

Auditors' Perception of the Effectiveness of Fraud Detection Techniques in Stock and Warehousing Cycles: Comparison between Ghana, U.S., and New Zealand

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Introduction

The main objective of this study is to explore auditor's perception about the degree of effectiveness of fifth-six widely used and frequently deployed audit techniques within the stock and warehousing cycle to detect fraud in accounting information systems. Auditor's failure to design audits that provide reasonable assurance for fraud detection, detection of material misstatements and material errors, has led to a surge in financial losses for primary stakeholders, increase in lawsuits and financial settlements by audit firms (Kaplan and Williams, 2013). A second objective of this study is to use a qualitative approach to understand the reasons and nuances of auditor perceptions regarding the effectiveness of audit techniques.

Despite the promulgation of several auditing standards and country-specific laws, controversy still surrounds the effectiveness of auditors' fraud systems and practices. This scepticism has been exaggerated by the continuous spectacular incidences of accounting fraud within body corporates, often immediately after an unqualified audit opinion. Tied to this has been the constant debate and contestations, regarding the extent of auditors' responsibility for the detection and reporting of fraud. Quite clearly, and despite the fine prints that precede an audit opinion, there is a significant expectation gap between users of audited reports, on one side, and regulators and audit practitioners, on the other side, regarding the extent of culpability and responsibility that auditors must assume for fraud detection and reporting. The comparison of the results of this study with earlier studies by Owusu-Ansah et al., (2002) and Moyes (1996), which predate SOX, helps to evaluate if the introduction of remarkable regulations such as SOX and PCAOB have had an impact on auditor perceptions and approaches. Specifically, this study seeks to answer the question:

What are auditors' views about the effectiveness of 'conventional' fraud detection techniques in the stock and warehousing cycle, and what impacts such perceptions?

Even in tightly regulated professions such as auditing, understanding perceptions is important because they influence actions, attitudes, and realities. Watts and Zimmerman (1990) have previously highlighted the competing threats to the relevance of the accounting profession, in their attempt to refocus the profession on consumer centricism and stressing that substantively the accounting profession is a communication and information tool. To this end, the relevance of the accounting profession, auditing inclusive, should not be exaggerated beyond these boundaries and hence the professions' continuous relevance relies, to a greater extent, on how its information is decision-useful and faithfully representative. Admittedly, relying on an institutionalized routine, often backed by-laws, to engage the services of accountants, such as auditors, cannot provide a sustainable threshold for long-term continuous relevance and perhaps explains the dwindling interests in the profession as exemplified by the comparatively reducing enrolment of new students.

Beyond the legal requirements of SAS No. 9, auditors in their drive for legitimacy have sought to employ and deploy dynamic and revolutionary strategies, schemes, and practices in their pre-planning risk assessment and well as audit procedures to increase the detection of material misstatements, frauds, and errors (Sookhak, 2015). Part of these procedures involves increasing examination of high-risk areas within a firm's operations. Alleyne et al., (2010) and Owusu-Ansah et al., (2002) are among a long list of authors to highlight that stock and inventory fraud have featured regularly in corporate scandals in Blue Chip and renowned organization, with investigated cases exposing the regularity of auditor dereliction, material errors in stock valuations and wilful and deliberate overstating or understating of stock values to achieve narrow ends. Albrecht et al., (2008) confirm that effective procedures in the auditing of stock are essential because fraud associated with inventory is often costly to the organization with high potential for penalties for auditors. Auditing procedures regarding stocks and inventory should receive more attention within scholarly research than they are currently receiving, because even though they form a large a critical portion of company assets and are often highly valued items (Haribhai-Pitamber and Dhurup, 2014), they are particularly susceptible to fraud. The higher-than- usual susceptibility of stock and inventory to fraud is mainly due to inherent attributes as well as the wide and

complex methods allowable for the procurement, storage, management, use, valuing, and accounting (Chouhan, Soral, and Chandra, 2017). Arens et al., (2008) confirm that due to the issues enumerated above, auditors often consider attending stock taking a mandatory procedure including paying attention to stock management and valuation practices. However, the desire to perform more detailed procedures about stock and inventory is often mitigated by pressure on auditor time and auditor fees in line with global trends (Raghunathan, 1991). This pressure necessitates auditors to develop creative, value-driving auditing techniques and analytical procedures that are effective in identifying the risk, incidence, extent, and value of material misstatements, either due to fraud or error in the accounting for fraud (Janvrin, Bierstaker, and Lowe, 2009).

Unfortunately, there are few studies that focus on auditing stock and warehousing procedures. Also, the lack of existing literature studying about the red flag approach to estimate the existence and possibility of fraud within accounting information systems. Red flags are considered as the conditions and circumstances that indicate, predicate, or precede potential fraud. This article addresses this gap by exploring an alternative approach to fraud detection that focuses on the effective application of specific audit techniques. Also, the study adds to and extends the existing literature by exploring auditor's perception of the effectiveness of contemporary techniques in the stock and warehousing cycle using data sets from Ghana. Wilks, and Zimbelman (2004) confirm that understanding auditor perception(s) is important because anecdotal evidence confirms that auditors hardly change their perceptions and beliefs even in the face of new evidence. Specifically, the study seeks to measure external auditors' perception about the level of effectiveness of 56 widely used auditing techniques and/or procedures in the detection of fraud within the stock and warehousing cycle, as well as the reasons for such perspectives.

The findings of this study may be useful for improving audit quality by iterating the procedures widely perceived as 'more effective' for guidance in future audits. Owusu-Ansah et al., (2002) had earlier studied the phenomena with a data set from New Zealand while Alleyne et al., (2010) attempt to fill in the gap of the paucity of similar research in developing countries with a data set from Barbados. Alleyne et al., (2010) conveniently describe their data set as from 'English speaking Caribbean' perhaps acknowledging the underlying contingent cultural factors on auditor perception and action. Moyes (1997) had also studied the phenomena with a data set from the U.S.

Alleyne et al., (2010) Owusu-Ansah et al., (2002) and Moyes (1997) explored the variables quantitatively, which is useful but does not provide an adequate understanding of the nuances and underlying reasons for auditor perceptions. For instance, it is not clear from their studies why auditors perceive certain procedures as more effective than others. Our study is different for three reasons. First, we use data from respondents with at least three years of auditing experience and who have participated in audit activity regarding stock and warehouse management. Alleyne et al., (2010) and Owusu-Ansah et al., (2002) did not specifically exclude other 'less experienced' auditors or did not specifically state in their methodology that they did so. We consider this approach an important variable in gaining the perception of persons who influence the audit planning process. Secondly, we apply a mixed approach that adopts a quantitative and qualitative data collection strategy. Lastly, we attempt a comparison of our findings with Alleyne et al., (2010) and Owusu-Ansah et al., (2002) and provide a reasoned conjecture of any significant differences. In doing so we rely on assumptions about inherent national characteristics and cultural differences synthesised from the literature. We perform our comparison with caution bearing in mind that our respondent groups may be different as enumerated above.

The rest of the study is organized as follows. Section B discusses the literature, section C discusses the methodology, section D examines the data and discusses the results and findings, and the final section concludes including providing recommendations.

Literature Review

IAS 2.6 defines inventories to include assets held for sale in the ordinary course of business (finished goods), assets in the production process for sale in the ordinary course of business (work in process), and materials and supplies that are consumed in production (raw materials) (IAS 2.6). This study uses the words stock and inventory interchangeably. Also, audit techniques, audit procedures, and audit measures are used interchangeably in this study.

