THE UNIVERSITY OF HULL

Enhancing Auditors Fraud Risk Assessment by using Throughput Model as a Decision Aid

A Thesis submitted for the Degree of Doctor of Philosophy

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Abstract

Following the recommendations in the current standards (e.g., Canadian Institute of chartered accountants, IAASB, AICPA (SAS No. 82 and 99)), along with the fraud triangle factors, in this work, a decomposition approach that employs SAS No. 99 factors is proposed, whereby these are decomposed in a Throughput model (TP) that serves as a decision aid. Auditors' task of assessing fraud risk is a critical step that affects auditing planning and procedures, especially in the light of the recent major financial scandals. Authors of several prior studies suggest that a decision aid is an effective way to improve fraud risk assessment and make the best use of professional skepticism. Throughput model breaks up the decision making into four main dominant concepts: Perception (P), Information (I), Judgment (J), and Decision Choice (D). This decision aid is expected to be beneficial in the performance of comprehensive fraud risk assessments, and direct the auditor's attention to wide classes of problems, especially those associated with the SAS No. 99/ ISA 240 requirements. This work is intended to test the decomposition of the categorized fraud risk factors into processes comprising the thinking model. In the present study, an experimental setting comprising of 42 auditors from different audit positions was adopted, and the model was tested using Partial Equation Modeling PLS. A comparison analysis was subsequently performed to compare auditors characterized by high and low skepticism in two fraud risk conditions (high and low). The results suggest that, when the SAS No. 99 factors were decomposed into the dominant concepts of the Throughput model, an effect was found between these dominant concepts. In addition, study findings reveal no significant differences between high and low skepticism when auditors follow the process of thinking model to assess fraud risk. These findings suggest that the requirement and recommendation under SAS No. 99 can effectively increase auditors' sensitivity to high risk factors when the situation suggests high fraud risk.

Keywords: Fraud, Throughput model, Virtue ethical theory, decision aid, SAS No. 99, Professional skepticism.

Dedication

This research, accomplished by the Grace of Almighty Allah, is dedicated to my mother and father. Without their encouragement, support and prayers I would not be able to achieve anything today.

Also, I dedicate this work to my loving husband Ali, for his continuous encouragement and unwavering belief in my ability, which gave me the courage to accomplish this task. His patience and sacrifice will remain my inspiration throughout my life. I am truly thankful for having you for everything.

I also dedicate this work to my mother-in-law Nasra for her love and moral support, and to my children, Ghazl, Ghena, Laith and Gaith, for giving me happiness and a life full of joy during my studies.

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This thesis is only a beginning of my journey.

Publications associated with this thesis

During the preparation of this thesis, some papers were prepared as listed below. The remaining parts of the thesis have not yet been published.

- **Al Shammakhi, Badriya and Rodgers, Waymond, (2015)**. *Fraud in Entrepreneurship: Throughput model focused decisions. Paper accepted by British Accounting and Finance Association (23-25 March 2015),* University of Manchester, Manchester.
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- **Rodgers, Waymond and Al Shammakhi, Badriya, (2016).** *Decomposition Approach in Enhancing Auditors' Fraud Risk Assessment.* Journal of Critical Perspectives on Accounting (under review).
- **Al Shammakhi, Badriya and Rodgers, Waymond, (2016).** *Improving Entrepreneurship Performance: Understanding Fraud Risk Factors*. Academy of Management Review (under review).
- **Al Shammakhi, Badriya and Rodgers, Waymond, (2016).** *The effects of a process of thinking decision aid on auditors' skepticism: Application of SAS No.99*. Journal of Practice and Theory (under review).

The author of this thesis also reviewed the following paper:

- Reviewed this manuscript (May 2016), "Business Advice by Accountants to SMEs: Relationships and Trust". *Journal of Small Business Management.*

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Chapter 1 Introduction

1.1 Introduction

This chapter presents an outline of the current research study. It provides background information that helps the reader understand the study concepts, as well as introduces the purpose of this study, research questions, and methods used, to draw the final conclusion, summary of the findings, contribution, and implications. The chapter concludes with a summary that includes the thesis structure.

1.2 Motivation and Theoretical Framework

Fraud is an ever-present threat which has increased considerably and has become one of the important concerns for management and business owners (Ştirbu et al., 2009). It is defined as an intentional act involving use of deception to obtain personal advantage illegally (Zimbelman, 1997). Auditors have the responsibility to plan and perform an audit to obtain reasonable assurance that financial statements present fair information that is free of material misstatements caused by either error or fraud (AICPA, 1996, 2002).

Statement on Auditing Standards (SAS) No. 82 requires auditors to assess any misstatement without paying attention to whether the material misstatement occurred with or without intention. This is referred to as a holistic risk assessment (AICPA., 1997). However, decomposition and holistic assessment were examined by many scholars (Jiambalvo and Waller, 1984; Norman et al., 2010; Wilks and Zimbelman, 2004a; Favere-Marchesi, 2013). In general, the current auditing standards (AICPA, 2002, 2007; CICA, 2004; IAASB, 2004) require auditors to understand the conditions that affect financial statement fraud by paying attention to three components of fraud triangle factors: incentives, opportunities, and attitudes. Decomposition specifically requires auditors to separately consider and evaluate these components before making an overall fraud risk assessment (Wilks and Zimbelman, 2004a). Authors of extant studies have established that decomposition results in increased attention to the fraud triangle components and allows auditors to anticipate management actions (Wilks and Zimbelman, 2004a; Norman et al., 2010; Favere-Marchesi, 2013; Holton, 2009). In addition, SAS No. 99 requires auditors to exercise a level of professional skepticism when assessing fraud risk (AICPA, 2002). However, these standards do not provide auditors with a specific decision aid to rely on when making fraud risk assessment. Authors of many past studies suggest that a decision aid is an effective way to improve fraud risk assessment (Pincus, 1989; Boatsman et al., 1997; Eining et al., 1997a; Hackenbrack, 1992; Hoffman and Patton, 1997). Generally, a decision aid can be a list of fraud factors or red flags organized in a way that makes the auditors' decision-making process effective by ensuring that no relevant factor is overlooked (AICPA, 2002; Wood, 2012a). This current study is different from the past decomposition studies in that its aim is to propose a comprehensive decomposition approach that covers all aspects of the assessment procedures, starting with the auditor's perception about a particular entity. More specifically, the categorized factors provided by SAS No. 99, AICPA (2002) is intended to be decomposed into process thinking stages that should provide a comprehensive assessment of those factors. Moreover, as a part of the present study, a comparison between two groups of auditors (denoted as high and low skepticism auditors) is performed.

Based on the study findings, use of the dominant concepts that are included in a comprehensive process thinking model, such as Throughput model (TP), is recommended. The TP model is a process thinking model that describes the stages involved in the decision-making process by including four dominant concepts: Perception, Information, Judgment, and Decision. Combining these dominant concepts in one pathway is expected to provide a comprehensible decision pathway to follow (Rodgers and Housel, 2004).

Rodgers, Guiral, and Gonzalo (2009) posited that six dominant ethical pathways influence auditors' going concern opinions, namely: ethical egoism, deontology, utilitarianism, relativism, virtue ethics, and ethics of care. Thus, the present study contributes to the pertinent literature by providing a framework that employs one of the ethical pathways of the TP model. This ethical pathway is the virtue ethics-based pathway, which is explained by the virtue ethical theory. This theory highlights cultivation of virtuous traits of character as morality's primary function, such as auditors' professional skepticism. For example, in Aristotle's moral philosophy, the notion of virtue is central (Aristotle, 1984). Virtues are ideal traits that are necessary for an individual to attain a state of harmony within, and to attain such a state in relation to one's social environment. Aristotle identified the following traits as basic human virtues: justice, courage, temperance, liberality (not miserliness), magnificence (generosity), pride, shame, honor, good temper, friendliness, wittiness, and truthfulness. Moreover, virtues do not represent absolute rules and should be defined in terms of a specific purpose. Further, the virtue ethics perspective implies that a morally bound person with good motivations is more likely to recognize what task should be performed than a morally immoral individual is. Beauchamp (1997: p.39) advocated that “A person who simply follows rules of obligation and who otherwise exhibits no special moral character may not be trustworthy.”

The virtue ethics perspective combines the elements of auditors’ professional skepticism and manner of evaluation in that it emphasizes rules and duties, as well as the consequences of actions. This pathway was chosen because it is believed that auditors should begin their critique process with knowledge about the entity’s main fraud risk factors (perception), as well as all other dominant concepts (i.e., in the TP model) in order to facilitate a comprehensive evaluation of all of the areas to avoid overlooking important areas. Following the recommendations given in the current auditing standards, especially in SAS No. 82 and 99 and International Standards on Auditing (ISA) 240, in the present study, a framework that uses the process-thinking model as a decision aid is proposed, along with the SAS no. 99 fraud risk factors that have been categorized into the components of fraud triangle factors (AICPA, 2002). The main objective of this study is to test the current study’s process thinking pathway and to examine the effect of the decomposition of the categorization of fraud factors in this model. In extant studies on fraud risk assessment, researchers failed to empirically investigate the categorization when it is decomposed in a cognitive process thinking model or small components that should work as decision aids (Webber et al., 2006; Eining et al., 1997b).

The remainder of this chapter is organized as follows. In Section 3, the auditor’s role in assessing fraud risk is discussed, whereas factors that auditors need to understand before assessing fraud risk are provided in Section 4. The usefulness of the TP model is elucidated in Section 5, where the model pathways are also explained. Section 6 is designated for the discussion of the framework of auditors’ decision making that should be adopted to assess fraud. The study results are the subject of Section 7, and are followed by the study conclusion and the implications of its findings for the research and practice.

1.3 Purposes of this Study

Fraud risk assessment is a fundamental task that requires audit knowledge and judgment. The accuracy of complex cognitive tasks, such as fraud risk assessment, is closely related to the quality of cognitive processes (Arkes et al., 2006). Similarly, performing orderly information processing has been found to decrease biases found in the judgment and decision making (Wheeler and Arunachalam, 2008; Jonas et al., 2001). Therefore, the problem this research addresses is how to enhance the auditor's fraud risk assessments process taking into account reducing the information load related to fraud risk factors. Thus, the first objective of this study is to examine the categorization of the SAS No. 99 fraud risk factors that is intended to be decomposed in a process thinking model (Throughput model − TP). This model breaks the process thinking into four stages (information, perception, judgment, and decision). The current auditing standards advise auditors to consider specific fraud risk factors in the context of the fraud triangle (AICPA, 2002; CICA, 2004; IAASB, 2004). However, they do not highlight the benefits that might result from decomposing auditor's judgment process into several parts (Favere-Marchesi, 2013). It is expected that auditors who decompose the categorized fraud factors into the TP model will produce a more accurate assessment of fraud risk in the high risk condition, and low assessment when the information given suggests low fraud risk level.

The second objective is to examine Wilks and Zimbelman (2004a) decomposition approach (henceforth W&Z decomposition approach), since this approach is adopted in the present study in the decision stage of the TP model, in response to the authors' call for future research to examine the components assessment when attitude suggests high fraud risk. Thus, the aim of this study is to examine separately the effects of two components of fraud triangle (incentive and opportunity) on the overall fraud risk assessment when attitude factors suggest high fraud risk, as well as when attitude cues suggest low fraud risk assessment.

The last objective of this study is to conduct a comparison analysis between two groups of auditors in between-subjects design (2×2) in two levels of fraud risk conditions. Auditors that possess high skepticism are more likely to be sensitive to fraud cues and employ systematic information processing, while auditors low in skepticism tend to rely on heuristics and nonessential cues (Shaub and Lawrence, 2002; Hurtt et al., 2008). The decomposition approach of the SAS No. 99 fraud factors into process thinking stages (Throughput) along with the W&Z decomposition approach are expected to increase the extent to which low skepticism auditors exert their cognitive processing. This decomposition approach is expected to enhance the skeptical thinking of auditors, in that auditors low in skepticism will be prompted to engage in as much skeptical effort as those high in skepticism. An assessment procedure that activates deeper cognitive processing and provides accepted judgment framework and skepticism continuum should increase assessment accuracy, and reduce the difference between high and low skepticism auditors' assessment levels (Glover and Prawitt, 2014).

1.4 Research Questions

In order to meet the study objectives, the following research questions have been considered:

1- Is a decision-making model, such as Throughput model, an effective decision aid in auditors' fraud risk assessments?
2- Is the ethical pathway 'Virtue based-pathway' effective in explaining auditors' decision choice in the process of fraud risk assessments?
3- What is the impact of the component assessments of fraud triangle factors on overall fraud risk assessments when attitude factors suggest high fraud risk condition?
4- Does the process thinking employed in this study enhance auditors' assessment, in that high and low skepticism auditors provide high assessments to fraud risk factor when fraud risk level is high?
5- Does the process thinking employed in this study help auditors avoid over-assessing the fraud risk factors when under low fraud risk conditions?

1.5 Overview of the Study Background

1.5.1 Auditors' role in assessing fraud risk

According to ISA 240, fraud risk assessment is one of the tasks that the auditor should perform when conducting an audit. On the other hand, authors of some prior studies have stated that there is no requirement for the auditors to actually perform the fraud risk assessment task (Waller, 1993; Krambia-Kapardis, 2002). Additionally, by 1930s, it was recognized that the principal audit objective is to verify the financial statements accounts (Vanasco, 1998), whereas by 1960s, general public started criticizing the auditors' rejection of responsibilities for detecting fraud. However, by 1980s, the courts have attempted to ensure that auditors would assume certain level of fraud detection duty (Porter, 1997). On the other hand, authors of several prior studies recommended that auditor should perform fraud risk assessment and an audit plan should be modified accordingly based on the level of fraud risk (Kanter et al., 1990; Morton and Felix Jr, 1991; Messier Jr and Austen, 2000; Mock and Turner, 2005).

Auditors' obligations and roles should be clear to the users of the financial statements in order to reduce the expectation-performance gap. The expectation-performance gap is the difference between the expectations the users of the financial statements and the general public have from auditor performance and those that the audit professionals accept when conducting an audit (Pierce and Kilcommins, 1996; Ojo, 2006; Ebimobowei et al., 2011; Lee et al., 2009). Porter (1993) represented a structure of the audit expectation-performance gap between the duties that can reasonably be expected from auditors and the expected standard performance of auditors' existing duties and auditors' perceived performance as perceived from society. Porter (1993) also divided the performance gap into 'deficient standards gap' which is the gap between responsibility society should expect auditors to perform and auditors' actual responsibilities, and the 'deficient performance gap' which is the gap between the expected standards of performance and the auditor' actual performance of these standards.

The term "audit expectation-performance gap" was first introduced by Liggio (1974) and was later tested by (Commission, 1978) to examine whether this expectation-performance gap exists (Okafor and Otalor, 2013). In general, management is required by law to present true and fair view of the financial statements, and the purpose of the audit practice is to ensure that (Edgley et al., 2015).

According to the ISA international standards (UK and Ireland) 200, International Auditing and Assurance Standards Board IAASB 2004 section 240 of Sarbanes-Oxley Act section 404, and SAS No. 99, auditors are required to evaluate antifraud programs and assess the internal control systems by planning the audit to ensure that the financial statements are free from material fraud (Apostolou and Crumbley, 2008). SAS No. 99/ ISA 240 also recommend that auditors engage in a brainstorming session for assessing fraud risk and searching for material misstatements (Carpenter, 2007). The skillfulness of the perpetrator, the size and frequency of manipulation, and the degree of collusion involved can assist auditors in increasing their ability to detect fraud (Bierstaker et al., 2010a). In general, auditing standards require auditors to understand the psychology of fraud by gaining knowledge of the fraud triangle factors in order to enhance the auditors' professional skepticism.

1.5.2 Auditors need to understand the following factors before assessing fraud risk:

1.5.2.1 Fraud

Dictionary definitions of fraud typically define it as intentional deception made for individual gain or to trouble another individual, and as a criminal and civil law violation (Bressler and Bressler, 2007). Deception is defined in section 133.1 of the Criminal Code Amendment (Theft, Fraud, Bribery And Related Offences) Act 2000 as the intention to dishonestly obtain a gain from the common wealth or collude with another person with the intention to dishonestly attain gain (Smith, 2001). Developing a precise definition of fraud is the first step in devising a prevention program, especially given that this deep concept has never been consistently and carefully defined (Vaisu et al., 2003). Intention is the only element that distinguishes fraud from fault; fraud is always intentional either by communicating a false statement to the victim to defraud the victim or by producing harm to the victim, whereby affected parties are deceived or deprived of something of value (Vaisu et al., 2003).

Two types of fraud are committed in business: personal use of a firm's resources (occupational fraud), and falsifying the financial statements to either attract investors or avoid paying higher taxes (fraudulent financial reporting) (Özkul and Pamukçu, 2012). Fraud can be large and complex, or small and simple, or lie anywhere in between, and it can be committed to benefit the organization, as in the case of fraudulent financial reporting, or cause loss to the organization by stealing valuable assets (Cohen, 2002).

The Association of Certified Fraud Examiners (ACFE) has classified fraud into six categories: (1) misrepresentation of material facts, which generally means presenting a false statement with the knowledge of its falsity; (2) concealment of material facts (failure to disclose material facts); (3) bribery, which refers to the corruption of an individual to take advantage of the business; (4) conflict of interest; (5) theft of money and property, including embezzlement, larceny, and theft or misappropriation of trade secrets (intangible assets); and (6) breach of fiduciary duty, which refers to the fiduciary relationship, such as officers, directors, managers or even brokers who can abuse the principal for personal advantage.

One of AICPA's implications is SAS No. 99, which provides a definition for both errors and frauds; it distinguishes errors as unintentional misstatements or omissions of amounts or disclosures in financial statements from fraud, which is defined as intentional misstatements or omissions of amounts or disclosers in financial statements. It also identifies that, in order for fraud to take place, three factors must be present:

1. Incentive/pressure—a motive to commit fraud
2. Opportunity—weaknesses in the internal control system
3. Attitude/rationalization—the ability to justify the fraud to overcome feelings of guilt

1.5.2.2 Fraud triangle factors

Cressey's (1953) fraud risk theory provides a framework for identification of firms' risk factors. That is, when fraud exists in financial statements, it can be connected with incentive (pressure), opportunity, and rationalization constructs (Cressey, 1950). Albrecht et al. (2006) likened this theory to fire, in that there are three elements necessary for fire to exist—oxygen, fuel, and heat—whereas fraud is unlikely to exist in the absence of one of the Cressey's factors.

The fraud triangle framework is extensively accepted. It was first adopted and introduced to the professional literature in SAS No. 99/AU section 316, *Consideration of Fraud in a Financial Statement Audit*, which requires auditors to conduct their fraud risk assessment for each engagement and encourages them to frame their fraud risk assessments around the elements of the fraud triangle (Trompeter et al., 2012).

Various scholars have extensively analyzed and evaluated fraud triangle factors to find out the reasons for the occurrence and the possible techniques for execution and hiding (Mackevicius and Giriunas, 2013). However, fraud triangle has been criticized by some authors, who argued that fraud triangle model is not an adequate tool for deterring, preventing, and detecting fraud. They also share the view that this model has ignored some important factors that have a direct relation to the existence of fraud, such as fraudster's capability and skills (Kassem and Higson, 2012b; WIPO, 2011 ; Koerber and Neck, 2006). Despite these criticisms of the fraud triangle model, auditors and other anti-fraud professionals use fraud triangle factors as the basis for their investigations and many models and theories related to fraud have been explained by the rationale afforded by the fraud triangle. According to the extant literature, it helps understand the factors that lead people to commit fraud and provides supplementary psychological or sociological background factors (Dorminey et al., 2012; Lokanan, 2015). Several studies suggest that auditors should apply the fraud triangle factors to assess the fraud risk and detect fraud (Hammersley, 2011; Sitorus and Scott, 2009; Jaffar et al., 2011).

First, incentive or pressure is defined as personal financial needs that motivate an individual to commit fraud (e.g., inability to pay bills, drug or gambling addiction, need to meet productivity targets at work, or desire to gain higher standards of living, such as a bigger house, luxury car, etc.). Second, opportunity pertains to one's belief that a fraud could be committed without getting caught (internal control system weaknesses). In other words, opportunity can be found in situations when a weak internal control can be manipulated by an employee to commit fraud, conceal his/her actions, and avoid being punished (Rae and Subramaniam, 2008). Empirical evidence suggests that opportunity red flags are in the top five important indicators of the likelihood of committing fraud (Omar et al., 2010).

Third, the rationalization factor can be defined as a justification of fraud, in that fraudsters exercise it to overcome feelings of guilt. Rationalization is the hardest factor to control since individuals' rationales are difficult to observe. Individuals justify their criminal acts in different ways (e.g., 'I am only borrowing the money,' or 'I deserve it, the company does not appreciate me, and it really does not hurt anyone') (Laufer, 2011).

Furthermore, , things moved on since Cressey's fraud triangle and new fraud models have been introduced such as fraud diamond model (Wolfe & Hermanson, 2004) and Crowe's fraud pentagon model (Horwath, 2011). However, the focus of this study of fraud triangle factors since SAS No. 99 categorized the fraud risk factors using Cressey's fraud triangle factors.

1.5.2.3 Professional skepticism

When individuals are assigned multiple duties, this may result in improper activities, which can include materially misreporting financial results to investors and creditors. Since this possibility of material misstatement may be due to fraud, auditors are required to maintain professional skepticism throughout the audit process (AICPA, 2002). Prior research on professional skepticism has examined its psychological and behavioral aspects, defined as an attitude that includes a questioning mind and critical assessment of audit evidence (Nelson, 2009; Quadackers et al., 2014).

Critical assessment is a way of critically thinking to decide whether a claim is always true, sometimes true, partly true, or false. However, this definition focuses on the psychological aspects of audit cognition, which is the auditor's questioning mind when assessing the evidence gathered, and does not view skepticism as a way of knowing (Toba, 2011). SAS No. 99 and ISA 240 require firms to pay attention to their fraud risk and raises the question of what factors influence auditors' questioning mind (professional skepticism) (Hurtt, 2010). Moreover, these current standards state that all businesses are exposed to fraud risk and require that firms evaluate if they have the necessary background and the fraud expertise, although they are not required to employ staff members that are specifically trained to think like forensic accountants.

For auditors to increase the level of their professional skepticism, they need to understand non-financial measures (NFMs), such as the number of employees, square feet of operations, customer satisfaction, and number of customer accounts. NFMs tend to be major drivers for firms' success in business (Rodgers, 2007). Financial and non-financial information should be correlated, so any critical differences between them can be taken as red flags for fraud (Ames et al., 2012).

Hurtt (2010) developed a model describing the characteristics of skepticism. This model can be very instrumental to auditing firms because it was built on a theoretical basis, which helped develop a psychological scale that aims to measure individuals' inherent level of skepticism. The Hurtt's Scale examines whether an individual auditor's level of professional skepticism is associated with differences in his/her behaviors or attitudes (Hurtt, 2010). Carpenter and Reimers (2013) used this scale to measure auditors' professional skepticism, and they found that, when the level of a fraud indicator is strong, its efficiency and effectiveness have important consequences for firms.

As the auditors' responsibility to detect fraud becomes more difficult in this changing paradigm, auditors are seeking to educate themselves (Cheney, 2005). According to (DiGabriele, 2009), it is the responsibility of management academics to educate future decision makers in forensic skills, especially the questioning mind skill, as this will add value to the future of improved fraud risk assessment.

1.5.2.4 Decomposition approach

A decomposition approach in fraud risk assessment requires breaking down the decision of the assessment in to small component judgments and then mechanically combining those components to reach an overall decision (Edwards, 1966; Einhorn, 1972). Moreover, decomposition approach is more likely to improve judgment accuracy by requiring less cognitive effort, making separate consideration of each element, and making global decision by recombining the components (Eining et al., 1997b; Hamilton, 2011; Kleinmuntz et al., 1996; Wilks and Zimbelman, 2004a; Bonner, 2008; Norman et al., 2010; Favere-Marchesi, 2013). Wilks and Zimbelman (2004a) found that the application of the decomposition approach has increased auditors' sensitivity to opportunity and incentive factors, and they concluded that separate assessment for the three components of the fraud triangle factors allowed auditors to be more aware of the manipulation by management, which should help in detecting fraud.

Norman et al. (2010) examined the effect of decomposition in a study in which the internal auditors were the subjects. They examined the effect of reporting lines and replicated Wilks and Zimbelman (2004a) decomposition assessment. Their findings suggest that internal auditors differ from external auditors in the extent of their sensitivity of the fraud triangle components. In the study conducted by Norman et al. (2010), internal auditors were more sensitive to incentive, opportunity, and attitude cues. Norman et al. (2010) explained that external auditors focus more on evidence that might indicate overstatement of financial performance, whereas external auditors tend to rely on the perceived correlation between management attitude and the probability of financial fraud and performance overstatement. On the other hand, internal auditors focus on evaluating the internal control system and, because they work with the management on daily basis, they may not be sensitive to the management attitude as they are to the incentive and opportunity cues. This suggests that there is a need for further studies examining how decomposing fraud risk assessment functions in relation to different fraud risk levels and individual level factors. In their work, Wilks and Zimbelman (2004a) manipulated the two components of opportunity and incentive in high and low risk conditions keeping the attitude factor to suggest low risk level. The present study extends their model by employing the decomposition approach in four dominant concepts of a cognitive process thinking model. In other words, the categorized fraud risk factors are decomposed in four stages of perception, judgment, and decision.

Decision stage in the current study replicates the W&Z model, in that the decision is decomposed in the same way as was done by Wilks and Zimbelman. However, in the present study, the three components of fraud triangle are manipulated, creating high and low risk condition. The current study thus extends the original W&Z approach by manipulating the attitude component to indicate low and high fraud risk. According to Favere-Marchesi (2013), when auditors perceive attitude as indicating low risk they might ignore the high risk associated with two components of incentive and opportunity. In the present study, the decomposition of SAS No. 99 fraud risk factors serves as a decision aid with structure of a series of judgments to be followed, presented in perception, judgment, and the decision stages of the Throughput model. In addition, a more detailed decomposition approach is employed when determining to the components of fraud triangle factors and performing the overall assessment in the decision stage.

Moreover, the work conducted in the current study responds to the call made by Wilks and Zimbelman (2004) for further research that examines the decomposition approach when the attitude indicates high fraud risk. As noted by the authors, “While this appears to be a significant concern of audit policymakers, future research should also examine what impact this decomposition will have on fraud risk assessment under conditions, such as when attitude cues indicate high fraud risk” (Wilks and Zimbelman, 2004a: p.742).

1.6 Throughput Model Focused Decisions Pathways

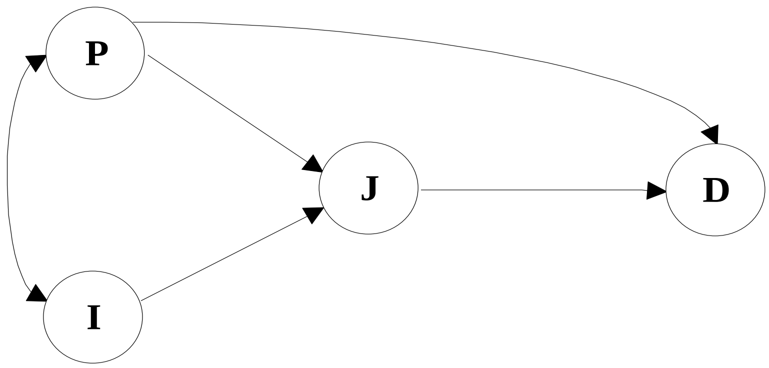
The cognitive process involved in considering a moral or ethical choice can be understood as an ethical decision pathway:

> *"Ethical pathways are not isolated responses but are general patterns of thought that consistently appear across many different kinds of issues… There is strong empirical evidence that suggests adopting theoretical ethical approach can lead to behavior that mirrors the approach" (Rodgers, 2009a: p.56).*

Philosophers, moral leaders, religious institutions, and others have defined, in many instances, ideal sets of moral principles or values (Rodgers and Epstein, 1997; Chippendale, 2001; Miller, 2005; Boldizar and Korhonen, 1999). Examples of pre-set moral principles or values at the implementation level include laws and regulations, church doctrine, codes of business ethics for professional groups, such as notary publics, and a code of conduct within distinct organizations (Rodgers and Housel, 2004). The separation of ethics and morality is a highly complex philosophical issue. Nonetheless, for the purpose of this study, the common understanding of ethics as a general term referring to both moral beliefs and ethical theories is adopted (Chippendale, 2001).

In the present study, the TP model is recommended for use in auditors' fraud risk assessment as a decision aid. The TP model has been used as a cognitive approach that helps auditors reach better reporting decisions (Rodgers, 2007). It has been also applied successfully in different contexts, such as loan analysis (AICPA., 1997; Rodgers and Johnson, 1988), banking (Andersson, 2004), tax compliance (O'Shaughnessy, 2014), ethics/corporate social responsibility (CSR) issues (Rodgers et al., 2015); auditors' ethical behavior (Rodgers et al., 2013), sexual harassment (Culbertson and Rodgers, 1997), as well as ethical dilemmas in auditing (Rodgers et al., 2009). The TP model includes four major concepts guiding human decisions: perception (P), information (I), judgment (J) and decision choice (D). The combination of these concepts will be explained by creating related pathways, which are also explained by known ethical theories (Figure 1.1).

Figure 1: Throughput Modeling Diagram



***Where P= perception, I= information, J= judgment, and D= decision choice*.**

Perception involves the process of individuals framing their problem-solving set or explaining how to understand or attach meaning to a situation based on previous experience (Pickens, 2005; Lindsay and Norman, 2013). Furthermore, Rodgers (2009a) argued that perception represents a person's expertise, classifying and categorization of information.

Information is a set of significant signs that has been processed into a form that is meaningful to the recipient. This stage includes the set of financial and non-financial information available to a decision maker for problem-solving purposes (Wersig and Neveling, 1975; Davis and Olson, 1984). The financial information includes liquidity (e.g., current assets/current liabilities), profitability (e.g., net income/sales), leverage (e.g., debt/equity), as well as market performance (e.g., price-earnings ratio). Non-financial information can be divided into three sub-groups of intangibles assets, namely human, organizational, and relational assets (Rodgers, 2003).

Judgment pertains to the integration of individual's knowledge and information about a person, object, or situation to reach an overall evaluation and as assessment between alternatives (Dowie, 1993; Maule, 2001; Einhorn and Hogarth, 1981b).

Decision choice arises when the individual identifies and chooses alternatives that might be based on the values and preferences of the decision maker by considering the possible consequences of different choices (Baker et al., 2002; Brockman and Russell, 2009).

1.6.1 Ethical pathways derived from the Throughput model

Ethical process thinking can be described in three primary pathways: *preference, rule,* and *principles*. These pathways vary on how much they rely on perception or available information. Particular combination of these three primary ethical pathways results in a further set of three secondary pathways: *relativism, virtue ethics,* and *ethics of care.* "An understanding of these six ethical pathways can help one compare, contrast, and reason with one's own ethical stance as well as other peoples' stances. There is strong empirical evidence that suggests that adopting a theoretical approach can lead to behavior that mirrors the approach" (Rodgers, 2009a).

The process thinking in the TP model emphasizes the six dominant ways to reach a decision choice, namely:

1) (P→D) represents the preference-based pathway, referred to in the literature as ethical egoism. Ethical egoism theory posits that humans are always motivated by self-interest. Hence, when people choose to help others, they do it ultimately for their own interests (Sidgwick, 1981). Egoists tend not to evaluate the facts available before they reach decisions, as they are not concerned with the consequences of their behavior as long as they maximize their benefits.
2) (P→J→D) highlights the rule-based pathway, referred to in the literature as deontology. Deontology is an ethical theory pertaining to making a decision either solely or primarily by considering the rights of individuals. The most famous deontological theory is derived from the thought of the German philosopher Immanuel Kant, who believed that, if all the universe follows the same rules and laws, the world will be better off (Kant, 1938). There is no need for deontologists to search for information, as the rules and regulations around them are already formulated into their perception, which would thus be evaluated to reach a decision.

3) (I→J→D) depicts the principal-based pathway, referred to in the literature as utilitarianism. Ethical utilitarianism holds that the good is whatever brings the greatest happiness to the greatest number of people. In other words, the right thing to do is that which produces the best consequences, in terms of material

welfare, reputation, or rationality (Singer, 2003). Utilitarianism was originally proposed by David Hume, but later 19th century thinkers like Jeremy Bentham and John Stuart Mill developed it further. Utilitarian individuals use the information around them and include it when making decisions without relying on their perception about a particular situation.

4) (I→P→D) represents the relativist-based pathway. The ethical relativist assumes that people use their views and attitudes and those of other people around them as their basis for defining ethical standards (Harman, 1978). Under this paradigm, there are no universally valid values and, in the absence of such universal values, each individual ought to do whatever seems the best to him/her, whether this decision is motivated by desire, reason, self interest, etc. (Rorty, 1991). Therefore, such individuals use the information they collect from their group to formulate their perception to reach a decision.
5) (P→I→J→D) reflects the virtue ethics-based pathway. Virtue ethics includes some versions of deontological and utilitarian theories in that it emphasizes duties or rules (P→J→D), or the consequences of action (I→J→D) (Hursthouse, 1999a). The virtue ethics-based pathway states that vales, attitudes, or beliefs enable individuals to act in ways that develop virtues.
6) (I→P→J→D) underscores the ethics of care-based pathway. The ethics of care is an approach that focuses on close personal relationships and asserts that caring should be a moral goal that works as a basis for acting (Held, 2006). This pathway places special attention on the reasons for performing certain actions. Since information (I) moderates the rule-based pathway (P→J→D), following a moral rule is often insufficient; instead, correct motivation will be needed and will be mostly determined by information.

1.6.2 Auditors' decision-making process framework in the fraud risk assessment

In general, fraud risk assessment includes the following three elements:

1. Based on historical information and known fraud schemes and interviews with staff, including management and business owners, the auditor will develop perception, which will be used to start measuring and assessing the significance of inherent fraud risk (Jones, 2009). Auditors' perception about the entity might be determined *a priori* if the auditor has previous experience with the same entity.

In addition, they will start exercising their perceptions and judgments to analyze the information they have collected. Five of SAS No. 99 fraud factors should be decomposed in the perception stage, as was done in the current study to enhance auditors' perception.

2. Once the auditor identifies the inherent fraud risk by creating perception about the level of fraud risk and the possibility of fraud, the focus should shift to schemes and scenarios that are applicable to the firm, including the existence of fraud triangle factors (incentives, pressures, and opportunities to commit fraud) (McKee, 2006). The auditor should start evaluating and analyzing the materiality level in the particular entity. In the current study, four fraud factors that are already categorized in fraud triangle components are chosen to correspond to the judgment stage.
3. Decision-making and responding to the significance of inherent fraud risk by deciding the overall level of fraud risk in the entity is the final stage of the audit process (Asare et al., 2008). As mentioned earlier, in this study, the decision stage replicates the Wilks and Zimbelman (2004a) decomposed decision approach. Hence, the decision stage is decomposed into three components of fraud triangle factors before assessing the overall fraud risk level.

1.6.3 Rationale behind choosing The Virtue Driven-pathway

As noted previously, this study is based on the premise that there is an optimal pathway to explain the auditor decision-making process, and is typically one of the secondary three higher-level ethical pathways. The three higher-level pathways add to the primary ethical pathways by including both perception (P) and information (I). They are motivated by the preference-based pathway (P→D) and the principal-based pathway (I→J→D) in that the primary pathways provide the foundations for the higher pathways (Rodgers, 2009a). The three higher-level ethical pathways are:

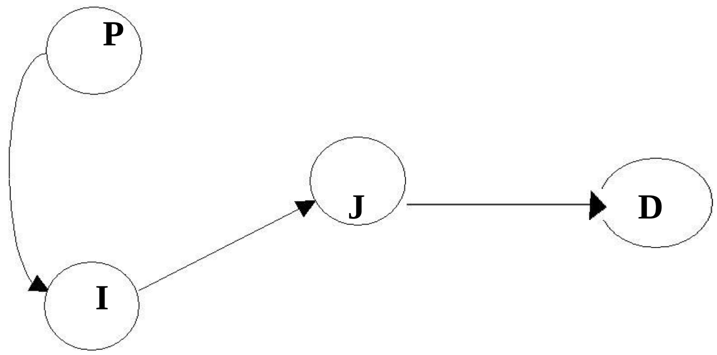
1. Relativist-based pathway (I→P→D)
2. Virtue Ethics-based pathway (P→I→J→D)
3. Ethics of Care-based pathway (I→ P→J→D)

The first higher-level ethical pathway is the relativist pathway (I→P→D). People who utilize this particular process thinking use information to change their preference-based pathway (P→D) into the relativist pathway (Rodgers, 2009a). This particular pathway highlights an unstructured environment, whereby individuals may use all information to influence their perception before rendering a decision. In the relativist pathway, the information can be complete or incomplete, as the individual would rely on adequate information to assist in revising his/her previous way of framing or viewing a particular problem. This pathway can accommodate a degree of time pressure, since a detailed analysis in the judgment function is not required for the decision-making process. However, in the present study, it is assumed that the relativist-pathway would not be suitable for auditors to follow, as the auditor cannot guarantee accuracy of the information provided. Moreover, this quick pathway to a decision is enhanced by the level of the auditor's experience or the expertise of the decision maker (Rodgers, 2006). Therefore, the use of this pathway is highly dependent on the information provided to the decision maker and how he/she perceives a particular situation (Rodgers et al., 2009).

Hence, auditors need to go through all dominant concepts in the TP model in order to conduct a comprehensive analysis of fraud risk. The second and third higher-level pathways include all the dominant concepts, i.e., the virtue ethics-based pathway (P→I→J→D) and the ethics of care-based pathway (I→ P→J→D). In the last pathway, information (I) enhances the rule-based pathway (P→J→D) and extends it by considering the change in environment and circumstances by gathering reliable and relevant information that might shed light on any overlooked areas (Rodgers, 2009a). This pathway enables information sources to modify and enhance the perception function, which influences analysis (Judgment) before a decision is made. Both the virtue ethics-based pathway and the ethics of care-based pathway might take a considerable amount of time to adopt, since they start from the beginning of the process thinking model with a comprehensive look at all areas. Therefore, these two pathways should help auditors make better decisions and enhance quality of fraud risk assessment. However, outcome of the ethics of care-based pathway would depend on information sources required to revise the perception function, and in unstable environment may cause the information set to become irrelevant (Rodgers, 2006).

Thus, it is posited that the best pathway for the independent auditors to follow in their decision-making process is the *virtue-driven pathway* (P→I→J→D), as shown in Figure 1.2.

Figure 2: The Virtue-based Pathway



The virtue ethical theory was Aristotle's view of sciences. It is characterized by essential similarities and differences with two other ethical theories—deontological, which places emphasis on duties or rules, and utilitarianism, which emphasizes the consequences of actions (Hardie, 1980). The right action in the virtue theory view is not the one that maximizes utility or the one with a moral rule, principle or law; an action of virtue ethicists is the one a virtuous agent would choose depending on the circumstances (Hursthouse, 1999b). Virtue ethics is partly intellectual and partly moral; the intellectual aspect requires experience and time, whereas the moral aspect is the outcome of habit and desire to do good (Hursthouse, 2013).

The virtue theory or the virtue-driven pathway was chosen for the present study for three reasons. First, this pathway accounts for the complexity of ethics in that good action might vary in every situation. Second, this pathway is flexible, in that it allows individuals to behave differently in different situations. Third, virtue ethics perspective is not solely driven by moral rules, which may have great consequences (Hardie, 1980). Thus, there is no effective guidance on how individuals should behave in every case; the action taken is determined by the individual attitude and assessment of the situation. For example, if two virtuous agents faced the same situation, one might decide to take her father off a life support machine and the other might decide to leave her father on it. Virtue theory clearly allows that no action is exclusively right in such a case, but both can be right (Hursthouse, 2013).

The virtue-driven pathway indicates how an individual's perceptual framing helps guide his/her actions and selects certain types of information used in the judgment function. In this pathway, the auditor's perception influences the available information, which can be modified to be analyzed before arriving at a decision. Understanding the behavior of fraudsters and their decision-making process adds to the knowledge and experience of auditors and thereby enhances their perceptions of fraud risk factors.

As can be seen from the TP model (Figure 1.2), the perception and information concepts are interdependent because information can influence how the decision-maker frames a problem (perception) or vice versa (Rodgers and Gago, 2006). In the TP model, the information is perceptually determined and framed in order to be used in the two later stages of the decision-making process (*judgment* and *decision*). The auditor's decision in assessing fraud requires perception and framing of the financial information and other internal and external information affecting fraud assessment. However, this framework is intended for auditors with a high level of independence, who will not reach decisions that can lead to client-preferred outcomes (Rodgers et al., 2009). In other words, perception should be advanced by understanding the fraud triangle factors and assessing the fraud risk, rather than the relationship between the auditor and the client.

1.7 Overview of the Research Methods

In this experimental study, the participants were 42 auditors, who were asked to respond to the hypothetical scenario and assess the fraud factors in three stages (perception, judgment, and decision). The Partial Least Squares method of structural Equation Modeling (PLS-SEM) was adopted for testing the current study model (Hypothesis 1 and 2). SPSS-20 was used for descriptive and comparative analyses. The experiment followed a 2×2 between-subjects design, allowing for two levels of skepticism (high and low) and two levels of fraud risk (high and low). The two cases employed in this study are adopted from Lindberg (1999) and Knapp (2006). Both case scenarios describe hypothetical clients in different industries. The auditors that took part in this experiment were asked to assess fraud risk factors that are provided by SAS No. 99 and categorized into three components of fraud triangle factors (Incentive, Opportunity, and Attitude).

1.8 Overview of the Study Findings

The results of this research indicated that auditors' perception of the fraud indicators provided in SAS No. 99 and their knowledge of the financial information ratios (liquidity, profitability, and leverage ratios) have significant influence on their judgment of SAS No. 99 fraud factors. On the other hand, auditors' assessment of the fraud triangle components and their overall assessment were influenced by the judgment stage. In other words, auditors have used their declarative knowledge and procedural knowledge in the assessment of Incentive, Opportunity, and Attitude before proceeding to the overall assessment. These results confirm those reported in extant studies, confirming that breaking down the assessment into stages for the given fraud cues help auditors to think more broadly about fraud risk factors (Wilks and Zimbelman, 2004a; Turkson and Riley, 2008; Johnson and Weber, 2009).

