mind, fraud risk assessment mostly consists of three major elements such as the "identification of inherent fraud risk, the assessment of the possibility and significance of inherent fraud risk, and response to reasonably likely and significant inherent and residual fraud risks" (Dzomira, 2014; Owens, 2012; ACFE, 2009).

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Most specifically, this study adapted and integrated the triangle of fraud action theory (Dorminey *et al.*, 2012; Kranacher *et al.*, 2011; Albrecht *et al.*, 2006) with the theory of planned behaviour (Ajzen, 2002; 1991; 1988; 1985). Specifically, the triangle of fraud action theory described the actions an individual must perform to perpetrate fraud, that is, the three components - the act, the concealment, and the conversion; and the theory of planned behaviour that integrated attitude, subjective norms, perceived behavioural control (Ajzen, 1991), and Beck and Ajzen's (1991) moral obligation. To buttress further, Carpenter and Reimers (2005) confirmed in an empirical study that the theory of planned behaviour could assist to shed more lights on unethical and fraudulent financial reporting.

The three specific objectives of the study were: 1) to examine the relationship between Knowledge (KR); Skills (SR), Mindset (MR) of forensic accountants and auditors, and task performance fraud risk assessment (TPFRA), 2) to examine the mediating influence of fraud related problem representation on Knowledge (KR), Skills (SR), Mindset (MR) of forensic accountants and auditors, and task performance fraud risk assessment (TPFRA) and 3) to examine whether forensic accountants have higher levels of knowledge (KR), skills (SR), mindset (MR), fraud related problem representation (FRPR), and task performance fraud risk assessment (TPFRA) requirements than auditors. Consequent upon these objectives, a theoretical model was developed based on four main theories: the theory of reasoned action, the theory of planned behaviour, the fraud triangle theory and the triangle of fraud action theory. Two attributes (knowledge, and skills) and one attitude (mindset) of capability were chosen as the exogenous variables. Fraud related problem representation was posited to mediate the relationship between knowledge, skills and mindset (forensic

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accountant and auditor) and task performance fraud risk assessment. Task performance fraud risk assessment is directly related to the forensic accountants and auditors' knowledge, skills and mindset in the detection, prevention and response to fraud in an audit.

Most specifically, the theoretical model was consequently used as a framework to test fifteen hypotheses formulated in order to answer the research questions of the study:

1. Do knowledge (KR), skills (SR) and mindset (MR) of forensic accountants and auditors relate to task performance fraud risk assessment (TPFRA)?

2. Does fraud related problem representation (FRPR) mediate the relationship between knowledge (KR), skills (SR), and mindset (MR), and task performance fraud risk assessment (TPFRA)?

3. Do forensic accountants have higher levels of knowledge (KR), skills (SR), mindset (MR), fraud related problem representation (FRPR), and task performance fraud risk assessment (TPFRA) than auditors?

6.3   Discussion of Results

This section discusses results of the direct relationships between: 1) knowledge (forensic accountant and auditor) as exogenous variable and task performance fraud risk assessment as the endogenous variable; 2) skills (forensic accountant and auditor) as exogenous variable and task performance fraud risk assessment as an endogenous variable; 3) mindset (forensic accountant and auditor) as exogenous variable and task performance fraud risk assessment as endogenous variable. Following, there is a

discussion on the results of the direct relationships between: 4) knowledge (forensic accountant and auditor) as exogenous variable and fraud related problem representation as endogenous variable; 5) skills (forensic accountant and auditor) as exogenous variable and fraud related problem representation as endogenous variable; 6) mindset (forensic accountant and auditor) as exogenous variable and fraud related problem representation as endogenous variable; and finally 7) fraud related problem representation as mediating variable and task performance fraud risk assessment as endogenous variable. There were seven hypotheses formulated to test the direct effects. These hypotheses and summary of results are presented in Table 6.1.

Table 6.1
Hypotheses and Summary of Results for all the direct relationships

No	Hypotheses	Result
	Direct effect on task performance fraud risk assessment	
H1a	Knowledge - forensic accountant and auditor (KR) is positively related to task performance fraud risk assessment (TPFRA).	Supported
H1b	Skills - forensic accountant and auditor (SR) is positively related to task performance fraud risk assessment (TPFRA).	Supported
H1c	Mindset - forensic accountant and auditor (MR) is positively related to task performance fraud risk assessment (TPFRA).	Supported
	Direct effect on fraud related problem representation (FRPR)	
H2a	Knowledge - forensic accountant and auditor (KR) is positively related to fraud related problem representation (FRPR).	Supported
H2b	Skills - forensic accountant and auditor (SR) is positively related to fraud related problem representation (FRPR).	Supported
H2c	Mindset - forensic accountant and auditor (MR) is positively related to fraud related problem representation (FRPR).	Supported
	Direct effect of mediating (FRPR) on dependent (TPFRA) variable	
H3a	Fraud related problem representation (FRPR) is positively related to task performance fraud risk assessment (TPFRA).	Supported

Source: The Researcher

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6.3.1 Direct effects of Knowledge, Skills and Mindset (forensic accountant and auditor) on Task Performance Fraud Risk Assessment

In this study, task performance fraud risk assessment (TPFRA) refers to the forensic accountant and auditor's ability to assess the risk of fraud to a "defined standard in the real working environment." TPFRA is the bedrock of an audit assignment with respect to fraud detection, prevention and responses in the public sector environment (Wuerges, 2011; Chui, 2010). This symbolises the fact that the procedures to be adopted will depend upon the organisation's conditions, timing and scope of the audit assignment. With respect to knowledge (KR), skills (SR), mindset (MR) and TPFRA of the accounting and auditing organisations, this study found that the knowledge, skills and mindset have significant relationships with task performance fraud risk assessment.

6.3.1.1 Direct effects of Knowledge (forensic accountant and auditor) on Task Performance Fraud Risk Assessment

Knowledge (KR) refers to the forensic accountant and auditor's attribute and ability towards competent performance in the workplace. Thus, knowledge in this study refers to the forensic accountant and the auditor's attribute and proficiency competences necessary and relevant to discharge technical and innovative task, especially with respect to identifying and analysing methods and procedures for fraud prevention, detection and response from the Nigerian public sector environment (Popoola et al., 2013a; Popoola et al., 2013b; Davis, Farrel & Ogilby, 2010; Ramaswamy, 2007; 2005). Hypothesis H1a of this study states that Knowledge - forensic accountant and auditor (KR) is positively related to task performance fraud risk assessment (TPFRA). As expected, the finding provides support for the hypothesis. Importantly and in this context, the current findings significantly agree

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with the previous research (Wuerges, 2011; Davis, Farrel & Ogilby, 2010; Ramaswamy, 2007; 2005) that found a positive relationship. This clearly shows that as forensic accountant and auditor gain more knowledge in relation to fraud detection, prevention and response, the individual level of fraud risk assessment task performance increases. The result in knowledge development would correspondingly increase their proficiency competences; create awareness and understanding of the fraud schemes. KR thereby reduces the fraud malaise and enhances the transparency and accountability in governance.

Specifically, forensic accountant knowledge comprised fundamental forensic knowledge and specialised forensic knowledge (AICPA, 2008). The fundamental forensic knowledge areas are: "professional responsibilities and practice management; laws, courts and dispute resolution; and planning preparation; information gathering and preservation; discovery; and reporting, experts and testimony" (Davis, Farrel & Ogilby, 2010; Durkin & Ueltzen, 2009). Auditor's knowledge areas are: "historical financial information audit at a higher level; financial accounting and reporting at a higher level; and information technology (IFAC-IES, 2006).

Prior literature was in agreement with the Certified in Financial Forensics core focus wheel that confirms fraud prevention, detection and response as one of the specialised forensic knowledge (Davis, Farrel & Ogilby, 2010; Durkin & Ueltzen, 2009). Most specifically, this study focused on this specialised forensic knowledge. Specifically, it also supported the argument of Davis, Farrell and Ogilby (2010) that "being an effective accountant or auditor does not necessarily translate into being an effective forensic accountant or auditor, and being an effective forensic accountant requires the

professional to possess a broad spectrum of skills and knowledge." In the current study, respondents might have demonstrated TPFRA in an attempt to evaluate the knowledge requirement of forensic accountant and auditor in the Nigerian public sector. This finding validates most of the knowledge (forensic accountant and auditor) and task performance fraud risk assessment studies (Wuerges, 2011; Davis, Farrel & Ogilby, 2010; Durkin & Ueltzen, 2009; Ramaswamy, 2007; 2005).