Fraud and Auditors Responsibility for Fraud

Since the promulgation of the Sarbanes-Oxley Act of 2002, auditors have had various mandatory requirements and partial responsibility to detect and report material misstatements, fraud and errors. The extent of auditor responsibilities concerning fraud detection and reporting is country contingent and has evolved gradually over the period and often in response to stakeholder agitation. At the very least, auditors are required to develop procedures to review the internal control systems of auditee organisations for the effectiveness of fraud prevention and detection. Admittedly there are differing opinions regarding how much responsibility auditors must bear for detecting and reporting fraud (Vinten,

Alleyne, and Howard, 2005), but there is consensus regarding the fact that auditors must develop creative and dynamic techniques for fraud detection especially with high-risk operations.

Levy (2008, p.78) conceptualizes fraud as an act of “intentional deception, misappropriation of a company’s assets, or the manipulation of its financial data to the advantage of the perpetrator.” Owusu-Ansah et al., (2002) apply a similar definition in their study highlighting that often fraud ‘includes an array of irregularities and illegal acts’ underpinned by international misstatements and omissions of values and ‘disclosures in accounting records or financial statements, intentional false statements’, intentional false ‘accounting or misapplication of accounting principles relating to amounts,’ classifications, manner of presentations or ‘disclosure and misappropriation of assets.’ Arens et al., (2008) distinguishes between two types of fraud within auditing. Misappropriation of an asset is a kind of fraud usually involving defalcations perpetuated by employees leading to the physical disappearance of assets and hence losses to the company. Management fraud involves deliberate misapplication of quantitative techniques including accounting rules to the valuation of stock and inventory items to achieve the desired outcome. A link can be established between the two types of fraud because sometimes defalcations necessitate the deliberate manipulation of valuation and accounting techniques to obfuscate detection.

Prior Research on The Perceived Effectiveness of Auditing Techniques

Vanasco (1998) links the rise in inventory fraud with the increasing number of accounting scandals. Owusu-Ansah et al., (2002) uses a data set from New Zealand to confirm varying degrees of perceptual effectiveness across 56 standard procedures for fraud detection within stock and warehouse management. Moyes (1997) suggests that audit procedures that collect direct evidence are more effective audit procedures than indirect evidence during stock audits. As indicated earlier, prior research regarding fraud detection has been inundated with studies about the use of red flags. The consensus in the literature seems to be that red flags are effective tools for auditor fraud detection. Studies about red flags have been diverse applying various approaches and sometimes resulting in contradictory findings, mainly focused on identifying effective red flags and the appropriate timing and manner of use. Albrecht and Romney (1986), for instance, confirms 87 red flags as effective predictors of fraud.

Loebbecke, Eining, and Willingham (1989) proposed a risk-assessment model as a conceptual framework for assessing the likelihood of occurrence of fraud using red flags as variables. The data set included 227 respondents who were external auditors and concluded that the factors that increase the likelihood of fraud occurring can be categorised under three groups: (a) the external control environment that provide the conditions (conditions risk assessment) for fraud; (b) internal environment that is a conducive motivator (motivation risk assessment) of fraud; and (c) individual characteristics that determine attitude (attitude risk assessment) towards fraud. Bell, Szykowny, and Willingham (1991) subsequently amended Loebbecke et al., (1989) conceptual model and apply a cascaded logic analysis in a bivariate analysis of 305 non-fraud and 77 fraud cases. They attempted to predict how auditor perceptions about the client affect the likelihood of fraud occurring concluding that fraud is preceded by a variety of conditions.

Pincus (1989) uses an experimental setting to confirm that the use of red flags significantly increases audit effectiveness by improving the quality of audit planning. The data set included 68 auditors who used red flags and 69 respondents who did not, concluding that the application of red flags increases auditor comprehension, and uniformity in data collection and hence increasing auditor assessment about the risk of fraud.

Auditor (Experience) and Audit Firm-Specific Characteristics (size) and Fraud Detection

Despite numerous studies, it is not exactly clear how and why larger audit firms impact fraud detection relative to smaller firms. Moyes and Hassan (1996) had previously established that larger audit firms have a higher probability of detecting fraud. Salehi et al., (2009) attributes this to the ability of larger firms to command more allocative and authoritative resource to perform complicated audit tasks. The implication of audit experience on fraud detection is not clear. Payne and Ramsay (2005), for instance, confirm that auditor experience reduces professional scepticism with attendant implication on fraud detection. However, other studies such as Sarwoko and Agoes (2014) suggest that higher experience improves fraud detection.

Auditor practices have been established to differ based on national characteristics, as well as cultural factors. Alzeban and Gwilliam, (2014) confirm, using data from Saudi Arabia, the distinctive influence of Hofstede’s, cultural dimensions on the quality of internal audits. Grabner Vienna and Haesebrouck, (2019) confirm that organisational culture within auditing firms shape audit practices and planning affecting auditor perceptions and hence audit quality. Cowperthwaite (2010) provides an extensive discussion about how culture moderates and differentiates auditing practices. Gullkvist and Jokipii (2013) examine the importance of red flags across fraud type (fraudulent financial reporting and misappropriation of assets), among three professional groups (internal auditors and economic crime investigators) using

a data set of 471 respondents and find that significant differences in aggregate means exist in part between the groups. Internal auditors report higher perceived importance of the red flags related to detecting misappropriation of assets than of those related to fraudulent financial reporting, whereas the opposite is true for economic crime investigators. For external auditors, only small differences in aggregate means between misappropriation of assets and fraudulent financial reporting were found.

Auditor Perception and effect on Audit Procedures and Audit Quality

The Public Company Accounting Oversight Board (PCAOB) has confirmed that auditors fail to effectively modify their standard audit procedures and perceptions in response to fraud risk. However, Hoffman and Zimbelman (2009) examine the effects of two interventions (strategic reasoning and brainstorming in groups) and find that each intervention leads to more effective modifications to the standard audit procedures and that the combination of the interventions is not significantly more effective than either intervention used alone. Simon, Smith, and Zimbelman (2018) experiment with 101 experienced auditors to confirm that the likelihood and magnitude of risks decomposition leads auditors to be less concerned about high-risk fraud schemes relative to auditors who make holistic risk assessments.

The likelihood and magnitude of risks decomposition mitigate the influence of affective responses on high-risk judgments. Their study also finds that relative to those making holistic risk assessments, the correlation between auditors' likelihood judgments and their overall fraud risk judgments and the coherence of their fraud risk judgments are higher for auditors who perform a likelihood and magnitude of risks decomposition. Two follow-up experiments with students replicate these findings for higher-risk events, and (unlike the auditor experiment) likelihood and magnitude of risks decomposition results in lower risk judgments for lower-risk issues. Simon, Smith, and Zimbelman (2020) provide a practitioner summary of their prior experimental studies on the likelihood and magnitude of risk decomposition.

Considering that previous studies suggest that even though auditors can identify fraud risk factors, they are unable to translate this knowledge into an audit plan that effectively takes these factors into account to increase the likelihood of detecting fraud, Efrim Boritz, Kochetova-Kozloski, and Robinson (2015) contend that fraud specialists may be able to compensate for such limitations. Their study, therefore, investigates the relative merits of involving fraud specialists in assisting auditors by developing an audit plan that would effectively address fraud risk in a revenue cycle. They find that fraud specialists did not differ from auditors in the number of procedures selected from a standard audit program; nor were these procedures cumulatively more effective than those selected by auditors. Rather, fraud specialists generated a greater number of non-standard additional audit procedures, and those procedures were marginally more effective, but less efficient, than those of auditors, except for certain groups of procedures. Also, although the fraud specialists proposed significantly more additional (non-standard) procedures than auditors, their proposed budget increase for this category of procedures was significantly smaller than the budget increase proposed by auditors and adjustments to the overall time budget did not differ between fraud specialists and auditors. Asare and Wright (2018) follow Efrim et al., (2015) by documenting the field experiences of auditors with forensic specialists. In the process, they propose and test a model that links the antecedents of consultation between auditors and forensic specialists to the work performed and the overall effectiveness of the consultation.