The results of the regression analysis indicate that, when the fraud triangle components suggest high fraud risk, auditors are more sensitive to incentive and opportunity factors in assessing the overall fraud risk level. However, the test employed in the present study is different from what utilized by Wilks and Zimbelman (2004a) and Favere-Marchesi (2013), who manipulated incentive and opportunity factors into high and low fraud risk while keeping fraud risk low. In addition, authors of these studies focused on comparing categorization assessment and decomposition assessment, whereas determining the effect of the fraud triangle components on the overall fraud risk assessment was the objective of the present study. Therefore, the findings yielded suggest that, when attitude factor indicates high fraud risk, auditors tend to pay more attention to the incentive and opportunity to arrive at the final assessment. However, when attitude suggests low risk, the results are in line with those reported by Wilks and Zimbelman (2004a) and Favere-Marchesi (2013) in that auditors gave low assessment to incentive and opportunity and consequently rated the overall fraud risk as low. In addition, in the low fraud condition, auditors were sensitive to all three components of fraud triangle factors.

After testing Hypothesis 3, a Pearson correlation analysis was performed to determine whether incentive, opportunity, and attitude assessments were correlated with the overall fraud risk assessments. This step was necessary to confirm the results of the regression analysis and to provide evidence that component factors affect overall fraud risk. Moreover, Pearson correlation analysis was used for testing the sensitivity of each component that flows from component risk assessment to overall fraud risk assessments. The Pearson correlation table in the high risk condition confirms that fraud triangle components significantly correlate with the auditors' overall assessment and incentive and opportunity play the critical role in their overall fraud risk assessment. Conversely, attitude factor was more correlated to the overall fraud risk assessment than were incentive and opportunity components in the low fraud risk condition.

The current auditing standards (AICPA, 2002; IAASB, 2004) urge auditors to consider assessing fraud risk factors in three separate assessment stages. However, they do not emphasize the power that comes from decomposing the judgment process into several parts (Favere-Marchesi, 2013). This study addresses this shortcoming, as its goal is to determine whether a decision-making model that separates the fraud risk assessment into three stages of perception, judgment and decision can help auditors simplify their fraud risk assessment. In general, the results show that auditors used these decomposed stages in their judgmental process to assess the overall fraud risk level. However, as any study, this work is also subject to certain limitations. Specifically, the research model was not compared to other decision-making models or even to a holistic approach, making it difficult to determine its wider applicability. Thus, this remains a fruitful area for future research.

Additionally, the results yielded by the comparison analysis between low skepticism and high skepticism conditions reveal that the current research auditing process thinking model has helped both groups improve their assessment process. There were no statistically significant differences between the assessments produced by the groups characterized by high and low level of skepticism when evaluating fraud risk, in high fraud risk condition as well as low risk condition. This finding confirms the results reported by Carpenter and Reimers (2013), who observed that, when auditors are presented with evidence or cues indicating fraud or incentive to encourage them to exercise skeptical judgment, they tend to make more skeptical judgments.

1.9 Contribution and Implications

The present study contributes to the existing research in fraud risk assessment in a number of ways. First, auditors are responsible for improving the fraud risk assessment process as a part of financial statement audit. Authors of past research call for more studies focusing on judgment and decision making processes, aiming to develop new strategies for auditors to follow (Milkman et al., 2009). In addition, auditing practitioners seek to answer questions regarding the best audit procedures that help detect financial fraud more accurately. They also need procedures that have been tested empirically, demonstrating their effectiveness in detecting financial fraud. It is also essential to define behaviors and indicators that help in detecting financial fraud and enhance fraud risk assessment (AICPA, 2002; IAASB, 2004; Nusbaum, 2007). It is also essential to adopt both behavioral and empirical perspectives in order to define the most effective procedures for detecting fraud (Nusbaum, 2007). Thus, research that aims to help auditors understand the fraud risk factors that influence their fraud risk assessment is valuable in that auditors might use the findings and recommendations to enhance their assessment procedures.

This study builds upon prior literature indicating that decomposition assessment is beneficial in the fraud risk assessment process. Therefore, the findings yielded by the present study contribute to the extant literature by introducing new process thinking model (Throughput) that should simplify the auditor's fraud risk assessment by decomposing the process into four stages. These stages are expected to prompt auditors to pay attention to different fraud factors. Additionally, these dominant concepts in the model separate the categorized SAS No. 99 into the factors that auditors need to assess as a part of their perceptual process after they memorize the financial information cues before they start evaluating the factors to reach a decision of assessment. This judgmental process thinking expected to provide and guide auditors to create a comprehensive evaluation in all the areas of fraud risk assessment.

The fraud risk assessment approach adopted in this study replicates the Wilks and Zimbelman (2004a) decomposed approach. These authors decomposed the decision into the fraud triangle components, whereby the auditors are required to assess the fraud risk components attributable to incentive, opportunity, and attitude before determining the overall fraud risk level. However, in their work, Wilks and Zimbelman (2004a) have manipulated the two components of fraud triangle incentive and opportunity keeping attitude to present low fraud risk. In contrast, in this study, the three components of fraud risk factors have been segregated into high and low fraud risk condition, which has not been done before. Hence, this research adds to the literature in examining auditors that have different professional positions (partners, managers, senior) and the way they behave when the attitude cues present high fraud risk.

Moreover, the results of previous studies suggest that, although high skepticism is required, too much skepticism might increase the cost and the time of audit engagement. In addition, exercising low level of skepticism would result in undetected fraud that might drive the firm to bankruptcy. This study contributes to the literature in examining and comparing two groups of auditors (characterized by high and low levels of skepticism, respectively) to determine whether their skeptical judgment is influenced by the use of a comprehensive decomposition approach. Despite the significance of auditor's skeptical judgments and decisions, there is a lack of empirical data on how to enhance auditors' skepticism and how can process thinking change skeptical judgment in specific settings (Quadackers et al., 2009). Moreover, in low fraud risk conditions, auditors may show similar levels of low skeptical judgment but the level of skeptical judgment would be different depending on their level of skepticism. Therefore, in this study, it is proposed that auditors engage in more systematic processing which should direct both high and low fraud risk assessment and result in more accurate outcomes. This study also adds to the literature in analyzing the interaction between the level of fraud risk condition and the skepticism dimensions that will help in explaining judgments and decisions (Hurtt et al., 2008).

1.10 Summary

This chapter provided a summary of the thesis content by presenting some background information, objectives, research questions, methodology, and contribution. This thesis is structured into eight chapters, whereby the first chapter provided the introduction and the basis for the later chapters in this thesis. The second chapter provides the literature review that examines the relevant literature on auditing and specifically in auditors' fraud risk assessments. The third chapter presents the theoretical framework indicating that the Throughput model as a decision making model should be employed in fraud risk assessments performed by auditors.

The forth chapter presents the hypotheses development, whereby critical review of the existing literature is performed to derive the hypotheses on the basis of relationships among the variables under study. The fifth chapter presents the research methodology that includes the research philosophy, research approach, and research strategy, as well as provides the overall research plan for answering the research questions. The sixth chapter is dedicated to the detailed analysis of the study results. The seventh chapter presents the discussion of the study findings in relation to the existing literature. The eighth and the last chapter concludes the thesis by providing a summary of the main findings and discussing the study limitations, as well as offering suggestions for future research.

The following chapter investigates and reviews the existing literature.

Chapter 2 Literature Review

2.1 Introduction

This chapter presents a detailed review of the literature on auditors' fraud risk assessments. In addition, it provides analysis of previous work related to this research that helps the scholar of this thesis to become familiar with existing studies prior to collecting the research data. This chapter begins by presenting the literature arguments in regard to the role of auditors in fraud risk assessments.

The review includes extensive literature on the following research concepts: fraud risk assessment, the use of fraud indicators, the effectiveness of decision aid, decomposition as a decision aid, SAS No. 99 fraud risk factors, fraud triangle factors, and professional skepticism. Through critical analysis of the existing literature, the author was able to identify gaps in the literature that justifies the conducting of the present study and validates its contribution to the research field.

2.2 Auditors' Role in Fraud Risk Assessment

According to ISA 240, fraud risk assessment is one of the tasks that the auditor should perform when conducting an audit. On the other hand, authors of some prior studies have stated that there is no requirement for the auditors to actually perform the fraud risk assessment task (Waller, 1993; Krambia-Kapardis, 2002). Additionally, it was known by 1930s that the principal audit objective is to verify the financial statements accounts (Vanasco, 1998), whereas by 1960s, general public started criticizing the auditors' rejection to the responsibilities for detecting fraud. However, by 1980s, the courts have attempted to ensure that auditors perform fraud detection within reasonable limits (Porter, 1997). On the other hand, authors of several prior studies recommended that auditor should perform fraud risk assessment and an audit plan should be modified accordingly based on the level of fraud risk (Kanter et al., 1990; Morton and Felix Jr, 1991; Messier Jr and Austen, 2000; Mock and Turner, 2005).

The auditor's obligations and roles should be clear to the users of the financial statements in order to reduce the issue of expectation-performance gap. The expectation-performance gap is the difference between the expectations from the users of the financial statement and the general public from auditor performance and the actual audit professionals' view of their responsibilities in conducting an audit (Pierce and Kilcommins, 1996; Ojo, 2006; Ebimobowei et al., 2011; Lee et al., 2009). The term “audit expectation gap” was first introduced by Liggio (1974) and was later tested examine whether this expectation gap exists (Okafor and Otalor, 2013).

The public users are generally expecting high performance from auditors in detecting and preventing fraud. Thus, it is assumed that auditors’ responsibility extends beyond examining and testing the fairness of the financial statement (Sikka et al., 1998). However, many auditors are of the view that financial statement fraud detection is the responsibility of management, since management is responsible for implementing appropriate internal control systems to prevent fraud in their organizations (Vinten et al., 2005a; Porter, 1997). Thus, in order to reduce this expectation-performance gap, some researchers suggest that greater responsibility should be given to external auditors (Chye Koh and Woo, 1998). Ebimobowei et al. (2011) examined the role of theory and audit expectation-performance gap and stated that the expectation-performance gap should be closed by satisfying reasonable expectation of the public, and that if this expectation is not clear, the auditor as the role model will perform poorly. Okafor and Otalor (2013) have also recommended that it is very important to educate the public and improve their understanding on the auditor’s duties and responsibilities to reduce their unreasonable expectations.

In general, the purpose of the audit practice is to ensure that the presented financial statements show a true and fair view and are not misleading. Auditors are responsible for professional conduct, to plan and perform audits and obtain reasonable assurance about whether the financial statements are free from material misstatement (AICPA, 1988; Soltani, 2007). SAS No. 82 distinguished between responsibility of auditor and management, stating, “The auditor has a responsibility to plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatements, whether caused by error or fraud….The auditor has no responsibility to plan and perform the audit to obtain reasonable assurance that misstatements, whether caused by error or fraud, that are not material to the financial statements are detected” (AICPA, 1997b).

In accordance with Section 404 of Sarbanes-Oxley Act and SAS No. 99, auditors are required to plan and evaluate a client’s programs and internal control and to issue an opinion on management’s assessment of internal control. Professional skepticism is one of the important attitudes that SAS No. 99 required auditors to adopt along with conducting brainstorming sessions to discuss the risk of material fraud and how it could be concealed (AICPA, 2002). Maintaining professional skepticism throughout the audit should help in recognizing the potential for management to override controls, as well as in designing procedures to detect the material misstatement. In addition, auditors are responsible for obtaining and evaluating sufficient appropriate audit evidence regarding the assessed risks of material misstatement due to fraud (AICPA, 1997b, 2002). However, the audit should be designed to give a reasonable likelihood that fraud will be detected, which can be ensured by adopting a level of professional skepticism in every stage of the audit (Abdullatif, 2013; AICPA, 2002; Porter et al., 2008).

Moreover, SAS No. 99 requires auditors to gather and consider different types of information in assessing fraud risk. The international standards ISA (UK and Ireland) 200 require auditors to pay attention to the effects of inherent limitation. This pertains to the cases where the risk of not detecting material misstatement resulting from fraud is greater than the risk of not detecting material misstatement resulting from error, this is because fraud may involve complicated organized schemes designed to conceal it (Harrison, 2009). Furthermore, the risk of detecting material misstatement resulting from management fraud is higher than employee fraud, due to the management being in position to directly override the internal control system.

SAS No. 99 also required auditors to pay attention to the risk factors and the identification of red flags that could assist the auditor in detecting fraud in the financial statements. It emphasizes the importance of considering the three components of the fraud triangle factors (Cressey, 1950) which provide explanation of how fraud might be pretreated. SAS No. 99 and ISA No. 240 have listed numerous fraud risk factors related to pressures, opportunities, and rationalization, relating these factors to the two major types of fraud, which are fraudulent financial statements and misappropriation of assets. The existence of these factors may not necessarily imply presence of fraud in the financial statement, but auditors must take certain actions in the presence of such factors (Albrecht et al., 2008). These actions might involve changing some of items included in the plan, such as the quantity, timing of audit procedures, or even including more experienced auditors in the audit team.

Furthermore, according to SAS No. 99 and ISA 240 recommendation, in maintaining professional skepticism, the auditor should recognize the possibility of fraud and the auditor should ignore any positive experience of honesty and integrity of the entity's management and those charged with governance to avoid decisions that can lead to client-preferred outcomes (Rodgers et al., 2009). If conditions identified during the audit give the auditor a reason to question the authenticity of evidence collected or that it has been modified but not disclosed to the auditor, the auditor will have to explore further and review more data (Apostolou and Crumbley, 2008). Discussion among the engagement team is also required from the auditors in SAS No. 99 and international standards ISA 240, because this discussion might place particular emphasis on the areas where the financial statements may be susceptible to material misstatement due to fraud and how fraud might occur. It is important to mention that, in the activity, auditors should set aside the honesty and integrity of management and those charged with governance. The auditor should obtain information to identify the risks of material misstatements due to fraud in order to obtain understanding of the entity and its culture and environment, including the entity's internal control system (AICPA, 2002; ISA240, 2009). The information obtained from other risk assessment procedures should also be evaluated to indicate if one or more fraud risk factors are present and whether fraud has occurred.

The auditor should determine overall responses to address the assessed risks of material misstatement due to fraud. In doing so, first, the auditor should assign and supervise personnel taking account of the knowledge, skill, and ability of the individuals to be given significant engagement responsibilities. Second, the auditor should assess whether the application and accounting policies by the entity, mainly those related to subjective measurements and complex transactions, may be indicative of fraudulent financial reporting, and finally incorporate an element of randomness in the selection of the nature, timing, and extent of audit procedures (ISA240, 2009; AICPA, 2002). Although the Public Accounting Oversight Board (PCAOB) inspection team observed numerous cases where auditors failed to implement SAS No. 99, the American Institute of Certified Public Accountants (AICPA) continues to release a series of audit risk standards (SAS Nos. 104-111) (Chui and Pike, 2013).

According to Jaffar et al. (2008), the ability to assess fraud risk is largely overlooked in the fraud detection literature and that this is an important issue that should not be ignored, as the factors affecting auditors' ability to assess fraud risk might not be understood. Thus, one of the aims of the current study is to examine effects of some of SAS No. 99 factors on the auditors' ability to make appropriate fraud risk assessments and consequently decide on the proper detection procedures. The aim is to ensure that, when those factors are organized in a certain way, they will enhance auditors' cognitive judgment.

2.3 Fraud Risk Assessment

Auditors need to assess and identify risks to determine what areas are more susceptible to fraud. Fraud risk assessment requires high-level judgment as it is a multi-attribute task that requires auditors to exercise their knowledge, experience, and reasoning (Loebbecke et al., 1989). The risk can be expressed in words as probable, likely, or unlikely, or in percentage chance such as 60% or 20% chance. In practice, auditors normally uses very low, low, moderate, and high level, when rating the likelihood of fraud in financial statements (Carpenter et al., 2011b). Auditors are required to assess the client's fraud risk level prior to planning the audit. Even if the auditors would like to examine each single transaction, they simply cannot, as they are allocated a fixed time and budget for their work. If they spend too much time reviewing one account, they might overlook another important area (AICPA, 2002).

In order for auditors to detect fraud, they have to be successful in performing higher fraud risk assessment, as the level of this assessment enhances the auditor's ability to detect fraud. According to Hogarth (1991), there is always a need for more quality studies that examine and explore detailed aspects of judgment processes in auditing. To date, several studies have been conducted to address fraud risk assessment. For example, Bloomfield (1995) studied strategic reasoning, using laboratory experiments to see if the accuracy of the audit fraud risk assessment varies with the auditor's degree of strategic reasoning. His findings showed that inaccurate assessment of fraud risk leads to lower payoffs for both auditors and management, and that inaccurate expectation by auditors and managers may make the auditor's report unattractive for investors.

Authors of other studies have examined fraud risk assessment using strategic reasoning combined with another procedure, such as brainstorming or game theory (Hoffman and Zimbelman, 2009). Generally, their results show that using strategic reasoning along with any other technique may improve the fraud risk assessment, and that brainstorming can be more effective at obtaining ideas and developing procedures to detect fraud. However, Carpenter (2007) found that brainstorming sessions alone result in increasing auditors' fraud risk assessments especially when fraud was present. This finding supports SAS No. 99 recommendation for using audit team discussion and brainstorming. Desai and Gupta (2015) examined the effect of group brainstorming using the audit procedure recommended by SAS No. 99 on auditors' perceptions of incentives and opportunities in fraud risk assessment. The results of their study indicated that auditors assessed fraud risk as significantly higher when they observe high pressures and low opportunities compared to the scenario in which they observed low pressures with high opportunities. Moreover, this difference was significantly higher when they performed group brainstorming. Kochetova-kozloski et al. (2011) conducted a study on improving auditors' fraud judgments using a frequency response mode. Their findings indicated that using statistical reasoning within an understandable framework can better help auditors improve their judgments and decision-making when assessing rare events, such as fraud and when information is presented as natural frequencies instead of probabilities. Although the authors focused on psychological aspects, they have applied their approach to the general population and they failed to provide any specific subpopulation information (e.g., red-flag style).

Additionally, Mock and Turner (2005) used a sample of 202 audit clients to investigate actual fraud risk assessments and their influence on audit programs following the consideration recommended in SAS No. 82. They found that the changes to audit programs were associated with increased fraud risk assessment, in that the decision to modify the planned audit program in response to the fraud risk assessment was affected by the identification and documentation of fraud risk factors. Moreover, they also found that, regardless of the level of their assessed client risk, the changes to the audit programs were most often linked with identification of industry-based risk factors.

Improving the fraud risk assessment through analytical procedures was part of the study conducted by (Jones, 2004). The importance of this research lies in the introduction of two new auditing standards that require the auditors to perform and document a specific fraud risk assessment. The author provided evidence that the analytical procedures have not been used effectively by auditors; this evidence was derived by using logistic regression in identifying variables in financial statements where fraud is more prevalent.

Jones' study suggests that the fraud risk assessment can be improved by the auditors using an effective analytical procedure. However, akin to many studies on fraud, the author lacked actual fraud data, and thus had to resort to archival analysis of the potential benefit of auditors utilizing an improved analytical procedure. Trotman and Wright (2012) examined fraud risk assessment following triangulation framework, which states that external evidence collected by auditors should enhance auditors' skepticism and increase the quality of their fraud risk assessments. The results reported by the authors revealed that auditors fraud risk assessments were influenced by evidence linking to the client's business model only when financial statement and business process performance information were in conflict.

Furthermore, (Brazel et al., 2009) examined whether the relationship between financial measures and non-financial measures would help in assessing fraud risk. They stated that, as fraud firms are unlikely to manipulate both the financial statement and non-financial measures at the same time, comparing the two might lead auditors to fraud cues that should help them make better decisions regarding the assessment of fraud risk. They found that fraudulent firms had significant differences between the changes in their financial measures and their non-financial measures, suggesting that auditors should take into account non-financial information when assessing financial statement fraud risk.

Auditors' success in detecting fraud depends on the process adopted for assessing fraud risk; they employ it to assess the likelihood that fraud might exist and this process most of the time depends on their past experience with the client and the amount of evidence. The level of assessed fraud risk directs auditors toward the areas in which they need to concentrate their audit procedures. In the fraud risk assessment process, auditors might be left with tradeoff between audit effectiveness and audit efficiency. In other words, high fraud risk assessment might increase the effectiveness in addressing fraud in financial statement audit, which may result in increased time and audit cost (Skalak et al., 2011). Conversely, low fraud risk assessment when fraud is present would increase the auditors' efficiency, but might put the auditor into litigation, costly settlement, and reputation loss (Palmrose, 1987). However, performing audit program or audit plan based on the fraud risk assessment helps auditors to increase audit efficiency without forfeiting audit effectiveness (Hoffman and Zimbelman, 2012). Furthermore, the audit risk model and audit standards recommend that auditors should maintain an explicit fraud risk assessment and develop audit plans that vary with fraud risk factors (Zimbelman, 1997; AICPA, 1988; AICPA, 2002). In addition, Glover et al. (2003) reported that SAS No. 82 auditors are more alert of the necessity to adjust audit plans and typically increase the degree of their audit test to the level of fraud risk assessment. However, according to Knapp (2012), auditors respond to high level fraud risk by performing more traditional tests and increasing the scope of standards, rather than developing effective fraud detection procedures. Authors of some prior studies found a weak association between fraud risk and audit plans (Asare and Wright, 2004; Quadackers et al., 1996). On the other hand, other authors reported strong evidence suggesting that there is a link between some of the client risk factors and audit plans (Mock and Wright, 1999; Hackenbrack, 1992).

In the present study, the same classification of prior fraud risk assessment research is used as that employed by Nieschweitz et al. (2000). Nieschweitz et al. (2000) classified fraud risk assessment studies into three subsections: (1) research that tests empirically the validity of fraud indicators in fraud risk assessment; (2) studies on unaided fraud risk assessments that examine the auditors' processes of assessing fraud risk and measuring the auditor's performance in doing so; and (3) works that discuss methods that help auditors' improve their judgment in fraud risk assessment (aided fraud risk assessment).

2.3.1 The use of Fraud indicators (e.g. red flags, checklists) in fraud risk assessment

Fraud indicators (red flags) help to alert the auditors of the possibility of fraud so they can plan, discuss, and give an early warning to the client. The risk of detecting fraud would decrease if the auditors understand the red flags and apply their skepticism in a professional manner (Smith et al., 2005). SAS No. 82 started implementing fraud risk assessment by identifying fraud risk factors (red flags) that is believed to be associated with an elevated risk of fraud and by requiring auditors to consider these red flags and make a separate assessment of fraud risk (AICPA, 1997b). Additionally, SAS No. 53 has provided qualitative and quantitative fraud indicators that have been validated to examine its fraud predictive ability (Loebbecke et al., 1989; Hansen et al., 1996; Albrecht et al., 1986; Summers and Sweeney, 1998; Spathis, 2002). Judgmental checklist or red flags can be defined as a decision aid that decomposes judgment into components that decision makers can evaluate, and combine to provide the best solution (Raiffa, 1968).

“Red flags” checklists have been examined experimentally in fraud risk assessment studies, yielding results that invalidate the use of fraud “red flags” checklists. Specifically, several authors found that using checklists would restrict auditors’ creation of ideas for fraud detection and thus harms the process of fraud risk assessment more than it helps (Pincus, 1989; Asare and Wright, 2004; Hogan et al., 2008; Jamal, 2008). However, other researchers found that checklists are useful in fraud risk assessment as their use improved the effectiveness of audit decisions (Eining et al., 1997b; Bell and Carcello, 2000; Marley, 2011). According to McKee (2010: p.3), “The best empirical estimations indicate that the overall financial fraud risk rate in specific audit probably changes by approximately .003 from overall environmental fraud risk when red flags are present.” Hence, this small change indicates that using red flags significantly increases auditors’ overall fraud risk assessment. Moreover, authors of some studies have suggested a way to make the red flags checklists more useful. For example, Hammersley (2011) suggested that red flags fraud checklists can be more effective when supplemented with client-specific contextual cues related to the client’s circumstances in the year under audit in order to translate the assessment of fraud risk into an effective audit plan. Pincus (1989) also suggested that checklists can be improved by identifying and focusing on a small number of high predictability red flags instead of providing large number of red flags with limited predictive ability. However, several previous studies on using of checklists indicate that auditors could improve their risk assessment through simple modification to checklist design (Boatsman et al., 1997; Bedard and Graham, 2002; Wood, 2012b).

Mock and Turner (2005) found that auditors working for clients that have been assessed and categorized as having higher client risk than those assessed as having lower client risk. Similarly, Albrecht et al. (1986) found that 31 factors had significant fraud predictive ability, 30 had no ability, and the remaining 26 could not be tested due to insufficient data. However, the authors faced many difficulties, such as low incidence of fraud, reluctance of firms to participate, and the various levels of participants’ understanding of terms used to describe the red flags. Loebbecke et al. (1989) assessed the likelihood of fraud and presented a logical model designed to increase the cognitive involvement of auditors. The model put the fraud factors into three categories—conditions, factors that might motivate a person to commit fraud, and attitude (personal ethics). Although the authors employed a comprehensive theoretical model, they failed to provide an integrating algorithm for calculating an overall risk level (Nieschweitz et al., 2000).

Using external information along with internal information would help auditors discover fraud indicators that might lead to detection of existing fraud. Summers and Sweeney (1998) conducted their study on the premise that external information might improve fraud risk assessment, and reported that the insider trading power can support the process of fraud risk assessment. They hypothesized that, during the period of fraud's occurrence, the managers would be involved in trading activity that might work as red flags for fraud, such as reducing the net position in the entity's firm by selling more stock and buying less stock. Their findings indicate that insider trading and financial statement factors are useful when using a model that differentiates firms based on the presence of fraud, which eventually helps both auditors and regulators monitor insider trading to detect fraud.

2.4 Studies where the Decision Aid did not Play a Role in the Process of Fraud Risk Assessment

In the psychology literature, some cognitive biases are highlighted, whereby when auditors as decision makers may unintentionally use heuristics to complete audit tasks, such us the dilution effect (Hackenbrack, 1992; Nelson and Tan, 2005; Waller and Zimbelman, 2003), halo effect and anchoring effect (O'Donnell et al., 2005; Chapman and Johnson, 2002; Kowalczyk et al., 1998; Switzer and Sniezek, 1991). Dilution effect is the propensity of non-diagnostic evidence to dilute the significant power of diagnostic evidence; it occurs when auditors unintentionally integrate irrelevant information in to judgments of fraud risk (Hoffman and Patton, 1997). Halo effect is "a marked tendency to think of a person in general as rather good or rather inferior and to overshadow the judgments of the person's specific performance attributes by this general feelings" (Thorndike, 1920: p.25). The halo effect was found when using holistic strategic assessments that influence the extent to which auditors adjust account-level risk assessment (O'Donnell et al., 2005). Anchoring effect has been defined as the tendency to anchor on an estimate for one event and adjust to take into account the other events, as well or when uninformative number influences the judgment (Chapman and Johnson, 2002). For example, an auditor is asked to estimate whether atypical accounts receivable sample size for a global financial institution is greater or less than a randomly chosen number (e.g., 500). When the auditor is asked to generate the estimate for the account receivable of an comparable financial institution, he/she would be likely to have an estimate close to 500 on either side, exhibiting an anchoring effect on the 500 and under-adjustments (Harvey, 2007).

Authors of some previous studies indicated that auditors' perception of management's attitude or character affect their prediction of the likelihood of fraud (Nieschweitz et al., 2000; Wilks and Zimbelman, 2004a). SAS No. 99 required auditors to ignore any past positive experience with client's management, as auditors tend to lower their assessment of fraud risk when positive characteristics like integrity are present (Graham and Bedard, 2003), developing anchor belief on certain information which leads them to fail in adjusting that belief when new information is attained (O'Donnell et al., 2005; Payne and Ramsay, 2005).

Previous studies provide evidence that auditors' aided judgment would result in lowering their estimate of fraud risk when exposed to irrelevant information. For example, Hackenbrack (1992) examined the use of non-diagnostic information on auditors' fraud risk assessment, based on a judgment phenomenon known as the dilution effect. The author found that using both red flags and irrelevant information caused auditors to be less sensitive to the red flags, which led auditors to lower their fraud risk assessment. The result also support that auditors' fraud risk assessment would be enhanced by using red flags without any other distracting information.

Furthermore, (Hoffman and Patton, 1997) extended the work of Hackenbrack (1992) by investigating the dilution effect in psychology aspects, and found that accountable auditors' judgments in fraud risk assessment are more conservative than those of less accountability. This discrepancy exists because unaccountable auditors attend to use irrelevant information more often than accountable auditors, which opens a new area for future research on the effect of accountability of auditors in fraud risk assessment (Nieschweitz et al., 2000). In 2006, Favere-Marchesi and Pincus published a study on the impact of accountability and locus of control on auditors' processing of non-diagnostic evidence. They investigated whether holding subjects accountable would exacerbate the dilution effect and whether high pressures from different levels of accountability would result in a greater dilution effect. They found that accountability has an impact on both the frequency and extent of the dilution effect (Favere-Marchesi and Pincus, 2006).

While Hackenbrack (1992) and Hoffman and Patton (1997) gave an important insight into the influence of the dilution effect on auditors' judgment, they did not examine the effect of audit experience on the dilution effect. Addressing this gap, Shelton (1999) examined the effect of experience on dilution effect by comparing three levels of experienced auditors—seniors, managers, and partners. She found that seniors' judgments were compromised by irrelevant information, and were thus diluted. On the other hand, managers and partners did not exhibit dilution. However, Shelton noticed that the dilution effect decreased linearly with experience and that the bias seemed to disappear once auditors have gained around eight years of experience. Moreover, Knapp and Knapp (2001) reported that experience has the potential to reduce cognitive biases. They tested whether audit managers were more effective at using analytical procedure to detect fraud than audit seniors were. Their finding indicates that auditors become better at discovering fraud risk factors as their level of experience increases, as managers performed better than seniors did.

Waller and Zimbelman (2000) analyzed auditors' inherent risk assessments, clients' inherent risk indicators, and detected misstatements. The results of their study showed that the auditors' inherent risk assessment accuracy is low because auditors depend on too many risk indicators that have low diagnostic ability. Hence, the cues they used had diluting the effect of highly diagnostic indicators. However, Waller and Zimbelman (2000) examined both intention and fraudulent misstatement, suggesting that the dilution effect might be a result of irrelevant cues and cues that have low diagnostic value. Wood (2012b) aimed to establish whether decision aids reduce dilution. He examined the use of decision aid in auditor's fraud risk assessment by dividing auditors into two groups, one of which was provided by decision aid from SAS No 99. The results yielded indicate that instead of reducing the dilution effect as was expected and proposed by previous studies (Hackenbrack, 1992; Hoffman and Patton, 1997), the dilution effect actually worsened. In particular, audit seniors who used a decision aid lowered their fraud risk assessment when exposed to irrelevant information. Wood's findings suggest that, while decision aids should enhance the process of fraud risk assessment, the tool's ability to influence auditor fraud risk assessment is limited.

Pincus (1989) studied the efficacy of using red flags to assess the possibility of fraud, in both fraud and no fraud conditions. The author used red flag questions as two conditions (presence versus absence) and two types of experimental case (fraud versus no fraud). In the fraud case, Pincus (1989) found that auditors' judgment was ineffective when relying on a decision aid in fraud risk assessment. She provided the participants with a decision aid that should direct auditor's attention to the fraud indicators. She found that auditors' judgment had a dysfunctional effect in assessing fraud risk when using the questionnaire in the fraud case, whereas in no fraud case, the use of questionnaire had no significant effect on auditors' judgment. However, it is not clear why questionnaire impaired judgment. Pincus assumed that it might be because auditors may not have considered as many relevant cues as those that were unaided in their judgments. She also stated that unaided auditors may have focused more on negative indicators, while the aided auditors focused more on balanced set of positive, neutral, and negative indicators. Overall, Pincus observed that auditors were more consistent and comprehensive in gathering information needed for making the fraud risk assessment when provided with an aid.

2.5 The Effectiveness of Decision Aid in Fraud Risk Assessment

Despite a large body of accounting studies on auditors' heuristic cognitive biases, a decision aid is treated as a key feature in the audit environment. Audit firms use decision aids to improve the auditors' judgmental process in assessing fraud risk (Brown and Murphy, 1990; Messier, 1995; Shelton et al., 2001). Decision aid is any explicit procedure for generating, analyzing, and selecting the best alternative to explain particular situation (Rohrmann, 1986). It can be basic, such as SAS No. 99 fraud risk factors list, checklist and red flags (AICPA, 2002), or is a more complex form of an expert system (Eining et al., 1997b).

According to Asare et al. (2015), past studies suggest that auditors tend to respond to high fraud risk by practicing standard audit procedures that are generally shown to be ineffective at detecting a concealed fraud. In addition, authors of extant studies affirmed that, in a fraud risk assessment task, auditors need to use decision aids to direct their attention to risk factors, such as those detailed in Statement On Auditing Standards No.

82 and 99 (AICPA, 2002; Shelton et al., 2001; Zimbelman, 1997). Loebbecke et al. (1989) surveyed audit partners to find out if experience would have an effect on the ability of recognizing fraud risk factors. However, they asserted that, because of the low incidence of fraud, auditors have little opportunity to gain advantage from experience. They concluded that it is important to provide auditors with a tool that aids in their assessment of fraud risk.

Boritz and Timoshenko (2014) state that, despite growing evidence that using decision aids such as checklists is dysfunctional, their analysis of checklist use in auditing suggests that changing and improving checklists design and application methods can enhance their effectiveness. They conducted their study based on a review and synthesis of the extant literature on the use of checklists in auditing and other fields. Regarding fraud risk assessment, they stated that customization and reliance on formal cue-combination models, along with taking into consideration client circumstances and characteristics of the fraud risk assessment task, might make fraud checklists more successful than extant research entails. In fraud risk assessment, customization is approached by adapting the checklists that fit the characteristics to the particular client and industry (Cowperthwaite, 2012). Cowperthwaite (2012) recommended that auditors can start with general checklists and gradually make them more specific to their knowledge of the client and understanding of the requirement of GAAS. Regarding the method of combining cues, there are two reasoning systems that govern cue processing—an initiative system and deliberative system. An intuitive system combines cues into a compound based on experience, stereotype, expectancies, and schemas, whereas deliberative system combines cues in accordance with a rational decision model (Kahneman, 2011). However, the intuitive reasoning system often prevents the deliberative system and leads auditors to rely on their heuristics and biases. This conclusion by Boritz and Timoshenko (2014) leads to their rationale for using decision aids in fraud risk assessment that can compensate for the risk associated with the application and method used of intuitive judgment to combine the identified cues with the help of checklists.

Trotman et al. (2009) found that auditors in the interaction groups who receive brainstorming instructions generate more misstatements, expert identified misstatements, and expert identified fraud hypotheses than those without this type of a decision aid. Similarly, Lynch et al. (2009) examined the effectiveness of computer-mediated brainstorming in the context of the SAS No. 99 mandated fraud brainstorming requirement. They found that electronic interaction groups were able to identify more fraud risk factors than those that took part in face-to-face brainstorming.

Moreover, Bonner et al. (1996) examined checklist and mechanical-aggregation as decision aids that targeted retrieval and aggregation of frequencies in auditors' probability judgments. Their findings were consistent with those reported by (Nelson et al., 1995) in that both decision aids used in this study (list-aided and mechanical-aggregation aid) better reflected experienced frequencies, signifying that both decision aids could enhance auditors' judgment. Eining et al. (1997b) examined the influence of using decision aids in auditor's assessment of the risk of management fraud and the selection of appropriate audit actions. They developed a model that incorporated a constructive dialogue based on psychology research to increase auditors' engagement in the decision-making process. Their results support using decision aid in enhancing auditors' judgment in fraud risk assessment, as they found that users of expert systems exhibited higher consensus in risk assessments. They concluded that, by giving auditors an expert system, their reliance on the aid and their related performance increased. However, their study was conducted in a relatively structured large firm, making the study findings difficult to generalize to other less structured auditing firms.

Wright and Bedard (2000) examined how the differences in client inherent risk factors might affect the auditors' decision-making processes. They tested whether providing a checklist of risk factors would be associated with greater justification for program-planning decisions. They found that, when risk factors were present, auditors increased their risk assessment and when a checklist of risk factors was provided to novice auditors, their risk assessment performance was improved, as they performed better in the planning stage. However, they also found that auditors' experience had an impact on their concentration on presenting risk factors, in that high level of domain experience appeared to increase concentration.

Bierstaker et al. (2010b) examined the decision quality by using a decision aid along with brainstorming. The task was performed by two groups, involved in brainstorming groups and individual work, with or without a decision aid, respectively. Their results show that a decision aid has statistically significant effect on both fraud risk identified by individuals and groups. Although individuals rely more on decision aids, brainstorming groups performed better than individuals did. However, as Bierstaker et al. (2010b) study sample was small, the brainstorming group comprised of only two individuals and did not include auditors from various levels that should be normally involved in these sessions.

Pakdel and Sadeghi (2012) studied the effect of a decision aid on the following:

- The level of using decision aid by seniors and juniors. The results showed that average use of a decision aid by seniors was greater than among juniors when the company is large.
- Effect of ICPAS membership on auditors' use of decision aid. The results revealed that ICPAS members make more fraud risk assessments than non-members when they do not rely on a decision aid.
- The effect of the decision aid on performance of auditors with bachelors and masters degree. The results revealed that auditors with bachelors degree benefited more from using the decision aid to assess fraud risk than those with a masters degree did.
- The effect of education level and field of study (accounting and management) on tendency to use a decision aid in fraud risk assessment. The results indicated that auditors with a masters degree used the aid more than did the auditors with bachelors degree, and auditors from management field tended to rely more on a decision aid than those from accounting field.
- The effect on professional experience and the amount of decision aid use. The results showed that auditors with at least 20 years of professional experience tend to assess fraud risk without decision aid more often than other auditors.

In general, Pakdel and Sadeghi (2012) findings suggest that using a decision aid would enhance the quality of fraud risk assessment for less educated auditors with less experience.

2.6 Decomposition as a Decision Aid

Authors of some previous audit studies have experimentally tested decomposition as a decision aid technique confirming its capacity for improving audit judgment in decision-making process (Zimbelman, 1997; Wilks and Zimbelman, 2004a; Favere-

Marchesi, 2013; Asare and Wright, 2004; Messier, 1995; Raiffa, 1968). Some researchers also advise decision makers to decompose complex issues into smaller problems, whereby their solutions are subsequently combined, as described by Raiffa (1968: p.271): "The spirit of decision analysis is to divide and conquer: Decompose a complex into simpler problems, get one's thinking straight in these simpler problems, paste these analyses together with logical glue and come out with a program of action".

Decomposition of overall judgment into smaller sub-judgments in a decision aid was recommended by (Beach et al., 1976). The rationale behind decomposition is that the process of identifying, classifying, and assessing components stimulates more insightful and reflective assessment (Kleinmuntz et al., 1996). In complex situations, such as auditing, rational individuals might struggle with focusing all their relevant knowledge on a particular task and instead allocate their limited processing capacity to a subset of available indicators (Birnberg and Shields, 1984). The decomposition approach is suggested to enhance judgment accuracy and it has been extensively studied in the auditor's judgmental process literature (Raiffa, 1968; Daniel, 1988; Libby and Libby, 1989; Messier, 1995; Zimbelman, 1997; Wilks and Zimbelman, 2004a; Jiambalvo and Waller, 1984; Bonner, 2008).

However, some authors found that decomposition is not effective when using audit risk model. For example, Jiambalvo and Waller (1984) compared the use of a holistic approach with decomposition and intuitive combination based on the audit risk model, reporting that decomposition and intuitive combination of risk judgment was not consistent with audit risk model[1] and outcomes were not significantly different from those obtained in the holistic approach. Daniel (1988) extended their study, whereby he asked auditors to give separate assessment to the inherent risk and assessing the account receivable with a decomposition approach into the various risk components. Daniel found that the decomposed audit risk assessment was typically inferior to the auditors' holistic assessment approach, making it ineffective as an audit risk model.

On the other hand, other researchers argued that decomposition might improve auditors' decision-making capacity, especially when it was accompanied by appropriate decision aids. For example, Armstrong et al. (1975) hypothesized that, when problems are

[1] Audit risk model is defined as a multiplication of inherent risk control and detection risk; {Audit risk = Inherent risk x Control risk x Detection risk.}

decomposed into smaller sub-problems, accuracy of the decisions made will increase because decision makers will consider more indicators then when using a holistic approach. They found that estimates obtained from the implementation of decomposition approach were less likely to contain large errors. In addition, Libby and Libby (1989) used conceptualized control reliance decision (Libby, 1985) comprising of three attributes: process susceptibility, control risk, and compliance risk. Libby and Libby (1989) applied Einhorn's expert measurement/ mechanical combination[2] (Hamilton, 2011) which was established to lower the overreliance bias. This approach uses human judgment to measure cue values and combines the decomposed component judgment with a mathematical model to find out the overall control reliance. Their findings suggest that the decomposed internal control judgments, when mechanically combined, were almost identical to those produced by the expert panel and were superior to making the overall judgment at once. Kleinmuntz et al. (1996) conducted an experimental study in order to explore the benefits of decomposition and investigate its effects on decision making. Their results were consistent with their theory that the accuracy improvement benefits decomposition results due to the reduction in random response errors.

Chen et al. (2014) examined two strategies (simultaneous and sequential unpacking of potential frauds) on individual auditors' identification of potential fraud risk assessments. The key difference between the two groups is that, in the simultaneous strategy, the respondents were asked to identify the potential fraud risk factors involving four categories—revenue recognition/receivables, inventory, noncurrent assets, and management estimate. On the other hand, in the sequential unpacking group, the participants were asked to consider one category at a time. In their work, Chen et al. (2014) employed the concept of decomposition by telling auditors to consider and assess each category separately. The results of their study showed that the sequential unpacking of the brainstorming task categories resulted in a greater quantity and quality of identified potential fraud risk factors compared to the other group.

[2] A mechanical combination is an algorithmic rule for combining a series of judgment, which might be developed by regressing the component judgments on the standard, Libby, R. & Libby, P. A. (1989), "Expert measurement and mechanical combination in control reliance decisions." *Accounting Review*, No.729-747.)

Another study on decomposition was conducted by Bonner et al. (1996), who focused on probability judgments, and found that errors were less common when probability judgments were decomposed into components and the estimates were combined mechanically comparing to the estimation of probability judgments of violating an audit objective when it is conditional on a particular transaction cycle. Similarly, Eining et al. (1997b) findings suggest that auditors using a decomposition aid are more likely to identify the fraud and non-fraud cases than unaided auditors or even those who used the list-type aid. They have used a constructive dialogue that has five features, one of which is the decomposition judgment.