6.3.1.2 Direct effects of Skills (forensic accountant and auditor) on Task Performance Fraud Risk Assessment

Skills (KR) are defined as an attribute that relates to competences in the areas of knowledge and ability as well as those that relates to performance in fraud risk assessment task in the public sector environment (Popoola *et al.*, 2013a). First, the knowledge and ability component refers to whether a forensic accountant or auditor has the background knowledge and thinking skills to be effective. Second, the performance component identifies the ability of a forensic accountant or auditor to make this knowledge and ability into an operational presentation (Hopwood *et al.*, 2008; Rosen, 2006; Singleton *et al.*, 2006; IFAC IES, 2005).

Specifically, Hypothesis H1b states that Skills - forensic accountant and auditor (SR) is positively related to task performance fraud risk assessment (TPFRA). As expected, the finding provides support for the hypothesis. Importantly and in this context, the current findings significantly agree with the previous studies (Wuerges, 2011; Davis, Farrel & Ogilby, 2010; DiGabriele, 2008) that found a positive relationship. This clearly shows that as forensic accountant and auditor gain more skills competences in relation to fraud detection, prevention and response, the individual level of fraud risk assessment task performance increases. These

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competences are deductive analysis, critical thinking, unstructured problem solving, investigative flexibility, analytical proficiency, composure, specific legal knowledge, written communication and oral communication (DiGabriele, 2008). The result in enhanced skills development would correspondingly increase their proficiency competences; create awareness and understanding of the fraud schemes. SR thereby reduces the fraud malaise and enhances the transparency and accountability in governance. Most importantly, the respondents of this study in Nigeria confirmed and reaffirmed the position of previous studies that were conducted in a developed nation, United States of America (Wuerges, 2011; Davis, Farrel & Ogilby, 2010; DiGabriele, 2008).

6.3.1.3 Direct effects of Mindset (forensic accountant and auditor) on Task Performance Fraud Risk Assessment

Mindset (MR) refers to the forensic accountant and auditor's attitude towards competent performance in the workplace. Mindset is the positive mental attitude of a forensic accountant and auditor to prevent, detect and response to fraud (Popoola *et al.*, 2013b; Wuerges, 2011; Chui, 2010; Singleton & Singleton, 2007). In this study, mindset is defined as a positive mental attitude which influences individual's cognitive behaviour towards task performance fraud risk assessment. Most importantly, Hypothesis H1c of this study states that Mindset - forensic accountant and auditor (MR) is positively related to task performance fraud risk assessment (TPFRA). As expected, the finding provides support for the hypothesis. Importantly and in this context, the current findings significantly agree with the previous research (Wuerges, 2011; Chui, 2010; Frank, 2010; Boritz *et al.*, 2008; Singleton *et al.*, 2006) that found a positive relationship. This clearly shows that as forensic accountant and auditor's mental attitude and state of mind held as core assumptions forming the

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principal motivations for participation improves in relation to fraud detection, prevention and response, the individual level of fraud risk assessment task performance increases. The result in attitudes and orientations improvement of forensic accountant and auditor would correspondingly increase their proficiency competences; create awareness and understanding of the fraud schemes. MR thereby reduces the fraud malaise and enhances the transparency and accountability in governance. Most importantly, the respondents of this study from the offices of the Accountant General of the federation and the Auditor General for the federation in Nigeria confirmed and reaffirmed the position of previous studies that were conducted in developed nations (Wuerges, 2011; Chui, 2010; Frank, 2010; Brandstatter & Frank, 2002; Gollwitzer, 1990).

6.3.1.4 Integrating the Theories of Planned Behaviour and Triangle of Fraud Action on Knowledge, Skills and Mindset (forensic accountant and auditor) on Task Performance Fraud Risk Assessment

Most importantly, the knowledge, skills and mindset content of forensic accountant and auditor is consistent with the theory of planned behaviour TPB), the fraud triangle (TFT), the theory of fraud diamond (TFD), and the theory of the triangle of fraud action (TFA) (Dorminey *et al.*, 2012; Kranacher *et al.*, 2011; Cohen *et al.*, 2010; Albrecht *et al.*, 2006; Carpenter & Reimers, 2005; Beck & Ajzen, 1991; Ajzen & Fishbein, 1980). The theory of planned behaviour is a parsimonious model that has substantial power to explain disparities of intentions (Cohen *et al.*, 2010; Hess, 2007). TPB deals with the antecedents of attitude, subjective norms and perceived behavioural control (Aizen, 2006). Specifically, perceived behavioural control (PBC), otherwise called perceived control over performance of behaviour (PCPB) in TPB refers to individuals' expectations regarding the degree to which they are capable

of performing a given behaviour and the degree to which they have the pre-requisite resources whether these resources are internal or external (Al-Qeisi, 2009; Ajzen 2002).

In essence, the PCPB refers to forensic accountants and auditors' expectations about the degree to which they are capable of performing fraud risk assessment and the degree to which they hold the pre-requisite resources be it external or internal. The theory of the fraud triangle by Cressey (1953, 1950) refers to "non-shareable business problem, knowledge of the workings of a specific enterprise and the opportunity to violate the position of trust, and the ability to adjust one's self-perception such that violating this trust does not constitute in his or her mind, criminal behaviour." The Statement of auditing standard No. 99 adapted Cressey's (1953) three criteria for criminal violations of trust and gave recognition to the three elements of fraud. These elements are incentive or pressure, opportunity and attitude or rationalisation (AICPA, 2002). Wolfe and Hermanson's (2004) "capability" as additional to the three elements constitutes the fraud diamond.

Similarly, the fraud triangle identifies the conditions under which fraud may occur (Dorminey *et al.*, 2012) and this is very crucial to forensic accountant and auditor in the assessment of fraud risk task performance in the public sector environment. The triangle of fraud action (TFA) deals with the attributes of fraud or white collar crime (i.e. action). Specifically, TFA describes the actions an individual must perform in order to perpetrate fraud (Dorminey *et al.*, 2012). There are three components of TFA. These are the act, the conversion and the concealment (Kranacher *et al.*, 2011; Albrecht *et al.*, 2006). These components are paramount to forensic accountants and

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auditors in the detection, prevention and response to fraud. The incremental value of

TFA represents the documentation of specific actions with evidence as well as control

points where the potential fraud may be prevented, detected or remediated. For

instance, the "act" represents the execution and methodology of fraud; the

concealment represents hiding the fraud act, and the conversion refers to the process

of turning the ill-gotten gains into something usable by the perpetrator in a way that

appears to be legitimate.

Having discussed the findings with respect to the direct relationships found in TPFRA

model, the following section discusses the findings of the direct relationships in the

fraud related problem representation (FRPR) model.

6.3.2 Direct effects of Knowledge, Skills and Mindset (forensic accountant and auditor) on Fraud Related Problem Representation

In this study, fraud related problem representation (FRPR) refers to the forensic

accountant and auditor's mental representation of information towards understanding

a fraud related problem and solving a fraud related problem through a strategy based

on prior or existing knowledge, skills and mindset. So, a problem representation

relates to how a solver mentally processes or represents the information contained

within the problem (Glass & Holyoak, 1986). Prior literature has described FRPR as

"an internal reasoning framework, which embodies an individual's understanding and

analysis about a fraud related problem situation" (Christ, 1993; Chi *et al.*, 1981;

Greeno, 1977). This problem solving model consists of eight process stages, which is

very significant to the forensic accountant and auditor in the understanding of and

solving of fraud detection, prevention and response problems. These are: find the

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problem; find the facts; define the problem; find the ideas; select and evaluate the ideas; plan; sell the idea, and act (Basadur, Basadur & Licina, 2013; Hester *et al.*, 2012; Mumford, Medeiros & Partlow, 2012; Basadur & Basadur, 2011; Reiter-Palmon, Herman & Yammarino, 2008; Basadur, 2004; 1995; Basadur, Runco & VEGAxy, 2000). Specifically, with respect to knowledge (KR), skills (SR), mindset (MR) and FRPR of the accounting and auditing organisations, this study found that the KR, SR and MR have significant relationships with FRPR (Torelli & Kaikati, 2009; Kadous & Sedor, 2004; Armor & Taylor, 2003).

6.3.2.1 Direct effects of Knowledge (forensic accountant and auditor) on Fraud Related Problem Representation

In this study, knowledge (KR) as an integral part of the capability represents the attribute possess by forensic accountants and auditors to demonstrate competence (IFAC IES, 2006). Forensic accountant knowledge as an attribute suggests the application of accounting, laws, quantitative analysis, and information technology and criminology know-how to prevent, detect and respond to fraud in the public sector environment.