A path model, based on a field survey of 57 experienced auditors, shows that forensic specialists' understanding of the client's business and engagement objectives is positively associated with risk assessments and effective teamwork, which, in turn, are positively associated with overall consultation effectiveness. Further, involving forensic specialists early in the engagement is associated with improved teamwork and risk responsiveness. Qualitative responses identify other factors, such as investment in joint extra-collaboration enterprises, which may moderate the association among the antecedents, work, and outcomes.

Hammersley, Bamber, and Carpenter (2010) test the assertion by the PCAOB that auditors' lack of specific fraud planning documentation has led auditors to devote insufficient attention to fraud risks in subsequent audit work. They apply a Support Theory in an experimental study to investigate how the specificity of fraud risk documentation during audit planning influences auditors' subsequent audit work, and in the process, they examine the effect of priming auditors about the fraud risks identified during planning before they begin subsequent evidence evaluation. Their study finds that auditors' planning stage efforts affect subsequent fraud risk assessments and evidence evaluation decisions. Un-primed auditors who receive more specific documentation increase their fraud risk assessments and evidence requests. Priming's effects are more relatively more complex. Specifically, priming auditors who receive summary documentation also increase fraud risk assessments and evidence requests; however, priming auditors who receive specific documentation reduces these judgments because the priming makes the client-specific risks seem less typical. Impliedly, the PCAOB's call for more documentation can have the unintended consequence of reducing auditors' sensitivity to fraud.

Methodology

The sample consisted of auditing firms within Ghana that had offices within the capital city of Ghana (i.e., Accra). The focus on auditing firms within the capital city was to ease the cost and other operational bottlenecks with the collection of data. However, the data is still representative because Accra holds about 51% of the Ghanaian population and over 60% of formally registered businesses.

Questionnaire

The study collected quantitative data using a structured predominantly closed-ended questionnaire, on a five-point Likert-scale (See Appendix 1). The Likert scale responses ranged from ‘not effective’ (scored as 1) to ‘extremely effective’ (scored as five), similar to Owusu-Ansah et al., (2002). This approach allowed for comparability. Initial contact was made with the administrative office of 26 auditing firms, out of a list obtained from the Institute of Chartered Accountants (ICA-Ghana) website to request for permission to engage with their employees regarding this study. The websites of the listed firms on ICA-Ghana’s website were then scanned to identify the office locations within the capital city of Accra. The 26 firms that were approached constituted the firms that the researcher could trace, based on website information, and other professional contacts, within the vicinity of Accra.

The objective of the study was explained to the administrator(s), including the fact that participation is voluntary, and anonymity based on conventional practices will be guaranteed. These face-to-face discussions were complemented by the submission of an official introductory letter that provided an e-mail, postal address and cell-phone number for the researcher. A copy of the questionnaire was attached to the introductory letter for their perusal. Sixteen firms gave an immediate affirmative response, two firms responded by e-mail to affirm their willingness to participate, two firms called to agree to allow contact with their employees, one firm posted a letter to agree, and one firm posted a letter to disagree (citing, the excessive workload during the estimated period for their ‘lean’ staff). Therefore, 21 firms granted permission for engagement with their staff regarding the study. Twelve firms provided e-mail addresses of their staff for the questionnaire to be e-mailed to them. Ten firms allowed the distribution of hard copies of the questionnaire (the persons interviewed, as will be explained in the next subsection, were selected from these seven firms).

Hard copies of the questionnaire were accompanied by a pre-paid return envelope that was pre-addressed to the researcher. However, all respondents who filled hard copies of the questionnaire preferred to call the researcher to pick up the questionnaire when they had completed them. All questionnaires, both e-mailed and hard copies, were preceded by an introductory section that explained the objective, purpose and relevance of the study, confirming as well, that participation is voluntary and conventional anonymity assured. The cell phone number and e-mail address of the researcher also were provided if respondents required further clarity. Considering that the questionnaire had previously been tested in a study by Owusu-Ansah et al., (2002), it was not piloted before administration.

The first part of the questionnaire (Section A) gathered bio-demographic data, while the second part of the questionnaire (Section B) solicited respondents’ perceptions on the extent of effectiveness of 56 fraud detecting procedures applied to the stock and warehousing cycle. These two parts applied a five-point Likert-Scale, with an additional column to indicate non-applicability of a specific audit-measure. The 56 measures were similar to the measures tested by Owusu-Ansah et al., (2002) and Moyes (1997). The final part of the questionnaire provided an optional opportunity for respondents to provide further written comments about the effectiveness of other auditing-procedures not itemized with section B of the questionnaire.

One hundred and sixty- seven questionnaires were distributed, out of which 118 responses were received, of which 101 were useable. This represented a response rate of 59.88%. Moyes (1997) had a response rate of 19% for 86 useable questionnaires, whereas Owusu-Ansah et al., (2002) did not explicitly indicate their response rate. To allow for comparison, the analysis of the quantitative aspects of the study followed similar iterations such as for Owusu-Ansah et al., (2002) and Moyes (1997). Specifically, step one involved computing the mean response of all the respondents on each of the audit procedures/measures. This step was used to evaluate the degree to which a specific audit measure is perceived as effective, by respondents, in fraud detection. Step 2 involved computing an overall mean response of 3.916 for the 56 audit procedures. This overall mean response represented the ‘perceived fraud-detecting effectiveness of a hypothetical average audit procedure in the stock and warehousing cycle’ and is ‘used as a benchmark to determine the degree of effectiveness in detecting fraud for each audit procedure.’

Step 3 involved testing for significant differences between the overall mean response and the mean response for each audit procedure with parametric one-sample t-test and used to classify the audit procedures into one of three categories: “more effective”, “moderately effective”, and “less effective.” Impliedly, each of the three categories represents a perceptual differing degree of effectiveness in detecting fraud in the stock and warehousing cycle. In this case, and similar to Owusu-Ansah et al., (2002) and Moyes (1997), ‘an audit procedure is classified as ‘more effective’ if its mean response exceeds the overall mean response by a significant difference at any of the conventional levels. On the other

hand, an audit procedure is classified as ‘less effective’ if its mean response is below the overall mean response by a significant difference at any of the conventional levels. Finally, an audit procedure is classified as ‘moderately effective’ if its mean response, when tested against the overall mean response, is not statistically significant.’

Interviews

Interviews also were used to capture salient issues to buttress some of the key findings emanating from the questionnaire analysis. Twelve people were interviewed (seven males, and five female respondents) and their responses people (descriptive analysis presented in Table 1 below). The interviews were based on a semi-structured format aimed at soliciting explanations for responses provided to the structured questionnaire. For those persons identified for an interview, the administration of the questionnaire and the interview occurred concurrently. The process was such that the researcher administered the questionnaire to the respondents and asked for further explanations for answer choices.

Table 1: Descriptive Statistics of Interview Respondents

REF	Gender	Level Within the Organisation	Experience ¹	Firm ² Size
1	M	Managing Consultant	12	SMALL
2	M	Managing Consultant	10	SMALL
3	M	Deputy Manager	7	LARGE
4	M	Audit Senior	8	SMALL
5	F	Audit Senior	5	SMALL
6	M	Senior Associate	3.5	LARGE
7	F	Senior Associate	4	LARGE
8	F	Senior Associate	5	SMALL
9	M	Senior Associate	5	SMALL
10	F	Semi Senior	5	LARGE
11	M	Semi Senior	3	LARGE
12	F	Assurance Senior 2	5	SMALL

The interview participants were between 26–53 years old (mean=37.73; Median =34). Seven participants were male, and five participants were female. Hill et al., (2005) recommend developing interview protocols that consist of between 8–10 questions with probes to fit within one hour. They also recommend at least two pilot interviews to test the questions. The interview protocols in this interview consisted of eight main questions (with secondary follow-up questions), and two pilot interviews were conducted among graduate research students. Interviews varied in length but were approximately 40 minutes per interview. To help participants feel comfortable, the interview began with background questions, which also help gather pertinent background data (Hill et al., 1997). After the participants signed the consent form and filled out the demographic form, conversations regarding participants’ work, home life, and interest in the study were discussed (Jalma, 2008).