The decomposition judgment in the Eining et al. (1997b) work was used to decompose the risk judgment into three components of Loebbecke/Willingham model (conditions, motivation, and attitudes). The participants were later provided with assistance in combining these assessments. Zimbelman (1997) compared holistic and decomposed approach. In the holistic risk assessment group, auditors were told that the material misstatement in the client account is caused by inherent risk, prompting them to start assessing misstatement without paying attention to whether the misstatement is intentional or unintentional. On the other hand, in the decomposition group, the subjects was given two definitions of inherent risk, namely unintentional and intentional misstatement. However, the study findings suggest that the SAS No. 82 might increase the budgeted time for both high and low fraud risk conditions due to three reasons. First, data on auditors' information search indicates that auditors who carry out a separate fraud risk assessment use significantly more time to attend to fraud risk factors. Second, a comparison between the two groups (holistic and decomposed) in budgeted hours suggests that those who decomposed fraud risk assessment had greater sensitivity to fraud risk, as reflected in the irregularity of the extent of planned audit work. Finally, the analyses of the impact of decomposition on auditors' second-order uncertainty (SOU) revealed that auditors were not able to rely on client evidence when making their fraud risk assessment. Zimbelman (1997) thus concluded that future research could examine and explore the effects of other, more detailed decomposition, as there are many possible decompositions that can be investigated.

Wilks and Zimbelman (2004a) extended Zimbelman's (1997) work by integrating SAS No. 99 fraud triangle factors categorization in a decomposition approach. Again two groups were compared, denoted as holistic judgment and decomposition judgment group. Wilks and Zimbelman (2004a) used SAS No. 99 in their research and examined the fraud triangle decomposition in SAS No. 99. They investigated if specific assessment of each of the three fraud triangle factors of Incentive, Opportunity, and Attitude prior to an overall assessment would improve an auditor's sensitivity to high levels of fraud triangle factors. Auditors in the holistic group had to go through a lengthy checklist of forty fraud risk factors and were required to make an overall assessment without performing separate assessment for the fraud triangle factors of incentive, opportunity, and attitude, which made incorporating the components into comprehensive evaluation difficult. The authors reported that, when incentive and opportunity suggest high level of fraud risk, auditors are equally sensitive to those factors, irrespective of whether they use decomposing or a holistic approach. Wilks and Zimbleman (2004a) justified the use of decomposition approach, noting that separate consideration of the three components of fraud triangle factors will give auditors the chance to predict management action, and eventually enhance the ability of deterring and detecting fraud. The authors concluded their study by emphasizing the need to understand fraud risk decomposition in the standards setting process and audit practice, which is the focus of this current study.

Wilks and Zimbleman's subsequent study yielded results suggesting that audit standards should be designed to consider how management might manipulate the fraud cues, instead of providing auditors with long checklists that tend to be ineffective in fraud risk assessment (Wilks and Zimbelman, 2004b). They also suggested that the standards should encourage auditors to gather new, unusual, and random audit evidence and use unpredictable strategies.

Norman et al. (2010) studied the internal auditors' fraud risk assessment via the decomposition approach. They conducted an experiment with 2×2×2 design in that they manipulated two internal reporting lines (management vs. audit committee), assessment procedures (decomposition vs. holistic), and two levels of risk conditions (high vs. low). Replicating the work of Wilks and Zimbelman (2004a), Norman et al. (2010) compared the decomposition group with the holistic assessment group comprised of internal auditors. Their results showed that decomposition procedure lowered the overall assessment in both high and low fraud risk condition. Moreover, when the auditors were asked to report to audit committee, their fraud risk assessment was lower than when reporting to management line. In addition, decomposition method helped auditors in focusing more on management attitude cues across all fraud risk levels without changing their focus to any increase in incentive or opportunity cues. Norman et al. (2010) thus provided further evidence of the effectiveness of the decomposition approach in fraud risk assessment. However, it is still not certain if a detailed decomposition approach potentially enhances fraud risk assessment and increases auditors' sensitivity to fraud risk factors. To mitigate this shortcoming, the aim of the current study was to investigate the use of a detailed decomposition approach as a decision aid integrated into the decision-making process. This decomposition strategy comprising of four stages of judgment is likely to significantly improve the quality of fraud risk assessment.

2.7 SAS No. 99 Fraud Risk Factors

SAS No. 99 directs and guides auditors to gather information that help them identifying risks of material misstatement due to fraud, while exercising their professional skepticism to consider the attributes of the risk (AICPA, 2002). It is worth noting that the presence of fraud risk factors does not necessarily indicate the existence of fraud; however, they are often present in those circumstances where fraud exist, AICPA (2002, para. 31). Fraud risk factors (red flags) are actions, circumstances, situational pressure, opportunities, or personal attitudes that may cause management or employees to commit fraud (Gullkvist and Jokipii, 2013).

Many researchers have used different SAS-based red flag systems in their studies (Loebbecke et al., 1989; Heiman-Hoffman et al., 1996; Apostolou et al., 2001). For example, Loebbecke et al. (1989) utilized SAS No. 53 and find out that most of red flags had relatively high frequency of occurrence. More recently, (Apostolou et al., 2001) used SAS No. 82 and found that three risk factors have been given the highest rate of importance, namely "known history of securities law violation", "significant compensation tied to aggressive accounting practices" and " management's failure to display appropriate attitude about internal control". However, Zimbelman (1997) evaluated the effects of SAS No. 82 on auditors' attention to fraud risk factors and audit planning decisions, reporting that auditors did not develop budgets that were sensitive to the changes in the fraud risk factors and did not evaluate or modify their audit plans in response to fraud risk. Glover et al. (2003) conducted a follow-up of Zimbelman (1997) study, revealing that, after the issuance of SAS No. 82, auditors became more sensitive to the provided fraud risk factors, but still did not modify the nature of their audit plans and audit tests in response to fraud risk. Red flags in the previous experimental studies were developed before the issuance of Statement on Auditing Standards (SAS No. 99). However, the situation worsened in 2001, with the collapse of Enron as result of financial statement fraud, which compromised the public's trust in the audit profession and resulted in increased audit performance gap. SAS No. 99 was implemented in 2002 to expand audit procedures to facilitate fraud detection and reduce the expectation-performance gap. This standard required the audit team members to discuss and identify fraud risk factors and develop audit plans based on the fraud risk factors (AICPA, 2002). Moreover, SAS No. 99 also required auditors to question management on its views of the risks of fraud in the entity and its knowledge of any unknown or suspected fraud and develop an appropriate response for each fraud risk identified (Montgomery et al., 2002). More recently, Lesage et al. (2015) compared auditors' duties that are already described by the auditing standards with descriptions of fraud scenarios provided in published articles. The result of their study provided evidence that (1) performance gap can be reduced by strengthening auditor's willingness and ability to employ existing auditing standards regarding fraud detection; (2) the standards gap can be lessened by increasing and improving obtainable auditing standards; and (3) unreasonable expectations, however, engage elements that beyond the profession's area of control. Additionally, Lesage et al. (2015) concluded that due to the media's tendency toward bias, the expectation-performance gap issue is not likely to disappear, due to the reinforcement and overemphasis of the responsibility of auditors for detecting fraud irrespective of whether this is feasible at a reasonable cost.

SAS No. 99 fraud risk factors reflect three factors or conditions in the fraud triangle, which help to explain how fraud is pretreated, namely Incentive (Pressure), Opportunity, and Rationalization (Attitude) (AICPA, 2002). The fraud triangle factors will be explained in more detail in the subsequent sections. However, authors of some prior studies have criticized SAS No. 99 standards, given that, despite the change in the scope of audit and increasing its time requirement and costs, it did not provide guidance on how auditors should decide on the quality or weights assigned to red flags for fraud (Casabona and Grego, 2003; Wells, 2004; Hoffman and Zimbelman, 2009). Thus, the auditors would assume that all the fraud indicators are equally weighted, which will create a system that lacks the predictability element, as stated in Para 33 of SAS 99, "The order of the examples of risk factors provided is not intended to reflect their relative importance or frequency of occurrence" (AICPA, 2002; Smith et al., 2005). For example, Albrecht and Albrecht (2003) categorized the symptoms of fraud in to six types of fraud indicators, namely accounting anomalies; internal control system weaknesses; analytical anomalies; extravagant lifestyles; unusual behaviors; and tips and complaints. They have struggled in identifying fraud, while the fraud red flags were observed frequently, the presence of such indicators is not necessary or sufficient to indicate the existence of fraud.

Despite the critics of SAS No. 99 (Wells, 2004; Hoffman and Zimbelman, 2009; Casabona and Grego, 2003), authors of several prior studies have found a positive effect of SAS No. 99 on fraud risk assessment. For example, Marczewski and Akers (2005) conducted a study on Certified Public Accountants CPA's perception of the impact of SAS No. 99 and how is SAS No 99 is different from SAS No. 82. Their findings answered an interesting question, i.e., whether "there is increased substance and responsibility attached to the new standards or is it just a restatement of SAS 82 aimed at convincing public critics that increased efforts to detect fraud are taking place?" (Marczewski and Akers, 2005: p.38). They have distributed a survey to 300 CPAs from Wisconsin public accounting firms, revealing that partners were more positive assessors of SAS No. 99 than managers and perceived more responsibility to detect fraud in financial statement audit than managers did. However, their results also indicate that SAS No. 99 played moderate effect in increasing the effectiveness of audit procedures, while it may not increase the public's confidence in audit.

Carpenter et al. (2006) examined the brainstorming session, which is required by SAS No. 99, and noted that, when fraud is present, auditors engaged in-group brainstorming activity tend to perform better than auditors brainstorming individually and auditors that do not practice brainstorming. Carpenter (2007) and Carpenter et al. (2006) provided evidence of the usefulness of brainstorming session recommended by SAS No. 99. However, Hoffman and Zimbelman (2009) found that combining strategic reasoning with brainstorming sessions would enhance the effectiveness of audit procedures, even if standard audit programs are used. They noted that SAS No. 99 guided auditors to use brainstorming without strategic reasoning, while brainstorming would help auditors to achieve the benefits of strategic reasoning (Kassem and Higson, 2012a).

Furthermore, Moyes et al. (2006) examined the effectiveness of SAS No. 99 red flags in helping auditors in detecting fraud. Approximately 1,800 auditors from the Institute of Internal Auditors (IIA) participated in their study and were asked to rate their perceptions of 42 red flags listed in SAS No. 99 from "not effective" to "extremely effective". Moyes et al. (2006) found that auditors' rated the red flags differently according to the categorization of SAS No. 99 fraud risk factors, in that they perceived the attitudes/ rationalization red flags as slightly more effective than those associated with opportunities or incentives.

Authors of prior studies have also examined some of SAS No. 99 fraud risk factors, revealing their impact on the way fraud is presented. For example, in some studies, fraud was investigated as an extension of earnings management strategies. Kinney and McDaniel (1989) analyzed the characteristics of firms that reported errors that are detected and deemed sufficiently material for correction at year end. Although virtually all situations involved in their study included corrections of overstated rather than understated amounts, these corrections did not necessary indicate presence of fraud. However, Kinney and McDaniel's analysis revealed that, consistent with earnings management motives risk factor, these firms were small, highly leveraged, slower growing, and received more uncertainty qualified opinions than others in the same industry. Marquardt and Wiedman (2004) examined three types of earnings management contexts: equity offerings where incentive is to increase reported income, buyouts where incentives are to decrease reported earnings, and firms' actions in order to avoid earnings decreases. Their finding suggest that firms issuing equity would be likely to manage earnings upward by accelerating revenue recognition, management buyout firms have unexpectedly low accounts receivables, while firms trying to avoid earnings decrease use more transitory, less costly items. Marquardt and Wiedman (2004) conclusions suggest that auditors should match management incentives to the types of risks that should be assessed as high.

In another study, Beasley (1996) used logit regression analysis to examine whether audit committees, board of directors and corporate governance affect the likelihood of financial statement fraud. He found that presence of external members on the board of directors significantly decrease the likelihood of financial statement fraud. Kaplan and Reckers (1995) examined the risk of management bias and auditors' reporting decisions for accounting estimates. They noticed that auditors typically incorporated red flags related to management intentions (lifestyle and bonus opportunity) into their decision making process. However, these fraud factors were not a part of auditors' materiality assessments.

Authors of extant studies conducted before the issuance of SAS No. 99 usually emphasized the importance of identifying aggressive/unusual accounting behavior as an indicator of financial statement fraud. Abbott et al. (2002) found that the independency of the audit committee and the number of times they meet per year had significant impact on the occurrence of financial reporting fraud. In fact, the occurrence of fraud reduced as the number of meeting reach four times a year. Dunn (2004) examined the insider power and the issue of corporate governance and used logistic regression to study the relation between the top management and board of directors' characteristics. Dunn found that fraud would occur more often when there is a concentration of power in the hands of insiders.

SAS No. 99 emphasizes the importance of using financial ratios as an indicators of fraud. Extant studies examining the effect of financial ratio variable in identifying and classifying fraud firms approved the effectiveness of these variables in assessing fraud risk. For example, Beneish (1997) presented a model to detect earnings management among firms experiencing extreme financial performance and compares the model's performance to discretionary accrual models. Beneish used total accruals divided by total assets, sales growth, and leverage as the useful variables in identifying GAAP violators and aggressive accrues. He found that, at the 10% level, these variables were different for GAAP violators and non-GAAP violators. Others also found that financial ratio variables are useful in assisting auditors in fraud detection. These financial ratios include liquidity ratio, current ratio, and gross margin ratio (Kaminski et al., 2004; Persons, 2011). In line with the extant research, in the current study, three financial ratios (liquidity, profitability, and leverage) are employed as indicators of financial statements fraud.

Furthermore, SAS No. 99 emphasizes high risk areas where fraud might take place more often and where the auditor may need to perform additional procedures to identify and detect fraud (AICPA, 2002). For example, SAS No. 99 requires auditors to perform analytical procedures relating to revenue to identify unusual or unexpected relationships involving revenue accounts that may indicate a material misstatement due to fraudulent financial reporting (AICPA, 2002: p.section 329, Para. 04 and 06). Beasley et al. (2000) reported that the most common fraud techniques include deception sales, false confirmation, premature revenue recognition (before the terms of the sale are completed), improper cutoffs, unauthorized shipments, and consignment sales. Moreover, authors of past studies found that 38 per cent of financial statement fraud is committed by increasing credit sales and accounts receivable or delaying revenue recognition by using deferred revenues (Rezaee, 2005; Caylor, 2010).

SAS No. 99 also emphasizes that all audit committee members should be financially literate and that they should include at least one financial expert, who can help others understand appropriate accounting estimates, accruals, and reserve provisions. The issue of significant or unusual accruals relates directly to the intentional overstatement of accruals in one period, so management can manipulate the figures with earnings in subsequent periods and through the reversal of those accruals (Hogan et al., 2008). Sloan (1996: p.290) explained, “the importance of analyzing both the accruals and cash components of earnings in the assessment of future earnings is frequently emphasized in texts on financial statement analysis”. Nelson et al. (2002) distributed a questionnaire to audit partners and managers, asking them to recall specific experiences they had with clients. According to their responses, it seems that they believe that the intentional overstatement of accrual is the most common earnings management technique.

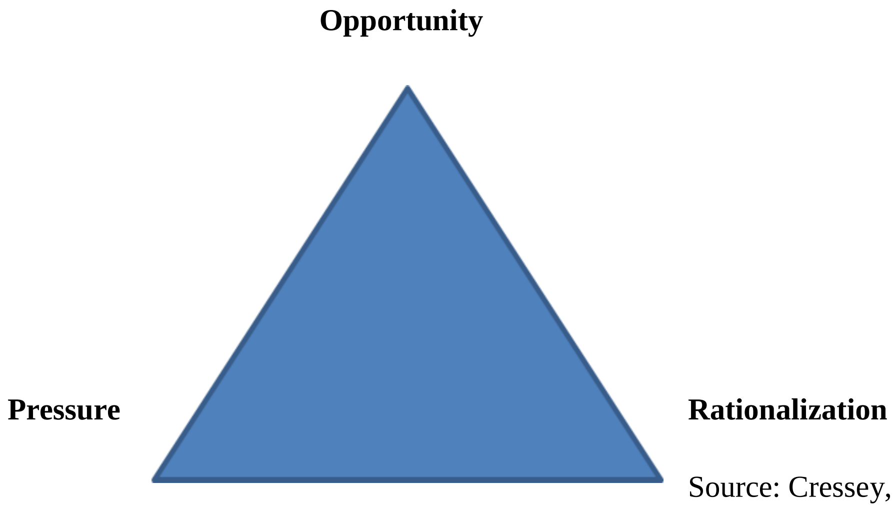
Moehrle (2002) findings were consistent with managers using restructuring charge as a cookie jar reserve reversals to manage earnings. Cookie jar is used by firms to smooth out volatility in their financial results, giving the investors the misleading impression that they are consistently meeting earnings targets. Moehrle (2002) noted that managers are more likely to reverse restructuring charges when pre-reversal net income is negative or below the forecasted earnings. Kanagaretnam et al. (2003) and Kanagaretnam et al. (2004) found that banks use loan loss reserve as earning management tool to reduce earning variability in that bank managers save earning in good times in loan loss reserves and borrow from loan loss reserves in bad times.

While these studies focused on earnings management, their finding support the identification of significant or unusual accruals as a high risk area (Hogan et al., 2008). Similarly, Dechow et al. (1996) reported that one important incentive for earnings manipulation is the desire to attract external financing at low cost. Dechow et al. (1996: p.1) also explained that "firms manipulating earnings are: i) more likely to have boards of directors dominated by management; (ii) more likely to have a Chief Executive Officer who simultaneously serves as Chairman of the Board; (iii) more likely to have a Chief Executive Officer who is also the firm's founder;(iv) less likely to have an audit committee; and (v) less likely to have an outside blockholder". Thus, this factor is deemed important and is included in the current study, where the auditors are asked to give an assessment to this factor after reading a hypothetical case. SAS No. 99 urges auditors to develop expectations about possible relationships that are expected to exist, based on the auditor's understanding of the entity and its environment. It also recommends comparing those expectations with recorded amounts yield unusual or unexpected relationships. Thus, auditors should take into account those results in identifying fraud risk factors (AICPA, 2002). In addition, SAS No. 99 categorized fraud risk factors used in this study, which were tested and examined in prior studies and were found to successful in helping auditors to effectively assess fraud risk (Moyes et al., 2006; Wilks and Zimbelman, 2004a).

2.8 Fraud Triangle Factors

Donald R. Cressey (1950) developed a theory of fraud risk factors in his PhD thesis titled *Other People's Money: A Study in the Social Psychology of Embezzlement*. Cressey performed interviews with 200 individuals who had been charged with fraud. He found that every fraud had three factors in common. First, fraudsters have a reason that drives them to commit fraud (pressure/motivation). Second, the embezzler had the knowledge and the opportunity to commit the crime (opportunity). Third, Cressey noticed that they were able to rationalize the fraud (rationalization/attitude). These three factors create the fraud triangle factors shown in Figure 3.

Figure 3: Fraud triangle



Source: Cressey, 1973

It is worth noting that Cressey posited that, in order for fraud to exist, the three fraud triangle factors should be present, while SAS No. 99 suggests that only one element of the fraud triangle needs to be present for a fraud to occur. Theory of white-collar crime suggests that criminal behavior results from the presence of appropriate motivation and opportunity (Coleman, 1987). Coleman (1987: p.409) also noted that “research in white-collar crime in holding motivation to consist of a set of symbolic constructions defining certain kinds of goals and activities as appropriate and desirable and others as lacking those qualities”. Moreover, criminology theory asserts that motivation refers to specific internal or external incentives that relate a fraudulent act to personal wealth and power (Coleman, 1992).

Authors of prior studies have found that executives at fraudulent firms have significantly larger equity-based compensation than do executives at similar non-fraudulent firms (Johnson et al., 2003). Once motivation exists, the presence of opportunities needs to be identified, specially the attractiveness of those opportunities. Coleman (1987) identified four factors for opportunity attractiveness—the perceived gain, management of the entire opportunity structure, the perceived risk, and the compatibility of the opportunity, rationalization, and beliefs that management holds. However, Cressey (1950) was of view that, without the ability to rationalize the fraud act, the fraud will never take place. Those who are involved in fraudulent behavior tend to justify their behavior by claiming that the laws they are violating are unnecessary or even unjust, or that certain types of criminal behavior are needed to achieve important economic goals or even just to survive.

SAS No. 99 categorized fraud risk factors into three categories of the fraud triangle. Table 1 and 2 provide SAS No. 99 fraud risk factors by fraud triangle factor category.

Table 1: Examples of Fraud Risk Factors from SAS No. 99 Relating to Financial Statement Misstatements[3]

1- Misstatements Arising from Fraudulent Financial Reporting

Incentives/Pressures	**Opportunities**	**Attitude/Rationalization**
1.Threatened financial stability or profitability • High degree of competition or sales saturation • High vulnerability to rapid changes (e.g., technology, interest rates) • Declines in customer demand, business failures in industry • Operating losses • Negative cash flows from operations • Rapid growth or unusual profitability • New accounting, statutory, or	1.Industry provides opportunities for • Related-party transactions beyond ordinary • Company can dictate terms or conditions to suppliers or customers (may result in inappropriate transactions) • Accounts based on significant estimates • Significant, unusual or highly complex transactions • Significant operations across international borders with differing business environments and cultures • Significant bank accounts in tax haven jurisdictions	Relating to board members, management, or employees • Ineffective communications, implementation, support or enforcement of ethics • Nonfinancial management excessive participation in selecting accounting principles or determining estimates • Known history of violations of securities or other laws • Excessive interest in maintaining or increasing stock price • Aggressive or unrealistic forecasts • Failure to correct reportable conditions on a timely basis • Interest by management of employing inappropriate

[3] From Statement on Auditing Standards No. 99, *Consideration of Fraud in a Financial Statement Audit*, Appendix: "Examples of Fraud Risk Factors." Copyright © 2002 by the American Institute of Certified Public Accountants, Inc., New York, New York

regulatory requirements 2. Excessive pressure on management to meet requirements or third party expectations due to • Profitability or trend level expectations • Need for additional debt or equity financing • Marginal ability to meet exchange listing requirements • Likely poor financial results on pending transactions 3. Management or directors' financial situation threatened by • Significant financial interests in company • Significant portions of compensation contingent on results of company • Personal guarantees of debts of company	2. Ineffective monitoring of management allows • Domination of management by a single person or small group without controls • Ineffective board of director or audit committee oversight 3. Complex or unstable organizational structure • Difficulty in determining organization or individuals with control of company • Overly complex structure • High turnover of senior management, counsel, or board members • Internal control deficient • Inadequate monitoring of controls • High turnover rates or ineffective accounting, internal audit or information technology staff • Ineffective accounting and information systems	means to minimize earnings for tax reasons • Recurring management attempts to justify marginal or inappropriate accounting based on materiality • Strained relationship with current or predecessor auditor

4. Excessive pressure to meet financial targets established by directors or management		

Table 2.2

Misstatements Arising from Misappropriation of Assets

Table 2: Misstatements Arising from Misappropriation of Assets

Incentives/Pressures	**Opportunities**	**Attitude/Rationalization**
1. Personal financial obligations 2. Adverse relationship between company and employees • Known or anticipated layoffs • Changes in compensation • Promotions, compensation or other rewards inconsistent with expectations	1. Characteristics of assets • Large amounts of cash on hand or processed • Small, high value, or high demand inventory items • Easily convertible assets (bearer bonds, diamonds, computer chips) • Small marketable fixed assets 2. Inadequate internal control, including inadequate: • Segregation of duties • Job applicant screening of employees with access to assets • Record keeping for assets • Authorization or approval of transactions • Reconciliation of assets	Attitude or behavior of those with access to assets susceptible to misappropriation • Disregard for need for monitoring or reducing risks • Disregard for internal control • Behavior indicating displeasure or dissatisfaction with company or its treatment of employees • Changes in behavior or lifestyle indicating that assets may have been misappropriated

	• Documentation of transactions (e.g., credits for merchandise returns • Requirements for mandatory vacations • Management understanding of information technology • Access controls over automated records	

Various scholars have extensively analyzed and evaluated fraud triangle factors to find out the reasons for their occurrence and the possible techniques for fraud execution and concealment (Mackevicius and Giriunas, 2013). However, fraud triangle has been criticized by some authors who argued that fraud triangle model is an inadequate tool for deterring, preventing, and detecting fraud, as this model has ignored some important factors that have a direct relation to the existence of fraud, such as fraudster's capability and skills (Kassem and Higson, 2012b; WIPO, 2011 ; Koerber and Neck, 2006). Despite the critics of the fraud triangle model, many models and theories related to fraud are explained by the rationale afforded by the fraud triangle, and these theories seek to identify supplementary psychological or sociological background factors (Dorminey et al., 2012). Several studies suggest that auditors should apply fraud triangle factors to assess the fraud risk and detect fraud (Hammersley, 2011; Sitorus and Scott, 2009; Jaffar et al., 2011).

Bell and Carcello (2000) estimated a logistic regression model to predict the incidence of fraud and the factors associated with fraud. Using a sample of companies that had committed financial fraud, they found evidence in support of the existence of fraud triangle factors . However, their results did not reveal a significant association between financial fraud and some traditional risk factors. Moreover, Wilks and Zimbelman (2004a) found that auditors usually conduct separate assessment of the three components of fraud triangle factors. Thus, when attitude factor suggest low fraud risk, auditors' judgment would be more sensitive to opportunity and pressure factors. Skousen and Wright (2006) developed a model to estimate the level of fraud incidence that consists of different risk factors, which are limited to pressures and opportunities. They found that a positive relationship between pressure and high level of fraud occurrence and also fraud frequency increase when the opportunity is high. Skousen et al. (2008) conducted a follow-up study two years later, aiming to improve on their previous approach by developing proxies to measure the fraud triangle factors and find the impact of these factors on predicting and detecting fraud in financial statements. They used two proxies to study opportunity and five proxies to study incentive and found that they have a significant effect on financial statement fraud.

Prior studies have provided evidence for the existence of each of fraud triangle factors. For example, Hackenbrack (1993) used fraud risk task to determine how much auditors emphasize the opportunity factor, revealing that auditors placed more emphasis on opportunity when they were assigned to large firms relative to those assigned to small firms. Authors of some studies have also identified different fraud risk factors that can serve as indicators of increasing opportunity to commit financial statement fraud. SAS No. 99 provides examples of these fraud risk factors (AICPA, 2002). Albrecht and Albrecht. (2003) identified some factors that increase the chance of committing fraud because of the opportunity factors, stating that having an effective internal control system is probably the most important step to reduce opportunity to commit fraud. Similarly, Goldschmidt (2004) and Rezaee (2005) affirmed that the control comes from the top; therefore, ineffective audit committee and duality of the position of the chairman and chief executive of the company increase the opportunity for committing fraud. Farber (2005) examined the relation between credibility of the financial reporting system and the quality of governance mechanisms using a sample of 87 firms that are identified by SEC as fraudulently manipulating their financial statements. Farber's results suggest that fraud firms have a serious problem of credibility and poor governance, including fewer external and independent auditors, a smaller percentage of Big 4 auditing firms, and a higher percentage of CEOs who are also chairmen of the board of directors.

Prior studies also provide evidence of the existence of incentive factors and identify the external pressure that exists when a firm is faced with financial distress and poor financial performance (Carcello and Palmrose, 1994; Dechow et al., 1996). Efendi et al. (2007) found that the likelihood of fraud increases with the increase in the number of stock options that the CEO owns. Their findings are based on a sample of firms that restated their financial statements. They also noted that fraud occurs more often in firms where the CEO is also a chairman of the board, firms constrained by debt covenants, and firms raising new debt or equity capital. In their study, Burns and Kedia (2006) examined whether management incentives through their compensation contracts affect the likelihood of aggressive accounting, by studying the linkage between a manager's compensation and stock price. They found that stock options or CEO compensation packages affect the adoption of aggressive accounting practices, and CEOs with option portfolios that are more sensitive to stock price are more likely to misreport. Moreover, extant literature provides evidence that stock options as a form of compensation provide incentive for fraudulent behavior (Morgan and Poulsen, 2001; Shrieves and Gao, 2002; Lie, 2005).

Albrecht et al. (2008, 2010) categorized pressure and explained that pressure can be financial, such as personal financial loses, falling sales, inability to compete with other companies, inability to meet financial forecasts and unexpected financial needs. Non-financial pressures include the need to report better results than the actual results, frustration with work and a challenge to beat the system. However, Albrecht et al. (2008, 2010) were of view that, even when strong pressure exists, executives who believe that they might be caught and punished would be less likely to commit fraud.

Authors of several studies focused on manipulating two components of fraud risk factors (incentive and opportunity) when assessing fraud risk to examine the behavior of auditors when assessing fraud risk when attitude suggests low fraud risk condition. For example, Desai (2015a) conducted an experiment to gain perspective about the auditors' perceived responsibility for detecting fraudulent financial reporting in the context of three components of fraud triangle factors (pressures, opportunity, and rationalization). Desai also examined how auditors correlate two of the SAS No. 99 factors with two of the fraud triangle factors (pressures and opportunity). His results indicate that auditors of larger and smaller clients focused equally on fraudulent financial reporting, while those assigned to larger clients assessed significantly lower responsibility to detecting misstatement of assets compared to fraudulent financial reporting. Additionally, the results reported by Desai (2015) indicate that auditors of larger clients perceived high risk of fraudulent financial reporting when the pressures suggest high fraud risk, and perceived the risk of misappropriation more when opportunity factors suggested high fraud risk. In general, Desai's (2015) results suggest that auditors of larger firms provided high fraud risk assessment and exerted greater audit effort when pressure was high compared to cases characterized by high opportunity was high. This finding might be due to the fact that those auditors perceive higher responsibility for detecting fraudulent financial reporting than they do when faced with misappropriation of assets. However, there were no significant differences in the assessment of fraud risk and audit effort in the presence of high pressure and high opportunity when auditors worked with smaller clients, in that they did not associate fraudulent financial reporting and misappropriation of assets with the existence of high or low pressures and opportunity.

In a another study, Desai (2015b) conducted an experiment using a 2×2×2 between-subjects design with two components of fraud triangle factors (pressures and opportunities) and two levels of fraud risk (high and low), whereby brainstorming occurred individually or in three-member audit teams. Desai intended to examine the effect of brainstorming on the auditors' search for potential material misstatements and fraud risk assessments when manipulating pressure and opportunities at different levels. Desai also explored how group brainstorming exaggerates differences when evaluating the pressures on management as well as opportunities for management to commit fraud due to control deficiency in corporate governance mechanisms. The study results indicate that auditors were more sensitive to fraud factors and found a significantly greater number of potential material misstatements when the pressure (incentive) suggested high fraud risk and opportunities suggested low fraud risk compared to when they observed low pressure and high opportunity. Additionally, this difference was more significant when auditors took part in group brainstorming. However, since the potential misstatements were constant across all experimental treatments, the findings suggest it is not necessary to increase the likelihood of fraud detection in all pressure and opportunity scenarios.

Most perpetrators have clean history of no criminal records and typically have a personal code of ethics to rationalize their behavior. Rationalization is the third element in Cressey's fraud triangle factors and is the most difficult one to control. SAS No. 99 also noted the difficulty linked with isolating characteristics used as an indicator of rationalization (AICPA, 2002). Financial misreporting perpetrators are able to rationalize their behavior, because they have some insight that such fraud has to be committed to encourage investment in the company by hiding the inability to generate cash flow, or to obtain funding or concessional funding (Sabău, 2013). Gillett and Uddin (2005) investigated the factors that indicate CFO intentions of fraudulent financial reporting and found that, although the compensation structure is not a good indicator of CFO intentions, the attitude of CFO toward fraudulent reporting has a strong influence on intention to misreport.

In general, authors of prior studies found that fraud risk factors alone, or combined with other fraud assessment procedures, will help auditors successfully assess high fraud risk (Jaffar, 2009; Curtis, 2010; Jaffar et al., 2011; Anandarajan and Kleinman, 2011). However, fraud risk factors need to be aligned to client characteristics and client industry. Moreover, the effectiveness of fraud risk assessment process often relies on the level of professional judgment (skepticism) exercised by the audit team.

2.9 Professional Skepticism

In order to enhance auditors' fraud risk assessment, they should have reasonable level of skepticism or "questioning mind". While too much skepticism might be costly, lack of skepticism might result in undetected fraud. Auditors need to maintain appropriate level of skepticism during all stages of audit, specially the planning stage, where they have to make a risk assessment.

A recent review of the auditing literature regarding professional skepticism revealed that authors of some studies refer to skepticism as a questioning mind and critical assessment of audit evidence (PCAOB, 2007; AICPA, 2002) and "multi-dimensional individual characteristic" (Hurtt, 2010: p.150).

Nelson (2009: p.4) defined professional skepticism as "one whose behavior indicates relatively more doubt about the validity of some assertion", more specifically, he defines skepticism as indicated by auditor judgments and decisions that reflect a heightened assessment of the risk that an assertion is incorrect, conditional on the information available to the auditor". Nelson's definition of skepticism includes the auditor's decision of level of risk that an assertion is not correct, depending on the information available. Furthermore, McMillan and White (1993: p.445) defined auditors' professional skepticism as "…sensitivity to evidence that reduces the risk of failing to detect material error". However, researchers are still facing absence of a common accepted definition of skepticism (Bell et al., 2005; Nelson, 2009; Quadackers et al., 2009; Hurtt, 2010).

Professional auditing standards require auditors to maintain an independent mental attitude (skepticism), so that the auditor would be able to establish the true and fair value of financial statements (AICPA, 2002; PCAOB, 2007; AICPA, 2007). Fullerton and Durtschi (2004) examined whether higher levels of skepticism enable internal auditors to better detect fraud, using Hurtt skepticism scale to classify the level of skepticism as either high or low.

Similarly, Fullerton and Durtschi (2004) examined the behavior of auditors when exposed to various types of fraud aiming to establish whether their desire to search for additional facts has increased. The results of their study indicate that levels of skepticism had great impact on auditors' desire to increase their information search related to fraud, in that auditors with a high level of skepticism generally had a significantly greater desire to collect more evidence relative to those with low skepticism. Kadous and Zhou (2015) recently conducted an experiment in which 95 senior-level auditors participated and were assigned to one of three motivational oriental conditions (intrinsic, extrinsic, and control). The motivational orientation manipulation in their study was a brief intervention that harnesses auditors intrinsic/extrinsic motivation by having them rank order a list of possible intrinsic/extrinsic motivations for their job. However, in the control group, auditors were asked to rank order a list of factors that, by giving them incentive to eat at a restaurant, should be neutral comparing to the other motivational orientation. The findings yielded by Kadous and Zhou (2015) study show that auditors who were under intrinsic motivation condition paid greater attention to a broader set of information, processed fraud indicators at deeper level, and asked for more evidence than other auditors did. This suggests that the increased desire for more information processing behaviors allowed intrinsically motivated auditors to make more skeptical judgments about biased fair values compared to other auditors.

Auditors' professional skepticism needs to be balanced between trust and suspicion. Deutsch (1958) suggested that intense trust or extreme suspicion will cause more dysfunctional behavior. Shaub and Lawrence (1996) developed a model of professional skepticism comprising of three factors that constitute professional skepticism, namely ethical disposition factors, prior experience, and situational factors. They used three types of behavioral elements—suspicious thought, additional testing, and confrontational action—to measure professional skepticism, reporting that ethical reasoning may have a relation with lowering the levels of professional skepticism and that ethical disposition variables have no relation with predicting variables. Moreover, they also reported another finding which is consistent with Shaub (1996) results in that situational factors affect the level of skepticism exercised. They found that CPAs are less likely to conduct more tests to assure the reliability of the evidence provided and less likely to confront clients.

Jeanette Franzel, a member of the PCAOB, is of view that professional skepticism comprises of three elements—auditor mindset, auditor attributes, and actions (Curtis, 2014). Auditor's mindset also includes a psychological perspective. For example, Chung et al. (2008) examined and distinguished between the level of skepticism and decisions made by auditors with positive mood[4] and those that exhibit negative mood. They found that negative mood auditors were more skeptical toward potentially negative information. On the other hand, auditors with positive mood were less skeptical and were unwilling to confront others. Bowlin et al. (2015) examined whether mandatory auditor rotation increases or decreases skepticism and enhances audit quality. Their findings suggest that rotation could result in unintentional consequences for professional skepticism standards, in that they presented evidence that the benefits of skepticism could be counterbalanced under mandatory auditor rotation.

Hurtt et al. (2013) recognized four antecedents that affect the factors to influence auditor judgments (auditor characteristics, evidential characteristics, client characteristics and environmental influences). Auditor characteristics are found to play a vital role in a large number of research studies on professional skepticism, as each auditor possesses traits, experience, training, motivation, and moral reasoning that are unique and comprise of a varied combination of individual characteristics (Payne and Ramsay, 2005; Jones et al., 2003; Carpenter et al., 2011a). Ability to judge audit evidence is also important, as not all audit evidence should be weighted equally, and clients; characteristics also influence audit judgments, as many have propensity to ingratiate themselves with the auditor (Hurtt et al., 2013; Robertson, 2010). Finally,

[4] Positive moods are feelings of pleasure, being supported and excitement that drive the individual to interpret information more positively, however, negative moods are feelings of despair and depression Hume, D. (2012), "Emotions and moods." *Organizational Behavior*, No.258-297.

Hurtt et al. (2013) stated that the control of the environment surrounding the audit engagement might have an influence on the auditor's professional skepticism.

Moreover, Nelson (2009) classified three categories of traits that might influence auditor's level of skepticism, namely problem solving ability, ethical moral reasoning, and dispositional skepticism. According to the author, problem solving ability helps auditors enhance their skepticism by finding potential misstatements, as auditors behave differently in their general disposition towards skeptical judgments and actions (Quadackers et al., 2009). Finally, higher ethical reasoning reduces skeptical judgment, as it lowers one's sensitivity to evidence about client integrity (Jones et al., 2003). Authors of several studies found a relationship between ethical levels and auditors' skepticism (Shaub and Lawrence, 1996; Jones et al., 2003), but there are also some studies indicating the absence of influence between ethical reasoning and professional skepticism (Bernardi, 1994).

In addition, professional skepticism can also be affected by incentives that may be direct or indirect. Nelson (2009) mentioned examples of incentives that might increase the level of skepticism judgment and actions, such as regulation, litigation, and reputation loss, as well as other incentives that might lower the skepticism judgment, such as client satisfaction and budget pressure. However, auditors' decisions and skepticism are also highly influenced by the preference of their supervisors and directors (Peecher, 1996), as the auditors cannot ignore such pressure, which might affect their self-esteem, causing them to justify current judgments, as their supervisors will make them select evidence that is likely to suit their preferences.

Moreover, repeatedly auditing the same entity and involvement in the non-auditing services might lower auditor's skepticism because of their increased understanding of the business (Tan, 1995; Geiger and Raghunandan, 2002). However, according to Joe and Vandervelde (2007), in fraud cases, auditors who were not engaged with other non-audit services were able to identify fraud risk factors more effectively than those who provided both audit and non-audit services.

The current study differentiates between two groups of auditors (characterized by high and low level skepticism) as the aim is to examine individual trait differences using the Hurtt Professional Skepticism Scale (HPSS) developed by Hurtt (2010). Hurtt (2010) proposed that professional skepticism is a multi-dimensional individual characteristic, and the scale measures trait skepticism based on six characteristics: (1) search for knowledge (curiosity), (2) suspension of judgment, (3) interpersonal understanding, (4) questioning mind, (5) autonomy, and (6) self-esteem (Hurtt et al., 2013). Hurtt (2010) described curiosity for knowledge search and differentiated curiosity from questioning, because questioning is more about disbelief and doubt while curiosity prompts an individual to search for reasons, evidence, justification and evidence, rather than investigation skills that distinguish curiosity. Furthermore, skeptical individuals always seek to enhance their knowledge in general and are not necessarily reaching a specific conclusion or even want to obtain specific information; they just have an incentive to investigate (Johnson, 1978; Bunge, 1991; Hurtt, 2010; Popkin, 1979, 2002; Litman and Silvia, 2006).

The second trait of professional skepticism is suspension of judgment, which implies withholding judgment until the most appropriate evidence becomes available before reaching a conclusion (AICPA, 1997a). In other words, judgment should be suspended until sufficient and reliable evidence is attained; in psychology, this characteristic is referred to as the need for closure, which means finding a clear conclusion about a certain topic (Hurtt et al., 2013). Interpersonal understanding is critical characteristic of auditor skepticism, as it enhances the process of evaluating audit evidence. Interpersonal understanding helps the skeptical auditors to understand the incentive and the integrity of those who provide audit evidence (Hurtt et al., 2013). Literature on skepticism indicates that understanding people's incentives and manners is a fundamental component of skepticism because individuals have different perceptions and motives that can lead them to behave in their best interest by providing inaccurate, biased, or misleading information (Johnson, 1978; Ashari, 2013; Daukas, 1994; Kurtz, 1992). "Unless the skeptic understands people, it is difficult to recognize the potential for bias that exists in information given by people, and it is difficult to detect when people might be intentionally providing misleading information, once an individual's assumptions or motivations are identified and understood, the skeptic has basis for challenging or correcting mistaken assumptions" (Hurtt, 2010: p.154).

Questioning mind trait is required by auditing standards, as skepticism as defined in these standards as an attitude that includes "a questioning mind" (AICPA, 2002, 1997a).

Other research indicates that skepticism implies careful observation, examination, consideration, methodological doubt, seeking clarification, demanding reasons, justification, and evidence (Stough, 1969; Bunge, 1991). The fifth trait in Hurtt's scale is autonomy, which is basically the objectivity the auditor should exercise when evaluating audit evidence to determine if the evidence is sufficient to reach a judgment (Hurtt, 2010). Moreover, it is important for auditor to further indicate if there is a need for more evidence, especially in absence of communication or any doubtful impressions or unanswered questions (Kurtz, 1992). Skeptical auditors should have the courage to conduct additional investigations and tests and require more evidence until they reach a level of satisfaction with the evidence collected.

Self-esteem is the last trait in Hurtt's professional skepticism and refers to the self-confidence in acquiring a certain knowledge, feeling of self-worth and the belief in individual's own abilities (Lom, 2014). According to Hurtt (2010), skepticism involves some level of self-esteem that is essential to take action to obtain adequate evidence to alleviate doubts or answer questions raised during audit. This current study focused on each dimension of Hurtt's professional skepticism scale and linked the analysis of these dimension to the other variables in the study.