Similarly, auditor knowledge as an attribute suggests the designing of audit procedures considered necessary to provide sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement. In essence, knowledge (forensic accountant and auditor) influences the understanding of fraud related problem as well as the interpretation of the problem in any situations. Before a forensic accountant and auditor could proffer solution to the problem, it is necessary to understand or decode the problem. This could only be possible if there is existing information mentally stored and accessed by the problem solver. In the Latin

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words, "nemo dat quod non habet," which literarily translate to "you cannot give what you do not have" alluded to the fact that knowledge (forensic accountant and auditor) is directly and positively related to fraud related problem representation. Hypothesis H2a of this study states that Knowledge (forensic accountant and auditor) is positively related to fraud related problem representation (FRPR). As expected, the finding provides support for the hypothesis.

Importantly and in this context, the current findings significantly agree with the previous research (Wuerges, 2011; Chui, 2010; Davies, Farrell & Ogilby, 2009; Ramaswamy, 2007; 2005) that found a positive relationship. This clearly shows that as forensic accountant and auditor's knowledge competence improves in relation to fraud detection, prevention and response, the level of fraud related problem representation increases. The result in knowledge enhancement of forensic accountant and auditor would correspondingly increase their fraud related problem representation proficiency competences, create awareness and understanding of the fraud schemes. Most importantly, the respondents of this study from the offices of the Accountant General of the federation and the Auditor General for the federation in Nigeria confirmed and reaffirmed the position of previous studies that were conducted in developed countries (Wuerges, 2011; Chui, 2010; Davies, Farrell & Ogilby, 2009; Ramaswamy, 2007; 2005).

6.3.2.2 Direct effects of Skills (forensic accountant and auditor) on Fraud Related Problem Representation

Specifically in this study, skills (SR) as an essential part of the capability represents the attribute possess by forensic accountants and auditors to demonstrate competence in the workplace (IFAC IES, 2006). The underlying purpose of fraud related problem

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representation is to encourage individuals' understanding of the problem and to solve the challenge (Markman & Gentner, 2001; Rouse & Morris, 1986). Most importantly, Owojori and Asaolu (2009) argued that the need for forensic accountants became an issue as a result of the let-down of auditing system in the organisation since the organisation's internal and external audit did not live up to the required standard to figure out definite errors in the management system. Hypothesis H2b of this study states that Skills (forensic accountant and auditor) is positively related to fraud related problem representation (FRPR). As expected, the finding provides support for the hypothesis.

Importantly and in this context, the current findings significantly agree with the previous research (Wuerges, 2011; Davies, Farrell & Ogilby, 2009; Owojori & Asaolu, 2009; DiGabriele, 2008) that found a positive relationship. This clearly shows that as forensic accountant and auditor's skills competence improves in relation to fraud detection, prevention and response, the level of fraud related problem representation increases. The result in skills enhancement of forensic accountant and auditor would correspondingly increase their fraud related problem representation proficiency competences, build knowledge and understanding of the fraud schemes. Most importantly, the respondents of this study from the offices of the Accountant General of the federation and the Auditor General for the federation in Nigeria confirmed and reaffirmed the position of previous studies that were conducted in developed and developing countries (Wuerges, 2011; Davies, Farrell & Ogilby, 2009; Owojori & Asaolu, 2009; DiGabriele, 2008).

6.3.2.3 Direct effects of Mindset (forensic accountant and auditor) on Fraud Related Problem Representation

Most importantly in this study, mindset is defined as a positive mental attitude which influences individual's cognitive behaviour towards a fraud related problem representation. In other words, mindset (MR) as an essential part of the capability represents the attitude hold by forensic accountants and auditors to demonstrate competence in the workplace (IFAC IES, 2006). Similarly, fraud related problem representation empowers individuals to deduce the significance of the job outside the rudimentary specifics which are given before undertaken the assignment (Christ, 1993; Pitz & Sachs, 1984).

Specifically, the attitude of an individual forensic accountant and auditor is reflected on the understanding of fraud related problem and the interpretation given to such a problem. Hypothesis H2c of this study states that Mindset (forensic accountant and auditor) is positively related to fraud related problem representation (FRPR). As expected, the finding offers support for the hypothesis. Importantly and in this context, the current findings significantly agree with the previous research (Wuerges, 2011; Chui, 2010; Frank, 2010; Torelli & Kaikati, 2009; Amor & Taylor, 2003) that found a positive relationship. This clearly shows that as forensic accountant and auditor's mindset competence improves in relation to fraud detection, prevention and response, the level of fraud related problem representation increases. The impact in mindset enhancement of forensic accountant and auditor would correspondingly increase their fraud related problem representation proficiency competences, create knowledge and understanding of the fraud schemes.

Most importantly, the respondents of this study from the offices of the Accountant General of the federation and the Auditor General for the federation in Nigeria confirmed and reemphasised the position of previous studies that were conducted in developed countries (Wuerges, 2011; Chui, 2010; Frank, 2010; Torelli & Kaikati, 2009).

Having discussed the findings with respect to the direct relationships found in FRPR model, the following section discusses the findings of the direct relationship of fraud related problem representation (FRPR) on task performance fraud risk assessment (TPFRA) model.

6.3.3 Direct effect of Fraud Related Problem Representation (FRPR) on Task Performance Fraud Risk Assessment (TPFRA)

In this study, fraud related problem representation (FRPR) refers to how a solver (the forensic accountant and auditor) mentally processes or represents the information contained within the problem (Glass & Holyoak, 1986). In other words, FRPR represents the forensic accountant and auditor's mental representation of information towards understanding a fraud related problem and solving a fraud related problem through a strategy for the purpose of decision making and judgement (i.e. task performance fraud risk assessment (Kadous & Sedor, 2004).

Prior literature has investigated auditors' FRPR and their task performance on the analytical methods through a think-aloud verbal protocol (Bierstaker *et al.*, 1999). Hypothesis H3a of this study states that fraud related problem representation (FRPR) is positively related to task performance fraud risk assessment (TPFRA). As expected, the finding offers support for the hypothesis. Importantly and in this

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context, the current findings significantly agree with the previous research (Chui, 2010; Kadous & Sedor, 2004; Bierstaker *et al.*, 1999) that found a positive relationship. This clearly shows that as a forensic accountant and auditor's fraud related problem representation competence progresses in relation to fraud detection, prevention and response, the level of task performance fraud risk assessment increases. The influence of fraud related problem representation enhancement of forensic accountant and auditor would correspondingly increase their individuals' judgement and decision making, create knowledge and understanding of the fraud schemes. Most importantly, the respondents of this study from the offices of the Accountant General of the federation and the Auditor General for the federation in Nigeria confirmed and reaffirmed the position of previous studies that were conducted in developed countries (Chui, 2010; Kleinman & Palmon, 2007; Kadous & Sedor, 2004; Bierstaker *et al.*, 1999).

Having discussed the direct effects of knowledge, skills and mindset (forensic accountant and auditor) on TPFRA and FRPR, in addition to the direct effect, of FRPR on TPFRA, the next section discusses the mediating effect of the study. In essence, the next part would focus on a detailed examination of the influence of FRPR on the relationship between the three exogenous variables of knowledge, skills and mindset (forensic accountant and auditor) and the endogenous variable of TPFRA.

6.3.4   Mediating influence of Fraud Related Problem Representation (FRPR)

In this part of the study, three hypotheses (H4a, H4b and H4c) were developed to test whether fraud related problem representation defined as the forensic accountant and the auditor mental representation of information towards understanding a fraud related

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problem and solving a fraud related problem through a strategy based on prior or existing knowledge, skills and mindset mediated the relationship between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment. Table 6.2 represents the hypotheses and summary of results for the mediating influence of fraud related problem representation.

Table 6.2

Hypotheses and summary of results for the mediating influence of fraud related problem representation

No	Hypotheses	Result
H4a	Fraud related problem representation (FRPR) positively mediates the relationship between knowledge (KR) - forensic accountants and auditors and task performance fraud risk assessment (TPFRA).	Supported
H4b	Fraud related problem representation (FRPR) positively mediates the relationship between skills (SR) - forensic accountants and auditors and task performance fraud risk assessment (TPFRA).	Supported
H4c	Fraud related problem representation (FRPR) positively mediates the relationship between mindset (MR) - forensic accountants and auditors and task performance fraud risk assessment (TPFRA).	Supported

Source: The Researcher

Most importantly, the results have highlighted that three hypotheses (H4a, H4b and H4c) were found to be significant. The details of the results are discussed in the subsection 6.3.4.1 of the study.