Face-to-face interviews were preferred over phone interviews because face-to-face interviews allowed for a naturalistic setting (Heppner, Kivlighan, and Wampold, 1999). All interviews were audiotaped, with the prior consent of respondents and took place within the work premises of participants, due to time pressure. The analysis of the interview responses was qualitative. Data collected from interviews were initially transcribed, coded and fitted into three domain themes. The transcripts revealed themes and patterns that emerged from the data. The researcher and his two assistants independently transcribed all interviews. One graduate assistant served as a tiebreaker if the researcher and his assistant could not reach a consensus.

A few of the transcribed responses were reviewed by a colleague to assure that it appropriately reflected the contents of the recorded interview and were found to be accurate. The transcripts were examined to look for themes related to those set out in the questionnaire survey and respondent reflections. These data were coded, and extraneous data were reduced to aid analysis. While reading the transcripts, notes were made, and statements highlighted and then responses categorised based on identified themes. Qualitative data was used to generate categories, identified themes, and recurring patterns. NVIVO was applied in a limited manner to help identify keywords to support the formulation of themes.

¹ EXP refers to audit practice experience.

² This refers to firm size based on number of employees.

Strauss and Corbin (1990) suggest the identification of domains based on context, intervening conditions, actions/interactions strategies, and consequence. This study follows a similar approach and identifies the following domain themes: (a) Perception about the critical importance of audit techniques for the Stock and Warehousing Cycle to overall audit quality and effectiveness; (b) Criteria applied in the categorization of audit procedures across a continuum of effectiveness; (c) Challenges faced in the effective deployment of audit techniques; and (d) Reflections on how to improve audit quality. The names of the domains were an appropriate reflection of the data.

After determining the domain themes, core ideas were applied to the data, and subsequently, each core idea was examined for categories, nuggets, or threads of common or unique experiences across the interview data. The analysis of the interview data set resulted in three domains, three core ideas and twelve categories. Core ideas attempt to categorise smaller nuances of information within u the domain. Categories highlight unique components of participants' experience within each domain. Direct interview quotes, which have been edited for grammatical clarity, are used to highlight the data.

Hill et al., (2005) recommend presenting the cross-analysis of qualitative results through the frequency of occurrence. In this interview of 12 participants, categories that occurred for just one participant are labelled Rare (Jalma, 2008), categories that occurred for between two to five participants are labelled Variant, categories that occurred for 6–10 participants are labelled Typical, and categories that occurred for eleven or more participants are labelled General. Interview responses were not quantitatively analysed and hence all quantitative results presented in this study emanate from the questionnaire instrument. Table 2 presents the frequency results for the interviews below.

Table 2: Domains, Core Ideas, and Categories

Domain	Core Idea	Category	N	Frequency
Perception about the critical importance of audit techniques for the Stock and Warehousing Cycle to overall audit quality and effectiveness	Perspective(s) on how procedural ineptitude in the audit of inventory or the detection of fraud in the inventory audit can affect overall audit opinion.	Generally critical to my decision matrix	7	Typical
		Useful to my decision matrix but not critical	2	Variant
		Irrelevant to my decision matrix	0	Rare
		Depends on a case-by-case basis	3	Variant
Criteria applied in the categorization of audit procedures across a continuum of effectiveness	The basis for evaluating the effectiveness of audit procedures in general and for inventory audit in particular?	Relies on primary data and not ordinarily performed by the client in the normal course of business.	12	General
		Provides me with a comprehensive understanding of the clients' business and often alters audit approach.	5	Variant
		Ease of application and not time-consuming	9	Typical
		Based on what I have been taught or told	3	Variant
Challenges faced in the effective deployment of audit techniques	Implications about how the perception of effectiveness affects the deployment and prioritisation of standardised audit techniques	Prioritise effective procedures	5	Typical
		Deploy all procedures with equal relevance	5	Variant
		Ignore procedures I do not deem effective	2	Variant

Analysis

Demographic Characteristics

Tables 3 and 4 present the demographic characteristics of the respondents. Eighty- nine percent (89%) of respondents were members of a professional accounting body with more respondents being members of ACCA than ICA-Ghana. Sixty-one percent (61%) of respondents were Chartered Accountants. The average position tenure of respondents is about two years even though respondents had on average three years of practical experience in auditing. There is a balance between responses from large audit firms (N=50) and small audit firms (N=51), even though this balance was not deliberately intended.

Table 1 also confirms minimal differences based on non-numeric demographic categorization between responses from large audit firms and small audit firms. Even though there are not clear and significant differences between respondents from large and small audit firms (along the lines of position, experience, and professional qualification), there are significant institutional and firm-level differences. Large audit firms have experienced significantly more practice reviews, and small audit firms have detected more fraud during audits of stock and warehousing cycles.

Table 3: Respondents' Demographic Characteristics (Non-Numeric Variables)

Response	Obs.	Large³ Firms	Small Firms	t-value	P(T<=t) two-tail
Respondent's present position:					
Combined	101	50	51	0.9523 ⁴	0.3433
Managing Consultant	3	0	3		
Deputy Manager	1	1	0		
Audit Senior	9	2	7		
Auditor	3	0	3		
Senior Associate	9	7	2		
Semi-Senior	6	6	0		
Assurance Senior 2	6	0	6		
Associate	50	29	21		
Associate 2	5	5	0		
Junior Assurance	3	0	3		
Assistant Auditor	6	0	6		
Respondent's membership of ICA-Ghana:					
Combined	101	50	51	1.4955	0.1380
Yes	58	25	33		
No	43	25	18		
Respondent's response on membership of any other professional accounting or auditing body:					
Combined	101	50	51	-0.2821 ⁵	0.7784
ICA	29	5	24		
ACCA	61	40	21		
NO	11	5	6		
Respondents' firm experienced practice review before:					

³ Large audit firms have employees of 100 and above. Small audit firms have less than 100 employees.

⁴ The following were classified as senior personnel and coded as 1, Managing Consultant, Deputy Manager, Audit Senior, Senior Associate, Semi-Senior. The rest were coded as 2.

⁵ ICA and ACCA membership were coded as 1

Combined	101	50	51	-3.6252	0.0006
Yes	87	49	38		
No	14	1	13		
Respondents' firm detected fraud in stock and warehousing cycle before:					
Combined	101	50	51	3.0500	0.0037
Yes	8	0	8		
No	93	50	43		
Respondent detected fraud in stock and warehousing cycle before:					
Combined	101	50	51	n/a	n/a
Yes	0	0	0		
No	101	50	51		

Table 4: Analysis of responses to demographic questions (Numeric variables)

Response	Obs.	Mean	Std dev.	Min	Max	Skewness	Kurtosis
1. No. of years in the present organisation	101	3.160	1.943	0.5	8	0.868	0.049
2. Position tenure	101	1.954	1.188	0.5	8	2.227	7.662
3. No. of years of audit experience	101	3.302	2.228	0.5	12	1.399	2.360
4. No. of staff of respondents' employer	101	108.564	98.649	5.0	400	0.804	0.233
5. No. of years of ICA membership of respondents	101	2.656	1.760	1.0	12	2.996	13.601

Respondents Perception About Effective Audit Procedures

Respondents perceive 25 audit procedures as more effective than the average audit procedures in detecting fraud within the stock and warehousing cycle, representing 45% of the total outlined procedures within the questionnaire. Owusu-Ansah et al., (2002) identified 14 procedures and Moyes (1997) also identified 14. Table III summarizes the respondent's perception about each of the 25 audit procedures with the mean score an indicative measure of the relative effectiveness of each audit procedure. The audit procedures are listed in descending order of their computed statistical significance without any consideration of the prioritisation of deployment and frequency of use in actual audits. However, three of the variables identified by Moyes (1997) with the U.S. data set as 'more effective' are perceived by the Ghanaian data set as 'less ineffective.'