In general, auditors should have an appropriate level of skepticism that should be balanced between trust and suspicion, as the dysfunctional behavior will present if there is extreme trust or extreme suspicion (Deutsch, 1958; Guiral and Esteo, 2006; McEnroe and Martens, 2001). Auditors are required to use the fraud indicators provided by SAS No. 99 because they will give them insights into the areas that require them to exercise their skepticism. For example, Carpenter and Reimers (2013) investigated professional skepticism by examining the effects of a partner's emphasis on professional skepticism and the level of fraud factors on auditors' ability to identify fraud indicators, conduct fraud risk assessment and make selection of the appropriate audit procedures. They conducted an experiment using a 2×2×2 design with two levels of partner emphasis on professional skepticism (high or low), and two levels of fraud indicators (weak or strong). In order to conduct this investigation, they tested Nelson Model and found that, when auditors are provided with fraud indicators or incentives, this results in enhancing their skeptical judgments. Carpenter and Reimers' study provides support for the Nelson Model by identifying elements that positively affect professional skepticism.

More specifically, the results show that partner emphasis on professional skepticism significantly affects auditors' decisions when assessing fraud risk factors (exercising their judgment) and identifying relevant fraud audit procedures (skeptical actions), when the level of fraud indicators suggested is high or strong. However, the results also suggest that auditors who experience a low partner emphasis on professional skepticism are not effective in identifying relevant fraud risk factors or even in choosing effective audit procedures that differentiate the two levels of fraud risk (weak and strong).

There is a need for further studies that induce skepticism, as the examination of the circumstances that might influence skepticism will offer further insights into different strategies for enhancing professional skepticism (Hurtt et al., 2008). It is worth mentioning some of the studies that addressed the factors or variables that might improve skepticism. For example, Carpenter (2007) used Nelson's (2009) professional skepticism scale to examine the effect of tone at the top on auditors' skeptical attitudes and found that the role of managers maintains and enhances the skeptical behavior of auditors.

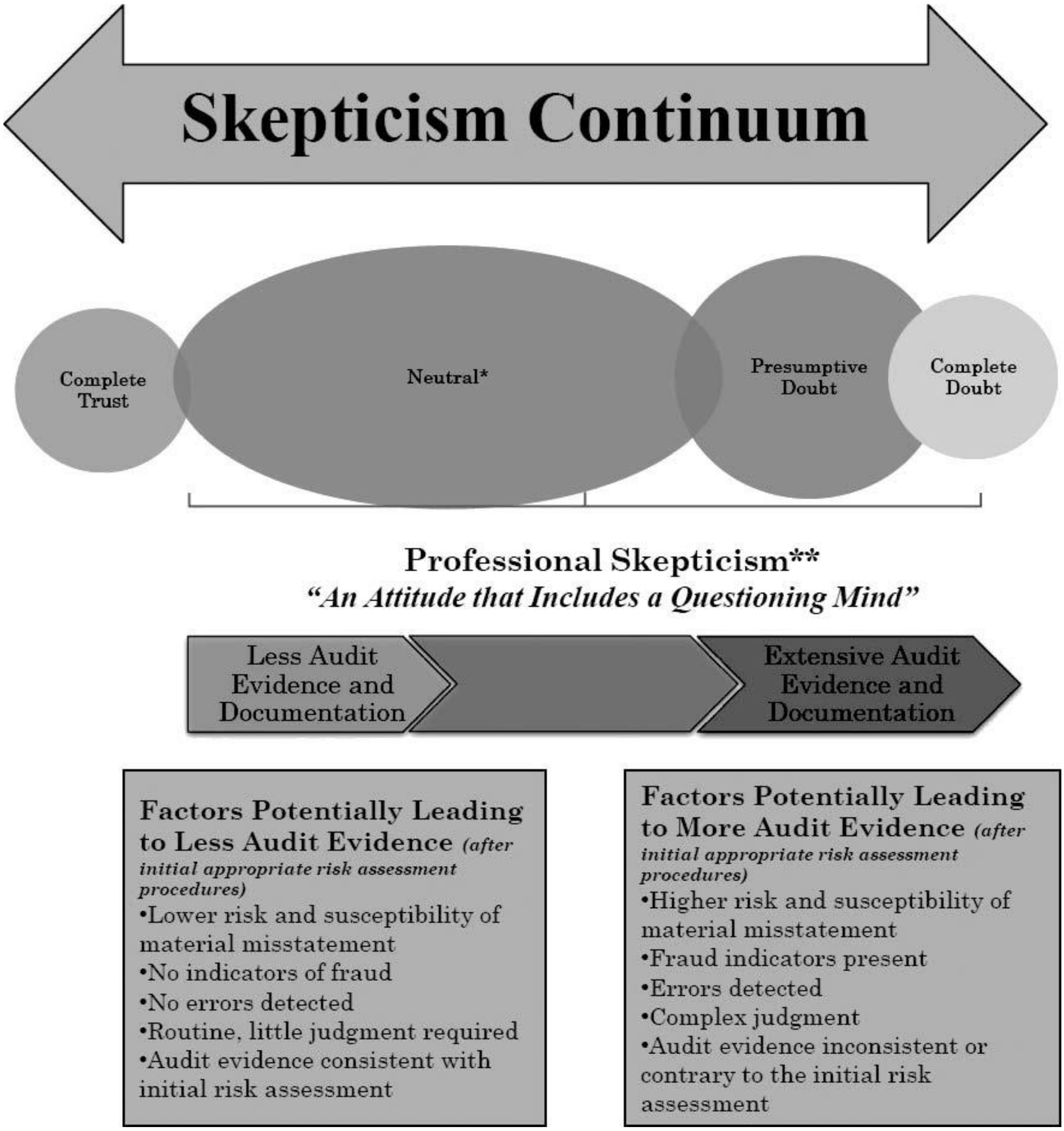
Similarly, Noviyanti and Winata (2015) conducted an experiment in which junior auditors, senior auditors, and auditor supervisors from public accounting firms took part. The authors examined the role of the tone at the top and the knowledge of fraud in influencing the skeptical attitude. The knowledge of fraud means having adequate level of understanding of fraud, which is posited to result in a greater level of professional skepticism behavior. The authors manipulated the knowledge into levels: (1) adequate knowledge and (2) inadequate knowledge. Consistent with Carpenter's (2007) results, Noviyanti and Winata (2015) found that auditors' level of skepticism depends on their supervisors' managerial tone, in that if the auditor was supervised by a strict partner, he/she would exhibit more skeptical attitude. In addition, the results supported the second hypothesis that auditor who attains an adequate knowledge of fraud will induce more skeptical behavior than an auditor who has no knowledge of fraud.

In an earlier study, Cohen et al. (2014) examined the effect of two perspectives on professional skepticism on critical job attitude and turnover intentions within the auditing profession. They found that professional skepticism correlates positively with both person-job fit and professional identification, which in turn leads to lower turnover intentions. However, their results suggest that the presumptive doubt perspective of professional skepticism had negative effect on the career trajectory of audit professionals. Brown-Liburd et al. (2013) examined the outcomes of client-auditor negotiation when it is affected by earnings forecasts and heightened professional skepticism. They posited that the auditor's final negotiation position might be influenced by those two factors. Thirty-eight auditors participated in their experiment (including 21 audit managers and 16 partners with an average of 9.76 and 20.12 years of auditing experience, respectively). All participants had prior client-auditor negotiation experience. The findings of their study suggest that there is no significant influence of earnings management on negotiation position and that, when auditors present heightened professional skepticism, they are significantly more conservative and are more resolute in their final negotiation positions. In other words, exercising high level of skepticism helped auditors to be more strict and determined, especially in cases where the management incentive to manage earning was high.

Glover and Prawitt (2014) proposed skepticism continuum in Figure 4 that allows choosing the appropriate perspective, considering the circumstances that are applicable to each audit area, and assertion. However, this continuum should be placed after a careful consideration of fraud risk assessment, whereby the auditor must keep evaluating the risk throughout the audit to assure that a proper amount of exercised skepticism is applied to the collection and evaluation of audit evidence. In addition, this exhibits lists factors that might lead auditors to exercise either a more neutral or doubting prospective, which will help auditors recognize the need for less or more audit evidence.

In addition, Peytcheva (2013) examined the relation between professional skepticism and the auditor's correct reasoning when testing the truthfulness of management's assertions by conducting an experiment where 78 audit students and 85 practicing auditors examined an audit case and decided the evidence needed to verify the validity of management's assertion. Peytcheva (2013) manipulated the presence of a professional skepticism prompt (present vs. absent) and the presence of cheater detection prompt (present vs. absent), aiming to find out whether both states and traits improve the auditor's reasoning about audit evidence. Professional skepticism prompt means that auditors must have an attitude of presumptive doubt, and a heightened awareness of the risk that the assertion may be wrong (Nelson, 2009). On the other hand, cheater-detection prompt means when the benefit is conferred and a corresponding obligation is incurred, it is the decision maker’s task to detect cheating from the obligation (Cosmides and Tooby, 2008). The findings reported by Peytcheva (2013) suggest that the presence of a professional skepticism prompt improved the cognitive performance of students, but did not affect the performance of auditors that took part in this study; the difference in skepticism between novices and professional auditors might be the reason for this finding. In addition, the presence of a cheater-detection prompt had no significant influence on either students’ or auditors’ performance and the personality trait was found to be a significant predictor of cognitive performance of students, but not of auditors.

Figure 4: Skepticism continuum (proposed by Glover and Prawitt, 2014)



Authors of previous studies examined the association between auditors' skepticism and experience. For example, Ríos-Figueroa and Cardona (2013) examined whether experience plays any role in the professional judgment of auditors during the audit planning stage. They have conducted a survey among auditors working in audit and accounting firms, independent practitioners, and university senior students majoring in accounting to determine whether the years of work experience an auditor possesses influence the evaluation of the internal control environment and the process of fraud risk assessment in a firm operating in different countries with different cultural characteristics. Their results indicate that experience does not seem to affect auditor judgmental process and eventually their decisions when they are based on professional judgment. However, university students and auditors with limited experience did not exhibit this correlation. It is important to note limitations affecting the Ríos-Figueroa and Cardona (2013) study. First, there is strong potential for self-selection bias because only individuals who decided to answer the study's questionnaire were included in analyses. Second, the number of participants was unequal in different categories. Third, the presence of many leading questions restricted the participants' answers to the desired responses, and finally, experienced auditors working in companies located in other countries were not included.

In general, archival literature provides evidence that experience and industry expertise enhance auditors' skepticism and correlate with audit quality (Krishnan, 2003; Romanus et al., 2008; Taylor, 2000). However, as authors of these studies used archival data, whereby judgment and decisions that reveal skeptical judgment and actions were not examined directly. There are also several studies in which researchers examined task-specific experience, revealing that it enhances skeptical judgment. For example, Rose (2007) reported that fraud-specific experience is positively correlated to judgments of intentional misstatements, while general experience is not significant. Another study conducted by Agoglia et al. (2009) revealed that those reviewers with high level experience were able to most accurately assess fraud risk regardless of the documentation format. However, some researchers found that experience is not that beneficial. Findings reported in the Grenier (2015) study suggest that audit seniors are less skeptical than staff auditors and that this finding is driven by situation with a low planning-stage that audit seniors gave low fraud risk assessment regardless of following evidence to the contrary.

Hurtt et al. (2013: p.52) "that the impact of experience on skeptical judgment (or lack thereof) is derived from a number of factors, such as the level of knowledge of the client's business and industry, the number of years one works as an auditor, task-specific experience, and experience with more complex audit tasks". They add that the finding that fraud-specific experience enhances skepticism judgments recommends that supplementing students and auditors with experiential learning in fraud detection may perhaps augment skeptical judgments. They also suggest that more research into the influence of specific types of experience and specific types of tasks on professional skepticism is necessary.

As a part of the current study, analysis was conducted on the relation between skepticism and experience, along with a comparison of auditors with high and low skepticism and their reaction to low or high fraud risk conditions. Curtis (2014) distributed a questionnaire to professionals, reporting that three out of five professionals interviewed are of view that experience is the most important quality in the development of an auditor's professional skepticism. Moreover, the interviewed professionals indicated that on-job-training and real life work situations can help auditors develop the ability to listen and pay attention to the details in the planning and audit performance.

The current study examined the relation between skepticism and auditors' experience in two ways, first linking the experience with each skeptical dimension before testing the relationship between auditors' experience and two levels of skepticism (high and low).

Vinten et al. (2005b) conducted an experiment in which professional auditors took part in examining the effect of two factors (planning stage fraud risk assessment and audit experience) on auditors' level of professional skepticism. The results were as expected, in that auditors respond to low fraud risk assessments with less skeptical behavior more than those with no knowledge of fraud risk. In addition, in high fraud risk conditions, auditors with no knowledge of fraud risk were less skeptical than those with fraud risk knowledge. The authors also found that staff auditors were more skeptical than seniors, and seniors with and without knowledge of fraud risk show no difference in skepticism. However, the professional skepticism in Vinten et al. (2005b) study was measured as the auditors' assessment of client truthfulness and, since there are different characterizations of professional skepticism, the reader is required to interpret professional skepticism with caution.

Recently, Ortegren et al. (2016) examined the relation between client identification and auditor skeptical judgment, the connection between skeptical judgment and skeptical action, and the role of professional commitment in these relationships. The authors employed 124 senior auditors as participants. Their results suggest that the client identification correlates negatively with auditors' skeptical judgment. However, evidence indicating that professional commitment reduces the negative link between skeptical judgment and client identification was weak. In addition, the findings suggest that professional commitment is able to enhance the link between skeptical judgment and skeptical action. However, authors provided some evidence indicating that skeptical judgment does not always lead to skeptical action.

This current study examined the impact SAS No. 99 factors decomposed in the process of thinking stages on auditors' skepticism. The aim was to elucidate whether this type of decision aid enhances auditors' professional skepticism in that auditors will give high assessment to high fraud risk cases and low assessment to low fraud risk cases.

2.10 Summary

The literature reviewed in this chapter revealed gaps in the extant knowledge on auditing fraud risk assessment. There is a need for a decision-making model to work more effectively on auditors' fraud risk assessment and methods that are more practical and useful in enhancing their skepticism. The literature reviewed also helped synthesize the findings of the previous research into new framework that combine SAS No. 99 fraud risk factors and ethical process of thinking model in a decomposition approach.

The following chapter presents the theoretical framework and the study's ethical pathway.

Chapter 3 Theoretical Framework

3.1 Introduction

In this chapter, the ethical decision-making model in the Throughput model is discussed. The chapter begins by explaining the Throughput (TP) model in relation to the extant literature, along with the description of the model's dominant concepts of perception, information, judgment, and decision choice. The ethical decision-making pathways are introduced, explaining each of the first primary pathways and the second higher ethical pathways. This chapter also provides detailed information on the research theory in the Virtue based-pathway and its applications in accounting and auditing studies. Finally, a link between the TP model and the fraud triangle factors is given before concluding the chapter.

3.2 Throughput Model

Ethical decisions are often difficult to make, due to the increased temptation and the misunderstanding of the decision-making process. The environment change, incomplete information, time pressure and a lack of expertise make the decision process more complicated. According to Gauthier (1979: p.553), Thomas Hobbes described moral philosophy as:

"Moral philosophy is nothing else but the science of what is good and evil in the conversation and society of mankind. Good and evil are names that signify our appetites and aversions, which in different tempers, customs, and doctrines of men are different: and diverse men differ not only in their judgment on the senses of what is pleasant to the taste, smell, hearing, touch, and sight: but also of what is conformable or disagreeable to reason in the actions of common life."

It is worth defining the word "ethics" before explaining the ethical decision-making process. Ethics refers to standard of conduct that specifies how one has to behave based on specific values and moral duties. Ethics is normally associated with honesty and truthfulness and defined as norms that differentiate between right and wrong. Ethics is related to trust in that it inspires trust, which is a set of beliefs or expectations and motivation to act on those beliefs (Rodgers, 2009b). The issue of ethical decision making has received much attention from scholars in different areas in recent years (O'Fallon and Butterfield, 2005; Herington and Weaven, 2008; Reynolds, 2006). An understanding of ethical decision making is very important, specially to deal with uncertainty, which is a fact of complex, dynamic organizational life that exists in conditions where multiple stakeholders, interests, and values are in conflict and laws are not clear (Dubinsky and Loken, 1989). Scholars and practitioners from different fields call for a conceptual model that helps guiding decision makers to different processing phases as well as influencing their ethical based choices (Brass et al., 1998; Kahn, 1990; Rodgers and Gago, 2001, 2006). Because of the need of a simplifying approach to thinking, Throughput model is proposed in this study as a decision aid in that auditors are exposed to a simplifying process of thinking such as the dominant concepts of *information*, *perception,* and *judgment* and *decision*. Also, a Throughput model is presented in this thesis to illustrate financial and other types of information that interact with the decision makers' processes at different stages of assessment. This model is a conceptualization of an individual's perception of the available information, judgment, and decision choice. The value of this model stems from the importance of determining the most optimal ethical behavior pathway to a decision, as there are many pathways to a decision and the ethical pathway should strongly influence which pathway is chosen (Rodgers, 2010).

In general, ethical process thinking starts with how an individual perceives the ethical dilemma or how he/she uses information, taking into account the consequences of the pathway chosen. Therefore, ethical decision making helps in explaining how to frame the problem to reach a desirable decision, by understanding the circumstances that are necessary to make an adequate decision choice, such as time pressure, the use of reliable and relevant information, and a sufficient level of expertise. Framing a problem refers to how individuals view it based on the stored knowledge that they usually used to solve problems. Moreover, throughout the world, perceptions of right and wrong may vary both across and within cultures. "Tolerance and respect for cultural diversity is an ongoing challenge in our global community. If we can identify and understand the specific ethical criteria that highlight the various pathways in which ethical reasoning can affect a decision, this understanding will be helpful for our future decisions" (Rodgers, 2009b: p.11).

The Throughput model has been used as a conceptual framework that helps integrate different concepts into a decision-making model. For example, Rodgers and Gago

(2003) applied a knowledge-based framework for explaining and interpreting executive compensation under a process of ethical consideration. They reached a conclusion that the six ethical pathways presented in the Throughput model can assist major activities and processes that influence management decisions. In their more recent study, Rodgers and Gago (2006) employed the same six ethical pathways that were also supported by Bible scriptures to address fraudulent activity and absence of morality in certain decision-making scenarios. Moreover, they suggested a modification of decision-making models that have been exercised in the organizations with stronger links with ethics and morality. Rodgers et al. (2015) also employed the Throughput model in fraud, and specifically in fraud triangle factors, whereby they embedded ethical process in the fraud triangle. Rodgers and Gago (2001) also used Throughput modeling approach to cultural and ethical concerns when dealing with accounting information processing. Rodgers et al. (2009) studied whether using the Throughput model can assist in explaining how ethical issues may be influenced by auditors' conflicts of interest, and Guiral et al. (2010) connected the Throughput model to the moral seduction theory, claiming that this connection helps in providing a better understanding of how conflicts of interest lead auditors to avoid the issuance of warning signals to stakeholders. Culbertson and Rodgers (1997) employed the Throughput model to test casual relationships between a set of constructs they found important in understanding the organizational effects of sexual harassment. Their aim was to examine the casual linkage between female Navy personnel perceptions of their organization's climate about sexual harassment, experiences, and judgments about presenting sexual behavior, and how the consequent results affect organization. Their findings enhance the understanding of situational variables in preventing harassment, while at the same time giving managers an early warning to help them mitigate this contemporary workplace issue.

The Throughput model was also tested and examined in several other studies (Guiral et al., 2015; Rodgers, 2012; Guiral-Contreras et al., 2007; Rodgers, 2007; Rodgers et al., 2008, 2013; Rodgers and Guiral, 2011; Rodgers and Housel, 2004; Rodgers et al., 2005)

The Throughput model has been employed empirically in many different studies. For example, Foss and Rodgers (2011) analyzed effects of line managers' prior cross-unit involvement with Corporate Audit using Throughput modeling. Their findings revealed that cross-unit involvement is more than an effective means of transmitting information, in that it appears that there are many possible casual relations that link the services received from auditing, leading to different pathways through which managers can reach an assessment of these services. Rodgers et al. (2013) utilized a two-stage investor decision making model (Throughput model) to examine the relationship among a firm's innovation effort, social responsibility commitment (CSR), and financial performance. The findings suggest that a firm's CSR contributes to its financial performance.

Ethical decision making in the Throughput model involves more than collecting factors; it is a process that involves four dominant concepts and relates them to an individuals' manner of resolving a dilemma. These dominant concepts are perception, information, judgment, and decision choice. The Throughput model supports the notion that people's models of decision making can be influenced by their preferences, rules, or principles. The final decision can be changed dramatically by selecting the suitable pathway for the decision-makers' process of thinking. Thus, it is essential to understand and recognize the four major concepts in the decision-making process in order to elucidate the decision-making pathways. Failing to understand the decision pathways can result in failing to take action when the circumstances start to change. The following section provides a more detailed explanation of the four major concepts that govern individuals' life.

3.3 Dominant Throughput Concepts: Perception, Information, Judgment, and Decision Choice

3.3.1 Perception

Perception is a process of interpreting and organizing the sensory impressions in order to give meaning to the individuals' environment, as their behavior is based on their perception of what reality is, not the facts that create this reality (Ravlin and Meglino, 1987; Pickens, 2005; Lindsay and Norman, 2009). Perception refers to the framing of the decision-making process that involves acquisition, storage, transmission, manipulations, and use of information. Perception helps to frame, guide, and edit the various pieces of knowledge used in the process of thinking; it presents the education, training, and experience. Rodgers (2009b) argued that heuristics and biases are a part of perception that represents engagement in dealing with the environmental conditions in life. Heuristics can be defined as the pre-programmed steps that guide and direct individuals' perceptions and as a mechanism for coping with the complex environment surrounding individuals' decisions. While heuristics can help to reduce complexity, they tend to lead to systematic errors, since individuals tend to focus on a significant aspect of the specific problem (Rodgers, 2009b). Moreover, "heuristics can be emotional and when are employed in certain situations can bias or condition what knowledge is implemented and what will be learned next" (Rodgers, 2009b: p.32). To improve the use of heuristics, individuals tend to use information and distinctive elements to fit the perceptual impressions process.

Individuals perceive things differently because of the factors around them that affect perception. These factors are either internal factors (within the receiver) or in the context of the situation in which the perception is taking place. Personal characteristics affect the way individuals perceive and interpret what they see. These characteristics are attitude, personality type, motives, interests, past experience, and expectations. The context where the objects and events exist is also important, such as time, location, light, heat, or any other situational factors. Nevertheless, perception is far from perfect, as our perception and judgment are swayed by different cognitive processes that are not governed by the actual facts. These biases and misrepresentations are well documented in numerous cognitive and psychological studies (Gilovich et al., 2002; Nickerson, 1998; Evans, 1989; Dror, 2005; Dror and Fraser-Mackenzie, 2008b).

3.3.2 Information (Relevancy and Reliability)

Information derives from all available sources and it represents knowledge sources that are formulated in text, words, graphics, or any other symbolic form. Ethical concerns arise is how reliable and relevant the information is. Reliability relates to correctness, reproduction, verification, and confirmation (dependable). Relevancy relates to linking information to the past, present or future events to understand and implement it in matters that are important to take action, depending upon circumstances. "In many decision making tasks, it is necessary to have information that is both reliable and relevant; this information is sufficient if the probabilities (chance or likelihood of occurrence) and events (measures, procedures or transactions) are precise" (Rodgers, 2009b: p.35). Incomplete information that cannot be compared, contrasted, ranked, or rated becomes very difficult to order and compromises one's ability to proceed with the decision-making process. Moreover, without reliable and relevant information, decision makers cannot confirm if they achieved their objectives. Throughput model does not only decompose information into its most elemental components, but also treats these components as a natural bridging mechanism between the decision maker and different levels of analysis. Thus, information is a basic element in the ethical process thinking that governs individuals' choice, since changing pieces of information interact and are related, prompting their users to assume delicate patterns of relationships to assist in the understanding and analysis (Rodgers, 2009b).

Information can be divided into different elements, such as political, economic, management, financial, and social elements. Political information relates to all legal matters of the organization and the rules and regulations of an entity, as well as the reality of how the entity governs and functions. Economic information pertains to the rules and policies that control economy and calls for good rules that maximize social welfare, and to the events outside control of individuals and organization (Laffont, 1999). This pertains, for example, to changes in government policies, purchasing habits of customers, union contracts, emerging technologies, etc. Management information is about the interactions and relationships between people in an entity, which includes supervisor/employee, parent/children, and individual-to-individual relationships (Stock and Lambert, 2001). This information helps individuals measure these relations to reach their objectives and goals. Financial information relates to monetary matters, such as liquidity, profitability, and risk features of an individual or organization (Rodgers, 1992). The simplest definition of liquidity is the ability to convert available assets into cash to handle day-to-day needs, whereas the ability to generate income beyond expenses is defined as profitability. Leverage or risk is the level of obligations and debts that an individual owes, and is thus related to one's wealth. Finally, social information is linked to the cultural, ethical, and trust systems that govern the organization or the entity. For example, the code of ethics, the enforcement of obligations, promises, and expectations occur through social processes that support socially acceptable and legitimate rationalizations for actions, solidarity, and information exchange (Salancik and Pfeffer, 1978).

Information, in the context of this study, includes the set of financial and non-financial information available to a decision maker for problem-solving purposes. The financial information includes liquidity (e.g., current assets/current liabilities), profitability (e.g., net income/sales), leverage (e.g., debt/equity), as well as market performance (e.g., price-earnings ratio). Non-financial information can be divided into three sub-groups of intangibles assets, namely human, organizational, and relational assets (Rodgers, 2003). Information can affect how the decision maker perceives a problem or selects the type of information to be used and perceptually determined in the judgment and decision choices within the decision-making process (Tversky and Kahneman, 1974). As the economy becomes increasingly global, people make decisions that are likely to be biased on ill (poor)-information, time pressure, immediate choice, and other constraints that have broader effects on society (Milkman et al., 2009).

3.3.3 Judgment (Analysis of perception and information)

Judgment pertains to evaluation and analysis of the evidence provided; it refers to the ranking and sorting aspects of the decision-making process. Judgment should be exercised when certain situations are not clear or when exceptional circumstances arise (Rodgers, 2009b). There are three characteristics of judgments, one of which is morality related to what is wrong and what is right. When an individual judges a particular situation, this judgment should be derived at the universal level; i.e., if this situation is right for the particular individual, it should be right for everyone else in similar circumstances. Further, if the particular situation is wrong, it should be wrong for everyone else (for example, the moral rule against murder or robbery is wrong for everyone and that is universal rule).

In order to understand judgment, it is important to recognize the components of the decision-making process that needs to be analyzed after perceptual framing of a particular situation, such as identifying the matter, weighing the criteria and guidelines, generating alternatives of possible courses of action, and finally evaluating these alternatives before reaching a decision. Judgment is made in this model by two methods: compensatory and non-compensatory. The compensatory method of evaluation requires comparison between two or more choices following essential criteria. Subsequently, sum the weights of these alternatives is used to determine the one with the highest value. However, the non-compensatory strategy modifies the basic compensatory strategy of adding and summing the weights of the criteria values, in that a selection of only one criterion value may be sufficient.

“Moral judgment’s degree of influence helps in moderating, reshaping, or repositioning information and our perceptions. Our analysis of the situation assists us in the weighting of information and perception in order to rank or rate a particular situation as right or wrong” (Rodgers, 2009b: p.37).

Judgment, in this study, pertains to a more detailed analysis of an individual’s knowledge and information. In other words, judgment is exercised after the individual’s analysis of the perception and information. The ability to judge and make decisions or structure opinions objectively and wisely has to be exercised whenever a situation is unclear or there are exceptional circumstances (Rodgers et al., 2009). Judgmental processes in the decision making require extensive analysis, which depends on the knowledge and experience of the decision maker in processing the presented information and the perceptual attention processes (Anderson, 1990).

3.3.4 Decision

After clear and careful assessment and analysis of perception, information, and judgment, the last step in ethical process thinking is making a decision. Rodgers (2009b) recognized three kinds of decisions: choices, evaluation, and construction. In choice, the individual will be presented with different well-defined sets of alternatives that should be evaluated to choose the best alternative for that particular situation. Evaluation requires making the best assessment of the alternatives by evaluating the consequences of each alternative. Finally, construction pertains to trying to identify different alternatives and combining the most satisfactory alternatives to arrive at the most possible satisfactory alternative. This process thinking helps to recognize the ethical dimensions of a decision; however, the relation between ethics and decision choice can be clarified through a careful examination of the six dominant pathways (Rodgers, 2009b).

Decision making is a daily task that requires individuals to take action; the nature of this task varies in complexity from relatively simple and straightforward to a complex and multi-step analysis. Thus, a decision is an action and the intention of this action is to produce a favorable outcomes. Successful decisions are those with satisfying outcomes, whereas unsuccessful decisions occur due to one or more decision errors committed while the decision was being deliberated (Rodgers, 2009b).

The following sections briefly introduce the six dominant decision-making pathways and the ethical theories that explain them.

3.4 Ethical Process Thinking Pathways

The ethical process thinking examined in the present study illustrates six major ethical pathways that follow different processes and steps required before reaching a decision choice. The integration of the four major concepts (perception, information, judgment, and decision choice) should provide a comprehensive picture of how these concepts interact before making a decision. There is no right or wrong answer to an ethical dilemma, as sometimes information may not be available to make the best decision in a particular situation (Rodgers, 2009b).

The six dominant pathways that individuals undertake before reaching a decision are described as follows:

1- Preference-Based Pathway (P→D)
2- Rule-Based Pathway (P→J→D)
3- Principle-Based Pathway (I→J→D)
4- Relativist-Based Pathway (I→P→D)
5- Virtue Ethics- Based Pathway (P→I→J→D)
6- Ethics of Care-Based Pathway (I→P→J→D)

The first three pathways are the primary and basic level of ethical process thinking consisting of preferences, rules, and principles. Preferences (utility), rules (laws), and principles (standards) are very important to decision making and can be viewed as "the three building blocks that motivate our ethical process thinking" (Rodgers, 2009b: p.93). Preferences are desires, wants, and needs, whereas rules are the laws, regulations, procedures, and guidelines that govern individuals' life. Principles are standards, values, attitudes, and beliefs. Depending on these three basic determinants, the decision makers make their decision choice. The three primary ethical pathways in the Throughput model are motivated either by problem framing influencing perception or by presenting information. These primary ethical pathways are the basics that are embedded in the secondary-level pathways of relativism, virtue ethics, and ethics of care.

3.4.1 The first three primary pathways

1- Preference-based pathway (ethical egoism): P→D, where individual's perception leads to a decision choice

> *"Ethical egoists believe that people will be happiest if they look out for themselves and do not concern themselves with others" (Rodgers, 2009b: p.124).*

P→D represents an individual with a certain level of expertise, who makes a decision without relying on information. The information might be too noisy, incomplete, inadequately understood, or may not suit the self-interest. Additionally, time pressure might prevent an individual from analyzing the available information.

There are a few key differences between psychological egoism and ethical egoism, one of which stems from the former asserting that humans *must be* selfish, and they perform beneficent acts because it makes them feel good, while the latter claims that human *should be* selfish. A distinction is drawn here between selfishness and self-interest. Selfishness concerns individuals' own interests regardless of whether this hurts others (it being implicit in the pejorative term that the interests of the selfish person are injurious to those of others), whereas self-interest concerns individuals' own welfare but not necessarily at the expense of others. Moreover, psychological egoism depends mainly on the way individuals act, implying that actions are dominated entirely by individual incentive, whereas ethical egoism indicates that one can exercise self-interest while being moral and happy; for example, if someone works to benefit him/herself while simultaneously not hurting others (unlike, for example, stealing) (Rodgers, 2009b).

Kalin (1975) developed a view that the moral system will be understood as we normally conceive and it will be treated as systems of non-traditional reasons. He argued that there are also traditional and non-traditional practical principles. Moreover, he also argued that egoism is a traditional principle that derives its power from its basis, whereas morality is a non-traditional principle that gains its force from mutual adoption. In other words, Kalin purported that the principles and rules governing any moral reasoning receive their reasonableness from egoistic purposes. Kalin (1975) concluded that ethical egoism cannot be taken as a basis for morality, and that morality logically rests on general good or equality of power or both of these two conditions.

Another argument in ethical egoism is put forth by Thomas (1980), who argued that the person is able to have the disposition he/she chooses. In other words, ethical egoism is unacceptable as a moral theory based on two arguments. The first argument stems from the definition of friendship. Thomas mentioned that a true friend cannot hurt his/her friend or exercise any of his/her egoism to harm anyone treated as a friend. The second argument pertains to healthy personality, whereby ethical egoism and healthy personality cannot coexist, and that the former is not healthy or moral at all. Thus, a person with an unhealthy personality could never be a true friend. Finally, Thomas (1980) concluded that there is a medical name for the people who seek to maximize personal good without caring about the welfare of others—psychopaths. Thomas (1980) also believes that the egoist would be a psychopath, and he argued against the possibility of being a pure egoist while simultaneously being a psychologically healthy individual. According to Rodgers (2009b), the preference-based pathway is concerned with actions being justified, in that a person accepts an action as right if it benefits him or her. “The search for truth is a dubious enterprise, it seems, both because it isn’t clear that it is a good idea for us to try and live with it, and because the very notion of finding truth is in itself suspect” (Nietzsche, 2007: p.15). Nietzsche’s perspective about the preference-based pathway supports the deliberation that individuals decide on the course of action that will result in the greatest good for them.

From an auditor’s point of view, and in the presence of time pressure and rapidly changing environment, this pathway seems to be the most efficient. However, especially in fraud risk assessment task, auditors need to be careful and comprehensive, rather than efficient.

2- Rule-based pathway (deontology viewpoint): *P→J→D Individual’s perception leads to judgment then to decision choice.*

“Philosopher Immanuel Kant strived to limit the differences between the existentialist (individual) and contractarian (group) perspectives by asserting that people’s decision should be converted into universal will”(Rodgers, 2009b: p.141).

P→J→D relates to situations where no time pressure exists. The individual in this pathway is thus confronted with a changing or unstructured environment. Ignoring the available information in this pathway can be justified because of incomplete and noisy information, inadequate understanding, and undifferentiated alternatives. This pathway is controlled by a person's internal and external rules and laws, in that once these rules and standards are memorized or practiced, they become the driving force in the perception process. This procedure motivates the analysis process (judgment) to follow a presenting set of rules applied to a particular situation. Thus, depending on the situation, this pathway can lead to favorable or unpleasant results.

The German philosopher Immanuel Kant formulated classical deontology. He believed that, since there are rules in physics and mechanics, there must be also rules for the world of morals, which should be universal. Kant believed that acts must be done for the sake of duty to have moral value, and stated that the good things for humanity are not health, power, wealth, and intelligence, but only goodwill (Kant and Gregor, 1996). Goodwill can be defined as performing one's duty for the sake of duty, which Kant believed accrued moral credit. David Hume disagreed with Kant and believed that what is admirably and morally right is whatever is good for the self or others, which has a great impact on consequential ethics (Hume, 2010).

To understand these contrasting views, it is worth imagining a man that, while driving a car, saw someone he does not like. He accelerates, hitting and killing that person. Hume would say that this action was bad, because killing someone is never right, but Kant would say that this is bad because the will and intention to kill the man were bad. If we turn the situation around, imagine that the driver sees this man crossing the street and mistakenly puts his foot down on the accelerator instead of the brake, consequently hitting and killing the man. Hume would still say that the act was bad because it resulted in death of a person, whereas Kant would say that it was unfortunate (not bad), because there was no intention to kill and thus no blame is attached to the driver. Moreover, Kant suggests acting according to maxims that he meant to be rules or principles, which should be applicable as universal rules; if a maxim fails to be universal, then this act is not right (Rodgers, 2009b).

Van Staveren (2007) discussed deontological ethics and superiority of deontology relative to utilitarianism in analyzing ethics in economics, arguing that deontology and economics are incompatible because the latter is always concerned with behavior related to decision-making and choice, whereas deontology is concerned with behavior related to duties and limitations. Rights and norms more widely exist to influence the economic behavior of individual agents, firms, and states and any entity functioning within political economy; these rights and norms affect economic behavior through constraints and choices. Deontology ethics can be limited to a small set of rights concerning property and contracts, and these moral rules limit choices that help to ensure that people are free to trade and they will not reduce other people's freedom to trade. In addition, Van Staveren (2007) stated that deontological ethics have nothing to do with incentives, as people are following universal moral rules, and following these rules will not necessary lead to disincentives to produce, as the people are led by the agreed universal moral rules and not by their choices and desires.

In general, the purpose of rules and laws is to allow society to function for the benefits of its members and their beneficiaries, for social, intellectual, educational, charitable, benevolent, moral, fraternal, patriotic, or religious purpose (Rodgers, 2009b). "Rather than focusing on consequences, the rule-based system emphasizes duty as the basis of moral value. In this way, this method emphasizes that a basic, correct action is one where the laws or other rules are followed" (Rodgers, 2009b: p.98).

3- Principle-based pathway (utilitarian View): *I→J→D where information leads to judgment and then to decision choice*

I→J→D represents an analytical and programmatic approach, starting with specifying the problem, identifying all factors involved in the situation, evaluating these factors, identifying all alternatives, assessing alternatives on each factor, and choosing the most satisfactory alternative. This pathway assumes that information used is reliable and relevant and the detailed information makes this pathway useful in detailing steps. Once these information sources are evaluated, they can then be used to compare and contrast before making a decision. However, if the information is noisy or incomplete, the use of this path might lead to unfavorable decisions.

As understood by the father of utilitarianism in the 18th century, Jeremy Bentham, "Nature has placed mankind under the governance of two sovereign masters, pain and pleasure" (Bentham, 1789: p.28). Bentham believed that any individual would always seek happiness and pleasure, regardless of whether he/she is a moralist or a religionist. Moreover, for Bentham, the most important issue pertains to the consequences of making moral judgments and how consequences became the foundation of human morality (Payne, 2006).

Mill (1863) defined utilitarianism as the greatest happiness principle, whereby happiness is intended pleasure and the absence of pain; in other words, is existence devoid of pain as far as possible, and as close to happiness and fulfillment as possible, with consideration of both quantity and quality. Mill believed that happiness, not pleasure, is the standard of utility.

Hinman (2001) explained that the fundamental idea behind utilitarianism is that the individual should always act in the way that will produce the greatest overall amount of good in the world, i.e., “Utilitarianism is most appropriate for policy decisions, as long as strong notion of fundamental human rights guarantees that it will not violate rights of small minorities” (Hinman, 2001: p.3).

Van Staveren (2007) stated that, in welfare economics, the Bentham utilitarian principle, which states that individual agents should focus on maximizing the welfare of others (greatest happiness for the greatest number of people) is rejected. Instead, Pertain principle works more effectively in welfare economics. Paretian principle is the opposite of utilitarianism in that identifying situations will be easier when no one can be made better off without making someone else worse off (also known as Pareto efficiency).

Mack (2004) described utilitarianism as welfarist in its philosophy, noting that welfarist theory is built on four tenets: utility maximization, consumer sovereignty, consequentalism and welfarism. Welfarist utilitarianism is also close to two other concepts: consequentalism, which implies that the consequences of an action solely determine whether it is the right thing to do, and the best thing to do is to maximize the overall welfare; and aggregation, which suggests that the collective welfare or the total welfare is equal to the sum of individual welfare. Moreover, Mack (2004) also believes that utilitarianism should be replaced with neo-utilitarianism because, in healthcare, the happiness and pleasure will be replaced by the length and quality of life, even though the basic principle is the same.

3.4.2 The second higher-level ethical pathways

1- Relativist-based pathway (Ethical Relativism theory): *I→P→D where information leads to the perception then to decision choice.*

I→P→D presents the pathway for a situation where environments are not structured. In this ethical pathway, individuals can use all available information to frame their perception before reaching a decision. However, because this pathway depends on information changes, this results in a modification of the individual's view of a situation. In addition, this ethical pathway ignores the judgment function, which allows individuals to handle a degree of time pressure, since individual detailed analysis is not required for decision making purposes. The preference path way (*P→D*) is embedded in this pathway, suggesting that a quick pathway to a decision is enhanced by experience or the expertise of the decision maker. That is, the relativism pathway allows information to provide more awareness in the perception function to guide an individual's experience to reach a decision.

From the moral relativism viewpoint, Harman (1975) mentioned that moral relativism was defined "as the assertion that there are no universal moral principles and one ought to act in accordance with the principles of one's own group, where this latter principle, is supposed to be a universal moral principle". Rodgers (2009b) argued that people in this position define ethical standards on the basis of themselves or the people around them. What might be good decision to the relativist might not be for another individual, as with regards to ethics, no independent standards are available. However, the view that moral relativism is related to a culture or society has persisted through most of the history of Western philosophy. According to Gowans (2015), there are two contrasting views of relativism in the literature—descriptive moral relativism suggesting that relativism is a matter of empirical fact, and extensive moral disagreements across different societies. The second contrast is meta-ethical moral relativism, where the true or wrong in moral judgment is not absolute or universal, but is determined according to the traditions, convictions, or a practices of a group of individuals.

The relativist-based pathway adds information to the preference-based position and, assuming that information pertains to culture, changing environment. Moreover, relativism-based position does not just explain that moral truths are relative to circumstances but also that moral rules are relative to circumstances and situations (Rodgers, 2009b). However, Rodgers (2009) argued that there are two dominant positions in regards to relativism: subjectivism that states that opinions and feelings set the standards of truth and falsity, and cultural relativism, where the cultural differences direct their decision (this position indicates that cultures define the standards of moral truth). "The disadvantage of the relativist-based pathways is that truth and justice are all relative. The value of a human being is determined by an amalgamation of social preferences and patterns, experience, emotions and 'rules' that seem to bring about the most benefit under the set of circumstances at hand" (Rodgers, 2009b: p.217). However, the relativist view is still attractive, in that it gives impression of respecting everyone's opinion.

The relative pathway might be useful as audits often operate as teams/groups, however, as judgmental stage is critical in auditors' fraud risk assessment, and relativist-based pathway ignores analysis, this makes this pathway unsuitable for auditors in their fraud risk assessments task. Moreover, auditors' cultural or society values does not influence their reasoning process associated with ethics (Kung and Li Huang, 2013).

2- Virtue ethics-based pathway (Virtue theory): *P→I→J→D, where individual's perception influences information that leads to judgment then to a decision choice.*

P→I→J→D illustrates how an individual's perceptual framing helps in choosing certain types of information that is going to be used in the judgment process. This pathway might not work well under time pressure, although the information used in this pathway is viewed as reliable and relevant for decision-making purposes. In the current study, this pathway is employed when examining auditor's fraud risk assessment process. There are many reasons to justify the decision of choosing this pathway as the best pathway that can present auditors' process of thinking when dealing with critical tasks, such as fraud assessments.