6.3.4.1 Mediating influence of FRPR on KR, SR and MR (forensic accountant and auditor) and TPFRA

Most specifically in this study, three hypotheses (H4a, H4b and H4c) were found to be significant. Particularly, there are significant relationships 1) knowledge (forensic accountant and auditor) and TPFRA; 2) skills (forensic accountant and auditor) and TPFRA; and 3) mindset (forensic accountant and auditor) and TPFRA. In addition, the TPFRA structural model results from PLS-SEM bootstrapping analytical tools

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demonstrated the mediating influence of FRPR on the relationship between knowledge, skills and mindset (forensic accountant and auditor) as hypothesized to be positive. As expected, hypotheses H4a, H4b and H4c were found to be positive and strongly validated.

Most importantly, the results obtained from the mediating effects represent the significant contributions of this study. The questions of "what" and "to what extent" mediation of fraud related problem representation (FRPR) did arise could be answered by theoretical explications and past research. Specifically, important theories such as the theory of planned behaviour (Ajzen, 2002; 1991; 1985), the theory of fraud triangle (AICPA, 2002; Cressey, 1953, 1950) and the theory of the triangle of fraud action (Dorminey *et al.*, 2012; Kranacher *et al.*, 2011; Albrecht *et al.*, 2006) have provided theoretical bases for the new findings. In addition, the previous studies on the mediating effect of fraud related problem representation on mindset and task performance fraud risk assessment (Chui, 2010; Torelli & Kaikati, 2009; Kleinman & Palmon, 2007; Kadous & Sedor, 2004; Taylor, 2003; Gollwitzer, 1996) have provided the foundation for the new findings.

Most specifically, hypothesis H4a and H4b of this study would be answered by theoretical explanations. Similarly, Hypothesis H4a states that fraud related problem representation (FRPR) positively mediates the relationship between knowledge (KR) - forensic accountant and auditor and task performance fraud risk assessment (TPFRA). In addition, Hypothesis H4b states that fraud related problem representation (FRPR) positively mediates the relationship between skills (SR) - forensic accountant and auditor and task performance fraud risk assessment (TPFRA). As expected, the

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findings provide support for these hypotheses. Accordingly, the present mediation results are supported by theory of planned behaviour (Ajzen, 2002; 1991; 1985), the theory of the fraud triangle (AICPA, 2002; Cressey, 1953, 1950) and the theory of the triangle of fraud action (Dorminey *et al.*, 2012; Kranacher *et al.*, 2011; Albrecht *et al.*, 2006).

First, knowledge and skills in this study refer to forensic accountant and the auditor's attribute and proficiency competences necessary and relevant to mentally represents information towards understanding a fraud related problem and solving a fraud related problem through a strategy (i.e. task performance fraud risk assessment) for the purpose of decision making and judgement. Knowledge and skills requirement of forensic accountant and auditor is a pre-requisite to understanding the perceived control over the performance behaviour of individuals (Ajzen, 2002).

TPB is concerned only with the degree to which resources are believed to be present and perceived to facilitate or impede performance of the behaviour of individuals. The perceived control over performance behaviour leads to intention (Cohen, Ding, Lesage, & Stolowy, 2010) and intention to behaviour (Hess, 2007; Ajzen, 2002) which are premised on the elements of fraud (i.e. need or pressure, opportunity, attitude or rationalisation (Dorminey *et al.*, 2012; AICPA, 2002; Cressey, 1953; 1950) and capability (Wolfe & Hermanson, 2004). These factors describe the condition under which fraud could take place, and it behoves the forensic accountant and auditor with the acquired knowledge to identify and analyse methods and procedures for fraud prevention, detection and response. Specifically, the understanding of the

conditions under which fraud may occur represents the first phase in the accounting and auditing system.

The most important for the forensic accountant and auditor is the second phase, which is lesser known. This phase was made prominent through the triangle of fraud action theory (Dorminey *et al.*, 2012; Kranacher *et al.*, 2011; Albrecht *et al.*, 2006) that describes the action a fraud perpetrator must perform in order for fraud to occur. This action of a fraud perpetrator is embodied in the components of fraud (i.e. the act, the concealment and the conversion). It is, therefore, necessary for the forensic accountant and auditor to develop particular measures, controls, or structure their task assignment in such a way to highlight on the act, the concealment and the conversion. The TFA represents a theory model for detecting fraud and obtaining prosecutorial evidence. This only means that the evidence of the act, conversion and concealment could be collected and presented in a court of law. To buttress, Dorminey *et al.* (2012) reasoned that the evidence of concealment especially provides a convincing argument that the act was intentional.

Second, this study has integrated the triangle of fraud action theory (Dorminey *et al.*, 2012; Kranacher *et al.*, 2011; Albrecht *et al.*, 2006) with the theory of planned behaviour (Ajzen, 2002; 1991; 1985) as a model catalyst for fraud detection, prevention and response. This study consequently branded the association "triangle of fraud action theory/theory of planned behaviour applied to fraud (TFA/TPB)" as complementary theories for fraud detection, prevention and response.

This study asserts that knowledge and skills requirements influence forensic accountants and auditors' task performance through the effect of fraud related problem representation. These knowledge and skills requirements also have an indirect effect on decision making performance through their impact on the fraud related problem representation and ultimately; they affect the way forensic accountant and auditor process task related information and subsequently affect the construction of their problem representation.

Third, mindset in this study refers to the forensic accountant and the auditor's attitude and proficiency competences necessary and relevant to mentally represents information towards understanding a fraud related problem and solving a fraud related problem through a strategy (i.e. task performance fraud risk assessment) for the purpose of decision making and judgement. Hypothesis H4c of this study states that fraud related problem representation (FRPR) positively mediates the relationship between mindset (MR) - forensic accountant and auditor and task performance fraud risk assessment (TPFRA). As expected, the findings provide support for this hypothesis.

Most importantly, the previous studies have provided empirical evidence to support the assertion that mindset impacts the development of individuals', that is, forensic accountants and auditors, problem representation (Chui, 2010; Torelli & Kaikati, 2009; Kadous & Sedor, 2004; Taylor, 2003), which ultimately influence their decision making performances (Chui, 2010; Kleinman & Palmon, 2007; Gollwitzer, 1996). This study asserts that the mindset influences forensic accountants and auditors' task performance through the effect of problem representation. It also has an indirect

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effect on decision making performance through its impact on the fraud related problem representation and lastly, it influences the way forensic accountant and auditor process task related information and subsequently affects the construction of their problem representation.

6.3.5 Differences between groups: Forensic Accountant and Auditor

In this section of the study, five hypotheses (H5a, H5b, H5c, H5d and H5e) were developed to test the hypotheses developed with respect to differences between the two groups (i.e. forensic accountant and auditor) in the area of fraud detection, prevention and response. Table 6.3 represents the hypotheses and summary of results for the differences between groups – forensic accountant and auditor in the office of the Accountant General of the federation and Auditor General for the federation in Nigeria. Most specifically, the results have highlighted that the five hypotheses (H5a, H5b, H5c, H5d and H5e) were found to be significant. The details of the results are discussed in the next subsection of the study.

Table 6.3
Hypotheses and summary of results for the Differences between groups (Forensic accountant and auditor)

No	Hypotheses	Result
H5a	Forensic accountants have significant higher levels of knowledge (KR) requirement than auditors.	Supported
H5b	Forensic accountants have significant higher levels of skills (SR) requirement than auditors.	Supported
H5c	Forensic accountants have significant higher levels of mindset (MR) requirement than auditors.	Supported
H5d	Forensic accountants have significant higher levels of fraud related problem representation (FRPR) requirement than auditors.	Supported
H5e	Forensic accountants have significant higher levels of task performance fraud risk assessment (TPFRA) requirement than auditors.	Supported

Source: The Researcher

6.3.5.1 Differences between groups: Forensic Accountant and Auditor Knowledge Requirement in the area of fraud prevention, detection and response

In this subsection of the study, forensic accountant and auditor knowledge requirement is the focus of the hypothesis H5a. According to Durkin and Ueltzen (2009), the fundamental forensic accountant knowledge comprises "professional responsibilities and practice management, laws, courts and dispute resolution, planning and preparation, information gathering and preservation, discovery, reporting, experts and testimony." Davis, Farrell and Ogilby (2010) also agreed on this attribute of competences for the forensic accountant in workplace. On the other hand, auditor's knowledge consists of historical financial information audit at a higher level, financial accounting and reporting at a higher level and information technology (IFAC IES, 2006).