Specifically, respondents considered tracing shipments to sales journals, tracing shipments to sales records, stock records, and bills of lading (shipping documents) and recounting a sample of client's counts to make sure the recorded counts are accurate on the tags (also check descriptions and unit of count, such as dozen or gross) as 'less effective,' even though Moyes (1997) confirmed these variables as 'more effective' with U.S. data set. Owusu-Ansah (2002) also confirms the recounting of sample clients counts as 'more effective.'

Even though both Owusu-Ansah et al., (2002) and Moyes (1997) confirm the review of major adjustments for proprietary as 'more effective' the Ghanaian data set only confirms it as 'moderately effective'. However, the measures perceived as 'more effective' with the Ghana data set substantially confirm that auditors perceived the collection of direct evidence as more effective within the stock and warehousing cycle. This confirmation is like the findings of Owusu-Ansah et al., (2002) and Moyes (1997) and suggest that the collection of direct evidence is most useful during the audit planning stage, especially to aid the formation of a professional opinion regarding the strength of internal controls and hence the likelihood of fraud or material errors to occur.

Fourteen procedures are perceived as 'moderately effective,' compared to 27 by Owusu-Ansah et al., (2002) and Moyes (1997). Even though the measures perceived by respondents as 'moderately effective' are substantive procedures used to confirm various management assertions and reported figures (similar to findings in the above-mentioned studies), the relative smaller set of 'moderately effective procedures' reveals, unlike prior studies' that Ghanaian respondents prefer to perform substantive analysis on primary data sources rather than rely on 'secondary outputs' such as computed numbers within financial statements or other third parties. This conclusion emanates from the categorization, by Ghanaian respondents, of traditional substantive procedures that place reliance on client computed numbers as 'less effective.' For example, all methods that relied on client prepared tags were categorised as 'less effective' as well as the performance of analytical procedures; and the tracing of balances of stock-listing to the general ledger; or the verification of stock prices based on client provided invoices.

The remaining 17 procedures are perceived as 'less effective' in fraud detection within the stock and warehousing cycle. Moyes and Owusu-Ansah et al., (2002) identified 15 measures. Most of these measures are used mainly to obtain evidence indirectly, relying on secondary and previously computed outputs, usually provided by the client and hence should often be used as complementary measures rather than as the prime procedure. Tables 5, 6, and 7 provide the three categorizations based on the computed mean scores for each measure by the overall mean score.

Table 5: Audit Technique evaluated as “more effective” in detecting fraud by respondents (overall mean response = 3.92)^f

Audit technique	Mean	Var	t-value ^a
1. Examine stock descriptions on the tags and compare to the actual stock for raw materials, work in progress, and finished goods.	4.82	0.89	1.61
2. Trace from stock tags to the stock listing schedules and make sure stock on tags are included. X_{14}	4.34	0.85	4.55
3. Review the adequacy of physical security for the entire stock. $X_5 M_5$	4.28	0.20	7.98
4. Verify that stock balances on stock listing schedules agree with perpetual records (stock subsidiary ledger). X_4	4.28	0.50	5.07
5. Follow up all exceptions to make sure they are resolved. $X_2 M_2$	4.26	0.45	5.04
6. Observe the physical count of stock at all locations. $X_{11} M_{10}$	4.25	0.55	4.45
7. Perform compilation tests to ensure that the stock listing schedule agrees with the physical stock counts. $X_3 M_{14}$	4.25	0.69	3.97
8. Observed that damaged or obsolete goods are valued at net realizable value.	4.25	0.39	5.28
9. Review stock count procedures: [1] accounting for items in transit (in and out); [2] comparison of counts with stock records; and [3] reconciliation of differences between counts and stock records. $X_1 M_4$	4.24	0.28	6.00
10. Trace stock tags identified as non-owned during the physical observation to the stock listing schedule to make sure that they have not been included. M_{12}	4.23	0.74	3.60
11. Trace stock listed in the schedule to stock tags and the auditor's recorded counts for existence, description, and quantity. X_7	4.22	0.83	3.28
12. Trace balances of stock listing schedules to the general ledger.	4.19	0.55	3.62
13. Determine if access to stock area is limited to approved personnel. $X_9 M_9$	4.17	0.36	4.15
14. Review the last receiving report used at year-end to make sure the stock for that item is included in the physical stock.	4.12	0.49	2.87
15. Review related party transactions involving stock movements. $X_{13} M_1$	4.11	0.46	2.81
16. Account for all used and unused tags to make sure none are lost, added or intentionally omitted (record tag numbers for those used and unused for subsequent follow-up).	4.08	0.83	1.75
17. Identify slow-moving, obsolete, or damaged items within the stock.	4.07	0.45	2.25
18. Perform analytical procedures by computing ratios and comparing them with previous years.	4.06	0.53	1.91
19. Compare the count of larger items stated on the tags to the counts in the prior year and the perpetual stock records.	4.05	0.35	2.15
20. Discuss with client management the stock and warehousing cycle.	4.04	0.50	1.70
21. Record client's counts for subsequent testing.	4.04	0.46	1.76
22. Review warehouse records for duplicate locations for the same items.	4.03	0.35	1.87
23. Compare the classification of raw materials, work in progress, and finished goods by comparing the description on stock tags and the auditor's recorded test counts to the stock listing schedule.	4.01	0.57	2.38
24. Obtain written confirmation of stocks in public warehouses. $X_{12} M_6$	4.01	0.80	1.12
25. Review procedures for receiving, inspecting, and storing incoming items and for shipments out of the warehouse. $X_8 M_7$	4.00	0.44	1.21

^a= significant at 0.05 level

^f X confirms that Owusu-Ansah et al., (2002) found a similar categorization for the measure (i.e., ‘more effective,’ ‘moderately effective’ and ‘less effective’) with New Zealand data set, whereas M confirms that Moyes (1997) also found a similar categorization for the measure. The numerical under script indicates the respective ranking in the respective prior study by the respective author(s).

Table 6: Audit Technique evaluated as “moderately effective” in detecting fraud by respondents (overall mean response = 3.92)

Audit technique	Mean	Var	t-value ^b
1. Examine the receiving area for stock that should be included in the physical count.	4.00	0.88	0.86
2. Observe that non-owned goods are either identified or segregated.	3.98	0.61	0.77
3. Review major adjustments for propriety.	3.95	0.49	0.44
4. Compare the extended stock value with previous years.	3.92	0.63	0.01
5. Tour warehouse facilities and become familiar with storage, marking, and location procedures.	3.91	0.70	-0.11
6. Review policies regarding stock returns.	3.91	0.56	-0.12
7. Compare current manufacturing costs with previous years.	3.89	0.90	-0.31
8. Send confirmations to lenders for pertinent details about warehouse receipts pledged as collateral for liabilities.	3.89	0.73	-0.34
9. Draw a flow chart of the internal control system and compare with written policies.	3.87	0.61	-0.63
10. Compare current stock levels and values with previous years and evaluate.	3.87	0.41	-0.76
11. Check the additions of the stock listing schedules for raw materials, work in progress, and finished goods.	3.86	0.52	-0.82
12. Enquire about stocks in other locations, on consignment or sale or return basis.	3.85	1.09	-0.66
13. Compare unit costs of a stock determined from either FIFO or Weighted Average Cost valuation methods with previous years.	3.85	0.77	-0.79
14. Perform purchases cut-off test to ensure that goods in transit on F.O.B. shipping point basis are recorded as purchases and included in stock.	3.83	1.26	-0.79