According to Rodgers (2009b), the virtue-based pathway is suitable for decision making processes that require critical evaluation, as it takes into account individual's perceived moral considerations (P) that affect the principle-based pathway (I→J→D). Virtue-based pathway is different from rule-based pathway and principle-based pathway in that virtue-based ethics is “individual-centered” rather than “duty-centered” or “consequence-centered”. Virtue ethics focus on the nature of the acting individual and are thus different form duty ethics, in that duty ethics are based on certain rules or norms, whereas virtue ethics are based on certain virtues (Broadie, 1991).

Virtues can be viewed as stable disposition to act to one’s duty, which make it an essential component of a good life. “Becoming morally virtuous would be for such a person, and should be for all of us, an ongoing process. It could be assumed that there are many things that one might not get right at first. . . . When we call someone virtuous there is an implication that they have learned to get things on the whole right” (Kupperman, 2009: p.246). The virtue ethics-based approach does not necessary follow a set of rules, but requires one to develop a collection of behaviors, dispositions, and qualities that lead to individual excellence and a good life. On the other hand, while virtue ethics might not provide an ideal answer in specific cases, it does help prepare an individual for adjustment and self-discovery (Rodgers, 2009b).

In (P→I→J→D) viewpoint, an individual must exercise the ability to perceive (P) and accurately describe the situational information (I) before analyzing them in judgment (J) in order to reach a decision choice. On the other hand, rule-based position (P→J→D) implies that, whatever ends an individual want to attain, either a deliberate end or happiness, the choice must be morally neutral (Rodgers, 2009b). Kant voiced his rejection to the virtue ethics on a number of issues; first, he indicated that the entire imperative is theoretical, allowing one to achieve a certain decision choice only. Kant also stated that duty is something that can be presumed rationally, whereas it is possible to learn, through observation, essential skills and prudence that are ethically neutral. In addition, Kant introduced a categorical imperative that allows individuals to determine what is actually ethical, which is known as an *a priori* choice that cannot be determined without reasoning process (Rodgers, 2009b). In general, the ethical virtue-based pathway is about virtues in various traditions, religious, or traditional communities that focuses mainly on the state of the character of an individual. A comprehensive pathway ***P→I→J→D*** helps present greater simplicity and structure to virtues and applies their requirements by emphasizing the principle-based part ***I→J→D*** of its pathway.

One of the most important reasons for employ the virtue-based pathway in this study is that it highlights the vital role played by motives in moral questions, since making decisions in virtue ethics is to decide from some particular motivation "correct moral decision choices necessitate correct motives" (Rodgers, 2009b: p.253).

3- Ethics of care-based pathway (ethics of care theory): *I→P→J→D, where information adjusts individual's perception that leads to judgment and finally to decision choice.*

Ethics of care-based pathway implies that the available information affects a decision maker's information search pattern and biases before an analysis (judgment) in order to rate, rank, or order information. It also enables information sources to adjust, improve, or modify the perceptual function, which influences analysis (judgment), before a decision is made. Because of the information demands on this pathway, it might not work well in situations where a time pressure exists. Thus, the process of information sources revising the perception function may take a substantial amount of time; moreover, unstable environment may result in making the information set irrelevant. The ethics of care pathway I→P→J→D contains P→J→D, so the information adds and provides support to improve upon the rules by adjusting the framing of a problem to be analyzed. Consequently, rules or laws are not blindly applied to a particular situation without considering the changing environment or a better information channel.

Ethics of care-based pathway states that basic caring relations are a moral necessity and focuses on justifying why a certain actions are performed, whereas the information moderates the rule-based pathway ***P→J→D*** by assuming that information provided from other people's viewpoints influences or changes laws, procedures, or guiding principles. This pathway not only focuses on mutual recognition of moral equality but also practices that avoid delicate and obvious power that may cause harm to others (Rodgers, 2009b).

The concept of ethics of care is only few decades old and "the concept of care has the advantage of not losing sight of the work involved in caring for people and of not lending itself to the interpretation of morality as ideal but impractical to which advocates of the ethics of care often object" (Held, 2005: p.9). Traditionally, ethical dilemmas were solved by employing logic or reasoning; however, ethics of care are relational in that the right action or decision depends on the context of situation surrounding those involved in caring relation (Foster, 2009). Ethics of caring "is that condition toward which we long and strive and it is our longing for caring- to be in that special relation- that provides the motivation for us to be moral. We want to be moral in order to remain in the caring relation and enhance the ideal of ourselves as one-caring" (Naddings and Caring, 1984: p.5). In addition, in care reasoning, attention to particularities of persons and situations helps in making judgment of responsibility that takes a central position (Gilligan, 1982). Moreover, ethics of care is guided by a need to maintain relationships through responding to wants, feelings, and desires of others (Caputo, 2000). The main concept implicit in ethics of care is connection, and it is centered in responding to the addressing question of how the needs of others and self may coexist, thus requiring more comprehensive understanding of dynamics and relationships (Gilligan, 1982).

However, ethics of care has been linked with empathy "By contrast, the care orientation rejects impartiality as an essential mark of moral, understands moral judgments as situation-attuned perceptions sensitive to others' needs and to the dynamics of particular relationships, construes moral reasoning as involving empathy and concern, and emphasizes norms of representativeness and responsibility in our relationships with others" (Carse, 1991: p.6). Moreover, because ethics of care has been described as emotionalism, which is based on reasoning, this leads ethics of care practices to advocate compassion rather than rule-guided conduct (Rudnick, 2001). Lawrence Blum (1988: p.475) summarized ethics of care as "understanding the needs, interests, and welfare of another person, and understanding the relationship between oneself and that other requires a stance toward that person informed by care, love, empathy, compassion and emotional sensitivity".

Ethics of care has been criticized and called slave morality because it motivates care without further inquiring as to who is caring for whom and whether these relations are fair, which may yield unsatisfactory outcomes (Davion, 1993; Puka, 1990). In addition, empirical accuracy and validity of ethics of care was questioned, and some believe that it is not a highly distinct moral theory. That is, some scholars suggest that care of ethics can be reduces to virtue ethics, with care being one of many virtues (Rachels and Rachels, 1993; Slote, 1998; McLaren, 2001; Jacobs and Halwani, 2007).

Ethics of care is nonetheless popular in healthcare, and it is perceived as a feminist approach. It lacks a normative framework the virtues ethics provides. According to

McLaren (2001: p.105), “the standard of appropriateness is the mean –a virtue is always the mean between two extremes. . . the normative frame work stems from the definition of virtue as that which promotes human flourishing”. Thus, ethics of care-based pathway is not applicable to the aims of the present study as, in a critical task such as fraud risk assessment, auditors need to question the accountability of their clients even if they have a positive experience with that client. Thus, they still need to be skeptical about evidence provided.

3.5 Virtue Ethics in Accounting and Auditing

Virtue ethics in accounting works as an agent-based approach to ethics, which concern the fundamental character and motivations of the individual agent (Mintz, 2006). Accountants and audit professionals use their experience and their ethical standards to judge the situation and the virtue should enable them to reach the right decision. Virtues allow accountants to resist client and commercial pressures that usually result from conflicts between an accountants’ obligation and a client interest consideration. Pincoffs (1986) posited that virtues are a position that are grounds for preferences (or avoidance) of persons and consequently aid individuals to decide with whom they want to be in a relationship of trust. If honesty is virtue, then accountants prefer honest clients to dishonest ones, and the same principle applies to reliability and dependability. Honest and reliable client is more likely to behave in an honest way and disclose relevant information that enhances the trust relationship between external auditor and the client.

Francis (1990) suggested five internal ethics that might be realized from practice of accounting: (1) honesty, where he argues that accounting practice will not move forward without assuming that accountant in general and auditor in particular is an honest individual; (2) concern for the economic status of others (accountability); (3) sensitivity to the value of co-operation and conflict “many accounting practices, for instance, standard costing, budgeting practices, transfer pricing, accounting-based incentive compensation agreements, responsibility accounting, cost centres, profit centres, and variance analysis, operates at the boundary between co-operation and conflict” (Francis, 1990: p.10); (4) communicative character of accounting that creates an understanding of economy experiences; and (5) dissemination of economic information, since accounting is characterized by a function that generates economic information for decision making.

Ahadiat and Mackie (1993) and Ahadiat and Smith (1994) conducted a survey on the ethical character that accounting graduates should have. Their results indicate that the accounting profession expects accounting graduates to have traits of character, such as honesty, reliability, trustworthiness, and credit the public trust and interest. These traits are accompanied by factors, such as communication skills and accounting education and knowledge. In general, these results suggest that accounting educators are required to discuss certain character traits that are essential to the development of trust in professional relationships present in accounting.

Aristotle believed that moral action requires the decision maker to possess intellectual virtue, which he defined as a state or disposition of an individual (Steutel and Carr, 1999). Intellectual virtue can be explained through experience that encourages the individual to reflect on his/her knowledge and apply it in different instances. “The accounting profession recognizes the importance of virtue in performing professional responsibilities. For example, the principles of the AICPA Code of Professional Conduct AICPA (2005) identify integrity as the quality of one’s character that enhance public trust. When faced with a conflict between competing interests, such as the client and outside investors, the CPA should maintain integrity and avoid sub-ordinating professional judgment to client” (Mintz, 2006: p.99).

In addition, Solomon (1992) asserted that almost all of Aristotle’s virtues are applicable to business practices and that individual virtue and integrity should lead good organizations and social policy. Newton (1992) concurred with Solomon’s view of Aristotle’s virtue ethics and developed a framework of virtue ethics in business. She believed that virtue has a place in business, since employees’ character guides them to do the right thing in a given situation. Plato recognized three virtues: (1) wisdom, which is the intellectual part of the soul or reason, (2) courage, which is the interaction between the spirited part of the soul and reason, and (3) self-control and justice that involves overcoming temptations (Prior, 1991).

Accountant practitioners use virtue ethics to fulfill the obligations prescribed by codes or by normative ethical theories. The Standard of the Institute of Management Accountants recommend that “Practitioners of management accounting and financial management have an obligation to the public, their profession, the organization they serve, and themselves to maintain the highest standards of ethical conduct”(Melé, 2005:

p.101). Pincoffs (1986) encouraged development of virtues ethics, in that he stated that the primary goal of moral education is encouraging the development of the person. Pincoffs (1986) added that deontological or utilitarian ethical theories are reductive because they eliminate what is morally relevant (character) and insist on the form of moral reflection (duties and consequences). Many scholars have showed significant interest in explaining the role of virtue in accounting and emphasized the role of virtue ethics in accounting (Francis, 1990; Mintz, 2006). Koehn mentioned that "practical judgment is, at the very least, crucially dependent upon perception" (Koehn, 2000: p.4). However, ethical judgment is affected by individual perception, that depends on certain human capacities related to logic. This capacity is to perceive the situation in an ethical dilemma framed with reality by employing practical wisdom in the moral sense. Reaching practical wisdom can be done by being independent and truly unbiased (Melé, 2005).

Audit professionals and practitioners admit that auditor's character is very important to ensure that the public expectations are met (Pitt, 2002b). "The public cannot be served if professionals who serve as gatekeepers merely follow the letter of the law, but not necessary its spirit. We need to move away from wooden, rigid literalism and encourage all upon whom the present system depends to adopt a bias in favor of the need of the needs of the investing public" Pitt (2002a, Remark to the SEC Speaks Conference, February 22, 2002). Virtue ethics is essential to auditors' role in protecting the public interest and the necessity to use judgment in fulfilling this duty (Dobson and Armstrong, 1995). The importance of virtue ethics in auditing is recognized by audit profession and regulators (e.g., Sarbanes Oxley Act, 2002: CICA Independent Exposure Draft, 2002) as well as theoretically and empirically by scholars (Dobson and Armstrong, 1995; Mintz, 2006; Lord and DeZoort, 2001; Windsor and Ashkanasy, 1995). Virtue ethics are normative qualities that reflect and direct individual's tendency to act ethically, and entail the pursuit of ethical goals that does not rely mainly on rules and results from a shared definition of values by a particular community (Dobson and Armstrong, 1995). Virtues help in achieving the balance between rules/principles/goals so that moral judgment can come to rely upon understanding what is a suitable action in a specific situation (Maguire, 1997). Thorne (1998) recommended a model that combines Rest's four-component model of ethical behavior. According to Rest (1986), the four processes are:

1- Moral sensitivity: understanding the situation, taking into account how various actions would affect the parties concerned, imagining cause–effect relationships and being aware that there is a moral issue when it exists.
2- Moral judgment: judging and analyzing which action can be more justifiable in moral sense.
3- Moral motivation: the level of commitment to taking the moral course of action, valuing moral values over other values, and being responsible for moral consequences.
4- Moral character: persisting in a moral task, having courage, fighting temptation, and employing subroutines that serve a moral goal.

Thorne (1998) claimed that the first two components of Rest's model are mainly intellectual in nature, whereas the last two are intimately connected with virtue.

Auditors use ethical qualities in virtues that tend to enhance the exercise of professional judgment in order to meet high ethical standards (Thorne, 1998). Auditors need to assure that their professional judgment is not affected by client pressure, and that exercising virtues is critical, especially when accounting roles are incomplete or do not exist (Jones et al., 2003). Pincoffs (1986) differentiated between two types virtues—non-instrumental virtues that pertain to the natural "goodness" in individuals, and instrumental virtues that capture their intention to exercise virtues associated with auditors' exercise of professional judgment. Auditors' non-instrumental virtues include being independent, truthful, and objective (Thorne, 1998; Jones et al., 2003; Libby and Thorne, 2004). However, according to Thorne (1998: p.299), "the integrative perspective suggests that an individual's ethical character is a reflection of his or her instrumental virtue".

In addition, Thorne's virtues consists of two elements—moral virtues and instrumental virtue—and his model helps clarify the relation between understanding and moral virtue. He mentioned. "Although not inconsistent with cognitive-development theory, the nature of this association largely reflects a virtue-ethics emphasis which accepts that virtuous individuals possess both the understanding of what is 'good' and the desire to be 'good'. . . . Hence, the integrated perspective explicitly acknowledges that an individual's perspective understanding of an ethical dilemma is integral to his or her desire and ability to act virtuously, and that an individual's ethical character is integral to his or her prescriptive understanding of an ethical dilemma" (Thorne, 1998: p.299).

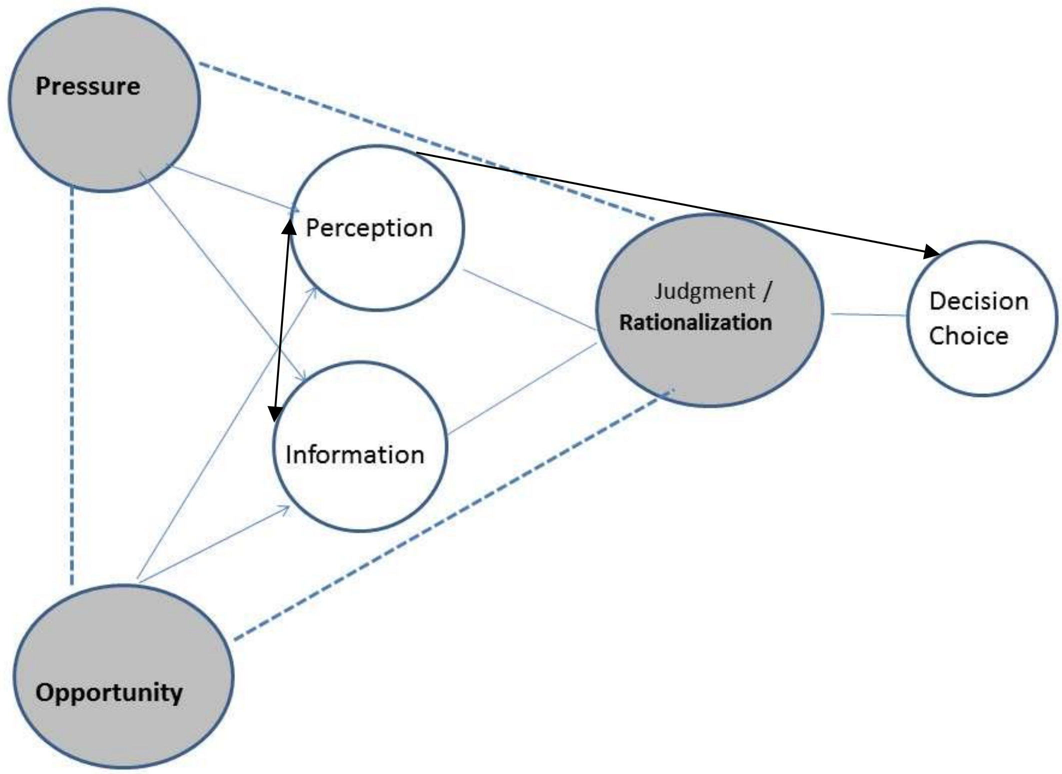
Libby and Thorne (2004) used a qualitative research methodology to classify virtues of auditors, as described by exemplars in the audit community and by obtaining the audit community agreement about the ideal qualities that virtuous auditors have. Their findings suggest that the importance of auditors' virtues is identified in codes of professional conduct and that mandatory virtues were the most frequently mentioned and important category of auditors' virtues, as described by the exemplars interviewed in the study. Non-mandatory virtues are defined as "those virtues reflecting auditors' willingness to go beyond the minimum, is particularly alarming given that these virtues are essential to the auditor's role" (Libby and Thorne, 2004: p.480). Libby and Thorne (2007) also examined auditors' virtues, whereby they validated a quantitative measure of auditors' virtue and administered the measure to a large sample of auditors. They found that highly ranked non-instrumental auditors' virtues are truthful, independent, objective, and integrity, and that the least important non-instrumental auditors' virtues are altruistic and benevolent. Moreover, they found that the most highly ranked instrumental auditors' virtues are alert, careful, and diligent, while courageous is the least important.

While authors of some theoretical and qualitative work have investigated auditors' virtues, more work needs to be done in this area to gain deeper understanding of auditors' virtues, as this is presently hampered by absence of a reliable and valid measure (Libby and Thorne, 2004; Pincoffs, 1986). In this current study, virtue is measured using ethical virtue-based pathway to explore auditors' virtue and the important association between auditors' virtue and professional judgment. The judgmental process in this study starts from perception that influences the formulation of information and then to detailed analysis to reach a decision choice.

3.6 Linking Throughput Model (TP) to Fraud Triangle Factors (Fraud Model)

Rodgers et al. (2015) developed a fraud model that embeds fraud triangle factors in to the TP (see Figure 5).

Figure 5: EPTM Framework Embedded In the Fraud Triangle (adopted from Rodgers et al., 2015)



As shown in Figure 5, pressure or incentive can influence one's perception and information pertaining to the need to commit the fraud. Pressure creates the motive to commit fraud, and might include money, ideology, or ego (Dorminey et al., 2012). This motive may work as a starting place, thereby influencing individuals' perception of available information. Opportunity exists when a control weakness is present, whereby the chance of being caught is remote. This element of Cressey's fraud triangle factors Cressey (1950) provides the fraudsters a perception that they are able to commit the fraud without detection, or it will provide them with information about how they can use these weaknesses to perpetrate fraud.

Rationalization process takes place before the fraud act in order to overcome the feeling of guilt. Consequently, if individuals are able to find reasons and justifications for their act, they will reach the decision that committing fraud is justified. As a direct link of this factor to the TP, the "judgment" concept emerges, where the individual is making analysis and reasoning to justify the behavior of fraud. Finally, rationalization also provides the decision maker with a reason (i.e., judgment) to decide; hence, it has a direct relation to the decision choice.

3.7 The Study Framework

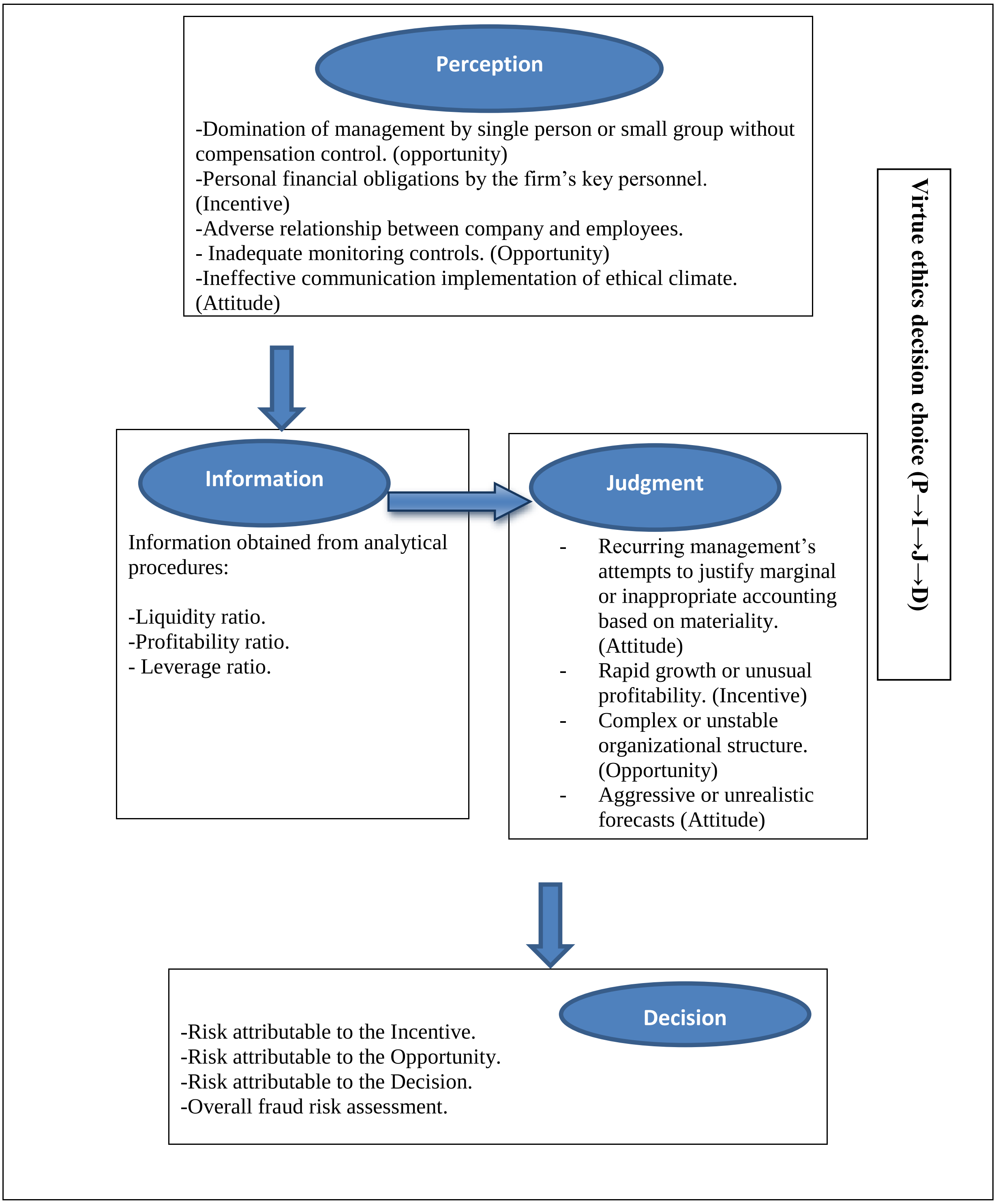
As seen from the study framework in Figure 6, auditors can fortify their decision by considering related fraud risk factors in their perceptual process. These SAS No. 99 fraud risk factors in the perception stage have been chosen to present the auditors' basis and the background impression about the fraud risk in a certain entity. In particular, auditors should gain an understanding the culture of honesty and ethical behavior governing the entity. However, some smaller entities may not have a written code of conduct, but they might develop an ethical environment where they emphasize the importance of honesty and integrity (Lou and Wang, 2011).

In addition, when auditors review interim financial information, their perceptions of current financial statements would be enhanced if they link non-financial measures (NFMs) with financial measures. Understanding both financial and non-financial information will also enhance the effectiveness of analytical procedures, especially during the planning stage (Ames et al., 2012). According to Rodgers and Housel (2004), auditors' perceptual framing involves encoding, whereby a set of facts are translated and processed in such a way that they become part of his/her declarative knowledge. Declarative knowledge includes the use of different financial information, such as factual ratios and trends extras (Ohlsson, 1994; Anderson, 2013; Winograd, 1975).

Rodgers and Housel (2004) used liquidity, profitability, and risk as the most significant indicators for determining financial statement information risk. In this study, the auditor is expecting the same indicators for the financial information in the study framework. Framing the information and filtering the data through perception would prepare the auditors to go through the judgment stage, during which auditors need to evaluate whether the information obtained from the other risk assessment procedures indicates presence of one or more fraud risk factors. It must be emphasized that the existence of fraud risk factors does not automatically indicate the occurrence of fraud. Moreover, when evaluating unusual or unexpected relationships that have been identified when performing analytical procedures, especially those related to revenue accounts (Quadackers et al., 2009), auditors need to evaluate the assessment of the risk of material misstatement at the assertion level. This evaluation is primarily a qualitative matter depending on, to a large extent, the judgments of auditors, who might need to perform additional or different audit procedures.

In addition, in case of unusual transactions, and after encoding and filtering all the information in the perception stage, the auditor should evaluate whether the business activities are justified or whether the lack of certain types of transactions indicates engagement in fraudulent financial reporting or concealment of misappropriation of assets (Kassem and Higson, 2012a). In such cases, auditor might need to identify events or conditions that indicate an incentive to commit fraud or provide an opportunity. For example, management is often under pressure to manipulate figures to meet the expectations of creditors to obtain additional equity financing. The opportunity for fraud in such circumstances is more prevalent when the control system is not effective. To identify whether fraud risk factors are present or not, based on the assessment process, auditors must exercise their professional judgment (Vinten et al., 2005b). However, in this current study, the fraud triangle factors were manipulated into two levels (high and low fraud risk conditions), as the aim is to answer the question "If the attitude factor is indicating high fraud risk, how would the two components of incentive and opportunity be changed?" Analyzing the fraud risk factors at the judgment stage should be influenced by the perceptual process that help auditors evaluate the fraud risk factors with more consideration about the level of fraud risk in an entity. Finally, the decision choice in this framework replicates Wilks and Zimbelman (2004a) methodology, as will be discussed in the following chapter.

Figure 6: Auditors' Decision-making Process Related to Fraud



3.8 Summary

This chapter provided a detailed description of the study decision-making in the Throughput model. The study framework employing the ethical pathway (the virtue based-pathway) has also been explained, along with the auditors' decision-making processes in fraud risk assessments.

In the following chapter, the study's hypotheses are structured and supported based on the findings stemming from relevant literature.

Chapter 4 Hypothesis Development

4.1 Introduction

In this chapter, the predicted relationships between the key concepts of the theoretical framework are developed in order to formulate a set of hypotheses that clarify uncertain relationships between the variables. The hypotheses that were tested in this study are derived from pertinent literature sources on which the conceptual model is based.

This chapter begins with a discussion of the most relevant works in the field of fraud risk assessment.

4.2 Auditors' Fraud Risk Assessments

Authors of most studies on fraud risk assessment used different procedures making it difficult to compare their findings. For example, (Bloomfield, 1995) examined strategic reasoning by conducting laboratory experiments to see if the accuracy of the audit fraud risk assessment varies with the auditor's degree of strategic reasoning. His findings showed that inaccurate assessment of fraud risk leads to lower payoffs for both auditors and management and that inaccurate expectation by the auditor and manger may make the auditor's report unattractive for the investors. Authors of several studies have examined the fraud risk assessment decision using strategic reasoning as a decision aid accompanied by another procedure, such as brainstorming or game theory (Wilks and Zimbelman, 2004b; Hoffman and Zimbelman, 2009).

Generally, their results show that using strategic reasoning with any other technique may improve the fraud assessment decision quality, whereby brainstorming is an effective procedure in obtaining ideas and developing procedures to detect fraud. (Kochetova-kozloski et al., 2011) focused on improving auditors' fraud judgments using a frequency response mode, reporting that using statistical reasoning can better help auditors improve their judgments and decision making when assessing rare events, such as fraud, when information is presented as a natural frequencies instead of probabilities. However, Boatsman et al. (1997) found that auditors who rely on a decision aid tended to perform better than those without the aid. Several studies suggest that decision makers are often hesitant to depend on a decision model, instead placing more confidence in their own unaided judgment, which resulted in worse performance (Eining et al., 1997b).

Authors of several prior studies also agreed that decision aid is an effective way to improve fraud risk assessment (Hackenbrack, 1992; Hoffman and Patton, 1997; Pincus, 1989; Boatsman et al., 1997). In general, fraud risk decision aid has been defined as a list of red flags or a list of fraud risk factors organized in a way to help the decision maker make a decision (AICPA, 2002). However, decision aids should support fraud risk assessment by going through all the important factors and ensuring that no relevant factor is overlooked (Wood, 2012b).

Auditors' task of assessing the fraud risk is a critical step that affects auditing planning and procedures, especially after the discovery of incidence of financial scandals (Hogan et al., 2008). SAS No. 99 states that auditors need to understand antecedents affecting financial statement fraud by taking into account the three components of fraud triangle factors, namely incentives, opportunity, and attitudes, which are generally present when fraud occurs (AICPA, 2002). Cressey (1950) proposed fraud triangle factors that have been adopted by many accounting professions around the world. According to Cressey, perceived pressure from the perception of social needs creates the motive to commit crime. The incentive or pressure is defined as personal financial conditions that motivate an individual to commit fraud (e.g., inability to pay bills, drug or gambling addiction, need to meet productivity targets at work and desire to gain higher standards of living). Perceived opportunity is the perception that the control system is weak and the chance of being caught is remote.

Cressey (1953) observed that most fraudsters desire to remain within the comfort zone, which would lead them to rationalize their behavior, which is the ability to reduce cognitive dissonance. When those factors interact, it can be seen clearly that when the fraudster's incentive is strong, making it likely for his/her to rationalize fraudulent behavior (AICPA, 2002). Attitude or rationalization is the least tangible measure in the fraud triangle, and if the internal control system is weak, the individual might conclude that manipulation will not be detected and penalized. Authors of prior studies concur on the importance of employing fraud triangle factors in the process of fraud risk assessment. For example, Hammersley (2011) expanded and reviewed the auditor judgment model and found that using red flags alone does not provide clear information about how fraud is committed. Thus, he suggested that using red flags along with fraud triangle factors would ultimately lead to more effective fraud risk assessment.

Theory of planned behavior (TPB) and its extension postulate that moral obligation could be an additional causal factor driving intention and attitude, and that the best way to understand individual and organizational behavior is to understand the attitude and intention factors (Ajzen, 1991; Sitorus and Scott, 2009). However, authors of some prior research advocate that auditors depend in their perceptions of management attitude when assessing the fraud risk. Thus, they claim that auditor should predict fraudulent behavior relying more in the situational pressures or opportunity rather than a person's attitude or disposition (Wilks and Zimbelman, 2004a; Moyes et al., 2006; Desai, 2008; Apostolou et al., 2001; Favere-Marchesi, 2013). For example, Desai (2008) examined how the assessment of fraud risk and material misstatement are affected by observing pressures and opportunities on management with the effect of brainstorming sessions on auditors' fraud risk assessment. The author found that auditors are more sensitive to presence of pressure than the presence of opportunities when they are asked to decompose fraud risk assessment, whereby that brainstorming sessions along with fraud triangle factors have a direct effect on the assessment of fraud risk. However, it is difficult to arrive at the correct answer in fraud risk assessment in the presence of pressure and opportunities because, without the rationalization factor, auditors cannot assess whether fraud is being committed by management. In the present study, attitude factor is manipulated as high and low fraud risk condition, whereby the other two factors are pressure and opportunity. In general, past studies have consistently provided support for the existence of the fraud triangle in financially fraudulent firms (Bell and Carcello, 2000; Loebbecke et al., 1989; Hogan et al., 2008; Albrecht et al., 2008; Rezaee, 2005; Jaffar et al., 2011).

4.3 Categorization of Fraud Risk Factors

SAS No. 99/ AU section 316 and other current auditing standards provide guidance on assessing fraud risk by including fraud risk factors, which work as symptoms of fraud. These standards further classified these factors into a fraud triangle (AICPA, 2002; CICA, 2004; IAASB, 2004). Categorizing fraud risk factors along the fraud-triangle components and evaluating the components (through assessment of opportunity, incentive, and attitude) at the aggregate level would likely induce auditors to engage in systematic processing (De Dreu et al., 2008). Categorization is the center of the psychological process that supports decision-making process (Hamilton et al., 2010; Porac and Thomas, 1994). Categorization would enhance auditor's judgment by promoting inference for the given relevant cues and give auditors the required time to think more broadly about fraud risk factors and be increasingly sensitive to each component of fraud risk factors (Wilks and Zimbelman, 2004a; Turkson and Riley, 2008; Johnson and Weber, 2009). In addition, categorization should support auditors' judgment by identifying relationships and differences among fraud risk factors, which consequently attract auditors' attention to fraud risk factors that are naturally underweighted (Heiman-Hoffman et al., 1996; Wilks and Zimbelman, 2004a)

Both SAS No. 82 and SAS No. 99 have increased the auditors' awareness of fraud. Several academic researchers have investigated the impact of both standards and found that most of the audit firms included all fraud risk factors indicated by these standards (Zimbelman, 1997; Asare and Wright, 2004; Wilks and Zimbelman, 2004a; Shelton et al., 2001). Knapp and Knapp (2001) also observed that auditors who were given a specific instruction and guidance to complete an assessment of fraud risk assessed fraud risk at a higher level than those who are not following specific instruction. However, auditors who use normal fraud risk checklist do not assess fraud risk effectively comparing to those who use different decision aids, such as categorization (Asare and Wright, 2004; Pincus, 1989). Findings yielded by previous studies suggest that an explicit and premeditated instruction used in categorizing fraud risk factors along the fraud triangle would likely persuade auditors to engage in systematic processing and thus alleviate systematic biases by focusing on relevant factors (De Dreu et al., 2008).

4.4 Decomposition Approach

Another approach to decision aiding is decomposition in that a decision is decomposed into its component judgments that are mechanically combined for the decision maker (Edwards, 1966; Einhorn, 1972; Dawes et al., 1993). Decomposition pertains to dividing the decision into component elements and an overall element, in that auditors would have the chance to focus on small subsets of information separately, rather than giving a decision based on all available information at once (Wilks and Zimbelman, 2004a; Einhorn and Hogarth, 1981a). Furthermore, past studies indicate that this decomposition approach is more likely to improve judgment accuracy as, by decomposing a decision into smaller components and making separate consideration of each element and then making the global judgment decision by recombining the components, auditors attain better outcomes (Einhorn, 1974; Kleinmuntz et al., 1996; Wilks and Zimbelman, 2004a). Therefore, decomposition can reduce cognitive strain and task complexity, which eventually help in reaching high quality judgment by reducing the information load at a given time (Bonner, 2007).

Making component decisions is considered to be efficient and may require less cognitive effort in that, when judgment is decomposed into components, the decision maker is more likely to pay attention to overlooked areas (Jiambalvo and Waller, 1984). Moreover, auditors are better at differentiating between fraud and none fraud cases when assisted by a decomposition aid (Eining et al., 1997b). Wilks and Zimbelman (2004a) examined the decomposition approach based on the fraud triangle factors categorized in SAS No. 99. They divided their study participants into two groups (holistic assessment group and decomposition group). The first group had to review a lengthy checklist of forty factors and made an overall assessment of fraud risk. The other group was asked to evaluate the risk of fraud attributable to management attitude, opportunity, and incentive before assessing the overall risk of financial statement risk. Participants in the holistic group found it more difficult to incorporate the components into a logical assessment. However, the decomposition group participants were more sensitive to opportunity and incentive in low risk condition and were equally sensitive to those fraud risk factors, whether they used decomposition or holistic approach when opportunity and incentive suggested high fraud risk. In general, it is expected that fraud risk assessment can be enhanced and improved when decomposition approach is employed (Einhorn, 1972; Messier, 1995; Jiambalvo and Waller, 1984; Daniel, 1988; Zimbelman, 1997; Wilks and Zimbelman, 2004a). This is the assumption for formulating the hypotheses tested in the current study.

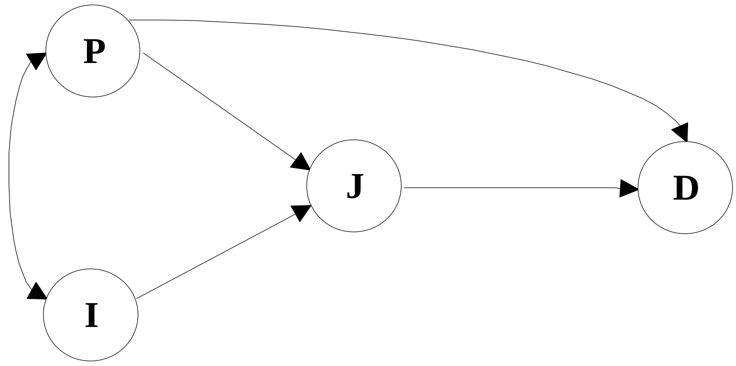
4.5 First Hypothesis (The effect of perception and financial information on judgment)

This study extends the W&Z decomposition approach by employing it in the identification of process thinking elements that are expected to result in a comprehensive evaluation of the categorized SAS No. 99 fraud risk factors. The work conducted as a part of the present study also takes into account the perception of attitude risk factors, as well as opportunity and incentive, in order to provide equal assessment of the three fraud risk factors. “The potential drawback is that when auditors perceive management’s attitude as indicative of low fraud risk, they may overlook incentive and/or opportunity risks indicative of high fraud risk in overall fraud-risk assessments" (Favere-Marchesi, 2013: p.202). The decision-making model used in this research is denoted as the Throughput model (TP) and focuses on the influences of decision makers' perceptual processes when faced with financial and non-financial accounting information (Rodgers, 1992). It describes the stages involved in the decision-making process by including four dominant concepts—Perception, Information, Judgment, and Decision—that, when working together, provide a comprehensible decision pathway to follow (Rodgers and Housel, 2004).

In this process thinking model, perception and information are interdependent, presenting a dual relationship. Information can affect how the decision maker perceives a problem or how the individual selects the type of information to be used and perceptually determined in judgment and decision choice in the decision-making process (Rodgers, 2006; Tversky and Kahneman, 1974). As the economy becomes increasingly global, people have to make decisions that are likely to be biased because of the presence of too much information, time pressure, immediate choice or some other constraint, which lead to a broader effect on society (Milkman et al., 2009). Authors of previous studies on fraud risk indicate that auditors depend on information from multiple sources, such as client inquiry, audit team communication, analytical procedures, and risk factors, as well as support of different decision aids (Carpenter, 2007; Knapp and Knapp, 2001; Pincus, 1989; Arens et al., 2003). Moreover Milkman et al. (2009) proposed that judgment and decision making studies should focus more closely on the development of improved strategies.

There are two primary phases of decision making, which affect how decision-makers' perception (first stage) and judgment (second stage) affect their use of various information sets in attaining auditing decisions (Rodgers and Housel, 2004). Figure 7 depicts the theoretical constructs of Perception (P), Information (I), Judgment (J), and Decision choice (D) (Rodgers, 1992; Rodgers and Epstein, 1997).

Figure 7: Decision-makers' Processes Diagram. P = Perception; I = Information; J = Judgment; D = Decision choice



As can be seen, perception and information are interdependent and are linked by a double-ended arrow. In addition, they both affect judgment in the first phase. In the second phase, perception of the financial and non-financial information and judgment affect decision choice (Rodgers, 1992; Rodgers and Housel, 2004). Perception is the process of interpreting and organizing a situation to produce a meaningful experience of the world or interpret the stimuli into something meaningful based on prior experiences (Lindsay and Norman, 2009; Pickens, 2005). However, perception is far from perfect, as our perception and judgment are influenced by different cognitive processes that are not dominated by the actual data. These biases and misrepresentations have been explored in many cognitive and psychological studies (Gilovich et al., 2002; Nickerson, 1998; Evans, 1989; Dror, 2005; Dror and Fraser-Mackenzie, 2008a). In addition, because decision-making errors are costly, especially in cases of fraud, attention should be paid to perception and judgmental process in decision making (Milkman et al., 2009). There is a need for further evidence to determine if the perception actually affects judgment.

SAS No. 99 provides more information on the issue of fraud compared to the previous audit standards, SAS No. 53 and SAS No. 82. SAS No. 99 advises adopting a process comprising of three important stages, the first of which pertains to obtaining financial information, which is presented in the first dominant concept in the TP model. The second is reserved for gathering information about the entity activities, such as inquiries directed at management and other employees, considering unusual or unexpected relationships (equivalent to the perception stage in the TP model). In the third stage, auditors synthesize this information to develop fraud risk assessment by using analytical procedures; this stage is the judgment stage in the TP model. Finally, auditors develop a response to this fraud risk assessment, as clarified in the decision in our TP model (Brazel et al., 2007). In the current study, the first processing phase decomposes some of SAS No. 99 fraud risk factors in the perception stage of the Process Thinking model, which is influenced by financial statement information (liquidity, profitability, and leverage). These financial indicators are the most significant aspects of financial information (Lau, 1987; Rodgers and Housel, 2004). Authors of several prior studies suggest that the accounts that measure liquidity, such as receivables, amount of cash, and all other current assets, are particularly susceptible to fraud because these accounts are often large enough to hide a fraud and their assessment requires a degree of subjectivity, which provide an opportunity to the fraudsters. Loebbecke et al. (1989) investigated auditors' experience with material irregularities, and found that accounts receivable were involved in 37 per cent of fraud encountered by audit partners. Therefore, analysis conducted in this study incorporates unusual fluctuations in liquidity and compares this ratio to two prior years' liquidity ratios. Profitability is one of the primary criteria by which management is ultimately measured, in that performance-based incentives are most probably tied to profitability (Latshaw and Elifoglu, 2003). If the performance does not meet their expectations, the incentive-based compensation increases the chances and opportunities to commit fraud. According to National Commission on Fraudulent Financial Reporting (AICPA, 1987), the intention of most fraud investigated by the SEC is to increase earnings and financial position to meet market-based earnings expectations. In addition, leverage may show a lack of justifiable capital-raising opportunities, in that highly leveraged firms no longer have debt as a capital option, which forces management to turn to equity financing. Moreover, because of the need to show strong financial performance, management will be motivated to resort to earnings manipulation, as many firms commit fraud in order to decrease their cost of capital (Dechow et al., 1996). Thus, these two ratios are incorporated into the analyses performed in the current study, as they are effective indicators for financial statement fraud.