The hypothesis H5a states that forensic accountants have significant higher levels of knowledge (KR) requirement than auditors. As expected, the finding provides support for the hypothesis. Importantly and in this context, the current findings significantly agree with the previous research (Wuerges, 2011; Davis, Farrel & Ogilby, 2010; Ramaswamy, 2007; 2005) that found a positive relationship. This clearly shows that forensic accountants have significant higher levels of knowledge (KR) requirement than auditors in the area of fraud detection, prevention and response. In the current study, respondents might have demonstrated the fact that the forensic accountants and auditors differ in terms of their levels of the knowledge requirement in the Nigerian public sector. This finding validates most of the knowledge requirement (forensic accountant and auditor) studies (Wuerges, 2011; Davis, Farrel & Ogilby, 2010; Durkin & Ueltzen, 2009; Ramaswamy, 2007; 2005).

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6.3.5.2 Differences between groups: Forensic Accountant and Auditor Skills Requirement in the area of fraud prevention, detection and response

In this subsection of the study, forensic accountant and auditor skills requirement are the focus of the hypothesis H5b. Skills are defined as the attribute that relates to competences in the areas of knowledge and ability, and performance (IFAC IES, 2005). The skills requirement of the forensic accountant represents exclusive skills purposely developed to gather evidence in respect of fraud detection, prevention and response (FRC, 2014; ACFE, 2010, 2008, 2006; DiGabriele, 2008; Hopwood *et al.*, 2008; Singleton *et al.*, 2006; ICAN 2005; AICPA, 2002). In contrast, auditor's skills are meant to provide reasonable assurance on the reported financial statements taken as a whole are stated fairly, in all material respects and, in accordance with standards and local statutes and, therefore, free from material misstatement due to fraud or error (Ekeigwe, 2011; Owojori & Asaolu, 2009; Grippo & Ibek, 2003; Davia, 2000).

The hypothesis H5b states that forensic accountants have significant higher levels of skills (SR) requirement than auditors. As expected, the finding provides support for the hypothesis. Importantly and in this context, the current findings significantly agree with the previous research (Wuerges, 2011; Davis, Farrel & Ogilby, 2010; Owojori & Asaolu, 2009; DiGabriele, 2008; Ramaswamy, 2005; Messmer, 2004; Grippo & Ibek, 2003) that found forensic accountants to have higher levels of skills requirement than auditors. This clearly shows that forensic accountants have significant higher levels of skills (SR) requirement than auditors in the areas of fraud detection, prevention and response. In the current study, respondents might have demonstrated the fact that the forensic accountants and auditors differ in terms of their levels of skills requirement in the Nigerian public sector. This finding validates most of the skills requirement (forensic accountant and auditor) research (Wuerges, 2011;

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Davis, Farrel & Ogilby, 2010; Owojori & Asaolu, 2009; DiGabriele, 2008; Ramaswamy, 2005; Messmer, 2004; Grippo & Ibek, 2003).

6.3.5.3 Differences between groups: Forensic Accountant and Auditor Mindset Requirement in the area of fraud prevention, detection and response

In this subsection of the study, forensic accountant and auditor mindset requirement is the focus of the hypothesis H5c. Mindset is the positive mental attitude of a forensic accountant and auditor to prevent, detect and response to fraud in the workplace (Wuerges, 2011; Chui, 2010; Boritz *et al.*, 2008; Singleton & Singleton, 2007). In this study, mindset is defined as a positive mental attitude which influences individual's (forensic accountant and auditor) cognitive behaviour in the workplace.

The hypothesis H5c states that forensic accountants have significant higher levels of mindset (MR) requirement than auditors. As expected, the finding provides support for the hypothesis. Importantly and in this context, the current findings significantly agree with the previous research (Wuerges, 2011; Chui, 2010; Frank, 2010; Boritz *et al.*, 2008; Singleton *et al.*, 2006) that found forensic accountants to have higher levels of mindset requirement than auditors. This clearly shows that forensic accountants have significant higher levels of mindset (MR) requirement than auditors in the areas of fraud detection, prevention and response.

In the current study, respondents in the office of Accountant general of the federation and the Auditor general for the federation have demonstrated the fact that the forensic accountants and auditors differ in terms of their levels of mindset requirement in the Nigerian public sector. This finding validates most of the mindset requirement

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(forensic accountant and auditor) studies (Wuerges, 2011; Chui, 2010; Frank, 2010; Boritz *et al.*, 2008; Singleton *et al.*, 2006).

6.3.5.4 Differences between groups: Forensic Accountant and Auditor Fraud Related Problem Representation Requirement in the area of fraud prevention, detection and response

In this subsection of the study, forensic accountant and auditor fraud related problem representation requirement is the importance of the hypothesis H5d. Fraud related problem representation is described as the internal reasoning framework that embodies an individual's (forensic accountant and auditor) understanding and interpretation about a fraud related problem situation (Christ, 1993; Chi *et al.*, 1981). Simply put, FRPR encourages individual's (forensic accountant and auditor) in the understanding of the problem and in solving of the challenge (Markman & Gentner, 2001).

The hypothesis H5d states that forensic accountants have significant higher levels of fraud related problem representation (FRPR) requirement than auditors. As expected, the finding delivers support for the hypothesis. Importantly and in this context, the current findings significantly agree with the previous research (Basadur, Basadur, & Licina, 2013; Hester *et al.*, 2012; Mumford, Medeiros, & Partlow, 2012; Basadur & Basadur, 2011; Chui, 2010; Reiter-Palmon, Herman, Yammarino, 2008; Basadur, 2004: 1995; Basadur, Runco & VEGAxy, 2000; Christ, 1993; Pitz & Sachs, 1984;) that found forensic accountants to have higher levels of fraud related problem representation requirement than auditors. This clearly shows that forensic accountants have significant higher levels of fraud related problem representation

(FRPR) requirement than auditors in the areas of fraud detection, prevention and response.

In the current study, respondents in the office of Accountant general of the federation and the Auditor general for the federation have demonstrated the fact that the forensic accountants and auditors differ in terms of their levels of FRPR requirement in the Nigerian public sector. This finding validates most of the fraud related problem representation requirement (forensic accountant and auditor) studies (Basadur, Basadur & Licina, 2013; Hester *et al.*, 2012; Mumford, Medeiros & Partlow, 2012; Basadur & Basadur, 2011; Chui, 2010; Reiter-Palmon, Herman & Yammarino, 2008; Basadur, 2004: 1995; Basadur, Runco & VEGAxy, 2000).

6.3.5.5 Differences between groups: Forensic Accountant and Auditor Task Performance Fraud Risk Assessment Requirement in the area of fraud prevention, detection and response

In this subsection of the study, forensic accountant and auditor fraud related problem representation requirement is the importance of the hypothesis H5e. Task performance fraud risk assessment is the bedrock of the audit assignment. It does not only indicates the direction of the audit, but assists forensic accountants and auditors to ascertain the organisation's environment and scope of audit procedures, which are planned to identify the possibility and importance of fraud (Wuerges, 2011; Chui, 2010). The hypothesis H5e states that forensic accountants have significant higher levels of task performance fraud risk assessment (TPFRA) requirement than auditors. As expected, the finding engenders support for the hypothesis.

Importantly and in this context, the current findings significantly agree with the previous research (FRC, 2014; Owens, 2012; Wuerges, 2011; Chui, 2010; IFAC, 2009; PCAOB, 2008; ICAN, 2005; Wilks & Zimbelman, 2004; Knapp & Knapp, 2001; Hackenbrack, 1992) that found forensic accountants to have higher levels of task performance fraud risk assessment requirement than auditors. This clearly shows that forensic accountants have significant higher levels of task performance fraud risk assessment (TPFRA) requirement than auditors in the areas of fraud detection, prevention and response.

In the current study, respondents in the office of Accountant General of the federation and the Auditor General for the federation have shown that the forensic accountants and auditors differ in terms of their levels of TPFRA requirement in the Nigerian public sector. This finding confirms most of the task performance fraud risk assessment requirement (forensic accountant and auditor) studies (FRC, 2014; Owens, 2012; Wuerges, 2011; Chui, 2010; IFAC, 2009; PCAOB, 2008; ICAN, 2005; Wilks & Zimbelman, 2004; Knapp & Knapp, 2001; Hackenbrack, 1992).

Specifically, the forensic accountants and auditors differences in terms of their levels of knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment requirements in the areas of fraud detection, prevention and response have been discussed, and the hypotheses confirmed and validated. The next section discusses the implications of the study.

6.4   Implications of the study

This research offered further understanding on the concept of task performance fraud risk assessment. The findings of the current study have significant implications for theory, methodology and management or practice in the areas of fraud detection, prevention and response, which are presented in this section.