^b=None of the t-values is statistically significant at the conventional level

Table 7: Audit Technique evaluated as “less effective” in detecting fraud by respondents (overall mean response = 3.92)

Audit technique	Mean	Var	t-value ^c
1. Examine financial statements for: [1] proper separate disclosure of raw materials, work in progress and finished goods; [2] proper description of the stock costing method; [3] inclusion of significant sales and purchase commitments; and [4] proper description of pledged stock.	3.82	0.49	-1.41
2. Review the last shipping document used at year-end and make sure the stock for that item was excluded from the physical count.	3.81	0.67	-1.21
3. Determine whether costs should be included in the valuation of a particular item of purchased stock such as freight, storage, discounts, and other costs and compare the findings with the prior year's audit working papers to make sure the valuation methods are consistent.	3.78	1.07	-1.34
4. Review contracts with suppliers and customers and enquire from management about the possibility of the inclusion of consigned or other non-owned stock, or of owned stock that is not included.	3.74	0.79	-2.00
5. Test pricing by tracing unit costs from vendors' invoices to the perpetual stock records.	3.72	0.94	-2.04
6. If a standard costing system is used, determine if the valuation method is efficient and useful by review and analysis of the variances.	3.71	0.49	-2.98
7. Account for the direct material costs, direct labour costs, and overhead costs involved in the valuation of manufactured stocks.	3.61	0.74	-3.58
8. Test direct labour costs by comparing with labour payroll and collective contracts.	3.60	0.78	-3.59
9. Recount a sample of client's counts to make the recorded counts are accurate on the tags (also check descriptions and unit of count, such as dozen or gross).	3.59	0.72	-3.85
10. Test number of hours needed to manufacture the product by comparing with engineering specifications.	3.54	0.93	-3.91
11. Trace shipments to sales records, stock records, and bills of lading (shipping documents).	3.49	0.67	-5.33
12. Verify pricing by locating the appropriate and sufficient invoices to account for the entire quantity of stock for the particular item being tested, especially for FIFO valuation method.	3.46	0.73	-5.46
13. Evaluate whether the percentage of completion recorded on the tags for work in progress is reasonable.	3.39	0.48	-7.75
14. Examine shipping area for stock set aside for shipment, but not counted.	3.37	1.07	-5.37
15. Trace shipments to sales journals.	3.29	0.57	-8.45
16. Extend the physical stock counts times the price on selected items on the stock summaries.	3.25	0.69	-8.15
17. In pricing stock, consider whether historical or replacement cost is lower.	3.03	1.31	-7.82

^c= significant at 0.05 level

Interviews

How Important is an effective inventory audit to overall audit qualities?

The focus of this domain was to understanding external auditors' perspective, based on personal experiences, about the bearing of effective auditing techniques within the stock and warehousing cycle, on the overall audit quality. There are no differences in perception based on gender, ($t=2.2621$, $p= 0.41823$) and respondents firm size (also $t=2.2621$, $p= 0.41823$). Seven respondents were emphatical in their conviction that the level of quality in stock and inventory audits had a direct and positive bearing on overall quality (typical), even though the basis for their convection(s) varied. In determining the

relevance of inventory audits to overall audit effectiveness, R1[§] referred to the inherent ease with which inventory values can be manipulated and stolen by other company assets. Essentially for R1, effective procedures or the lack of them during inventory audits has a significant bearing on overall audit quality because there is a comparatively inherently high risk of manipulation and theft.

R1: Inventory audit is important because it has an inherently high risk.

‘Inventory is easily moveable and hence can be easily stolen, unlike machinery.... [also] companies there are so many bases for computing inventory values with direct implication on profits, so companies try to manipulate their inventory values.’

R2: Inventory audit is important because the stock is diverse and more complex to value.

‘In my opinion, attributing accounting values to other assets is easy, but valuing stocks is complex. companies get the computation and valuation of stock wrong all the time.... [because] the IFRS standards on stock valuation are confusing and change all the time.... In recent times, the stock is high value and sophisticated because of technological advancement and this makes valuations more complex.’

R7: Inventory audit is important because the verification and confirmation process takes more time and starts before the audit.

‘We have to attend stock-takes even before the audit cycle opens.... We don’t do that for other assets. During my experience, it is the one area that takes a lot of time and where I have a lot of contention with clients. There is always a problem with the inventory valuation by clients... [perhaps because] There are too many kinds of inventory.... The mix is broad.... [hence] the valuation differs between different stock types and there are too many rules.... everyone gets confused sometimes.’

R10: Inventory audit is important because various regulations insist that stock audits are critical.

‘various practice and guidance notes [regulation] insist that stock audit should be given high focus.’

R9: Inventory audit is important because it is the ‘main-stay’ of the business.

‘a company’s main business is to sell the stock, so auditing stock is auditing a company’s main business.’

R6: Inventory audit is important because it is a huge proportion of mix of assets measured by value.

‘the stock balances are usually huge and form more than 50% of company assets [so] there is motivation by the client to manipulate it.’

R12: Inventory audit is important because auditors cannot rely entirely on management assertions because fraud can be perpetuated by others.

‘it is one of few assets that fraud can be perpetrated by persons other than management.’

Two respondents considered audit procedures for inventory as relevant but not critical (variant). R8 perspective was premised on the assumption that there is very little for auditors to discover during stock audits because clients expect audit procedures regarding stocks to be thorough due to various audit guidelines. Therefore, clients are diligent in the management, valuing and recording of stocks. Specifically, R8 asserted that:

‘companies expect auditors to be all over [do a comprehensive job] on stock processes and values...they know what auditors will look for and they make sure they correct or hide them very well before the audit. [Even] the numerous valuation methods and allowable estimates [such as provisions] allow clients a wide altitude to explain away any contentions.... for me [referring to the respondent] an effective procedure is a procedure that is value adding and not just a tick of a check-list box. Stock audits are merely confirmatory and not revealing, they don’t give any new information, auditors spend a lot of time to rationalise the client’s values. When it comes to assessing internal controls regarding stock management, most organisations follow the conventional and widely used practices, ...so again there is nothing new [to discover].’

[§] R1 refers to respondent 1 as per Table 1.

R3 went further and perceived that, unlike other company assets, management of client firms have a personal interest in ensuring that stock is properly managed, recorded and stored because it has a comparatively higher bearing on the existence of the company. Invariably most organisations ensure good stock management practices. R3 stated that:

‘stocks are what the company sells [deal in] to make money, so it is directly tied to the manager’s job. Very often they [managers] do a good job.... I am not saying [referring to the respondent] that stock audit is not useful, I am saying that [referring to the respondent], my opinion about overall audit risk does not change significantly after a stock audit, and very often it does not alter my audit approach.’

I countered by indicating to R3 that the reasons he enumerated above could be conceived as making effective audit procedures within the stock and warehousing cycle highly critical. R3 responded with an answer that provided his conceptualisation of the word ‘critical’ as against the word ‘relevant’. R3 stated that:

‘..... critical [audit technique] is what you can’t do without if you want to do good work....in the context of an audit procedure, critical techniques affect my opinion about the company and affect audit approaches. Relevant approaches are helpful confirmatory measures that don’t offer new insights and don’t affect what I already know or believe about the company....stock [audit] procedures are relevant but don’t necessarily flag big issues.’

It will seem therefore that R3 and R8 conceptualize critical audit procedures in terms of the ability to identify big and compelling issues, almost as if a forensic procedure was being undertaken. Three respondents indicated that any perception of the relevance of audit procedure must be contextually considered on a case-by-case basis (variant). R11 response summarizes the perspectives of these three respondents.