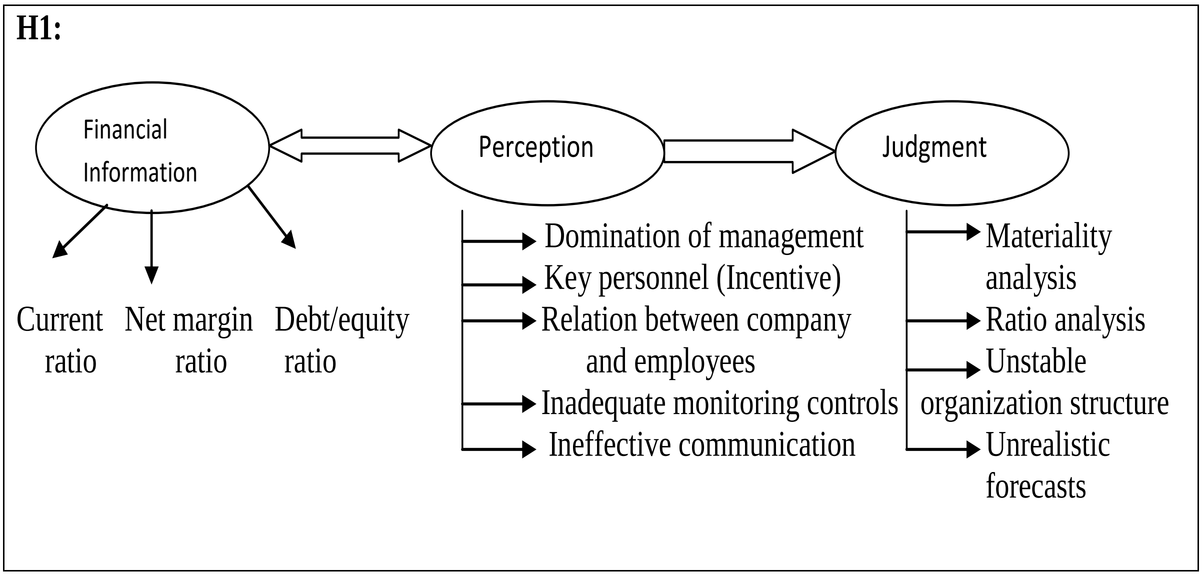
The indicators used to measure perception align with five of SAS No. 99 fraud risk factors that capture and influence the auditor's impression about a hypothetical client (AICPA, 2002). Perception of fraud risk factors is influenced by a decision maker's knowledge base and, when the individual encodes a set of facts, it becomes a part of his/her declarative knowledge structure (Rodgers and Housel, 2004). Declarative knowledge is defined as knowledge of facts, which embodies concepts, principles, ideas, and theories (Ohlsson, 1994; Anderson, 2013; Winograd, 1975). Moreover, declarative knowledge also includes certain facts and numbers, such as the use of financial ratios, trends, etc. (Rodgers and Housel, 2004), and it is not conscious until it is recaptured by indicators, which requires directed attention (Ten Berge and Van Hezewijk, 1999). Declarative knowledge in the present study includes the use of the perceived fraud risk indicators, along with certain facts pertaining to factual trends in the current ratio, net margin ratio, and debt/equity ratio over a three-year period. Auditors' knowledge is recognized as an important factor in decision-making performance (Nelson et al., 1995; Libby and Tan, 1994; Libby and Luft, 1993; Rodgers and Housel, 2004). In the Throughput model, the declarative knowledge represents the model's measurement system measuring the perception in five fraud risk factors provided by SAS No. 99 (see Figure 4.1). This model illustrates how this declarative knowledge is processed and modified using procedural knowledge in the judgment stage before a decision is made. Procedural knowledge is needed to perform and accomplish a task and is obtained within the framework of clear procedures and analysis (Star, 2002; Thagard, 2006). Moreover, in the procedural knowledge stage, facts are transformed into procedures. In the Throughput model, this is represented in terms of the judgment concept (Rodgers and Housel, 2004). Integrating both of procedural and declarative knowledge can influence creative thinking and improve education, especially if developed through different methods and techniques (Rittle-Johnson and Star, 2007; Howe et al., 2000). There is an academic call for further research in the field of cognitive sciences focusing on procedural knowledge and its relation to declarative knowledge (Ten Berge and Van Hezewijk, 1999).

Prior studies provided evidence that the effect of perception in judgment is highly observable (Newell and Shanks, 2014; Winkielman et al., 2007; Rodgers and Housel, 2004). Moreover, authors of previous studies found that auditors who employ and decompose SAS No. 99 fraud risk factors into a Process Thinking Model using a decision aid will produce improved judgments (Nelson and Tayler, 2007; Payne and Ramsay, 2005).

Hence, to determine the effect of auditors' perception of SAS No. 99 fraud risk factor categorization, as well as the financial information on their judgment, the following hypothesis is posited (see Figure 8).

H1: Auditors' perception of financial information, as well as SAS No. 99 fraud risk factors, will significantly influence their judgment in high and low fraud risk conditions.

Figure 8: Visual Representation of Hypothesis 1 Structure



4.6 Second Hypothesis (the effect of perception and judgment on decision choice)

The second phase of the process thinking depicted by the TP model involves problem-solving analysis affected by perceptual processes and aided by adequate set of operations, which should be known by the auditor (Rodgers and Housel, 2004). The decision choice in the present study replicates the work of (Wilks and Zimbelman, 2004a) who recommended that the categorization of SAS No. 99 with decomposition in decision choice would be helpful to audit practice.

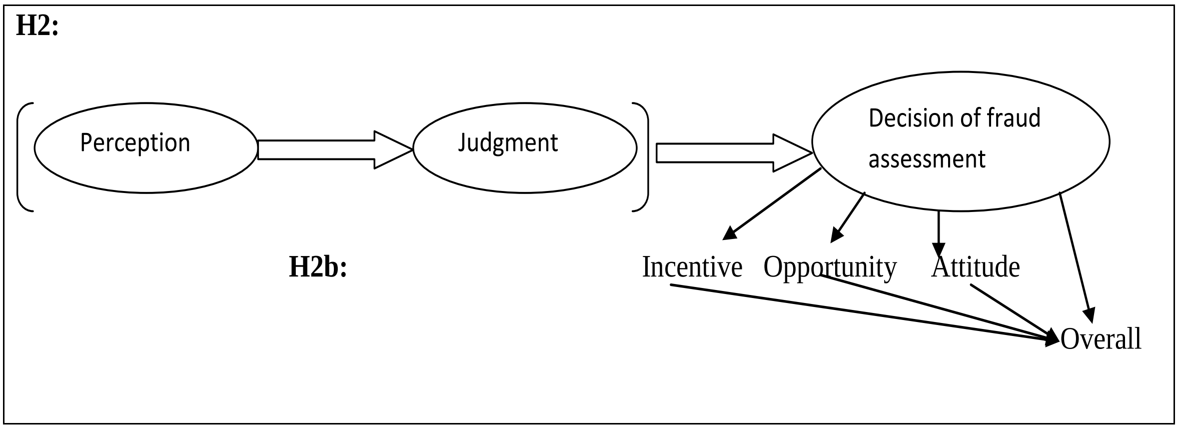
Judgmental processes in the decision-making endeavors require extensive analysis, which depends on the knowledge and experience of the auditor in processing the presented information and the perceptual attention processes (Anderson, 1990; Rodgers, 1992). To incorporate the constraints of mind and the structure of environment into cognitive models, it is recommended that heuristics that allow people to make good enough judgments be simplified (Payne et al., 1993). In line with previous studies, also in the present research, it is anticipated that fraud triangle decomposition in a logical manner would result in a simplified structure that helps auditors pay attention to all components of the triangle fraud factors (Wilks and Zimbelman, 2004a; Favere-Marchesi, 2009, 2013; Zimbelman, 1997).

In order to find out if the perception of the SAS No. 99 fraud risk factors and judgment will have an effect on the component assessment decisions, as well as the overall decision, the following hypothesis was tested (see Figure 9 for a visual illustration of H2).

H2a: Auditors' perception of SAS No. 99 significantly influences their decision choice in high and low risk condition.

H2b: Auditors' judgment significantly influences their decision choice in high and low risk condition.

Figure 9: Visual Representation of Hypothesis 2 and 3 Structure



4.7 Third Hypothesis (Relation between components assessments and overall assessments)

Wilks and Zimbelman (2004a) found that auditors' component assessment had an influence on auditors' overall fraud risk assessment, in that their overall assessments were sensitive to the manipulation of opportunity and incentive. However, W&Z

decomposition approach was based on manipulating the two triangle factors of opportunity and incentive, while the authors were careful not to manipulate any fraud risk factors that might amplify the attitude risk. Wilks and Zimbelman (2004a) found that, in high fraud risk conditions related to incentive and opportunity, the overall risk assessment given by the decomposition and holistic groups was not different. Favere-Marchesi (2009) replicated the W&Z decomposition approach, but also examined the sensitivity to incentive and opportunity when attitude factor suggested high fraud risk. He found that auditors pay more attention to incentive and opportunity when attitude factor suggests high fraud risk condition compared to the low fraud risk condition. In Another study, Favere-Marchesi (2013) again replicated the W&Z decomposition approach and found that auditors were sensitive to incentive and opportunity when those components suggested low risk.

An experimental study conducted by (Norman et al., 2010) replicate Wilks and Zimbelman (2004a) decomposition and holistic approach to on fraud risk assessments. However, in Norman et al.'s study, internal auditors took part and the findings revealed that the decomposition method resulted in lowering the overall fraud risk assessment, as compared to holistic assessments, in both low and high risk conditions. They further explored the relationship between component assessments and overall assessment and found that, under the decomposition assessment condition, the three component assessments of opportunity, incentive, and attitude were significantly related to the overall assessment of fraud risk. The present study responds to Wilks and Zimbelman's (2004) call for a study that examines these component assessments when attitude suggests high fraud risk conditions. More specifically, in manipulating all the fraud triangle factors of opportunity, incentive, and attitude in low and high fraud risk conditions, it is assumed that the decomposition approach will result in a significant relationship between the three fraud triangle factors and the overall assessment.

In general, previous studies confirmed that a detailed decomposition approach has the potential to enhance fraud risk assessments, as it directs auditors to be more sensitive to fraud risk factors and should encourage auditors to measure and combine component judgments to make global judgments (Arkes et al., 2006; Jiambalvo and Waller, 1984; Knapp and Knapp, 2001). Based on the findings of previous studies, it is evident that further research is needed to determine the factors that result in increased attention to fraud triangle components and elucidate the role decomposition plays in identifying these factors. However, in the current research, general decomposition of SAS No. 99 fraud risk factors is employed, followed by a more detailed decomposition in the decision stage of the Throughput model. In order to investigate if the decomposition approach used in the present study is effective and aligned with methods used in prior studies, the following hypothesis is proposed.

H3: There is a significant relationship between component assessment and overall assessment.

4.8 The Fourth Hypothesis (Skepticism analysis)

SAS No. 99, Consideration of Fraud in a Financial Statement Audit, emphasizes the need for auditors to exercise professional skepticism when making fraud risk assessments and provides assistance and guidance suggesting that auditors should respond to increased fraud risk assessments with increased professional skepticism (AICPA, 2002). Professional skepticism is an attitude that includes a questioning mind and a critical assessment of audit evidence. It is defined by Nelson (2009: p.1) as "professional skepticism is indicated by auditor judgments and decision that reflect a heightened assessment of the risk that an assertion is incorrect, conditional on the information available to the auditor". Moreover, Hurtt (2010) defined professional skepticism as a set of characteristics of skeptics, such as questioning mind, suspension of judgment, and self-confidence.

There is a need to address and examine how auditor judgment and decision making is affected by the level of professional skepticism exercised (Nelson, 2009; Hurtt et al., 2012; Shaub and Lawrence, 1996). Auditors' low level of skepticism may reduce the audit effectiveness and lead to audit failure, while very high level of skepticism may also lead to unnecessary costs and inefficiency (Nelson, 2009). However, highly skeptical auditors tend to generate more alternative explanations related to documentary evidence and react to audit circumstances, regardless of the experimental condition, relative to those who are less skeptical (Hurtt et al., 2008).

Professional skepticism might be affected by the amount of work experience (Payne and Ramsay, 2005). Hence, a combination of greater audit experience and a clear instruction of fraud risk assessment would result in the most effective fraud risk assessment (Knapp and Knapp, 2001). However, seniors who were less experienced than managers and partners tended to assess fraud risk relatively higher than the partners (Bedard and Graham, 1994) and that possibly because experienced auditors have more confidence due to the level of knowledge they have, which tend to lower their skepticism (Ponemon, 1990, 1992). Moreover, Nelson (2009) argued that, although highly knowledgeable auditors are better in identifying high-frequency errors, they are also likely to accept the correctness of non-error explanations and the missing evidence consistent with non-error explanations.

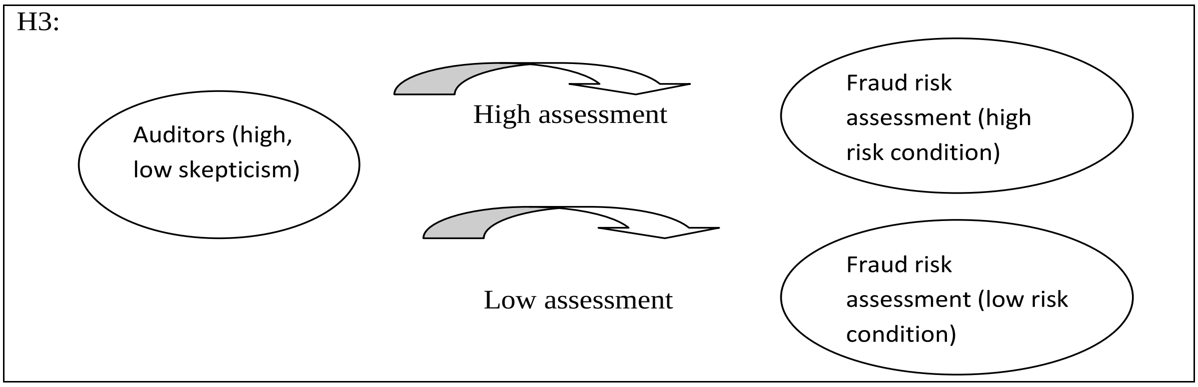
McMillan and White (1993) conducted a study of external auditors, revealing that auditors who consider that error is the reason of immateriality react more to confirming and disconfirming evidence compared to auditors who adopt the frame that environment is the reason for the change in the financial ratio profile. In other words, those auditors tend to examine more evidence to confirm to either accept or reject certain evidence. They also noted that highly skeptical auditors do not necessary perform increased information search, but they tend to search for information related to the pertinent fraud risk factors. However, Shaub and Lawrence (1996) concluded that the most skeptical auditors tend to perform additional procedures with an extensive search of information. Additionally, auditors will make more skeptical judgments when presented with evidence indicating fraud or incentive to commit the fraud (Carpenter and Reimers, 2009). Nelson (2009) also suggested the presence of a link between evidence collected by auditors and the incentive they face with their skeptical judgment and actions, positing that balancing incentives to reduce professional skepticism is also possible.

Shaub and Lawrence (1996) provided evidence that auditors will be more likely to be skeptical when various fraud risk factors are present, such as poor auditor-client communication, client financial stress, prior client inaccuracies, etc. They manipulated risk factors and found that high professional skepticism is significantly associated with risk in five of the nine scenarios they presented to auditors. Payne and Ramsey (2005) conducted a study on the effects of fraud risk assessment and auditor experience on auditors’ professional skepticism and found that auditors in the high risk fraud group were more skeptical than those in the control group to which no fraud risk information was provided. These findings provide evidence that, when fraud risk factors are provided, auditors perceive fraud risk information based on their professional skepticism mindset. The aim of this study is to answer the questions “Is there is any difference between auditors possessing low and high skepticism in assessing fraud risk when, given fraud risk factors decomposed into the Process Thinking Model?”

In this research, it is anticipated that, when auditors are provided with SAS No. 99 fraud risk factors and a clear Process Thinking Model to follow, auditors characterized by both high and low skepticism would be able to correctly assess the fraud risk in high level risk condition and give low assessments when fraud risk suggests low fraud risk condition. In that, the decision aid implementing in this study will weaken the differences between high and low skepticism auditors. Accordingly, the following research hypothesis is proposed (See Figure 10 for visualization).

H4: Implementing decision-aids will eliminate significant differences between high and low skepticism type auditors.

Figure 10: Visual Representation of Hypothesis 4 Structure



4.9 Summary

In this chapter, the hypothesized relationships between dependent and independent variables were discussed, allowing a set of hypotheses to be developed, which will be tested empirically in order for conclusions to be drawn.

The following chapter presents the research methodology and an essential discussion of research design and research methods employed to test the hypotheses empirically.

Chapter 5 Research Methodology

5.1 Introduction

This chapter commences by describing the research methodology employed in the present study to determine the relative effect of a decomposed decision aid (Throughput model) in fraud risk assessment. It also provides details about the research design components and the data collection methods. The following sections include research approach, rationale behind using quantitative approach, research strategy, the chosen strategy (experiment), research design, assessment procedures, fraud risk manipulation, sample size, participants, experimental task, tests of hypotheses, demographic variables, reliability and validity analysis, pilot study, research instruments, content and layout, scale used, and ethical considerations. Finally, this chapter concludes with a chapter summary.

5.2 Research Approach

There are two main research approaches in terms of process thinking involved: deductive and inductive approaches (Rosenthal and Rosnow, 1991; Knox, 2004). In deductive research, empirical observations are used to test the theory, which is referred to as moving from the general to the particular (Collis et al., 2013). However, in inductive studies, theory is developed through observations of empirical reality and general inferences are induced from particular instances. In addition, Sekaran (2003a) described deduction as a process by which a scholar reaches a reasoned conclusion by logical simplification of known facts, whereas induction is a process where a researcher observes and records certain phenomena and then arrives at a conclusion.

In general, the deductive approach starts with a theory that allows hypotheses to be developed before the research strategy is designed to test hypotheses through empirical data collection and analysis. However, the inductive approach is affected by the availability and quality of collected data and the analysis procedures, as this determines the type of theory developed (Bryman and Bell, 2007; Sekaran, 2003a). Some scholars argued that both deductive and inductive approaches should be used in the same study (Collis and Hussey, 2013; Easterby-Smith et al., 2012). Others, on the other hand, were of view that the deduction approach owes more to positivism and the inductive approach to interpretivisim, whereby the former requires theory testing and thus quantitative method that follow certain assumptions regarding realism and positivism (Saunders et al., 2009; Bryman and Bell, 2015).

The present research started with a detailed review of literature to ensure a clear understanding of the research domain, and help form a conceptual approach to be adopted in this study. The research findings yielded also assisted in hypothesis development, which is needed to test the study model. The current study's ideology is based on objectivism and positivism and is thus closely linked to the deductive approach, as quantitative data was primarily used. In sum, the objective of the present study is to test an existing theory, when applied in the context of the current study, whereby hypothesis testing is used to help support the reliability and validity of the framework.

5.3 Rationale Behind Using Quantitative Approach

Quantitative approach is based on positivism epistemology, objectivism ontology, unbiased axiology, and the deductive approach (Creswell, 2003). Positivism is the school of thought that advocates objectivity and value implicit in natural sciences and methods examining social reality (Bryman and Bell, 2007). The selection of a positivist approach for the present study is based on the nature of the research and pertinent literature. Positivism is employed when the aim is to examine reasoning using a deductive process, whereby the problem addressed in the research by (1) formulation of hypotheses, models, and causal relationships within constructs, (2) handling quantitative methods to test relationships, and (3) the objectivity of the researcher's interpretation (Hirschheim and Klein, 1992; Chen and Hirschheim, 2004). Authors of previous studies suggest that adopting a positivist approach would be very suitable if the researcher using questionnaire instruments, surveys, observation, laboratory and field experiments, simulations, case studies, and statistical analysis (Mingers, 2003; Choudrie and Dwivedi, 2005). The main objective of the current study is to investigate individuals' cognitive process established through the influence of perceived behavior beliefs, knowledge, and experience. Therefore, the positivist approach suits the current study, as the aim of the researcher is to discover the objectivity of social reality (Steffy and Grimes, 1986; Orlikowski and Baroudi, 1991). In addition, a quantitative research strategy is applicable to this study, since it helps the researcher to examine the reliability and validity of existing theoretical propositions, as well as hypotheses that solely depend on experimental and measurement techniques. Moreover, it is one of the most useful methods in natural sciences, as well as in social sciences research (Patton, 1990; Blumberg et al., 2005; Creswell and Clark, 2007). On the other hand, not using qualitative methods does jeopardize study reliability, since the approach used is very reliable and powerful when there is limited literature to outline constructs and their relationships (Cohen et al., 2013; Gilbert, 2001). In addition, qualitative research should be used when researchers aim to explore society in a subjective manner by utilizing their own experience and knowledge to describe and interpret human phenomena in a natural context (see the strengths and weaknesses of quantitative and qualitative approaches in Table 3)

However, in the current study, the researcher seeks to see the world in an objective manner without any impact of his knowledge and experience on the researched object or problem area. More specifically, the methodology includes testing of hypothetical observations emerging in human behavior towards the assessment of fraud risk. Thus, the current research framework was developed using appropriate literature that explains the nature of the relationships between variables, which should provide more explanation in terms of their relationship with the help of statistical tests that cannot be achieved without the use of quantitative methods (Collis and Hussey, 2013).

5.4 Research Strategy

Research strategy or research plan is a general plan that should help researchers to answer the research questions. Determination of a research strategy should be made once the study approach and methodology are defined, as at this point the researcher should have a clear idea about the research philosophy, research design, and research methods. Sekaran (2003a) suggested that strategy is a general term, in that it describes the overall research approach, while research design and research methods are more concerned with specific methods of data collection and analysis. As a part of the present study, existing literature was reviewed, revealing use of many research strategies, such as experiment, case study, action research, and archival research (Wilks and Zimbelman, 2004a; Asare and Wright, 2004; Carpenter and Reimers, 2013; Chui and Pike, 2013; Favere-Marchesi, 2013). However, deciding on a certain strategy depends on the nature of the study and on the questions that need to be answered, as the research success is affected by the strategy used for collecting and analyzing the data (Wilson and Sapsford, 1996; Punch, 2009; Auditing Practices Board, 2010).

5.5 The Chosen Strategy (Experimental research)

Use of the experimental method in educational psychology started around the turn of the century, motivated by the classic studies by Thorndike and Woodworh on transfer (Cronbach, 1957). During the past century, and with the paradigm shift in psychology studies including behavior and cognitive studies, from objectivism to cognitivism, the experimental approach remained invulnerable to the these changes (Jonassen, 1991; Jonassen et al., 1994). Experimental approach is common in behavioral research on auditing, as it allows researchers to determine causality and have the direct control of different situations in the experiment (Bernard and Whitley, 2002). Common types of experimentation consist of true experiments, repeated-measure designs, quasi-experiments, using time series data. True experiment is the best design for maximizing validity because of the random assignment of subjects to treatments, whereby potential for systematic errors is minimized, as two or more groups are subjected to equal environmental conditions while being exposed to different treatments. A repeated-measure design is employed when all the subjects are required to go through the same treatments, whereby each individual works as his or her own control when tested or observed (Diggle, 1988). The order of the treatments should be determined randomly to eliminate sequence effect. The third common form of experimental designs is quasi-experimental design, which is often used when the random element cannot be achieved, for example, in school-based research, where all the classes are formed at the start of the year and a true experiment cannot be conducted making the quasi-experimental design the only option (Ross and Morrison, 1996). One of the common applications of quasi-experiment is to expose two similar groups of students to alternative strategies and compare them on designated dependent measures (Cohen and Ledford, 1994). It is important to perform some pretesting and analysis of prior achievement to establish group equality. The main difference between quasi-experiment and a true experiment is the absence of randomly composed control and experimental groups, which makes it difficult to attribute changes in the dependent variable to the effect of the experiment (Berk et al., 2010). Finally, another experiment which comes from the same family of quasi-experiment is the time series design. However, true experiment provides the highest internal validity due to the random assignment of subjects to different treatments.

Experimental approach was chosen for the current study because the author needs to capture an aspect of the auditor's decision process in fraud risk assessment, as well as investigate the behavior of high/low skepticism auditors in fraud risk assessment when they are assisted with a decision aid. Also cognitive researchers on judgmental process of auditor's fraud risk assessment often employed experimental design (Carpenter, 2007; Chui and Pike, 2013; Desai, 2008; Favere-Marchesi, 2013; Carpenter and Reimers, 2013; Wilks and Zimbelman, 2004a).

5.6 Research Design

Research design refers to the outline, plan, or strategy that helps to answer questions, such as how to collect and analyze data (Christensen et al., 2011). It is also considered to be the road map for researchers (Davis and Cosenza, 2005), and as a program that guides the scholars in the process of collecting and analyzing data, and result interpretation (Frankfort and Nachmias, 1996). The success of the research depends mainly on the selection of the right research process and steps within the research design (PCAOB., 2006). Based on the research aim, Churchill and Iacobucci (2010) classified research design into three groups: descriptive, exploratory, and explanatory. Descriptive design involves assessment of frequency of occurrence and the relationship between two or more variables, and seeks to answer questions of who, what, when, where, and how (Cooper et al., 2006). Moreover, descriptive design is employed when the researcher's intention is to describe the characteristics of the phenomena under study (Sekaran and Bougie, 2010). On the other hand, exploratory design is used for discovering ideas and gaining insights into the research problem and is undertaken when the researchers have no or little knowledge about the research problem or even how it was addressed in the past (Sekaran, 2003b). Finally, explanatory research, the approach employed in this study, requires hypothesis testing, based on the cause and effect analysis, aiming to elucidate relationship between two or more independent variables (Cooper et al., 2006).

In the present study, within-subjects experimental design using simple random assignment (random order of cases) was employed to test the study model (Throughput) manipulated at two levels of fraud risk (high and low). In addition, 2×2 between subjects design was utilized to compare two groups of auditors (characterized by low and high skepticism) that are aided with the Process Thinking Model in their assessment of fraud risk at two fraud risk levels which are manipulated (high and low).

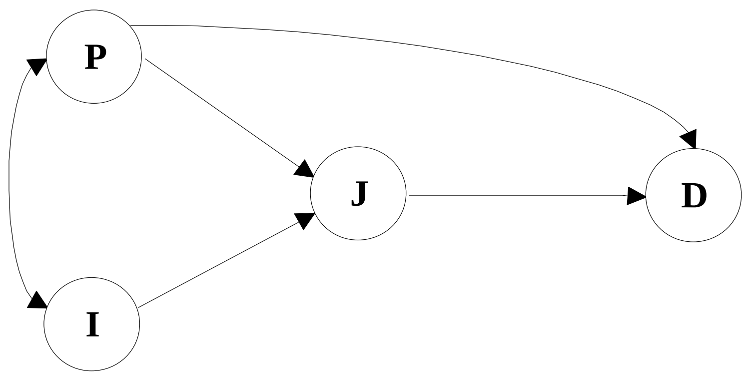
The key advantage of using within-subjects experimental design stems from providing the maximum control of irrelevant participant variables (Bryman and Bell, 2015). In within-subjects design, the effect of these extraneous participant variables can be removed by using statistical procedures. In addition, since the participants serve as their own controls, the participants in the different treatment conditions are perfectly matched, which increases sensitivity (power) of the experiment (Christensen et al., 2001).

5.7 Assessment Procedures

One treatment was employed for all the subjects and included: (1) impression (perception) of the SAS No. 99 fraud risk factors, (2) analysis (judgment) of the SAS No. 99 fraud risk factors, (3) components assessment, and (4) overall assessment. The study participants were asked to read through two cases, both of which included all the stages of the study's process thinking stages. The order of the cases was manipulated, in that if one auditor received the first case as low fraud risk condition, the other auditor would receive the opposite (i.e., the first case will be high fraud risk condition followed by low risk condition).

Because the process thinking model is applied in this study, all the dominant concepts in the model need to be measured in order to find whether this model enhances auditors' decisions in fraud risk assessment, see Figure 11.

Figure 11: Throughput Modeling Diagram



P = perception, I = information, J = judgment, and D = decision choice

In the current study, the first processing phase included perception of SAS No. 99 fraud risk factors and the financial information (i.e., liquidity, profitability, and risk). The SAS No. 99 factors used in this study have been categorized according to the fraud triangle (AICPA, 2002). Categorization of SAS No. 99 fraud risk factors is expected to reduce the cognitive effort needed by auditors to assimilate, rather than going to a large list of risk factors (Wilks and Zimbelman, 2004a). The process thinking model employed in this study asserts that an auditor places weights on analyzed information that are influenced by his/her perceptions of SAS No. 99 fraud risk factors. The categorization of fraud risk factors into fraud triangle components used in this study is presented in Table 5.2.

The financial information for the cases was measured by current ratio, net margin ratio, and debit/equity ratio, which represented the three major independent concepts of a firm's liquidity, profitability, and financial risk. Authors of a number of studies have used these ratios and pointed out their significance as indicators of a company's health (Rodgers and Housel, 2004).

Perception of the categorization of SAS No. 99 fraud risk factors was determined by asking the participants to assess the level of fraud risk based on the financial and non-financial information and to give their impression about each of the following five indicators used to measure perception:

1. Domination of management by a single person (Opportunity)
2. Personal financial obligation by clients' key personnel (Incentive)
3. Adverse relationship between company and employees (Incentive)
4. Inadequate monitoring controls (Opportunity)
5. Ineffective communications and enforcement of ethical climate (Attitude)

These indicators have been used to measure perception because auditors need to assess the level of risk of these factors in order to work as a baseline and background (*perception*) to their analysis (*judgment*) (AICPA, 2002). The participants were thus required to give their impression about the level of fraud risk using these indicators on a ten-point scale ranging from 1 (Extremely low) to 10 (Extremely high), similar to Carpenter (2007) and Hoffman and Zimbelman (2009).

Judgment of SAS No. 99 fraud risk factors and the analysis of financial information was determined by asking the participation to make evaluations of the following factors:

1. Justification based on materiality (Attitude)
2. Ratio analysis (Incentive)
3. Complex or unusual organizational structure (Opportunity)
4. Aggressive or unrealistic forecast (Attitude)

The participants were required to evaluate the above fraud risk factors on a ten-point scale ranging from 1 (Extremely low) to 10 (Extremely high). According to SAS No. 99, each of these fraud risk factors is categorized in one of the fraud triangle factors (AICPA, 2002), as shown in Table 4.

Decision choice was made in two stages— component assessment and overall assessment. The component assessment in this study replicates Wilks and Zimbelman, (2004a) and Norman et al., (2010), whereby auditors evaluated the risk related to management's attitude, opportunity, and incentive on a ten-point scale ranging from 1 (Extremely low) to 10 (Extremely high) (Wilks and Zimbelman, 2004a; Norman et al., 2010). Auditors that took part in the present study responded to the same questions as those used in Wilks and Zimbelman's (2004) study and rated the items on the scale from 1 (Extremely low) to 10 (Extremely high). The questions were:

1- What is the risk of financial statement fraud attributable to the incentives faced by management?
2- What is the risk of financial statement fraud attributable to the opportunities available to management?
3- What is the risk attributable to managements' attitude or character?

Overall fraud risk assessment was performed after completing the fraud triangle component assessments. In the overall assessments, participants were required to evaluate the overall risk due to financial statement fraud, on a scale ranging from 1 (Extremely low) to 10 (Extremely high). The overall question was based on all the information being reviewed in the case, from the perception of both the financial information and the categorization of SAS No. 99 fraud risk factors to judgment. In this study, the same questions as those posed by Wilks and Zimbelman (2004a) were adopted for this phase, namely:

Based on all the questions reviewed in this case, what is the overall risk of material financial statement fraud for this company?

Table 3: Fraud Risk Factors in the Experimental Instrument

Fraud Risk Factors	**Fraud categorization according to SAS No. 99**
1. Domination of management by a single person or small group without compensation controls.	Opportunity
2. Personal financial obligations by the firm's key personnel.	Incentive
3. Adverse relationship between company and employees • Changes in compensation • Promotions, compensation, or other rewards inconsistent with expectations	Incentive
4. Inadequate monitoring controls, including automated controls and controls over interim financial reporting (where external reporting is required)	Opportunity
5. Ineffective communications, implementation, support or enforcement of ethical climate	Attitude
6. Recurring management attempts to justify marginal or inappropriate accounting based on materiality: • Overstated net income by £29,016 due to Bad debt Expense account • Overstated net income by £21,481 due to Warranties expense • Combined effect is (£29,016 + £21,481) = £50,497 which is less than the materiality level of £52,020	Attitude
7. Rapid growth or unusual profitability especially compared to that of the prior years (see ratio analysis table)	Incentive
8. Complex or unstable organizational structure • Difficulty in determining organization or individuals with control of company • Overly complex structure	Opportunity

9.	Aggressive or unrealistic forecasts by management in maintaining earnings trend; Warranties expense in 2012 is £85,000, 25% decrease from the previous year	Attitude

5.8 Fraud Risk Manipulation

The manipulation of fraud risk factors resulted in two levels of fraud risk (high and low), consistent with prior studies (Wilks and Zimbelman, 2004a; Norman et al., 2010). Both risk levels were manipulated by varying the case context, including background information, competitive environment, and downturn in economic conditions. The experiment comprised of two cases, and each case was manipulated to present either high fraud risk or low fraud risk. This resulted in four cases, two suggesting low fraud risk condition, and the remaining two indicating high fraud risk condition. The first case used in the experiment was adopted from (Knapp, 2006) and the second case was adopted from (Lindberg, 1999) similar to (Carpenter et al., 2011a; Carpenter et al., 2002).

Both Knapp and Lindberg utilized cases pertaining to actual fraud that consequently did not contain a low fraud risk condition. Using real fraud cases provided a benchmark for assessing auditors' effectiveness in making fraud risk assessment, as well as enhanced the external validity by using real financial information that was available by actual auditing firms (Carpenter, 2007; Knapp and Knapp, 2001; Pincus, 1989; Nieschweitz et al., 2000). In Lindberg's case, the management of a hypothetical company had committed fraud in both the company's bad debt expense and product warranties expense accounts in order to receive bonuses based on net income (Lindberg, 1999). Knapp's case scenario exemplified the difficulties of financial statements preparation due to inefficiency of the current accounting systems and described the high risk from bad debt and inefficient inventory management system. In order to manipulate fraud risk, the same fraud risk factors were employed in those cases suggesting high fraud, while adding more fraud factors to suggest higher fraud risk conditions. Financial statements were not included in the experiment; instead, three ratios were provided for both hypothetical companies for three years for comparison. The manipulation of fraud risk factors is replicated in Table 5.

Table 4: Manipulation of Fraud Risk Factors

Fraud risk factors	**Low risk (Case Z)**	**Low risk (Case Y)**	**High risk (Case A)**	**High risk (Case B)**
Management's characteristics	Several reliable sources of information indicate that management team is of high quality	Several reliable sources of information indicate that management team is of high quality	-Controller's financially under pressure, because of his daughter disease -Accounting manager struggled in the past with gambling addiction and was expecting a raise but did not receive it	A significant change in the controller's lifestyle (Porsche sport car and taking loan to purchase a new home in an upscale neighborhood) Accounting manger has been advocating for less formality
Managerial Compensation	Each key personnel member received a cash bonus of 3% of their salary	Each key personnel receive a cash bonus of 1% of their salary	Each key personnel will receive a cash bonus based on predetermine percentage of company's reported income.	Each key personnel will receive a cash bonus based on predetermine percentage of company's reported income.
Accounting environment	Good control, No material deficiencies	Good control of financial reporting process. No material deficiencies	Some minor weaknesses in its accounting system	Some minor weaknesses in its accounting system
Bad Debt Expense	Overstated by £1,444, below materiality level of £45,020	Overstated by £722, below materiality level of £45,020	Overstated by £29,016, below materiality level of £52,020	Overstated by £24,180, below materiality level of £52,020

Product Warranties Expense	Overstated by £434, below materiality level of £45,020	Overstated by £902, below materiality level of £45,020	Overstated by £2,481, below materiality level of £52,020	Overstated by £22,720, below materiality level of £52,020

5.9 Sample Size

The process of choosing sample size is critical. It is a complex task, as the study reliability and result accuracy depend on the number of participants involved. For example, if the sample size is lower than the estimated size for a particular study, it results in greater chance of failure in negative error variance estimated for the measured variable and lower parameter accuracy (Hair et al., 2006). On the other hand, larger than required sample size will result in a waste of time, and cost to obtain respondents' data (Bryman and Bell, 2015). Therefore, critically assessing and establishing how large a sample size should be is essential, as this allows targeting population that is expected to provide reliable and trustworthy results. In the present study, the requirements of data analysis techniques that deal with structured equation modeling (SEM) using component based or variance based (PLS) has been followed.

However, before applying the techniques used to calculate the sample size, the size of the targeted population should be known. For the present study, it was important to make a random representation of the respondents covering those local firms for estimating a sample size that should represent the overall population. Authors of previous studies have proposed some rules and have offered guidance to be followed when choosing sample size. For example, Roscoe (1975) suggested that the sample size meeting the condition $n > 30$ and $n < 500$ is appropriate for most studies. Roscoe (1975) also recommended that, in a situation when the sample needs to be split into sub-samples (e.g., male/female), a minimum sample size of 30 for each category is appropriate and, for a simple experimental research with full control over respondents' behavior, a sample size of 10 to 20 respondents is sufficient.

In addition to following Roscoe (1975) recommendations, the criteria suggested by Cohen (1992) were also considered. Determining how many participants are needed to test the hypotheses must include assessment of issues such as the design of the study or the experiment. However, the main reason for determining a satisfactory sample size is to maintain a number of participants needed in order to detect an effect caused by the independent variable, if such an effect really exists (Christensen et al., 2001; Curtis et al., 2015). According to Cohen (1992), as the number of participants within a study increases, the power of the statistical test increases. Power is defined as the probability of rejecting a false-null hypothesis (Johnson and Christensen, 2008; HAMM et al., 1994). In other words, it is the ability of a test to detect an effect of a particular size, as a function of the size of the effect in the population, the sample size, and α. On the other hand, the effect size is the magnitude of the relation between the independent variable and dependent variable, which is expressed by correlation between these two variables (Johnson and Christensen, 2008). The effect size can be estimated through a literature review, focusing on extant works in which authors had investigated the same or similar independent and dependent variables . However, some authors posit that in within-subjects design, an effect size can be calculated directly using the *t* and *df* values yielded by the dependent samples t-test (Rosenthal, 1991), which might overestimate the true population effect (Field, 2013; Dunlap et al., 1996). See figure (12) for the differences of type I and type II error.

Table 5: Type I and Type II Error

	Experimental conclusion	
State of nature	Accept null hypothesis	Reject null hypothesis
Null hypothesis true	Correct conclusion	Type I or α error
Null hypothesis false	Type II or β error	Correct conclusion

In the present study, the recommendations made by Cohen (1988) were followed, thus a power level of 0.8 was chosen, while the anticipated effect size had to be estimated. The importance of using 80% power is because this percentage is sufficient to catch large effects and fewer subjects will be needed. Cohen (1992) recommended 128 participants (64 per group) in between-subjects design to detect an effect of d = .05, 80% power. However, in the current study's within-subject design, according to Cohen (1992), the required number of participants to detect an effect size of d =.05, with 80% power was 34. Thus, 42 participants were recruited to each experiment condition and this sample size was chosen because it is sufficient to detect an effect in a within-subjects design that is at least medium size or greater (Cohen's $d \geq .05$) with probability of 80%, as indicated by an *a priori* power analysis (Cohen, 1992). Moreover, the group size in between-subjects design that required comparing the two groups (high and low skepticism) resulted in 21 auditors in each group. According to Christensen et al. (2001) in (Cohen's $d \geq .05$) with probability of 80%, and with anticipated effect size of 0.60, the number of research participants in each condition should be 21 to reject the null hypothesis. Thus, the sample size in this study met the Cohen's rules for research design (Cohen, 1992).

5.10 Participants

This study focused on small local auditing firms and intended to find out how those auditors assess fraud risk when provided with a decision aid like the Throughput model, along with categorization of SAS No. 99 fraud risk factors. However fraud risk assessment is considered to be one of high-judgment tasks that require knowledge, experience, and reasoning (Loebbecke et al., 1989). Sutton and Byington (1993) suggested that staff auditors or even novices are the target users of many auditing decision aids. Furthermore, practicing audit seniors in public accounting firms are also suitable participants, as they have sufficient knowledge, experience, and training to perform the experimental task (Webber et al., 2006). While Hoffman and Patton (1997) recruited participants from auditor training sessions, other authors preferred samples comprised of senior auditors and managers, for example (Wilks and Zimbelman, 2004a; Bernardi, 1994; Knapp and Knapp, 2001). In order to recruit sufficient number of participants, 100 auditors of various experience levels were invited to take part in this study. The participants had an average of 11.7 years of experience, while those in the study conducted by Asare and Wright (2004) had an average of 9.7 years of experience.

The participants worked in geographically distributed firms in East Riding of Yorkshire, in the United Kingdom and were randomly selected for participation in the study. Having a sample comprising of auditors from different firms might help reduce the effect that certain firm training on fraud detection may have on the study result (Braun, 2000; Cushing et al., 1986). The study design consisted of four experiment cases, two representing the high risk conditions and the other two were manipulated to model low risk conditions. Each participant was asked to partake in to two experiment cases, resulting in two sets of responses from each subject.

5.11 Experimental Task

The participants were required to complete the Hurtt's professional skepticism scale at the beginning of the experiment. After this study phase, they were given the experiment cases that began with background information, including the position of the firm in the industry, key personnel traits, managerial compensation, the firm's accounting environment, fraud risk in bad debts expense account and fraud risk in product warranties expense account, as suggested by (Knapp, 2006; Lindberg, 1999). The participants were asked to read the information and use it to assess the perceived fraud risk and the level of fraud risk in the judgmental stage and to give a decision about the level of fraud risk in each of the fraud triangle components. Finally, they were asked to give comprehensive decision about the level of fraud risk based in all the information reviewed. Participants took approximately thirty minutes to complete the experiment.

The manipulated financial and non-financial information provided the participants with knowledge base to interact with their perception and judgment of SAS No. 99 fraud risk factors. All cases contained financial and non-financial information, which were manipulated to indicate high fraud risk (A, B) cases and cases (Z, Y) were manipulated to indicate low fraud risk. Before distributing the instruments to the auditors, the cases and assessment procedures were randomly ordered to alleviate uncontrolled influences across treatment conditions (Sweeney and Roberts, 1997). Each individual was randomly assigned two cases, one indicating high fraud condition and the other low fraud risk condition. Order effects are another threat to the validity of within-subjects design, which may result in the difference between two completed tasks due to the order in which they were completed, rather than the nature of the tasks. To mitigate the problem of sequencing effects, counterbalancing was employed, whereby different participants were tested in different order (Christensen et al., 2011). Counterbalancing would enhance the validity of within-subjects design in two ways, as it controls the sequence of the conditions, so that it is no longer a confounding variable (Charness et al., 2012).Thus, any main difference in the dependent variable between two conditions would be less likely to be caused by the order of conditions. Moreover, counterbalancing enhances the validity of within-subjects design by making it possible to detect carryover effect if it exists by analyzing the data separately for each order to find out whether this effect exists. Carryover effect emerges when the participants perform badly on tasks in later conditions because they have become tired or bored

(Charness et al., 2012). The order effect was controlled in the present study by randomizing the order of the experimental conditions, in that if the first individual was given high fraud risk condition as the first case and the low fraud risk condition as the second, the order would be reversed for another participant. In other words, 50% of the respondents were given the high level risk condition case first and the other 50% of the respondents had the low level risk condition case first. Summary of experimental procedures is provided in Figure 12.