6.4.1   Theoretical Implications

Granting the different constructs articulated in this study, the current findings have contributed to literature and theory development in five major ways, which include:

1) expanding task performance fraud risk assessment literature within the organisational context in a developing country, namely Nigeria; 2) establishing the mediating influence of fraud related problem representation on the relationship between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment; 3) establishing the positive influence of knowledge, skills and mindset (forensic accountant and auditor) on fraud related problem representation; 4) establishing forensic accountant and auditor differences in terms of their levels of knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment requirements; and 5) integrating the theories of planned behaviour and triangle of fraud action as model catalyst for fraud prevention, detection and response as well as integrating the fraud diamond and triangle of fraud action in the context of perpetrator(s) and crime.

6.4.1.1 Expanding Task Performance Fraud Risk Assessment literature

First and most importantly, the concept of task performance fraud risk assessment literature is expanded through this study, which examined TPFRA within the

organizational context in a non-western country like Nigeria. Similarly, research regarding knowledge, skills and mindset (forensic accountant and auditor) on task performance fraud risk assessment is emerging in the literature, it should not be assumed that findings derived using the developed countries data could be generalised to the developing country, especially Nigeria. Chui (2010) made the first attempt to examine the effects of fraud specialist and audit mindsets on fraud risk assessments and the development of fraud related problem representations in the United States of America. Inspired by his work, the study tested the concept of task performance fraud risk assessment in Nigeria and confirmed for the first time, a positive directional relationship between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment.

The context of the current study, Nigeria, is a multi-ethnic, multi linguistic, multi religious and the most populated in the African continent, thus literature regarding the knowledge, skills and mindset (forensic accountant and auditor) and fraud risk assessment task performance in relation to fraud detection, prevention and response are bound to be deepened. Differences in demographics traits of respondents together with collectivist and high power distance cultures that differ from the western samples may contribute to this unique finding. Most especially, the current study differs from Chui's (2010) work in all other features such as research design, analysis approach, knowledge and skills variables as well as the underpinning theory. Added together, it is not too much to assert that this study provided a new avenue of research surrounding task performance fraud risk assessment of forensic accountant and auditor, which extends beyond the reported scope of western countries.

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The current study is a good contribution to the literature since it revealed relationship between forensic accountant and auditor knowledge, skills and mindset and task performance fraud risk assessment in a Nigeria's context, which before now related literature has not reported. Consequently, this study has provided further demographic basis for comparative study and further validation that relates to a significant relationship between knowledge, skills and mindset (forensic accountant and auditor) and fraud risk assessment task performance in the areas of fraud detection, prevention and response.

6.4.1.2 Establishing the mediating influence of Fraud Related Problem Representation on the relationship between KR, SR, MR and TPFRA

Second, regarding the meditational relationship between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment, literature showed that previous studies have demonstrated the significant meditational relationships between mindset (forensic accountant and auditor) and task performance fraud risk assessment (Wuerges, 2011; Chui, 2010). In addition, this current study has demonstrated the significant meditational relationships between knowledge and skills (forensic accountant and auditor) and task performance fraud risk assessment.

Specifically, the current meditational study has theoretically given a new knowledge about mediation by demonstrating that knowledge, skills and mindset (forensic accountant and auditor) have positive influences on task performance fraud risk assessment through fraud related problem representation. In essence, this study has pushed the frontier of knowledge forward by providing empirical evidence about the potential of fraud related problem representation to mediate significantly between

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knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment. Therefore, the present study has found more theoretical implications than mere validating the positive influence of knowledge, skills and mindset on task performance fraud risk assessment of forensic accountant and auditor as demonstrated in the previous findings (Wuerges, 2011; Chui, 2010).

Particularly, the mediating role of fraud related problem representation on the relationship between knowledge, skills and mindset and task performance fraud risk assessment of forensic accountant and auditor has given a new perception regarding attribute (knowledge and skills) and attitude (mindset) to positively influence forensic accountant and auditor fraud risk assessment decision making or judgement. Importantly, the present study demonstrates that through the development of fraud related problem representation, attribute and attitude (knowledge, skills and mindset) can influence the task performance of forensic accountant and auditor fraud risk assessment for efficient, effective and economy functioning of their organisations (FRC, 2014; Basadur, Basadur & Licina, 2013; Owens, 2012; Wuerges, 2011; Chui, 2010; Davis, Farrel & Ogilby, 2010; DiGabriele, 2008, Ramaswamy, 2007, 2005; Sutton, 2003; Glass & Holyoak, 1986; Pitz & Sachs, 1984).

Furthermore, the present study has uniquely given a mediating mechanism for better understanding of relationship dynamics existing between knowledge, skills and mindset and task performance fraud risk assessment. With respect to the proven meditational potential of fraud related problem representation, this study has strengthened the arguments made by Chui (2010) and Wuerges (2011) regarding the possible significant part of fraud related problem representation as a mediator.

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6.4.1.3 Establishing the positive influence of KR, SR, MR on FRPR

Third, the current study represents an additional contribution to theory and literature of knowledge, skills and mindset (forensic accountant and auditor) and fraud related problem representation. Most especially, the study has, for the first time, found a positive directional relationship between knowledge, skills and mindset (forensic accountant and auditor) and fraud related problem representation.

6.4.1.4 Establishing forensic accountant and auditor differences in terms of their levels of knowledge, skills and mindset requirements

Fourth, this research proposed differences in the groups between forensic accountant and auditor with respect to knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment. The findings revealed that the forensic accountants have higher levels of knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment than auditors in the areas of fraud detection, prevention and response. To date, to the best knowledge of the researcher, this is the first study empirically to describe the direction of the difference through the median values (Mann-Whitney U Test) and the effect size using Cohen (1988) criteria. Prior literature on fraud detection, prevention and response claimed that the forensic accountant possesses higher levels of knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment than auditors (FRC, 2014; Basadur, Basadur & Licina, 2013; Owens, 2012; Wuerges, 2011; Chui, 2010; Frank, 2010; Davis, Farrel & Ogilby, 2010; DiGabriele, 2008; ACFE 2010, 2008, 2006; Asare & Wright, 2004; ICAN, 2005; AICPA, 2002).

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6.4.1.5 Integrating the theories of Planned Behaviour and Fraud Triangle Action

Fifth, the integration of the theories of planned behaviour and fraud triangle action through the concept of task performance fraud risk assessment has been another milestone contribution of this current study to the literature. The importance of the triangle of fraud action theory is that it describes the action an individual must perform to perpetuate fraud (i.e. the act, the concealment and the conversion). The incremental value of the TFA is that it represents the documentation of specific actions with evidence as well as control points where the potential fraud may be prevented, detected or remediated (Dorminey *et al.*, 2012; Albrecht *et al.*, 2006). This allows the forensic accountant and the auditor to develop certain measures, controls or structure their audits in such a way to signpost the act, the concealment and the conversion.

On the other hand, the theory of planned behaviour, otherwise known as the perceived control over performance behaviour (Ajzen, 2002) describes the conditions under which fraud can occur. These are need/pressure, opportunity, attitude/rationalisation and capability (Wolfe & Hermanson, 2004; AICPA, 2002; Cressey, 1953; 1950). This theory, TPB, assists the forensic accountant and auditor in designing the procedures to assess the risk of fraud where internal control is weak in an organisation.

Most specifically, to date and to the best knowledge of the researcher, there is no study that examines the capability and competence of forensic accountants and auditors on fraud prevention, detection and response in the Nigerian public sector. In essence, this current study is the first to have examined the mediating influence of fraud related problem representation on task performance fraud risk assessment and

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knowledge, skills and mindset (forensic accountant and auditor) in the Nigerian public sector.

6.4.2 Methodological Implications

Granting the fact those previous research on knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment have employed the use of statistical analysis tools such as SPSS and CB-SEM (Amos) to produce results (Wuerges, 2011; Chui, 2010; Davis, Farrel & Ogilby, 2010; DiGabriele, 2008), this study explored a relatively robust statistical analysis tool, PLS-SEM. This unique tool is used to explain the measurement and structural relationship of this study five constructs. The PLS-SEM belongs to the class of multivariate techniques that combine features of factor analysis and regression, thus enabling the researcher to simultaneously examine the relationships among measured variables and latent variables as well as between latent variables – a silver bullet in many research situations (Hair, Sarstedt, & Ringle, 2011). Therefore, the present study's employment of this relatively unique tool of analysis has some significant methodological implications.