‘.... difficult to give a general indication because the answer depends on the business in question, the kind of stock, and the nature of the balance sheet [proportion of stock to other assets] and any prior audit issues. small [easy to carry items in terms of physical size and weight], high value, technological, bespoke, and new [in terms of new market entry innovations] inventory is usually high risk so very critical. New companies also carry high risk regarding inventory because they are probably now defining their internal controls.’

Basis Applied to Evaluate the Effectiveness of Audit Techniques

The basis applied to evaluate the effectiveness of audit procedures also varied. All respondents (general) considered the ability of the audit technique to gather direct evidence from primary data as a key criterium in determining the effectiveness of an audit approach. R1, for instance, indicated that *‘the audit technique should go to the source data because client provided figures are already computed and can be suspicious.’* R6 goes further and suggests that *‘I don’t want to go and repeat the same procedures the client has done; I want to do something new.... I may arrive at the same conclusion [as the client has] but with a different approach. Therefore, effective procedures are procedures that clients don’t normally do themselves as part of the normal business.’* R12 also highlights the preferences for techniques grounded in primary data sources as effective because the process aids the understanding of the client’s business and hence improves auditor confidence with consequential implications on audit quality and fraud detection. She says that *‘usually when I spend time to compute all numbers from scratch, I understand the client’s business better, so I usually like procedures that go to the source data. I become more confident when I understand the client’s business, and therefore can confidently confront fraud’.* It will seem from the analysis above that most respondents place little reliance on pre-prepared reports and valuations by clients.

Five respondents also underpinned their perception about the ability of the technique to affect their audit planning and offer new insights into the client’s business and manner of operations. R9, for instance, indicated that *‘I prefer techniques that help me to plan the audit before I start the substantive work, so I want techniques that give me an idea about what to expect and help me to understand the client’s business before I go in to start my work. It helps me to target my effort and not waste too much time and effort.... [also] it does not make me look clueless before the client’.* His statements underscore the views of this subset who mostly hold the view that *‘auditing planning is the most important stage within the audit cycle’ (R3) and that ‘detecting fraud occurs during the assessment stages within auditing planning and the substantive procedures are merely used to confirm or dispel prior convictions’ (R4).*

Nine respondents perceived effective audit procedures as procedures that are easy to apply and not time-consuming or expensive. R7 suggested that an effective procedure *‘must not have any ambiguity about what the results mean’* and R11 argued that an effective procedure *‘must be a procedure I understand and can apply...some of the techniques are just too*

time consuming to understand and apply. R2 believed that effective procedures must be subject to *'general application [can be applied in all scenarios] and must consistently deliver good outcomes*. R2 referred to procedures that are only contextually effective as *'specialised audit techniques'* and hence cannot be included in the group of *'more effective'* procedures because *'their application is limited and hence their usefulness is limited.....[because] it will be difficult to reach an acclaimed [general] consensus about their effectiveness among like-minded professionals [auditing professionals], and the lack of frequent use will make them difficult for auditors who have not experienced them before to use them properly'*.

Three respondents perceived effectiveness based on inferences from other *'authorities'* such as *'what we were thought in school'*[R9], *'my audit manager considers them as effective'* [R12], and *'my colleagues within client firms usually joke that they wish we do not perform those procedures'*. [R5].

Strategies for Actual Deployment of Audit Procedures

There were no statistically significant differences between large and small audit firms concerning strategies for deployment of audit strategies but there was a statistically significant difference based on gender. Two respondents (male) indicated that they ignored procedures they consider ineffective. R3 was quite firm in his belief that this action was rational because *'there is pressure on audit fees'*. R2 concurred arguing that *'auditing must be responsive [and hence] we should focus on developing new strategies that are effective [rather than] reapplying strategies that make no sense'*.

All female respondents (N=5) indicated that they attached equal importance to all procedures irrespective of their perception about their effectiveness. While all respondents indicated adherence to organizational policy because *'we are part of an organisation, we don't make the rules'* [R5] or because *'the approach we apply to an audit is a group decision, my perspective cannot override others...[even though] I am entitled to an opinion'* [R8], or *'that's how it has to be, there are rules one needs to abide-by to safe oneself from litigation and to meet the threshold of quality assurance....it is not up to us to decide what to apply and what to ignore'* [R12], others (N=3) alluded to an ethical consideration by suggesting that *'auditing is supposed to assure third parties, not me the auditor [the respondent], and there are rules that must be followed....[refusing to follow the laid down rules means] you become complicit and the action is wrong [unethical]'* [R10].

Five respondents (all male) indicated that even though they applied all iterated audit techniques (as per the questionnaire), they prioritise *'more effective procedures.'* R1 attributed this to *'there is a need to be timely and cost-effective because we are not [adequately] compensated for the work we do.'* R6 also attributed it to the need to *'achieve more valuing despite dwindling audit fees.'* R11 following on from his earlier assertion that effective techniques must be easily understandable queried rhetorically that *'what's the point in using testing procedures that I do not understand?'* R4 indicated that *'eagerly prioritising processes that the clients know are ineffective will just send the wrong impression to the clients that I don't know what I am about. A serious auditor cannot generate doubts about his competency.* R9 also linked the need to prioritise with the *'rational expectation of clients is that we are selective, or at least prioritise the various testing procedures. Doing anything different will create unnecessary tension and will not even be practical. Prioritising some tests will indicate to the client that some preplanning and logical reasoning has gone into the audit. It earns us some respect in a very boring and rudimentary profession'.... we can't be dogmatic. Our ability to balance the guidelines requiring a thorough application of multiple and often redundant techniques with the need to show some reasoning leads us to prioritise.... that planning phase of the audit is what I enjoy most'*.

Conclusion

This study used Ghana data set and applied a mixed-methods approach to explore auditor perception regarding, and insightful reasons for perceiving, differential level effectiveness for 56 widely used audit procedures, in fraud detection, within the stock and warehousing cycle. Like New Zealand (Owusu-Ansah et al., 2002) and U.S. respondents (Moyes, 1996), Ghanaian respondents considered audit procedures that gathered direct evidence as *'more effective,'* that gathered substantive evidence as *'moderately effective'* and that gathered indirect evidence as *'less effective.'*

However, the Ghanaian data set revealed a comparatively higher number of highly effective audit procedures. The qualitative exploration revealed that Ghanaian respondents only classified a measure as *'more effective'* if it gathered direct evidence from primary data sources (rather than client pre-prepared reports) and affected audit planning. This finding did not differ based on demographic characteristics or firm size.

However, the actual deployment of the audit techniques in fieldwork differed significantly on the bases of gender. Female respondents still deployed the 56 audit procedures, where they are all applicable, with equal focus, however, male

respondents significantly prioritised perceived 'more effective' audit procedures. While female respondents considered an ethical responsibility in their deployment action as well as the need to be compliant with auditing guidelines, male respondents considered audit fees and the need to appear competent to the clients in their deployment action. Additionally, male respondents prioritise 'more effective' audit procedures because they believed it met client expectation and reduced auditor-client tension, whereas female respondents did not consider potential tension with clients in their deployment action.

The generalization of the results of this study must be done with caution and must consider these limitations. First, the 56 audit procedures tested within this study may not be an exhaustive list of procedures used within the stock and warehousing cycle. The measures tested are similar to Moyes (1997) and Owusu-Ansah (2002) to allow for a comparative analysis. Considering the fast-changing nature of audit practices aided by technology, new and more dynamic measures may have evolved, and hence the 56 listed procedures herein may contain some out of date and obsolete procedures. Nevertheless, the findings of this study are still relevant, considering that the interactions during face-to-face interviews suggested general awareness and application of these measures. No respondent ticked the 'not applicable' option in Section B of the questionnaire (Likert Scale responses), and no respondent filled Section C (that allowed respondents to state other procedures deployed). Second, the sample size, even though higher than previous studies may not provide the appropriate critical mass required for generalization, even though it may be helpful for contextual understanding and comparative evaluation by other studies.