Figure 12: Summary of Experimental Procedures

Phase 1:

Step 1: Participants complete the Hurtt's (2010) professional skepticism scale to provide a measure of trait skepticism.

Phase 2: Case materials provided suggest either high or low fraud risk.

Step 1: Participants are provided with a case scenario and they are required to read all the background information carefully.

Step 2: Participants are asked to respond to five questions related to their perception of the financial and non-financial fraud risk indicators.

Step 3: Participants are asked to respond to four questions related to their judgment and analysis of fraud risk factors.

Step 4: Participants are asked to give a component assessments for each of the fraud triangle factors of Incentive, Opportunity, and Attitude.

Step 5: Participants are asked to respond to a comprehensive or overall assessment, which is based in all the reviewed information pertaining to the case.

Phase 3: Another case material is provided suggesting low fraud risk if the first case (Phase 1) had high fraud risk condition and *vice versa*.

Step 1 to Step 5 in Phase 3 are the same as those in Phase 2 for both risk conditions (the only difference is the level of fraud risk).

Phase 4: Participants are asked to respond to demographic questions

5.12 Hypotheses Testing

The main dependent variable is the fraud risk assessment, which was measured on a scale from 0 = very low risk to 10 = very high risk (Reimers et al., 1993). Fraud risk assessment is measured in phase two and three throughout all the steps. However, in order to test the final decision of fraud risk assessments, it is necessary to test the effectiveness of the model. In order to do that, the model was separated into two phases, each of which was tested in two hypotheses. The first and second hypotheses were tested using structural equation modeling PLS.

5.12.1 Test of hypothesis 1

The first phase pertained to establishing the effect of perception of financial statement and SAS No. 99 fraud risk factors on Judgment. The dependent variable in the first hypothesis was the judgment. The perception of financial information and SAS No. 99 fraud risk factors served as independent variables. The structural equation for the first phase was as the follows:

$$y1 = \gamma 1x1 + \gamma 2x2 + \gamma 3x3 + \gamma 4x4 + \varepsilon \qquad (1)$$

where $\gamma 1$ indicates the value for the effect of perception on $y1$, which is the effect of perception after controlling the effect of $\gamma 2$ (liquidity), $\gamma 3$ (profitability), and $\gamma 4$ (leverage) variables in the equation; $x2$, $x3$ and $x4$ represent financial statement information measured by current ratio, net margin ratio, and debt/equity, respectively; $x1$ represents auditors' perception of SAS No. 99 fraud risk factors, and the latent variable is measured by their assessment of the following fraud risk factors:

1. Domination of management
2. Personal financial obligation
3. Adverse relationship between company and employees
4. Inadequate monitoring controls
5. Ineffective communication

The specific research questions that capture the perception variable are Q1 to Q5, presented in Section A in all experiment cases.

5.12.2 Test of hypothesis 2

The second phase represents the effect of perception and judgment on the auditors' decision choice. The dependent variable in the second hypothesis is the decision choice, whereas the effect of perception and judgment serve as independent variables. The structural equation for the second phase is as follows:

$$y2 = \gamma 5x1 + \beta 1y1 + \varepsilon \qquad (2)$$

where $\gamma 5$ corresponds to the effect of perception on $y2$ after having controlled for β1 (judgment). The latent variable $y1$ is measured by four procedural knowledge indicators, which represent auditors' analysis and evaluation of the following fraud risk factors:

1. Justification based on materiality
2. Ratios analysis
3. Complex or unusual organizational structure
4. Aggressive or unrealistic forecast

$y2$ in Equation (2) relates to auditors' decision choices, whereby the latent variables is measured by four indicators:

1- Level of fraud risk attributable to incentives faced by the company
2- Level of fraud risk attributable to opportunities available to the hypothetical company
3- Level of fraud risk attributable to the firms' attitude
4- Overall fraud risk assessment

5.12.3 Test of hypothesis 3

Regression analysis was used to test the relation between overall assessments and the fraud triangle components assessment. The regression equation for this hypothesis is as follows:

$$Y = \alpha + b_1X_1 + b_2X_2 + b_3X_3$$

where:

Y is the overall assessments

α (Alpha) is the constant or intercept

b_1 is the slope (Beta coefficient) for X_1 (Incentive component)

X_1 is the Incentive component, which is first independent variable explaining the variance in Y

b_2 is the Beta coefficient for X_2

X_2 is Opportunity component, which is the second independent variable explaining variance in Y.

b_3 is the Beta coefficient for the Attitude component

X_3 is the attitude component, which is the third independent variable explaining the variance in Y.

Pearson correlation tests were also performed to confirm the results yielded by the regression analysis tests. These tests were performed in both fraud risk conditions (high and low).

5.12.4 Test of hypothesis 4

The fourth hypothesis was performed by a comparison analysis between the two groups comprising of auditors possessing high and low skepticism, an independent t-test was performed between low and high skeptic groups and in two fraud risk conditions (high and low).

To support the comparison analysis, an independent t-test was performed for each single indicator in this study to compare high and low skepticism auditors and also in two fraud risk conditions (high and low).

5.13 Demographic Variables

A demographic variable can work as a moderator, which is a variable that change the direction or strength of the relation between a predictor (independent variable) and an outcome (dependent variable); thus it signifies interaction, whereby the effect of one variable depends on the level of others (Holmbeck, 1997; Baron and Kenny, 1986; Frazier et al., 2004). It is very important to study these interaction effects, since they are common in psychology logical research. For example, if gender is a significant moderator, the predictor variable will react differently for males and females (Frazier et al., 2004). In the current study, four main demographic variables were examined, along with further three variables that answer specific questions about the main demographic variable. Before explaining each variable, it is important to mention that all demographic variables were examined on the basis of an exploratory approach, in that correlation investigation, along with casual investigation such as independent samples t-test, ANOVA, and Chi-squared tests, to see if these demographic variables have a direct effect on the predictors and the outcome variable. In other words, if these demographic variables have no impact on the independent and dependent variables, it is less likely that they will have an impact in the model.

Since authors of several studies across different domains discovered the differences between men and women in decision-making process, it was important to investigate the influence of this demographic variable in the present study. However, it was also important to evaluate the distinct role of experience, level of education, and professional position, given that, in contrast to the previous work in this field, here, the effect of these demographic variables was examined on an independent basis (Edwards and Lambert, 2007; Morris and Venkatesh, 2000). Participants in the current study were required to respond to seven questions (1 to 7) in the demographic section of the questionnaire, whereby their answers were measured on a nominal scale to gather their background information, such as gender, audit experience, highest level of education, professional position, professional certificates, fraud risk experience, the number of audit engagements the auditor experienced where fraud was discovered, and years of working experience as an auditor. Prior to hypothesis testing, these demographic variables were used as explanatory variables and were examined by certain tests to explain their relationship with predictors (independent variables) and the outcome variable (dependent variable).

5.14 Reliability Analysis

Reliability analysis refers to the degree to which results are consistent over time and provide an accurate representation of the total population (Joppe, 2000). Kirk and Miller (1986) suggested that, if the research instrument achieves stability of measurements over time and if the repeated measurements in the same conditions yield the same results within a given time period, the research instrument is considered reliable. The consistency of the research instrument is determined by a test-retest method whereby the same test is given at two different times; if the measure is stable, then the result should also be stable. However, not all researchers are able to adopt the test-retest method because of the subjects availability. Moreover, Joppe (2000) stated that the test-retest method might make the instrument unreliable as it may sensitize the participants to the subject matter and accordingly influence the responses given. In addition, measurement error could be the reason for a change in score, which is due to a change in some characteristics of the respondent. Presence of these kinds of errors will reduce the accuracy and consistency of the instrument (Crocker and Algina, 1986; Joppe, 2000).

The current study's reliability tests was based on internal consistency (Cronbach's alpha coefficient) which is the most common measure of scale reliability. Alpha value increases as the correlation among items increases, which means that high score in one question is associated with higher scores in other questions (Kline, 1999).While Pallet (2007) suggested that Cronbach's alpha coefficient would be acceptable if it is greater than 0.6, George and Mallery (2003: p.231) provide the following rules of thumb: "_>.9 Excellent, _>.8 – Good, _>.7 _Acceptable, _>.6- Questionable, _>.5 – Poor _<.5 – Unacceptable". In this study, the alpha value in the pilot study was between 0.6 and 0.87, and between .08 and .09 in the actual study, which shows that the measures are reliable. However, even if the scholar might be able to prove the reliability of the instrument, that does not mean that the study is valid.

5.15 Validity

According to Joppe (2000), validity pertains to whether the study measures what it was intended to measure or how accurate the research results are. There are different methods for validating the results; in general, based on statistical validation, the conclusion of the study should be reached by following a proper use of statistical tests (Hair Jr et al., 2013; Saunders et al., 2009). Before testing the hypotheses, the researcher needs to have a good knowledge of conducting inferential statistics, to check if the data examined, meets all the major assumptions such as normality, linearity, homoscedasticity and multicollinearity. In the present study, the data have been subjected to different assumptions tests, which confirmed that the data is appropriate for the hypothesis testing.

Wainer and Braun (2013) described validity in quantitative research as construct validity, whereby the construct is the preliminary notion, question or a theory that determines which type of data is to be collected and how it is to be collected. The researcher must demonstrate that the selected measures actually address concepts and relationships. Hence, the measures within a construct should be correlated (convergent validity) (Hair et al., 2006). Convergent validity is measured by Cronbach's alpha or by t-values in PLS path model analysis. In this current research, appropriate Cronbach's alpha values were obtained, with significant *p*-values in the path analysis.

Another measure of validity is internal validity, which occurs when the researcher has the control over all variables, except the manipulated variable that influences the results of the research (Cook and Olive, 2012). Given that, in the present study, the existing literature was reviewed to derive the interrelationship between the main variables, any possible biases that arise from studying relationships have been avoided.

5.16 Pilot Study

A pilot study is simply defined as a small study involving a small sample to test research protocols, data collection instruments, sample recruitment strategies, and other research procedures in preparing for the main study (Zailinawati et al., 2006). Pilot study can be conducted after designing the initial version of the experiment and data collection instrument in the research design and it is a very important stage in the research project. Its aim is to identify potential areas of deficiencies in the experimental design or the instrument before the implementation of the main study (Kraemer et al., 2006). The first objective of conducting a pilot study is to determine the feasibility of the study protocol in terms of reliability and validity to improve the design of the instrument (Zikmund, 2003; Zailinawati et al., 2006). In addition, pilot study will help to reveal any issues in the recruitment of subjects, such as adequate time given to the respondents to consider their involvement in the study. Testing the measurement instrument (questionnaire) by ensuring that the questionnaire items accurately address the research questions is another benefit gained from conducting a pilot study. It also helps determine if the particular questions are appropriate, clear, and presented in a consistent manner (Lancaster et al., 2004).

Authors of previous studies suggested that the pilot study sample size should be generally small, and 10 to 30 sample size is reasonable (Kluckhohn and Strodtbeck, 1961; Lancaster et al., 2004; Luck and Rubin, 1987; Hertzog, 2008). In this study, a sample of 25 MBA students participated in the pilot study. The purpose of conducting pilot study was to evaluate the level of content validity and reliability to ensure that the major requirements are achieved, such as testing questions wording, sequence of the conditions per experiment, layout, familiarity with respondents, clarity of scales and questions, and questionnaire completion time (Ticehurst and Veal, 2000a; Sekaran, 2000; Creswell, 2002), see Table 6.

Table 6: Pilot Study

Required analysis	**Purpose**	**Analytical method**	**Tool**	**Required value with Reference**
Coding the variables and editing of data	To define the labels for each variable and assign numbers to each of the possible responses	Variable coding	SPSS	(Pallant, 2007)
Reliability	To ensure that measures of an assessment tool produces stable and consistent results.	Cronbach's α Item-to total correlation	SPSS SPSS	(Cronbach, 1951) α >.6 (Churchill Jr, 1979) Value > .60

The pilot study was conducted in a classroom for 32 Master level students in a accounting and finance module. The pilot test was administered after students were given an hour-long lecture on fraud risk assessment process and fraud triangle factors. The questionnaires completed by 25 out of 32 students were used in analyses, as the remaining 7 contained large number of missing responses. The response rate of the pilot study was 78% and the findings demonstrated that, on average, participants took about 25 to 30 minutes to complete the experiment instruments. Those who were invited to participate in the pilot study were not invited to participate in the main study even if they are practicing auditors, to avoid the effect of the behavior of the respondents if they are already familiar with instruments (Haralambos et al., 2000).

Since the main objective of conducting the pilot study in this current research was to test the reliability of the scales included in the instrument, the first stage in analyzing the gathered data was conducting content validity or reliability (Cronbach's α). The reliability tests would ensure that the measures are free from error and therefore yield reliable and consistent results (Peter, 1979). The overall reliability of each of the perception, judgment, and decision elements for both high and low risk conditions was measured. The perception scale Cronbach α for both high and low risk conditions is 0.69,which was in acceptable range (Cronbach, 1951). However, judgment scale Cronbach α in both high and low fraud conditions came out with 0.71, 0.72 in low fraud risk condition which is above than the recommended threshold 0.7 (Nunnally and Bernstein, 1994) and 0.67 in high fraud risk condition. In the decision construct, the reliability was 0.84, 0.87 in low fraud risk condition and 0.75 in high fraud risk decision which can be taken as accepted (Nunnally and Bernstein, 1994; Cronbach, 1951), see Table 7.

Table 7: Reliability and Validity of Pilot Study Results

Factor	**Cronbach's α**			**Variance explained**		
Risk Condition	High	Low	Both conditions	High	Low	Both conditions
Perception	.613	0.687	.690	43.333	56.093	54.874
Judgment	0.67	.723	.712	38.693	46.833	45.421
Decision	0.75	0.87	0.83	34.293	60.040	48.882

5.17 Research Instrument Wording and Layout

The layout and wording chosen in the questionnaire plays a vital role in enhancing participants' interest in filling out the questionnaire. The first step in designing a questionnaire is to define the goals of the research, as failing to identify the study objectives would increase the risk of gathering incomplete, misleading, or nonessential data (Fink, 2012). Moreover, careful consideration of the wording and language in the questions can minimize bias, in that it avoids confusing or misleading participants (Dillman et al., 2014; Kaplan and Saccuzzo, 2012). Since the current study focused on qualified accountants and auditors, an experiment instrument that includes simple language and words was chosen, to ensure that it could be completed even by those who are less familiar with accounting and auditing terms. However, an explanation of fraud triangle factors was provided to guide the respondents in answering the questions (Phellas et al., 2011; Check and Schutt, 2012).

The data collection instrument developed for the present study intended to explore the individual's knowledge of fraud risk assessment, which was measured using Nominal and Likert scale techniques. In addition, closed-ended questions were used where appropriate, to capture the information that is not exploratory and the researcher is just interested in certain set of responses. Another reason for choosing closed-ended questions is because open-ended questions require more time for coding and analyzing the data in that analysis time will depend on how long the responses are (Fink, 2012; Dillman et al., 2014). Moreover, applying closed-ended questions allows the researcher to code and tabulate the responses straightforwardly for quantitative data analysis purposes (Zikmund, 2003). With respect to the layout of the instrument, some of researchers suggested that personal information questions should be kept either at the start or the end of the instrument depending upon the objective of the research (Sekaran, 2000). However, Dillman et al., (2014) advised that personal information questions should not be given at the start of the instrument, as this might give the participant an indication that the instrument is boring, since those questions are easy to answer. In the current research, personal and demographic information was important to measure to see if it acts as moderating variables or not. Therefore, the demographic information was sought at the end of the instrument, to ensure that the respondents are willing to answer the questions as they have already completed all the tasks and are confident that they are not required to be involved in any personal issues. However, there is a possible risk that information at the end of the instrument may be left incomplete or be less motivating to the respondents. Still, for the current study, the participants' responses were examined in the pilot study, which confirmed that the participants were committed to respond to all their personal and demographic information at the end of the instrument.

5.18 Scale Used

The data collection instrument predominantly required responses on a 10-point Likert scale, which was appropriate for most constructs selected for measuring the predictors and the outcome variable. Likert scale was established by Renesis Likert in 1932 (Likert, 1932). In general, rating scales are most widely used tools, as they allow researchers to capture information on a range of phenomena (Dawes, 2008). There are two reasons for selecting Likert scale in this study (Viswanathan et al., 2004). First, it is one of the most common and easiest methods for gathering information from participants in an experimental setting. Second, it has been used widely in the published studies relevant to the current study or in general on topics, such as auditor judgment and auditors' decision-making process (Wilks and Zimbelman, 2004a; Asare and Wright, 2004; Chui and Pike, 2013; Carpenter, 2007; Hoffman and Zimbelman, 2009).

The range of possible responses for a Likert scale can vary, whereby authors of previous studies employed 5 to 7 categories (Malhotra and Peterson, 2006). Nonetheless 10- or 11-point scales are also frequently used (Loken et al., 1987). As the reliability of a scale increases, the number of possible alternative responses would also increase (Matell and Jacoby, 1971). In addition, Champney and Marshall (1939) stated that the practice of limiting scale categories to five or seven points may often give unjustifiably inaccurate results. Thus, in the current study, 10-point Likert scale was employed to avoid this issue (Wilks and Zimbelman, 2004a; Asare and Wright, 2004; Chui and Pike, 2013; Carpenter, 2007; Hoffman and Zimbelman, 2009).

5.19 Ethical Considerations in Conducting the Study

There are several ethical principles in social and business science research the researcher should take into account when examining human behavior. Ethical considerations cover all the structural aspects of a study, from the nature of the study sample and design and randomization with protecting human rights to data presentation and interpretation. These ethical considerations should be addressed prior to the data collection and also during the data collection process, as the failure to adhere to these ethical requirements will result in failing to collect the desired amount of data (Zikmund, 2003). The following sections address the main categories of ethical considerations in social science studies.

5.19.1 Ethical considerations in research design and sampling

Ethical issues that need to be addressed in this stage would be the sample size, the form of quantification employed, and the type of statistical design. However, the main critical areas of ethical concern in this stage stem from the need to define those who are eligible to be studied, randomization, and achieving the balance between the welfare of subjects and their potential benefits (Bradley and Oaks, 1999). Ethical issues arise in the sampling procedure if the sample is too large, as this entails unnecessary involvement of additional participants, additional costs, wasting people's time, and causing possible harm through unnecessary testing (Altman, 1980). However, when the sample is too small, this is also an ethical issue since the sample size will fail to represent and generalize the results to the population, which would be a waste of time and resources. Thus, researchers should consider maintaining a good statistical power when calculating sample size (McMillan and Schumacher, 2014). In the present study, statistical G*power has been used to calculate the sample size needed to generate 80% statistical power to detect an effect with degrees of freedom = .05. The required number of participants in within-subjects design with 5 degrees of freedom and d = .8 is 34, which is considered a large effect, according to Cohen (1992). However, sample size of 42 was achieved, which is more than what Cohen recommended with statistical power > 80% (Cohen, 1992).

5.19.2 Ethical considerations in protecting human rights and potential harm to participants.

According to Sekaran (2000), protecting participants' rights is essential to achieve high level of ethical consideration, which requires the researcher to assure participants that their information will not be disclosed and kept strictly confidential. Confidentiality means that any information obtained about a research participant is not exposed to anyone other than the researcher, and anonymity refers to the fact the identity of the research participants is unknown (Christensen et al., 2001). In addition, it is essential to assure respondents that their information will not be distorted or misused during the study, as well as to explain the research study purpose and the rules the participants will follow in the study without misrepresentation of the goals. Moreover, participants' self-esteem and self-respect should not be violated and the respondents should have the choice of participating in the study and should not be forced to participate.

In the present study, a cover letter (which included the title of the research and brief description of the study and requirements of the ethical considerations) was attached to the research instrument. Through the cover letter, participants were informed that they were assured that their confidentiality and data privacy would be secured and the data will not be shared or used in any other research. In addition to the cover letter, and by following Sekaran's (2000) recommendations, the guidelines of Hull University Business School were followed when collecting data. Purpose of the study and the experiment design were described in the ethical application form. After completing all the requirements of the Hull University Business School Ethics Committee, approval to collect data was obtained by the researcher's supervisor and the School Ethics Committee.

In the data collection stage, the ethical approval form and the cover letter were attached to each instrument. A copy of the cover letter is presented with the questionnaire in the appendix II.

5.19.3 Ethical considerations in data collection, processing, and analysis

There are two main ethical considerations when processing data, the first one is how to deal with outliers (observations points that are very different from other observations), as excluding these values will create a problem of dealing with missing values. The ethical consideration stems from the researcher selecting data just to make the results look more attractive, which is unethical. Hence, the researcher is required to give justification for any removal of the data values. The second ethical consideration arises when analyzing the data, as it is essential to comply with assumptions underlying a certain test (Altman, 1980; McMillan and Schumacher, 2014). The ethical impact of ignoring or manipulating the data to achieve a certain assumption can exaggerate the accuracy and the power of the data, which will result in misleading conclusions.

In the present study, the data did not contain outliers and this was confirmed by finding the median (middle) value of the data set along with inferential statistical results such as: Z-score and Mahalanobis D^2 measure. Testing for normality assumptions was performed prior to testing the hypotheses to determine the appropriate test (Fink, 2012).

5.20 Data Analysis Process

After establishing the research design and finalizing the data collection, the next step is analyzing the data and findings. For this purpose, the analyses performed in the current study were divided into three phases: preliminary data analysis (using SPSS), evaluation of structural model (using Partial Least squares (PLS)) and comparison tests (using

SPSS). Preliminary data analysis presents the descriptive statistics (inferential statistics) that should provide the general picture of the subjects' information and their responses to the experiment instrument. In doing so, SPSS version 20.0, which was recommended by many researchers, was used to conduct the inferential statistics and also to test some hypotheses (Field, 2013; Tabachnick and Fidell, 2007). Preliminary analysis included assumptions of normality, linearity, multicollinearity, and common method bias, as well as reliability analysis.

In phase two, the main model in the present study was tested and this analysis was performed by applying Structural Equation Modeling (SEM). SEM is a second-generation multivariate data analysis method and it is also referred to as casual modeling, path analysis or confirmatory analysis that allows relationships between one or more independent variables and one or more dependent variables to be studied at the same time (Tabachnick and Fidell, 2007). There are two basic components in SEM—structural model and the measurements model. Structural model is also called the inner model and represents the path model that connects independent variables with dependent variables (Hair Jr et al., 2013; Tabachnick and Fidell, 2007). The measurement model (also called outer model) allows the researcher to apply several indicators to measure a single variable and facilitates combined analysis of the measurement and structural model, which will help in giving the measurement error more attention, and it can be analyzed as an important part of the model (Hair et al., 2006). SEM is very common in the field of behavioral science and is used to assess the casual modeling of complex dataset. Its popularity has significantly increased due to the availability of several software packages that perform SEM (Hair et al., 2006; Hair Jr et al., 2013).

On the other hand, SEM is considered as a family of techniques and it is normally equivalent to implementing covariance-based analysis by using well-known software, such as AMOS and LISERL (Hair Jr et al., 2013). However, SEM includes software that is very practical, PLS-SEM, which allocates the same basic roots with AMOS and LISREL. The partial least squares (or PLS path modeling) was initially developed by Wold (1985) and Lohmöller (1989). It is a causal modeling approach intended at maximizing the explained variance of the dependent latent square with an alternative to the more prominent covariance-based (Joreskog, 1978; Wong, 2013). There are two approaches to estimate the relationship in structural equation model: the CB-SEM (which is widely used) and the PLS-SEM. Moreover, PLS path modeling is seen as a soft-modeling technique, with inflexible distribution assumption, whereas CBSEM requires solid distribution assumption. In addition, the main focus of CB-SEM is to estimate a set of model parameters without focusing on explained variance, while keeping the difference between the theoretical covariance matrix and the estimated covariance matrix at a minimum (Hair Jr et al., 2013). PLS is based on an approach that focuses in maximizing the explained variance of endogenous constructs and functions much like a multiple regression analysis, which makes it more valuable for exploratory research purposes (Hair et al., 2011; Hair et al., 2014; Hair et al., 2012b).

Exogenous latent variables and endogenous latent variables are two types of variables used in measurement models. Exogenous latent variables are those constructs that explain other constructs in the model (independent variable), whereas endogenous latent variables are those constructs that are being explained in the model (dependent variable). Measurement error is connected to endogenous constructs and reflective measured variables by single-headed arrows. Another term used in PLS is formative measurement model (when the directional arrows are pointing from indicator variables to the construct), and reflective measurement model (when the direction of arrows is from the construct to the indicators). However, the central difference between reflective and formative constructs is that reflective measures have an error term associated with each indicator and formative is considered to be error free (Hair et al., 2014). In addition, the researcher should be careful when approaching formative indicators and should be alert that the assessment of formatively measured constructs relies on a completely different set of criteria compared to their reflective indicators (Hair et al., 2012a; Hair et al., 2012b; F. Hair Jr et al., 2014).

5.20.1 Rationale for using PLS-SEM

PLS-SEM was adopted to test the study model (Throughput Model) as it provides a proper and well organized inference for a series of separate multiple regression equations. In addition, partial least squares is more flexible, in that it provides an opportunity for researchers to move forward in their studies without being restricted by large sample size, complicated theory, and need for normally distributed data (Hair Jr et al., 2013). Chin (1998) suggested that, depending on the scholar’s objectives and epimistic view of data to theory, properties of the data at hand or level of theoretical knowledge and measurement development, PLS path modeling is more appropriate. In other words, there are many areas in accounting and auditing research where theory is underdeveloped or the models being tested are very complex, making the PLS-SEM the suitable method for this type of research study. Increasing need in modeling especially in so-called formative constructs has led to a great interest in applying PLS path models. Moreover, PLS-SEM has recently received considerable attention in a variety of disciplines, including strategic management (Hair et al., 2012a), management information systems (Ringle et al., 2012), marketing (Hair et al., 2012b), accounting (Lee et al., 2011), and operational management (Peng and Lai, 2012). PLS-SEM applies confirmatory modeling that will achieve the aims of this current study by validating the hypothesized relationships between the different study variables.

In the current study, Smart PLS software package was utilized as a structural equation-modeling tool. In general, the purpose of this package is to exhibit a high R^2 score and significant t-value, accordingly invalidating the no effect of null hypothesis (Hair Jr et al., 2013). At the structural level, Smart PLS is employed to estimate path coefficients, along with correlations among the latent variables, as well as the individual R^2 and average variance extracted (AVE) of every latent construct (Hair et al., 2006; Hair et al., 2014). In the current study, the good model fit was established with the help of significant path coefficients and a suitable R^2 score, along with internal consistency or construct reliability of more than 0.70 for each construct (Cronbach, 1951; Chin, 1998). Moreover, the average of Average Variance Extracted (AVE) of each construct was greater than its correlation with other constructs. In addition, that each item had a greater loading on its assigned construct than on other constructs (Hair et al., 2006; Hair et al., 2011; Hair Jr et al., 2013). PLS-SEM was used in this study to validate the pre-established relationships between the endogenous and exogenous variables and for examining the results to help in accepting or rejecting the research hypotheses. The following chapter elaborates on the results in more detail.

5.21 Summary

This chapter was designated to explain the objectives of this study, the adopted philosophical assumptions and the methodological procedures employed to collect the data through experiments. The scholar of this study has examined different approaches and methods for data collection and has specified the reasons and criteria for choosing those methods and techniques.

In summary, the overall research methodology is based on a quantitative approach. This study was conducted mainly through instrument experiment, in that it sought to be explanatory in nature. This chapter has explained the statistical procedures for testing the study hypotheses. Ethical issues have also been discussed.

The following chapter presents the empirical findings of this research study

Chapter 6 Analysis and Results

6.1 Introduction

This chapter provides the results obtained through the experiment and data collection instrument of the study. The analyses discussed include tests for missing data, multivariate outliers, normality, and multi-collinearity, as well as reliability analysis, percentage analysis, descriptive statistics, t-test, analysis of variance, chi-squared test, correlation, regression analysis, using the software SPSS 20.0 and using partial least squares (PLS) to test the study's model. The number of the study participants is $N = 42$. The chapter ends with a summary.

6.2 Multivariate Outliers

An outlier is an observation that lies at an irregular distance from the other values in a random sample and represents extreme values or a mixture of scores on more than one variable (Tabachnick and Fidell, 2007). Outliers can be recognized by examination of the overall shape of the graphed data and can be detected by checking for presence of overly high or low values of variables or an exceptional observation that looks very different from the remaining data pattern (Hair et al., 2006). Outliers can result in non-normality of data and distorted statistical results (Hair et al., 2006; Tabachnick and Fidell, 2007; Bendat and Piersol, 2011). Moreover, Tabachnick and Fidell (2007) cited four reasons for the occurrence of outliers, namely incorrect data entry, failing in coding the missing values which might be dealt with as real data, entering observation that doesn't belong to the population from which sample is extracted, and finally entering data from population that appear as extreme values in the normal distribution. Kline (2005) categorized two types of outliers, univariate and multivariate outlier. Univariate outliers are extreme values that can be recognized and detected by assessing the distribution of the data for each single variable of the study. On the other hand, multivariate outliers include odd combination of extreme observations in two or more variables.

In the current study, univariate outliers were addressed by using standard score (Z-score), as there are rules of thumb suggesting that the case is an outlier if: standard score is ± 2.5 or beyond when the sample size is 80 or less, and ±3 when the sample size is greater than 80 (Hair et al., 2006). In this study, the items were grouped together to represent one single variable, so that the data values of each observation is transferred to the Z-score. The results indicate that no outliers exist in this data set, as all the observations are less than ±2.5. Table for the transferred Z-score are included in the Appendix V table (2).

In addition, multivariate outliers were detected by using Mahalanobis D^2 measure, which measures each observation's distance in multidimensional space from the mean of all observations and provides a single value; it is also considered as multidimensional version of the X-score (Hair et al., 2006; Tabachnick and Fidell, 2007). According to Field (2009), when the sample size is small, if the degrees of freedom *df* value exceeds 2.5 (or 3 to 4 in a large sample size), it is considered to be a possible outlier. Moreover, $p < .001$ or $p < .005$ are used as critical significant values x with Mahalanobis distance measure (Field, 2000; Hair et al., 2006). A linear regression method was conducted to calculate the Mahalanobis Distance value, *t*-value of significance was obtained by using SPSS v.20 and by using the Chi-squared by transforming and computing variable "1-CDF.CHISQ(MD,13)", where MD refers to Mahalanobis distance values, 13 is *df* taken according to the number of variables in this study. First, it was found that all the variables are within the range of standard score of 26.406 (see Table 8), which indicates that the data has no significant multivariate outliers. To confirm that the significant values were used and found that in all observations, the *p*-value was greater than .001.

Table 8: Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.20	8.11	5.45	1.174	42
Std. Predicted Value	-2.767	2.263	.000	1.000	42
Standard Error of Predicted Value	.224	.632	.415	.115	42
Adjusted Predicted Value	2.42	8.89	5.50	1.252	42
Residual	-1.109	2.398	.000	.651	42
Std. Residual	-1.434	3.098	.000	.841	42
Stud. Residual	-1.869	3.630	-.024	1.048	42
Deleted Residual	-2.407	3.291	-.053	1.041	42
Stud. Deleted Residual	-1.958	4.829	-.002	1.174	42
Mahal. Distance	**2.459**	**26.406**	11.714	6.684	42
Cook's Distance	.000	.488	.054	.102	42
Centered Leverage Value	.060	.644	.286	.163	42

a. Dependent Variable: overall risk

6.3 Test for Normality

An assessment of the normality of data is a precondition for many statistical tests because normal data is an underlying assumption in parametric testing (Field, 2009). It refers to the extent to which the data distribution can be approximated by the normal distribution (Hair et al., 2006). Normality is required because of the use of F and t statistics, so if the variation from normal distribution is large, all resulting statistical test are invalid (Hair et al., 2006). The assumptions of normality can be examined at univariate level as well as multivariate level and, if the variables achieve the multivariate normality, the univariate normality is also satisfied, while the reverse inference cannot be made, as univariate normality does not guarantee the assumption of multivariate normality (Hair et al., 2006; Field, 2009). Normality assumption at univariate level examines the distribution of scores at an item-level, whereas at multivariate level, the normality assumption tests will be in the distribution of scores within combination of two or more than two items. In addition, Central Limit Theory states that the distribution of sample means approaches normality as the sample size increases regardless of the shape of the population mean (Rietveld and van Hout, 2015). In general, this theory suggests a sample size of 30 or greater, so the sampling distribution of the mean can be safely assumed to be normal (Field, 2013). There are two main methods of assessing normality—graphical and numerical (Tabachnick and Fidell, 2007). When testing for normality, the Tests of Familiarity table and the Histogram are used as numerical and graphical methods to test for the normality of data, respectively. When using graphical method of normality checking, the shape of the histogram is examined, as it should approximate a bell-shaped curve and have higher frequency of scores in middle and lower on tails (Pallant, 2007; Field, 2013), then it suggests that the data may have come from a normal population. The Q-Q plot (normal probability plot), is another graphical method for assessing normality; if the points within are clustered around straight line, it shows that the data is normally distributed (Field, 2009). In the current study, a Q-Q plot in the appendix (V) shown that the data values were clustered around the straight line, suggesting presence of normal distribution. Moreover, the histogram for each variable in the current study was examined and was confirmed that it has the bell shape and higher frequency scores in the middle, and lower at the tails, see Appendix (V).

Table 9: Tests of Normality

Variables	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Domination	0.122	42	0.120	0.978	42	**0.579**
Personal	0.155	42	0.013	0.946	42	0.045
Adversely	0.161	42	0.008	0.971	42	**0.370**
Ineffective	0.151	42	0.017	0.963	42	**0.184**
Inadequate	0.171	42	0.004	0.952	42	**0.076**
Recurring	0.128	42	0.083	0.967	42	**0.261**
Rapid growth	0.141	42	0.036	0.973	42	**0.424**
Complex	0.128	42	0.081	0.952	42	**0.079**
Aggressive	0.120	42	0.138	0.967	42	**0.267**
Incentive	0.195	42	0.000	0.959	42	**0.136**
Opportunity	0.129	42	0.076	0.963	42	**0.195**
Attitude	0.126	42	0.089	0.975	42	**0.494**
Overall risk	0.176	42	0.002	0.962	42	**0.180**

Bolded value represents p > .05

Table 9 presents the outcomes from two renowned tests of normality, namely the Kolmogorov-Smirnov Test and the Shapiro-Wilk Test (Pallant, 2007). The Shapiro-Wilk Test is more appropriate for small sample sizes (< 50 participants), but can also handle sample sizes as large as 2000. According to Shaphiro and Wilk (1965), the null hypothesis in this test is that the population is normally distributed, so the *p*-value is less than the chosen alpha level then this hypothesis is rejected, suggesting that the data is not normally distributed. However, if the *p*-value is greater than the chosen alpha, then the null hypothesis is not rejected suggesting that the data is normally distributed (Shaphiro and Wilk, 1965).

From the above table for the “Domination”, “Adversely”, “Ineffective”, “Inadequate”, “Recurring”, “Rapid growth”, “Complex”, “Aggressive”, “Incentive”, “Opportunity”, “Attitude”, and “Overall risk” variables, it can be seen that each is normally distributed. In the Sig. value of the Shapiro-Wilk test, the alpha level was considered to be .05 (5%), so if the test result is greater than 0.05, the data is normal, while less than 0.05 indicates that the data is not normal. In the current study, all the variables were normally distributed, except “Personal” variable, for which the data significantly deviated from normal distribution. However, the sample size in the present study is greater than 30, so the significance of of K-S test for large sample size cannot be considered as deviation from normal distribution (Field, 2013).

6.4 Multicollinearity

Multicollinearity is a high degree of correlation (linear dependence) among several independent variables (e.g., .90 or above) (Hair et al., 2006). It usually occurs when a large number of independent variables are incorporated in a regression model. It is because some of them may measure the same concepts or phenomena and results in the lowering of the unique variance explained by each independent variable (β- value) and increases the shared prediction (Hair et al., 2006). The existence of multicollinearity limits the size of regression (R) and makes it difficult to recognize the contribution of each individual independent variable (Field, 2013). Moreover, a perfect multicollinearity violates the assumption that X matrix is fully ranked, making OLS impossible. When a model is not fully ranked, that is, the inverse of X cannot be defined, there can be an infinite number of least squares solutions.

There is no clear-cut criterion for appraising multicollinearity of linear regression models. We may compute correlation coefficients of independent variables. However, high correlation coefficients do not necessarily imply multicollinearity. We can make a judgment by checking related statistics, such as tolerance value or variance inflation factor (VIF), Eigen value, and condition number (Hair et al., 2006; Field, 2009; Pallant, 2007). However, there is no formal criterion for determining the bottom line of the tolerance value, or VIF. Pallant (2007) argued that a tolerance value less than .1 or the VIF greater than 10 roughly indicates significant multicollinearity. Others insist that magnitude of model's R^2 be considered determining the significance of multi-collinearity for example Klein and Nakamura (1962) suggested an alternative criterion, i.e., R^2_k that exceeds R^2 of the regression model. In this element, if VIF is greater than $1/(1-R^2)$ or a tolerance value is less than $(1-R^2)$, multicollinearity can be considered as statistically significant.

Table 10: Tests of Multicollinearity

Model		Unstandardized Coefficients		t-value	p-value	Collinearity Statistics	
		Beta	SE			Tolerance	VIF
1	(Constant)	0.767	0.729	1.053	0.299		
	Perception-High risk	0.467	0.111	4.193	**0.000****	0.727	1.375
	Judgment	0.500	0.094	5.339	**0.000****	0.727	1.375

Dependent Variable: Decision, $^{**}p < 0.01$

Table 10 presents the regression analysis for the variables in high risk condition in which dependent variable is the overall decision, and independent variables are perception and judgment, from which multi-collinearity is tested based on tolerance and VIF value. If the tolerance value is less than .1 or VIF greater than 10, this indicates significant multi-collinearity. In the above table, the tolerance value is 0.7, which is greater than 0.1, and VIF 1.4 is less than 10. Therefore, the results of VIF and tolerance coefficients both confirm that there is no issue of multicollinearity in the high risk condition.

Table 11: Tests of Multicollinearity in Low Risk Condition

Model		Unstandardized Coefficients		t-value	p-value	Collinearity Statistics	
		Beta	S.E			Tolerance	VIF
1	(Constant)	0.224	0.370	0.604	0.549		
	Perception-Low risk	0.394	0.106	3.717	**0.001****	0.513	1.950
	Judgment	0.478	0.123	3.900	**0.000****	0.513	1.950

Dependent Variable: Decision, $^{**}p < 0.01$

Table 11 presents the regression analysis in low risk condition, from which multicollinearity is tested based on tolerance and VIF value. If the tolerance value is less than .1 or the VIF greater than 10, significant multicollinearity is indicated. In the above table, the tolerance value is 0.5 and VIF is 2.0, indicating that there is also no issue of multicollinearity in the low risk condition. On the basis of these results, it can be concluded that there is no potential problem of multicollinearity in the current study.

6.5 Common Method Variance (CMV)

Researchers in the past studies on common method bias agree that common method variance is a potential problem in behavioral research. Campbell and Fiske (1959) were the first to recognize this issue (Jakobsen and Jensen, 2015; Spector, 2006). Common method variance is defined as systematic variance that emerges because of the method used in collecting data (Spector and Brannick, 2010). Fiske (1982: p.81-84) specified some sources that the CMV may arise from, "Method variance refers to variance that is attributable to the measurement method rather than to the construct of interest. The term method refers to the form of measurement at different levels of abstraction, such as the content of specific items, scale type, response format, and the general context". The problem of method bias is serious because it is one of the main sources of measurement errors that affect the validity of the relationships between measures. Moreover, it can have a serious confounding influence on empirical results, consequently yielding misleading conclusions (Bagozzi and Yi, 1991).

Researchers have developed a number of statistical techniques to detect the effect of common method variance. The two techniques that have been frequently used are the Harman single-factor test and the marker variable technique (Jarvenpaa and Majchrzak, 2008). The Harman single-factor test is by far the most commonly used technique to control CMV in different areas, such as management (Avolio et al., 1991), business ethics (Rego et al., 2010), psychology (Podsakoff et al., 2003), and marketing (Prendergast et al., 2009). This method requires loading all the measures in the study data into exploratory factor analysis, with the assumption that the occurrence of common method variance is indicated by appearance of either a single factor or a general factor accounting for the majority of covariance among measures (Podsakoff et al., 2003). However, Podsakoff et al. (2003) characterized the Harman single-factor test as a diagnostic technique that does not assist in solving this problem.

In the current study, Harman's single-factor test was conducted by using SPSS v. 20. The results of Harman's single-factor test given in Table 6.5 indicate that three factors were extracted when all the items/components were subjected to exploratory factor analysis (EFA). The first factor accounted for 39 per cent of the variance. In other words, as the total variance extracted by single variable should not exceed 50%, Harman's single test findings confirmed that common method bias was not a substantial issue in the data (Eichhorn, 2014). Harman's test can be conducted with EFA and CFA settings. However, Craighead et al. (2011) explained that, because CMV poses a serious threat and replication research in different fields (such as IT, OM and SCM research) is rare, scholars should at least perform Harman's single-factor test with CFA setting. As an alternative to EFA, in the present study, CFA was used to test CVM, as shown in Table 12.

Table 12: Harman Single-factor Test using Factor Analysis

	Total Variance Explained					
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.066	38.972	38.972	5.066	38.972	38.972
2	1.632	12.556	51.528	1.632	12.556	51.528
3	1.385	10.653	62.181	1.385	10.653	62.181
4	.976	7.510	69.691			
5	.865	6.657	76.348			
6	.709	5.455	81.803			
7	.650	5.002	86.805			
8	.490	3.766	90.571			
9	.409	3.150	93.721			
10	.311	2.394	96.115			
11	.198	1.524	97.639			
12	.170	1.311	98.951			
13	.136	1.049	100.000			

Extraction Method: Principal Component Analysis.