6.4.2.1 The Application of PLS-SEM in this Study

First, by applying PLS-SEM, this study was able to demonstrate the joint influence of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in the Nigerian public sector. Specifically, PLS-SEM considers the measurement error variances, hence the relationships between the factors in the hypothesized model are more accurate (Bollen, 1989). PLS-SEM does not only offer a way to test relationships in the

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hypothesized model simultaneously, but it controls for the measurement error in the scales that measure the theoretical constructs in the model. In addition, this research provided supplementary analysis using a new approach by Sobel (2013) and Preacher and Hayes (2008) bootstrap technique in testing the mediating effect. This effort afforded a new frontier in analysing approach to test mediating effect using PLS-SEM.

6.4.2.2 The use of PLS-SEM Bootstrapping Statistical Analysis Tool

Second, the use of PLS-SEM Bootstrapping statistical analysis tool provides a prospect for testing the robustness and predictive power of the tool in exploratory relationships of knowledge, skills and mindset (forensic accountant and auditor), and task performance fraud risk assessment. Specifically, by the use of knowledge, skills and mindset and task performance fraud risk assessment model in this study, the PLS-SEM provides a new framework for comparisons of results obtained from previous studies that used different tools of analysis such as CB-SEM.

Most importantly, another methodological contribution in this study relates to the validation of Chui (2010) and McLeod (2009) Mindset measurement scale adopted in this study. Therefore, the current study represents a robust methodological contribution to the mediating influence of fraud related problem representation on knowledge, skills and mindset and task performance fraud risk assessment literature. The adopted scale was subjected to reliability and validity tests. Results of convergent and discriminant validity showed acceptable results that surpassed the minimum thresholds.

6.4.2.3 The use of PLS-SEM Algorithm Statistical Analysis Tool

Third, PLS-SEM Algorithm tool was used to refine and fit the data for this study, thereby offering new information about the effects of PLS-SEM Algorithm on knowledge, skills and mindset (forensic accountant and auditor), fraud related problem representation and task performance fraud risk assessment constructs. After the PLS-SEM Algorithm, the multi-dimensionality of knowledge (Davies, Farrel & Ogilby, 2009; Ramaswamy, 2007; 2005), skills (Davies, Farrel & Ogilby, 2009; Di-Gabriele, 2008), mindset (Wuerges, 2011; Chui, 2010; McLeod, 2009) and task performance fraud risk assessment (Chui, 2010; Owens, 2012) were retained. Similarly, the uni-dimensionality of fraud related problem representation construct (Basadur, Basadur, & Livina, 2013; Basadur, 2004: 1995) was also retained after the SEM-PLS Algorithm.

Most importantly, the PLS-SEM Algorithm and validation processes for the five measurements of this study represent methodological contributions to the literature of knowledge, skills and mindset (forensic accountant and auditor), fraud related problem representation and task performance fraud risk assessment by providing additional validation about the constructs in a new methodological perspective.

6.4.3 Managerial Implications

The findings in this study have contributed to management practice in three major ways. These include: 1) revealing the value of knowledge, skills and mindset (forensic accountant and auditor) as a significant capability requirement in the workplace; 2) revealing the importance of fraud related problem representation as a significant mental state, and finally 3) revealing the importance of fraud related

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problem representation as a significant mediating variable on knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment.

6.4.3.1 Revealing the value of KR, SR, MR as significant capability requirement in the workplace

First, the current study has provided empirical evidence to support the argument that knowledge (KR), skills (SR) and mindset (MR) requirements are positively related to fraud related problem representation and task performance fraud risk assessment. Therefore, forensic accountants and auditors in the public sector accounting and auditing organisations can take a cue and improve their capability requirements to enhance competences (task performance fraud risk assessment) in the areas of fraud detection, prevention and response.

Specifically, it is necessary for management of any entities to understand the influencing power of knowledge, skills and mindset for forensic accountants and auditors positive results such as task performance fraud risk assessment and mental state such as fraud related problem representation. The management or people in authority should encourage, promote and imbibe the culture of forensic accounting knowledge, skills and mindset requirements in their organisations that may reduce the effect of fraud and corrupt practices in the public sector. In addition, the management can prioritize knowledge and skills (attribute) and mindset (attitude) of forensic accountant and auditor through their human resources policies and practices.

Most importantly, increased awareness of fraud schemes as possible outcome to low development and the connection between capabilities of knowledge, skills and

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mindset (forensic accountant and auditor) and positive work outcomes (i.e. task performance fraud risk assessment) can help to motivate capability and competences requirements among forensic accountants and auditors in the Nigerian public sector. It is well established that if you teach a woman to fish, she will fish the whole village.

This study emphasises that the organisation should encourage training and retraining policies and practices for forensic accountants and auditors in fraud detection, prevention and response so as to reduce the impact of fraud and imbibe the good corporate governance practice in the Nigerian public sector. Nigeria cannot be left out in the fight against fraud as government business grow in size and complexity, uncovering fraud (Ramaswamy, 2005) requires forensic accountant to become proficient in an ever increasing number of professional knowledge, skills, mindset and competences (i.e. task performance fraud risk assessment).

6.4.3.2 Revealing the importance of FRPR as a significant mental state

Second, the current study has revealed the importance of fraud related problem representation (FRPR) as a significant mental state that influences forensic accountants and auditors in task performance fraud risk assessment. Most specifically, these findings present yet another important clue for forensic accountants and auditors to utilize by influencing and enhancing task performance fraud risk assessment in the workplace. The management should appreciate the influence of fraud related problem representation as a model catalyst to understanding a fraud related problem and solving the challenge by enhancing its development, maintenance and sustainability among the forensic accountants and auditors.

6.4.3.3 Revealing the importance of FRPR as a significant mediating variable on KR, SR, MR and TPFRA

Third, the current study has statistically revealed the value of fraud related problem representation (FRPR) as a significant mediating factor for transferring the influence of knowledge (KR), skills (SR) and mindset (MR) - forensic accountant and auditor to task performance fraud risk assessment (TPFRA). Management attitudes and actions should be sensitive to create a sense of belonging to forensic accountants and auditors through mandatory continuous professional education with the objective of human capital development in the areas of fraud detection, prevention and response.

This study asserts that there is a link between lack of knowledge, skills and mindset and the different fraud cases, which are being thrown out of courts due to inadequate prosecutorial evidences in Nigeria. If the fraud and corrupt practices are to be tackled headlong, management in any organisation must be ready to competently hire forensic and information technology experts in the area of fraud detection, prevention and response (FRC, 2014; ACFE, 2010; IFAC IES 2006; 2005; ICAN, 2005; AICPA, 2002).

Most importantly, developing and improving these capability (knowledge, skills and mindset) and competences (task performance fraud risk assessment and fraud related problem representation) requirements could be achieved through the theories of perceived control over performance behaviour (TPB) and triangle of fraud action (TFA) which are complementary models for detecting fraud and obtaining prosecutorial evidence and the importance of attitude factors to symptoms of fraud.

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Furthermore, capacity building through Continued Professional Education (CPE) training and retraining of forensic accountants and auditors is a sine qua non towards improving these capabilities in order to achieve tangible competences in the workplace.

6.5   Limitations of the Research and Signposts for Future Research

6.5.1   Limitations of the Research

In this study, there are limitations despite its revealed insightful findings. First, this research is about fraud and corrupt practices in a developing country, Nigeria with over 165 million people. Examining the mediating influence of fraud related problem representation on knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment in the public sector could be considered as sensitive and thus raise the issue of such bias. Forensic accountant and auditor may feel more comfortable reporting their involvement in fraud investigation in the workplace, rather than exhibit their own lack of capability and competences requirements to detect, prevent and remediate fraud in the accounting and auditing system.

The result of this differential willingness to report may have somehow distorted the findings of this research. Notwithstanding, the research, introduced several preventative measures such as guaranteed anonymity and confidentiality, elimination of the item ambiguity, enhancement of informed and voluntary consent of respondents, and the use of reversed negative items to minimise bias (Podsakoff *et al.*, 2003). This design and some others ensure that the common method bias is not completely responsible for the current findings. In essence, methodological rating

power of the present study should not be in doubt as all levels of forensic accountant and auditor comprised the respondents.

Second, this study used self-reporting process to collect data from forensic accountants and auditors in the public sector accounting organisations in Nigeria, which produces the potential for common method variance (CMV). This process is consistent with previous fraud detection, prevention and response research (Wuerges, 2011; Chui, 2010; Okunbor & Obaretin, 2010; Kasum, 2010; Davis, Farrel & Ogilby, 2010; Owojori & Asaolu, 2009; DiGabrielle, 2008), some researchers are sceptical of the reliability of the measure because of possible rater's bias.