Future studies can apply a longitudinal approach or participant observation to gain more insight into how auditors deploy such procedures. Emanating from reasoned action and Gidden (1990) assertion that humans are existential and purposeful, it is not far-fetched to anticipate that the actual deployment of audit procedures will provide more evidence regarding auditors' perceptions.

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Appendix

Audit Technique	Mean	Var	t-stat	P-value
1. Discuss with client management the stock and warehousing cycle.	4.04	0.50	1.70	0.09
2. Tour warehouse facilities and become familiar with storage, marking, and location procedures.	3.91	0.70	-0.11	0.91
3. Draw flow chart of internal control system and compare with written policies.	3.87	0.61	-0.63	0.98
4. Enquire about stocks in other locations, on consignment or on sale or return basis.	3.85	1.09	-0.66	0.51
5. Review policies regarding stock returns.	3.91	0.56	-0.12	0.91
6. Review procedures for receiving, inspecting, and storing incoming items and for shipments out of the warehouse.	4.0	0.44	1.21	0.23
7. Determine if access to stock area is limited to approved personnel.	4.17	0.36	4.15	0.00
8. Review adequacy of physical security for the entire stock	4.28	0.20	7.98	0.50
9. Review stock count procedures: [1] accounting for items in transit (in and out); [2] comparison of counts with stock records; and [3] reconciliation of differences between counts and stock records.	4.24	0.28	6.00	0.16
10. Review warehouse records for duplicate locations for the same items.	4.03	0.35	1.87	0.06
11. Review the last shipping document used at year-end and make sure the stock for that item was excluded from the physical count.	3.81	0.67	-1.21	0.23
12. Observe the physical count of stock at all locations.	4.25	0.55	4.45	0.27
13. Review the last receiving report used at year-end to make sure the stock for that item is included in the physical stock.	4.12	0.49	2.87	0.01
14. Review contracts with suppliers and customers and enquire from management about the possibility of the inclusion of consigned or other non-owned stock, or of owned stock that is not included.	3.74	0.79	-2.00	0.04
15. Examine shipping area for stock set aside for shipment, but not counted.	3.37	1.07	-5.37	0.18
16. Examine receiving area for stock that should be included in the physical count.	4	0.88	0.86	0.39
17. Examine stock descriptions on the tags and compare to the actual stock for raw materials, work in progress, and finished goods.	4.82	0.89	1.61	0.11
18. Examine financial statements for: [1] proper separate disclosure of raw materials, work in progress and finished goods; [2] proper description of the stock costing method; [3] inclusion of significant sales and purchase commitments; and [4] proper description of pledged stock.	3.82	0.49	-1.41	0.16
19. Compare the classification of raw materials, work in progress, and finished goods by comparing the description on stock tags and the auditor's recorded test counts to the stock listing schedule.	4.01	0.57	2.38	0.02
20. Compare the count of larger items stated on the tags to the counts in the prior year and the perpetual stock records.	4.05	0.35	2.15	0.03
21. Perform analytical procedures by computing ratios and comparing them with previous years.	4.06	0.53	1.91	0.06
22. Observe that non-owned goods are either identified or segregated.	3.98	0.61	0.77	0.44
23. Compare unit costs of stock determined from either FIFO or Weighted Average Cost valuation methods with previous years.	3.85	0.77	-0.79	0.43
24. Compare the extended stock value with previous years.	3.92	0.63	0.01	0.99
25. Compare current manufacturing costs with previous years.	3.89	0.90	-0.31	0.76

Audit Technique	Mean	Var	t-stat	P-value
26. Compare current stock levels and values with previous years and evaluate.	3.87	0.41	-0.76	0.45
27. Account for all used and unused tags to make sure none are lost, added or intentionally omitted (record tag numbers for those used and unused for subsequent follow-up).	4.08	0.83	1.75	0.08
28. Evaluate whether the percentage of completion recorded on the tags for work in progress is reasonable.	3.39	0.48	-7.75	0.85
29. Verify pricing by locating the appropriate and sufficient invoices to account for the entire quantity of stock for the particular item being tested, especially for the FIFO valuation method.	3.46	0.73	-5.46	0.44
30. Account for the direct material costs, direct labour costs, and overhead costs involved in the valuation of manufactured stocks.	3.61	0.74	-3.58	0.00
31. Determine whether costs should be included in the valuation of a particular item of purchased stock such as freight, storage, discounts, and other costs and compare the findings with the prior year's audit working papers to make sure the valuation methods are consistent.	3.78	1.07	-1.34	0.18
32. Trace balances of stock listing schedules to the general ledger.	4.19	0.55	3.62	0.00
33. Perform compilation tests to ensure that the stock listing schedule agrees with the physical stock counts.	4.25	0.69	3.97	0.00
34. Verify that stock balances on stock listing schedules agree with perpetual records (stock subsidiary ledger).	4.28	0.50	5.07	0.87
35. Trace from stock tags to the stock listing schedules and make sure stock on tags are included.	4.34	0.85	4.55	0.49
36. Trace stock listed in the schedule to stock tags and the auditor's recorded counts for existence, description, and quantity.	4.22	0.83	3.28	0.00
37. Trace stock tags identified as non-owned during the physical observation to the stock listing schedule to make sure that they have not been included.	4.23	0.74	3.60	0.00
38. Trace shipments to sales records, stock records, and bills of lading (shipping documents).	3.49	0.67	-5.33	0.09
39. Trace shipments to sales journals.	3.29	0.57	-8.45	0.44
40. Recount a sample of client's counts to make the recorded counts are accurate on the tags (also check descriptions and unit of count, such as dozen or gross).	3.59	0.72	-3.85	0.00
41. Test pricing by tracing unit costs from vendors' invoices to the perpetual stock records.	3.72	0.94	-2.04	0.04
42. In pricing stock, consider whether historical or replacement cost is lower.	3.03	1.31	-7.82	0.53
43. Extend the physical stock counts times the price on selected items on the stock summaries.	3.25	0.69	-8.15	0.10
44. Check the additions of the stock listing schedules for raw materials, work in progress, and finished goods.	3.86	0.52	-0.82	0.42
45. Test direct labour costs by comparing with labour payroll and collective contracts.	3.60	0.78	-3.59	0.00
46. Test number of hours needed to manufacture the product by comparing with engineering specifications.	3.54	0.93	-3.91	0.00
47. Perform purchases cut-off test to ensure that goods in transit on F.O.B. shipping point basis are recorded as purchases and included in stock.	3.83	1.26	-0.79	0.43

Audit Technique	Mean	Var	t-stat	P-value
48. Send confirmations to lenders for pertinent details about warehouse receipts pledged as collateral for liabilities.	3.89	0.73	-0.34	0.74
49. Obtain written confirmation of stocks in public warehouses.	4.01	0.80	1.12	0.26
50. Observed that damaged or obsolete goods are valued at net realizable value.	4.25	0.39	5.28	0.43
51. Identify slow-moving, obsolete, or damaged items within the stock.	4.07	0.45	2.25	0.03
52. If a standard costing system is used, determine if the valuation method is efficient and useful by review and analysis of the variances.	3.71	0.49	-2.98	0.00
53. Record client's counts for subsequent testing.	4.04	0.46	1.76	0.08
54. Follow up all exceptions to make sure they are resolved.	4.26	0.45	5.04	0.09
55. Review major adjustments for propriety.	3.95	0.49	0.44	0.66
56. Review related party transactions involving stock movements.	4.11	0.46	2.81	0.00