Notwithstanding the fear of bias, individual rating remains the most effective and reliable mechanism to evaluate forensic accountant and auditor task performance fraud risk assessment. Zikmund (2003) argued that the use of professional real people in social science research where generalization of results to diverse conditions is a pre-requisite and for external validity, individual forensic accountant and auditor rating appears to be the most significant.

Third, this study adopted cross-sectional design in which data are collected at one point of time (i.e. within August to November 2013), there is no time to wait for different follow-up stages or interventions before data analysis. Notwithstanding the usefulness and popularity of this design, there are challenges. One of which is related to change over time of studied variables (i.e. knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment). A change in government policies towards human capital development and proper recruitment,

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selection and placement of key personnel to accounting and auditing organisations may likely have an impact on the research variables.

This study is not longitudinal as it has a specified required period of completion. Future research may adopt longitudinal design (Schwab, 2005) to explore the interactions between knowledge, skills, mindset (forensic accountant and auditor), fraud related problem representation and task performance fraud risk assessment for causality to reduce the incidence of common method bias. Most importantly, future research may adopt the use of experimental design or qualitative methodology to assess causality of the current study constructs.

Fourth, the variance explained in this current study of 82.2% and the predictive R-square of 83.5% and 85.4% for fraud related problem representation, and task performance fraud risk assessment respectively are considered large, significant and acceptable in adherence to Cohen (1988) criteria for small, medium and large effect sizes. Notwithstanding the theoretical demonstration of the predictive validity of knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment model of this study, there is room for future research. Specifically, future research can be conducted to examine other variables, which may increase the variance explained by the present model.

6.5.2 Signposts for Future Research

First, this study suggests the consideration of future study to be based on mediating and moderating capability and competences requirements of forensic accountants and auditors in the areas of fraud detection, prevention and response. Specifically, future

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research can examine the potential use of professional ethics and professional values forming an integral part of the capability to demonstrate competence (i.e. task performance fraud risk assessment).

Second, professional ethics can be adopted for further research as a mediator on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in any area, be it public or private. The importance of professional ethics to fraud detection, prevention and response cannot be over-emphasised among the forensic accountants and auditors in the Nigerian accounting and auditing systems.

Third and most importantly, values indicate what constitutes normative behaviours, as well as acceptable roles for the individual within particular social contexts (Bambale, 2013; Triandis, 1995). According to Nahum-Shani & Somech (2011), individual values have demonstrated large influence on individual's evaluation of other people's behaviours. In essence, values (forensic accountant and auditor) can serve as moderator in a model involving knowledge, skills, mindset (forensic accountant and auditor), fraud related problem representation and task performance fraud risk assessment. Specifically, values can be tested as a moderator on the relationship between knowledge, skills, and mindset (forensic accountant and auditor) and fraud related problem representation, as well as the relationship between knowledge, skills, and mindset (forensic accountant and auditor) and task performance fraud risk assessment.

Fourth, differences between forensic accountant and auditor's values and ethics as independent variables on their relationships with fraud related problem representation and task performance fraud risk assessment can also be considered on merit for future research. An investigation in a wholestic manner using the current study model exogenous variables (i.e. knowledge, skills and mindset), in addition to ethics and values as new exogenous variables with fraud related problem representation and task performance fraud risk assessment will be interesting as future research in the areas of fraud detection, prevention and response.

Fifth and finally; realising this could be the first empirical research to analyse the proposed relationships in Nigeria, replication of this research in future using samples from other sectors or race could be a fruitful effort to confirm a robust resolution of the findings. Specifically, future research should try to replicate this study by applying a different scale to measure the underlying constructs. For example, it would be interesting to use another mindset and fraud related problem representation scale for similar respondents in any continents of the world.

6.6   Conclusion

This doctoral research presented a detailed analysis of forensic accounting and fraud: capability and competence requirements in the Nigerian public section, emphasis is placed on the mediating influence of fraud related problem representation and knowledge, skills, mindset (forensic accountant and auditor) and task performance fraud risk assessment in Nigeria.

Although, fraud and task performance fraud risk assessment had been widely researched. Most of the researches are fragmented and piecemeal and not done wholestically. Such studies include among others: characteristics of creativity in relation to auditors' recognition of fraud cues (Herron, 2012); characteristics and skills of forensic accountants (Davis, Farrel & Ogilby, 2010); moderator and mediator analysis (Baron & Kenny, 1986); corporate fraud and managers' behaviour (Cohen, Ding, Lesage & Stolowy, 2010); empirical investigation of the relevant skills of forensic accountants and planning fraud detection (DiGabriele, 2008; Boritz, Kotchetova & Robinson, 2008); financial statement fraud (Hogan, Rezaee, Riley & Velury, 2008); auditors' responsibility for fraud detection: a new wine in old bottles (Wuerges, 2011). Little, with the exception of Chui, (2010) is known about the effect of fraud specialist and auditor mindset on fraud risk assessment and the development of problem representation in the private sector.

This doctoral research examined the relationship between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment; knowledge, skills and mindset (forensic accountant and auditor) and fraud related problem representation; and fraud related problem representation on task performance fraud risk assessment beyond the ordinary scope of western countries. The findings confirmed that fraud related problem representation did influence task performance fraud risk assessment. In addition, the three capability requirement (knowledge, skills and mindset) were found to be associated with task performance fraud risk assessment and fraud related problem representation.

Most importantly, this study responded to recent calls to examine the auditors' inability to detect and prevent financial statement fraud (Chui, 2010; Boritz, Kotchetova & Robinson, 2008; Hogan, Rezaee, Riley & Velury, 2008; Jamal, 2008; Rosen, 2006; Smieliauskas, 2006; Wells, 2005, Knapp, & Knapp, 2001). Specifically, the standing advisory group recommended for future research fraud detection in any organisation with respect to ascertain whether forensic accountants are capable and competent than auditors in detecting fraud (PCAOB, 2004). Other calls for future research are in the areas of the forensic accountant knowledge (Chui, 2010; Rose *et al.*, 2009), forensic accountant characteristics, traits and skills sets (Davis *et al.*, 2010; Sale *et al.*, 1998), creativity (Herron, 2012), components of fraud and prediction of a contingency model (Cohen *et al.*, 2010). The current study pays high attention to their calls, and the effort has made several contributions to the literature on fraud detection, prevention and response, especially on task performance fraud risk assessment in the non-western context.

In general, this study provided, perhaps for the first time, analysis of the relationship between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment by integrating the mediating influence of fraud related problem representation. Furthermore, the differences in groups between forensic accountant and auditor was analysed using IBM SPSS (version 20.0) Mann-Whitney U test (nonparametric test) and rigidly supplemented with a more robust second generation statistical analysis tool of PLS-SEM by Ringle *et al.*, 2005; 2004. Specifically, the results confirmed that task performance fraud risk assessment was associated with knowledge, skills and mindset (forensic accountant and auditor).

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Furthermore, fraud related problem representation was associated with knowledge, skills and mindset (forensic accountant and auditor). Fraud related problem representation was also confirmed to mediate the relationship between knowledge, skills and mindset (forensic accountant and auditor) and task performance fraud risk assessment. In essence, fraud related problem representation could be one possible explanation behind task performance fraud risk assessment challenges of workplace amongst forensic accountant and auditor in Nigeria.

Similarly, the results of the current study also confirmed that forensic accountants have higher levels of knowledge, skills, mindset, fraud related problem representation and task performance fraud risk assessment requirements than auditors in the Nigeria context.

In conclusion, by testing all the hypothesised relationships to a developing country like Nigeria, this research assisted to create a more inclusive global picture of knowledge, skills and mindset (forensic accountant and auditor) on task performance fraud risk assessment and fraud related problem representation. Thus, this study provided a verifiable starting point in the examination of fraud related problem representation on task performance fraud risk assessment and knowledge, skills and mindset (forensic accountant and auditor) in non-western countries.

Despite adding new information to the literature of task performance fraud risk assessment in the specialized area of fraud detection, prevention and response, the findings were predicted to assist public sector accounting and auditing systems in dealing with fraud and corrupt practices effectively and efficiently. Fraud in any form

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or shape is a problem, which is costly and dangerous and could negatively affect the development of any nation (FRC, 2014; Wuerges, 2011; ACFE, 2010; Chui, 2010; PCAOB, 2004, 2002). Therefore, understanding the competency requirement (i.e. task performance fraud risk assessment) of forensic accountants and auditors could be a valuable research field to venture into in the future.

Most importantly, as government activities grow in size and complexity, new and complicated legislation, acquisition and deployment of information technology as a business enabler, globalisation of trade and management override of the internal controls; there would be no end to fraud challenges and demand for forensic accountants.

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