However, Craighead et al. (2011) suggested that the use of the Harman's single-factor method is increasingly being questioned and that scholars should consider using the marker variable technique. Moreover, the marker variable method (Lindell and Whitney, 2001) is considered as a better option for quantifying and excluding common method variance CMV (Malhotra et al., 2006). In the present study, common method variance CMV was also tested using the marker-variable technique (Malhotra, Kim & Patil, 2006). In this method, CFA of the measurement model was conducted first with the marker variable, and again without the marker variable. The covariance between the measurement dimensions and the marker variable under each construct is presented in Table 13.

Table 13: Correlation between Measurement Dimensions and the Marker Variable

Measurement dimensions and marker variable	Correlation (r)	Average correlation (r_m)
r(perception, judgment)	0.821	0.867
r(judgment, marker_variable)	0.899	
r(perception, marker_variable)	0.881	

The average correlation (r_m) and original correlation (r_{un}) can now be calculated as a new correlation r_A (i.e., CMV- adjusted correlation) using the formula proposed by Malhotra et al. (2006).

$r_A = r_u\text{-}r_m/1\text{-}r_m$

Common method variance estimation

where, the r_m = average correlation between the marker variable and measurement dimensions, r_u = the actual correlation, r_A = adjusted correlation.

Table 14: Changes in Correlation between Measurement Items

Measurement items	Original Correlation r_{un}	CMV-adjusted correlation r_A	Δr
r(perception, judgment)	0.821	-0.35	1.171
r(judgment, marker_variable)	0.899	0.24	0.659
r(perception, marker_variable)	0.881	0.11	0.771

As can be seen from Table 14, the CMV-adjusted correlations were 0.24 and 0.11. In general, the results indicated that the correlation is not significant, confirming that the CMV bias is not an issue in this study.

Another way of checking common bias method is based on examining the correlation matrix (Bagozzi and Yi, 1991). It is based on the premise that presence of highly correlated variables are evidence of common method bias; usually results with greater than 0.90 is considered to be extremely high correlation where the common method bias is going to be an issue (Bagozzi and Yi, 1991).

Table 15: Correlation between Fraud Risk Factors

	Perception -High risk	**Judgment**	**Decision**	**Perception-Low risk**	**Judgment**	**Decision**
High risk						
Perception	1	**.522****	**.706****	-.149	-.098	.087
Judgment		1	**.761****	-.017	.103	.088
Decision			1	-.079	.034	.072
Low risk						
Perception	-.149	-.017	-.079	1	**.698****	**.774****
Judgment	-.098	.103	.034		1	**.780****
Decision	.087	.088	.072			1

$^{**}p < .01$

Figure 13: Scatter diagram for high-risk perception, judgment, and decision

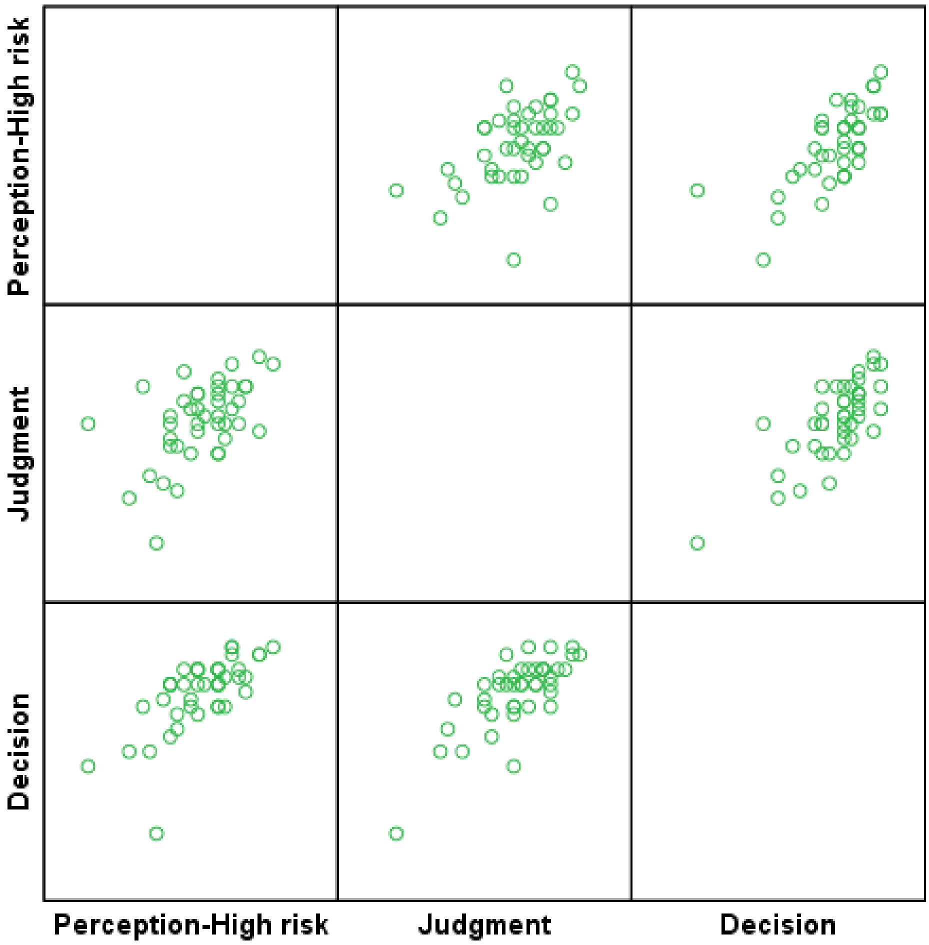


Figure 14: Scatter diagram for low-risk perception, judgment, and decision

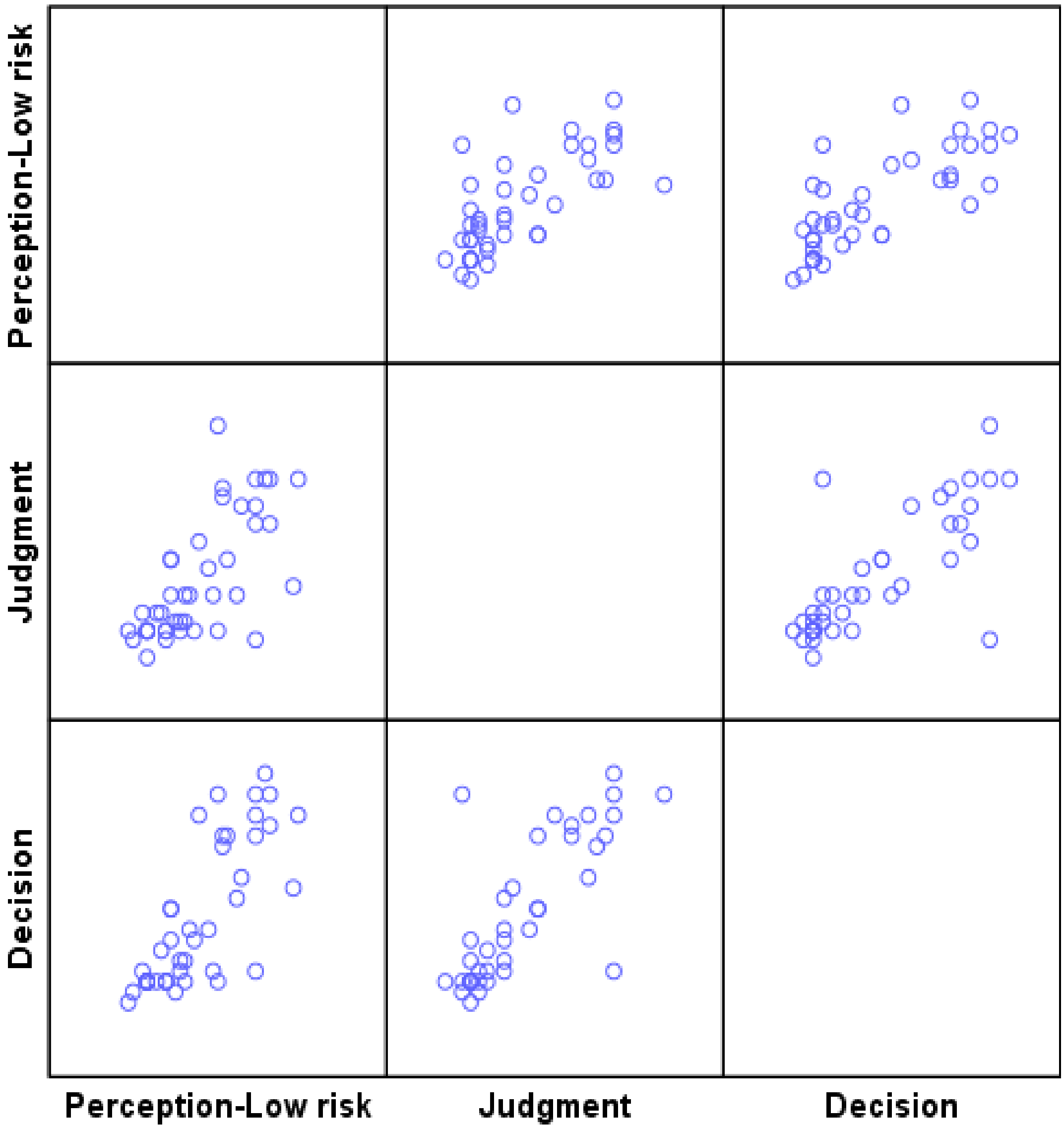


Table 15 presents the Pearson correlation among fraud risk variables. The correlation values in the table are significant at the 1% and 5% level. There is significant positive correlation in high risk condition between Perception and Judgment (r = .522, p < .01), Perception and Decision (r = .706, p < .01) and Judgment and Decision (r = 0.761, p < 0.01). The positive correlation indicates that, as Perception increases, so do Judgment and Decision. There is a significant positive correlation in low risk condition between Perception and Judgment (r = .698, p < .01), Perception and Decision (r = .774, p < .01) and Judgment and Decision (r = .780, p < .01). The positive correlation indicates that, as Perception increases, Judgment and Decision also increase. The bolded values in Table 6.9 denote positive significant correlation. However, correlations in high risk and low risk conditions between variables are less than 0.90, indicating that it is less likely for the common method bias to be a problem in this data set (Bagozzi and Yi, 1991).

6.6 Demographic details of the participants

6.6.1 Gender

Table 16 presents the respondents' gender. Majority of the 42 respondents are male (62%). This phenomenon is common in many of the private organizations, as the private sector is less attractive than public sector for many women due to long working hours. However, according to the Eurostat Database (2016), the percentage of women employed in legal and accounting activities in United Kingdom is 54.3%.

Table 16: Frequency for Gender

Gender	**Frequency (n)**	**Percentage (%)**
Male	26	61.9
Female	16	38.1
Total	**42**	**100.0**

6.6.2 Full-time audit experience

Table 17: Frequency of Full-time Audit Experience

Full-time audit experience (years)	**Frequency (n)**	**Percentage (%)**
<=2.5	11	26.2
2.6-5.0	12	28.6
5.1-17.0	9	21.4
>=17.1	10	23.8
Total	**42**	**100.0**
	Mean	**Range (Max-Min)**
Full-time audit experience (years)	11.7	45 (45-0)

Max- Maximum, Min-Minimum

Table 17 shows the full-time audit experience. As can be seen, majority (29%) of the study participants had 2.6-5.0 years' experience, followed by 26% with less than 2.5 years, and 21% with 5.1-17.0 years' experience. The mean of full-time audit experience is 11.7 years with the maximum of 45 years. The experience of the auditors in the current study is not below the range reported in the related studies, as Asare and Wright (2004) recruited auditors with 9.7 years of experience, Carpenter (2007) examined auditors with 6.4 years of experience, and Wilks and Zimbelman (2004a) employed auditors with 7.9 years of experience. However Knapp and Knapp (2001) suggest that a combination of great audit experience and clear fraud risk assessment guidance resulted in the most effective fraud risk assessment.

6.6.3 Highest level of education

Table 18: Frequency for the Highest Level of Education

Highest level of education	Frequency (n)	Percentage (%)
Bachelors	10	23.8
Masters	14	33.3
Others	18	42.9
Total	**42**	**100.0**

Table 18 reveals the highest level of education attained by the study participants, 33% of whom had masters' degree and 24% Bachelors degree. However, the majority (43%) reported different educational levels, such as PhD and a degree equivalent to MPhil. No respondents have an education below Bachelor's degree. In general, the majority of the auditors in United Kingdom have high level of education, possibly because part-time education is open and available locally for full-time auditors. Another reason is that the auditing firms encourage their employees to proceed with higher education.

6.6.4 Professional position

Table 19: Frequency for Professional Position

Professional position	Frequency (n)	Percentage (%)
Staff	7	16.7
Senior	9	21.4
Supervisor	3	7.1
Manager	9	21.4
Partner	8	19.0
Others	6	14.3
Total	**42**	**100.0**

Table 19 shows the professional position, indicating that majority (21%) of auditors in this study are seniors, and managers, followed by partner (19%), staff (17%) and supervisor (7%). Fraud risk assessment is considered to be one of the high-level judgment tasks that require knowledge, experience, and reasoning (Loebbecke et al., 1989). Therefore, auditors performing this function are required to have sufficient knowledge, experience, and training. Thus, practicing audit seniors are suitable participants because they have the knowledge and experience to perform the experimental task (Webber et al., 2006). However, managers and partners perform better in these judgmental tasks as they are considered experts. The results obtained in the current study show that most of the participants are managers and seniors, which is exactly what a task such as fraud risk assessment needs to be assessed in the appropriate way.

6.6.5 Professional certificate

Table 20: Frequency for Professional Certificate

Professional certificate	**Frequency (n)**	**Percentage (%)**
ACCA	21	50.0
CFA	3	7.1
Others	18	42.9
Total	**42**	**100.0**

Table 20 reveals that majority (50%) of study participants have Association of Chartered Certified Accountants ACCA (UK) certificate, followed by 43% with other certificate type (e.g., Certified Internal auditor CIA and Chartered Accountant ACA), and 7% holding Chartered Financial Analysis CFA certificate.

6.6.6 Descriptive statistics for experience

Table 21: Descriptive Statistics for Experience

	Mean	**Range (Max-Min)**
Experience in assessing the fraud risk (in months)	27.62	480 (480-0)
Number of audit engagements in which material fraud was discovered	4.95	150 (150-0)
Experience working as an auditor (in years)	11.36	42 (42-0)

Max- Maximum, Min-Minimum

Table 21 presents the descriptive statistics for experience with fraud detection. The mean experience in assessing the fraud risk is 28 months with a maximum of 480 months. The average number of audit engagements in which material fraud was discovered is 5, with a maximum of 150. The mean experience working as an auditor is 11 years, with a maximum of 42 years. Auditors with fraud experience do better in detecting fraud than auditors who had never come across it despite industry- specific experience. Payne and Ramsay (2005) stated that auditors with greater fraud knowledge and experience were more skeptical than those who were never or rarely exposed to fraud risk assessment. From this finding, it is evident that the majority of participants in this study have good fraud knowledge that will help them respond to the experiment tasks.

6.7 Main Study Variables

6.7.1 Reliability

After examining descriptive characteristics of the participants' demographic data, the next step in data analysis is to examine the reliability of their responses to the instrument questions. According to Hair et al. (2006), examination of the instrument questions requires an accepted level of reliability and validity and that is also known as examination of psychometric properties. There are many statistical methods that can be employed to measure reliability, such as the split half test which is an evaluation of consistency between number of measurement items measuring a single variable. Another method is test-retest, which is the measurement of the same participant's score obtained at two different points in time (Ticehurst and Veal, 2000b). For the current study, Cronbach's α coefficient was selected to measure the internal consistency and reliability of the study's main variables. Cronbach's α is well known and accepted by several academic scholars and is easy to calculate (Cronbach, 1951; Nunnally and Bernstein, 1994; Tabachnick and Fidell, 2007). Based on the Cronbach's alpha value, the following conclusions about the data can be reached:

- If $\alpha \geq 0.9$ – Excellent
- If $0.7 \leq \alpha < 0.9$ – Good (Cronbach, 1951)
- If $0.6 \leq \alpha < 0.7$ – Acceptable (Robinson et al., 1991).
- If $0.5 \leq \alpha < 0.6$ –Poor
- If $\alpha < 0.5$ – Unacceptable

There is a relation between Cronbach's alpha and correlation. Cronbach's alpha generally increases when the correlation among the item increases. So Cronbach's α can also be measured by examining the item-to-total correlation, which is the correlation of an item with the overall scale score, which is suggested to be 50% or above; or by inter-item correlation which is the correlation among items, suggested to be 30% or more (Hair et al., 2006; Robinson et al., 1991).

Table 22: Reliability analysis for fraud risk (Low and High) factors in separate conditions

Fraud risk factors	**High risk**					**Low risk**				
	Number of items	**Mean**	**SD**	**Range (Max-Min)**	**Cronbach's alpha**	**Number of items**	**Mean**	**SD**	**Range (Max-Min)**	**Cronbach's Alpha**
Perception	5	7.31	1.10	5.40 (9.40-4.00)	0.589	5	4.22	1.97	7.20 (8.40-1.20)	0.852
Judgment	4	6.61	1.31	6.25 (8.75-2.50)	0.629	4	3.45	1.71	6.50 (7.75-1.25)	0.875
Decision	4	7.49	1.21	6.25 (9.00-2.75)	0.724	4	3.54	1.74	5.50 (7.00-1.50)	0.895

SD- Standard Deviation; Max- Maximum, Min-Minimum

Table 22 presents the descriptive statistics for each of the fraud risk factors and the reliability analysis outcome using the Cronbach's alpha method in order to measure the reliability of each multi-item of the fraud risk factor (i.e., Perception, Judgment, and Decision) scale. From the results presented in Table 22, it is evident that there is an acceptable reliability with coefficient alphas ranging from 0.72 to 0.589 in high risk and from 0.895 to 0.852 in low risk conditions, respectively.

Table 23: Reliability analysis for fraud risk (Low and High) factors in both High and low risk (N = 84)

Fraud Risk Factors	Number of Items	Mean	SD	Range (Max-Min)	Cronbach's alpha
Perception	5	5.78	2.22	8.20 (9.40-1.20)	0.889
Judgment	4	5.03	2.20	7.50 (8.75-1.25)	0.885
Decision	4	5.51	2.49	7.50 (9.00-1.50)	0.941

Table 23 presents the descriptive statistics for each fraud risk factor and the reliability analysis outcome for both levels of fraud risk, i.e., high and low (N = 84) using the Cronbach's alpha method in order to measure the reliability of each multi-item of the fraud risk factor (i.e., Perception, Judgment, and Decision) scale. From the Table 23, it is clear that there is an acceptable reliability, with coefficient alphas ranging from 0.885 to 0.941 for both high and low risk, which is higher than the recommended value of .6 or even .7 (Cronbach, 1951).

6.8 Detailed Analysis of the Main Study Variables

6.8.1 Information

Information variable, which is the first construct in the TP model, is considered to be a formative measurement variable, based on the assumption that the indicators cause the construct (Hair Jr et al., 2013). Formative measures are perceived as not interchangeable, as each indicator of formative construct should capture a specific aspect of the model. Thus, the item itself explains the meaning of the construct, whereby omitting an indicator will potentially change the nature of the construct.

Table 24: Descriptive Statistics for Financial Ratios in High and Low Risk Condition

Financial ratios	High risk information			Low risk information		
	2012	**2011**	**2010**	**2012**	**2011**	**2010**
	Mean			**Mean**		
Current ratio	1.90	1.39	1.20	1.54	1.40	1.27
Net margin ratio	0.68	0.53	0.50	0.56	0.53	0.50
Debt equity ratio	0.29	0.38	0.43	0.35	0.38	0.43

Table 24 presents the descriptive statistics for financial information from 2010 to 2012 for both low and high risk conditions. For high risk condition the mean current ratio is higher in 2012 (1.90) compared to 2010 and 2011. The mean net margin is higher in 2012 (0.68) compared to 2010 and 2011. The mean debt equity ratio is higher in 2010 (0.43) compared to 2011 and 2012.

Similarly, for low risk condition, the mean current ratio is higher in 2012 (1.54) compared to 2010 and 2011. The mean net margin is higher in 2012 (0.56) compared to 2010 and 2011. The mean debt equity ratio is higher in 2010 (0.43) compared to 2011 and 2012. The figures were manipulated to indicate high risk in high risk condition and low risk in low risk condition.

6.8.2 Perception

Table 25: Descriptive Statistics for Perception in High and Low Risk Condition

Perception	High risk perception			Low risk perception		
	Mean	**S.D**	**Ranking**	**Mean**	**S.D**	**Ranking**
Personal financial obligations by firm’s key personnel	7.90	1.82	1	4.19	2.47	2
Domination of management by a single person or small group without recompense controls	7.69	1.65	2	5.19	2.81	1
Inadequate monitoring controls, including automated controls and controls over interim financial reporting	7.45	1.71	3	3.86	2.31	5
Adverse relationship between company and employees; Changes in compensation and promotions, compensation or other rewards inconsistent with expectations	6.76	2.25	4	3.98	2.46	3
Ineffective communications, implementation, support or enforcement of ethical climate	6.74	1.42	5	3.90	2.37	4

Table 25 shows the descriptive statistics, along with the ranking of each item of Perception. The ranking is based on the mean scores. From the analysis, it can be seen that the majority of the respondents gave high assessment (Mean > 7) in high risk condition. The item ‘Personal financial obligations by firm’s key personnel’ had the first rank, in that it was given the highest level in high fraud risk condition. The ‘Ineffective communications, implementation, support or enforcement of ethical climate’ indicator was given the lowest level (6.74), which is still considered to be high in high risk condition.

Similarly, majority of the respondents give low to moderate assessment (Mean from 3.86-5.19) in low risk perception. The item ‘Domination of management by a single person or small group without compensation controls’ had the first rank, in that the participating auditors give it the highest evaluation in low risk condition, which still considered low. The ‘Inadequate monitoring controls, including automated controls and controls over interim financial reporting’ had the last rank, in that it was given the lowest level in the low risk condition.

6.8.3 Judgment

Table 26: Descriptive Statistics for Judgment in High and Low Risk Condition

Judgment	High risk Judgment			Low risk Judgment		
	Mean	SD	Ranking	Mean	SD	Ranking
Aggressive or unrealistic forecasts by management in maintaining firm's earnings trend. Warranties expense in 2012 is £102,846, 6% increase from the previous year	7.36	1.87	1	3.98	2.05	1
Recurring management attempts to justify marginal or inappropriate accounting based on materiality	7.14	1.62	2	2.95	1.70	4
Rapid growth or unusual profitability especially compared to that of the previous years.	6.55	1.95	3	3.31	1.79	3
Complex or unstable organizational structure	5.40	2.14	4	3.55	2.40	2

Table 26 shows the descriptive statistics, along with a ranking of each item of Judgment. The ranking is based on the mean scores. From the analysis, the majority of the respondents gave high assessment to the Judgment indicators in high fraud risk condition (Mean > 5). The item ‘Aggressive or unrealistic forecasts by management in maintaining firm's earnings trend’ had the first rank, in that it was given the highest level in high fraud risk condition, while ‘Complex or unstable organizational structure’ had the lowest level of assessment (5.4), which is still considered high.

Similarly, the majority of the respondents gave low level of assessment in low fraud risk condition (Mean > 3). The item ‘Aggressive or unrealistic forecasts by management in maintaining firm's earnings trend’ had the first rank and ‘Recurring management attempts to justify marginal or inappropriate accounting based on materiality’ had the last rank.

6.8.4 Decision

Table 27: Descriptive Statistics for Decision in High and Low Risk Condition

Decision	High risk Decision			Low risk Decision		
	Mean	SD	Ranking	Mean	SD	Ranking
What is the risk of financial statement fraud attributable to the **incentives** faced by firm’s management	7.88	1.47	1	3.45	2.14	3
What is the risk of financial statement fraud attributable to the **opportunities** available to the firm?	7.38	1.91	2.5	3.88	2.07	1
Based on all the information you have reviewed in this case, what is the **overall risk** of material financial statement fraud for firm	7.38	1.55	2.5	3.52	2.00	2
What is the risk of financial statement fraud attributable to the firm management’s **attitude** or character	7.31	1.60	4	3.29	1.74	4

Table 27 shows the descriptive statistics, along with the ranking of each item of Decision. The ranking is based on the mean scores. From the analysis, it can be seen that the majority of the respondents gave high assessment to the decision indicators (Mean > 7) in high risk condition decision. More specifically, ‘What is the risk of financial statement fraud attributable to the incentives?’, ‘What is the risk of financial statement fraud attributable to the opportunities?’, ‘Based on all the information you have reviewed in this case, what is the overall risk of material financial statement fraud for the firm?' and 'What is the risk of financial statement fraud attributable to firm management's attitude or character?' were scored and the item 'What is the risk of financial statement fraud attributable to the incentives faced by firm management' had the first rank whereas 'What is the risk of financial statement fraud attributable to firm management's attitude or character' had the last rank. In other words, these results confirm that, in high risk condition, the participants were more sensitive to the incentive factor and they were less sensitive to the attitude factor.

Similarly, the majority of the respondents gave low assessment (Mean < 4) in low risk condition the following items: What is the risk of financial statement fraud attributable to the opportunities available to the firm, Based on all the information you have reviewed in this case, what is the overall risk of material financial statement fraud for the firm, What is the risk of financial statement fraud attributable to the incentives faced by firm management, and What is the risk of financial statement fraud attributable to the firm management's attitude or character. The item 'What is the risk of financial statement fraud attributable to the opportunities available to firm's had the first rank in that by giving it the higher assessment, participants were more sensitive to the factor opportunity. On the other hand 'What is the risk of financial statement fraud attributable to the firm management's attitude or character' had the last rank, indicating that the auditors were less sensitive to the attitude factor in low and high fraud risk assessment.

6.9 Comparison of means Tests between the Study's Main Variables and Demographic Variables

6.9.1 Independent samples t-test

The independent samples t-test evaluates the difference between the means of two independent or unrelated groups. In other words, we assess whether the means for two independent groups are significantly different from each other (Field, 2013). Independent-samples t-test is considered a between-subject design that can be used to analyze a control and experimental group. For the test to be conducted, scores pertaining to two variables scores must be available, the grouping (independent) variable and the test (dependent) variable, where the grouping variable divides the cases into two groups or categories, as was the case in the current study, where the participants were separated by gender into male and female group (Tabachnick and

Fidell, 2007). The t-test evaluates whether the mean value of the test variables (Perception, Judgment, and Decision) for one group (male) differs significantly from the mean value of the test variable for the second group (female).

Assumptions underlying the independent-samples t-test are:

1- Assumption of Independence: The data observations are independent of each other (scores of one participant are not systematically related to scores of other participants). This was not an issue in the current study, as each observation is done independently to achieve independence between participants.
2- Assumption of Normality: The test (dependent) variables are normally distributed. This was already tested in the current study and the results indicated that these variables are normally distributed.
3- Assumption of homogeneity of variance: The variances of the test (dependent) variable in the two populations are equal. The results of the homogeneity test are reported in Table 28. Leven's F test for equality of variances is the most commonly used statistical method for testing the assumption of homogeneity of variance. In this study, it has indicated that Perception in low risk condition, Perception in high risk condition, Judgment in high risk condition, and Decision in high risk condition are not affected by the homogeneity issue, so this assumption is not violated for these variables. However, the variables Judgment in low risk condition and Decision in low risk condition have violated the homogeneity assumption. Nonetheless, since the sample size is >30, the violation of this assumption is not an issue in the current study (Pagano, 2012).

Table 28: Levene's Test for Equality of Variances

		Levene's Test for Equality of Variances	
		F	Sig.
Perception-Low risk	Equal variances assumed	1.366	.249
	Equal variances not assumed		
Judgment	Equal variances assumed	6.520	.015
	Equal variances not assumed		
Decision	Equal variances assumed	10.460	.002
	Equal variances not assumed		
Perception-High risk	Equal variances assumed	.010	.920
	Equal variances not assumed		
Judgment	Equal variances assumed	.005	.946
	Equal variances not assumed		
Decision	Equal variances assumed	.442	.510
	Equal variances not assumed		

Table 29: Mean Difference in Assessing Fraud Risk (high and low) between Genders

Fraud risk factors	**Gender (*N* = 42)**		**t-value**	***p*-value**
	Male (*n* = 26)	**Female (*n* = 16)**		
	Mean±SD			
High risk				
Perception	7.40±1.09	7.16±1.14	0.674	0.504
Judgment	6.71±1.22	6.45±1.47	0.616	0.541
Decision	7.63±1.02	7.27±1.48	0.931	0.358
Low risk				
Perception	4.39±2.08	3.95±1.81	0.701	0.487
Judgment	3.73±1.88	2.98±1.32	1.511	0.139
Decision	3.99±1.89	2.80±1.17	2.525	**0.016***

*$p < .05$

As shown in Table 29, the *p*-value is greater than .05 for Perception, Judgment, and Decision in high risk condition and Perception and Judgment in low risk condition. Hence, there are no significant differences in the means for Perception, Judgment, and

Decision in high risk condition and Perception and Judgment in low risk condition between male and female groups. In other words, male and female auditors assessed fraud risk in high and low fraud risk condition similarly. However, the obtained t-value and *p*-value for Decision in low risk condition were derived from the values in (equal variances not assumed) row as the Levene's test was significant table (28), so the t-value and *p*-value were 2.525 and 0.016, respectively. Here, as *p*-value is less than .05, the null hypothesis is rejected and the alternative hypothesis is not rejected. In other words, there is a statistically significant difference between male and female participants when assessing fraud risk related to incentive, opportunity, attitude, and overall assessment in low risk condition. More specifically, male auditors assessed the risk as higher in the final decision (mean of 3.99) than did their female counterparts (mean of 2.8), indicating that male participants were more sensitive to fraud triangle factors in low fraud risk condition compared to females.

6.9.2 Analysis of Variance (ANOVA)

In general, analysis of variance (ANOVA) is used to test difference between two or more means and is commonly performed in experiments when treatments, processes, and products are being compared (Hinkelmann and Kempthorne, 2012). In other words, ANOVA provides a statistical test of whether or not the means of several groups are equal to generalize the t-test to more than two groups. The assumptions underlying ANOVA are the same as those in the independent-samples t-test. Thus, the data should satisfy the following conditions (Lund and Lund, 2015).

- Independent variable must be in categorical form
- Dependent variable should be measured on a continuous scale (interval or ratio)
- The data should contain no outliers
- The data should be approximately normally distributed for each of the independent variables
- The variability of the independent variable is not distinct
- Descriptive statistics (Mean, SD, and SE) for groups should be based on the dependent variable
- F-value and *p*-value are used to compare the mean values between the groups of the independent variable

- Multiple comparison tests give the information about whether combinations of two groups’ means are equal

In this current study, ANOVA was performed to establish if there is mean difference between the levels of the following demographic variables: four levels of experience, three levels of education, and six levels of professional positions.

Table 30: Mean Difference in Assessing Fraud Risk Factors for Different Experience Levels

Fraud risk Factors	**Experience in years (*N* = 42)**				**F-value**	***p*-value**
	<=2.5 (*n* =11)	**2.6-5.0 (*n* = 12)**	**5.1-17.0 (*n* =9)**	**>=17.1 (*n* = 10)**		
	Mean±SD					
High risk						
Perception	6.64±1.15	7.17±0.78	7.64±1.41	7.92±0.65	3.177	**0.035***
Judgment	6.68±1.62	6.15±0.93	6.81±1.58	6.93±1.08	0.759	0.524
Decision	7.09±1.73	7.27±0.83	7.61±1.34	8.08±0.54	1.368	0.267
Low risk						
Perception	4.56±1.63	5.22±2.00	3.18±1.99	3.60±1.84	2.562	0.069
Judgment	4.18±1.95	4.27±1.64	2.33±1.10	2.65±1.09	4.550	**0.008****
Decision	3.64±1.77	4.58±1.76	2.58±1.32	3.03±1.53	3.039	**0.041***

**$p < .01$, *$p < .05$

The F-value and p-value for Perception presented in Table 30 are 3.177 and 0.035, respectively. Here, *p*-value is less than 0.05; thus, the null hypothesis is rejected and the alternative hypothesis is not rejected. In other words, there is a statistically significant difference between years of experience, whereby greater professional experience (the mean increases with level of experience increases 6.64, 7.17, 7.64 and 7.92) auditors tend to give higher assessment to fraud risk in perception stage in the high fraud risk condition. On the other hand, years of experience had no impact on the assessment level in perception stage in low fraud risk condition.

However, for Judgment in low fraud risk condition, F-value and *p*-value are 4.550 and 0.008, while those for Decision are 3.039 and 0.041, respectively. The *p*-value is less than 0.05 leads to the rejection of the null hypothesis and provides support for the alternative hypothesis. Hence, there is a statistically significant difference between years of experience in assessing the fraud risk in judgment and decision stages. In other words, assessment of fraud factors in Judgment stage tends to be lower for auditors with greater professional experience (with lowest mean of 2.65 in >17.1 years of experience). In Decision, the lowest mean was given by the group with 5.1-17.0 years of experience in low fraud risk condition.

The *p*-value is greater than .05 for Judgment and Decision in high fraud risk condition. Hence, auditors' years of experience have no impact on their fraud factor assessment in these stages in high fraud risk condition. In other words, there is no effect of the participants' years of experience on the process of assessing fraud risk in high risk condition in decision and judgment stages.

Table 31: Mean Difference in Assessing Fraud Risk Factors (high and low) between Different Levels of Education

Fraud risk factors	**Highest level of education (*N* = 42)**			**F-value**	***p*-value**
	Bachelors (*n* = 10)	**Masters (*n* = 14)**	**Others (*n* = 18)**		
	Mean±SD				
High risk					
Perception	7.38±0.89	7.17±1.02	7.38±1.30	0.158	0.854
Judgment	6.60±1.40	6.48±1.53	6.72±1.13	0.127	0.881
Decision	7.25±0.90	7.34±1.47	7.74±1.17	0.663	0.521
Low risk					
Perception	4.16±1.43	4.89±2.17	3.74±2.02	1.347	0.272
Judgment	3.63±2.13	3.64±1.55	3.19±1.64	0.332	0.719
Decision	3.93±1.81	3.84±1.74	3.08±1.70	1.074	0.352

As shown in Table 31, the *p*-value is greater than 0.05 for Perception, Judgment, and Decision in both high and low risk condition. Therefore, level of education does not play any role in the fraud risk assessment process or in the model variables. Therefore, having a specific academic degree does not affect the way the participants assess the fraud risk factors in the present study model.

Table 32: Mean Difference in Assessing Fraud risk Factors (high and low) between Different Professional Positions

Fraud risk factors	Professional position (N = 42)						F-value	p-value
	Staff (n = 7)	Senior (n =9)	Supervisor (n = 3)	Manager (n = 9)	Partner (n = 8)	Others (n = 6)		
	Mean±SD							
High risk								
Perception	6.94±1.43	7.27±1.04	8.53±0.81	7.07±1.35	7.48±0.74	7.33±0.77	1.027	0.416
Judgment	7.18±0.86	6.61±1.32	7.25±1.09	5.67±1.93	6.97±0.80	6.58±0.77	1.560	0.196
Decision	7.39±1.14	7.69±0.56	8.42±0.52	6.64±1.92	7.91±0.40	7.54±1.26	1.594	0.187
Low risk								
Perception	4.69±1.90	3.73±2.20	6.87±1.72	3.22±1.52	4.55±1.98	4.17±1.59	1.988	0.104
Judgment	4.50±2.23	2.69±0.99	4.42±2.18	2.58±1.48	3.69±1.59	3.83±1.64	1.785	0.141
Decision	3.64±1.99	2.78±1.30	4.58±2.24	2.86±1.56	4.31±1.68	4.00±1.94	1.280	0.294

Table 32 reveals that the p-value is greater than .05 for Perception, Judgment, and Decision in both high and low risk condition. Hence, there is no significant difference in mean Perception, Judgment, and Decision in high risk and low risk condition between participants holding different professional positions. In other words, professional position does not affect the fraud risk assessment process in the current study in either condition. However, this result is surprising, as authors of extant studies found that the higher the professional position the participant holds, the higher his/her performance in fraud risk assessment (Loebbecke et al., 1989; Webber et al., 2006).

6.10 Testing the Model Hypotheses

6.10.1 Structural Equation Modeling

In this current study, Structural Equation Modeling was applied to test the study model, and to find the relationship among exogenous and endogenous variables. PLS was also used to analyze the data. PLS is similar to the covariance- based SEM (CBSEM), such as AMOS, LISREL, EQS. However, the primary objective of CBSEM is that the measurement items are extracted from the focused theory and are supported by the data that produces an estimated covariance matrix (Hair et al., 2012a). PLS approach tests both the measurement model and path model that support developing more realistic assumption (Hair Jr et al., 2013). Specifically, unlike CBSEM, PLS is less susceptible to sample size and multivariate normal distribution requirements (Chin, 1998; Hair et al., 2011). Hence, it is used in this study to examine the prediction of the dependent variable and explain the relation between dependent and independent variables.

To determine the strength and the dynamics of the PLS measurement model, validity (how well concepts are defined) and reliability (verifies the consistency of measure) must be established. In this study, two types of validity are used to study the measurement model—convergent validity, which is the level of association between two different scales that indicate and measure the same concept (Hair et al., 2012a), and discriminant validity that examines whether the scale is different from other scales that measure different concepts (Hair Jr et al., 2013). Discriminant validity can also be measured and assessed by the average variance extracted, as well as by checking factor loading for each indicator (Hair Jr et al., 2013).

6.10.2 Measurement of reliability (Item-level)

Reliability of an item indicates whether the scale used to measure a certain variable is consistent and the results are stable over time (Saunders et al., 2009). In the current study, Cronbach's α was used to test reliability, since it helps establish if the participants will give the same or almost the same answers to a similar set of questions (Cronbach, 1951). In addition, PLS scale reliability was assessed by using the item loading and item correlation that must be greater than 0.60 (Chin, 1998; Hair et al., 2006; Hair Jr et al., 2013). The approach adopted in the current study was based on the work by Chin (1998), who suggested that scores for item loading and item construct correlation and all item loadings should meet this standard and fulfill the requirements for reliability and convergent validity. All measures have a loading level above 0.70 with small measurement residuals. All loadings have the expected signs (i.e., non-negative) and are significant at the 0.001 level (one-tailed).

6.10.3 Measurement of reliability (Construct-level)

In measuring the reliability, internal consistency of the measures representing a latent variable are also examined, in that the observed variables can use the same underlying constructs (Hair et al., 2006). Moreover, CR is calculated by summing the square of factor loadings for each construct and the sum of error variance for each construct (Hair Jr et al., 2013). According to Hair et al. (2006), the rule of thumb for reliable construct is that 0.7 or higher is considered good reliability and 0.6 to 0.7 is considered to be feasible, as long as the other constructs have good reliability.

Table 33: Reliability and Validity Estimates for Information, Perception, Judgment, and Decision

Factors	**Composite Reliability (CR > 0.7)**	**Average Variance Extracted (AVE > 0.5)**	**Cronbach's alpha**	**R-squared**
Leverage	1.000	1.000	1.000	0.427
Liquidity	1.000	1.000	1.000	0.522
Profitability	1.000	1.000	1.000	0.490
Perception	0.920	0.697	0.889	
Judgment	0.921	0.746	0.885	0.727
Decision	0.958	0.851	0.941	0.877

Table 33 presents the reliability and validity estimates for information, perception, judgment, and decision. From the tabulated data, it is obvious that all factors satisfy the criteria for composite reliability (C.R > 0.7). Further, all constructs present a composite reliability (Fornell and Larcker, 1981) above 0.70, the benchmark level suggested by (Nunnally and Bernstein, 1978). As was mentioned in previous discussion of reliability, the Cronbach's α greater than 0.7 was obtained, indicating that the constructs used in this study achieved a sufficient level of reliability. Average variance extracted (AVE) is a measure that summarizes the convergence between all the items of a corresponding latent construct (Hair Jr et al., 2013). Moreover, it can be calculated by averaging the square of load factors. It should be greater than 5 (AVE>0.5), as AVE of less than 0.5 indicates that, on average, errors exceed variance (Hair et al., 2006; Chin, 1998). In all study models, average variance extracted (AVE) ranged between 0.70 and 1.00, indicating satisfactory convergent validity for the constructs. Table 34 shows the correlation matrix for the study's main constructs in both fraud risk conditions (low and high).

Table 34: Correlation Matrix

	P (High Risk)	J	D	L	P	L	P (Low Risk)	J	D	L	P	L
High risk												
Liquidity	.121	.056	.131	1	**.966****	**.966****	.023	.246	.119	-.170	-.170	-.170
Profitability	.096	.028	.110	**.966****	1	**1.00****	.021	.238	.117	-.185	-.185	-.185
Leverage	.096	.028	.110	**.996****	**1.00****	1	.021	.238	.117	-.185	-.185	-.185
Perception	1	**.522****	**.706****	.121	.96	.096	-.149	-.098	.087	.121	.096	.096
Judgment		1	**.761****	.056	.028	.028	-.017	.103	.088	.056	.028	.028
Decision			1	.131	.110	.110	-.079	.034	.072	.131	.110	.110
Low risk												
Liquidity	.140	.181	.210	-.170	-.185	-.185	**.338***	.206	.272	**1**	**1.000****	**1.000****
Profitability	.140	.181	.210	-170	-.185	-.185	**.338***	.206	.272	**1.000****	**1**	**1.000****
Leverage	.140	.181	.210	-.170	-.185	-.185	**.338***	.206	.272	**1.000****	**1.000****	**1**
Perception	-.149	-.017	-.079	.121	.096	.096	1	**.698****	**.774****	**.338***	**.338***	**.338***
Judgment	-.098	.103	.034	.056	.028	.028		1	**.780****	.206	.206	.206
Decision	.087	.088	.072	.131	.110	.110			1	.272	.272	.272

** Correlation is significant at the .01 level (2-tailed)
* Correlation is significant at the .05 level (2-tailed).

6.10.4 Measurement of Validity (Convergent validity)

Convergent validity explains to which extent a measure correlates positively with alternatives measures that have been obtained through different methods to represent the same construct (Hair Jr et al., 2013). In the current study, the outer loading of the indicators and Average Variance extracted (AVE) was considered, whereby higher outer loading on a construct indicates that the connected indicators have much in common and the significance of the outer loading is a minimum requirement for the model analysis (Hair Jr et al., 2013). On the other hand, AVE is intended to measure how much of the variance that a construct captures comes from its measuring items relative to the amount of measurement error (Hair et al., 2006; Tabachnick and Fidell, 2007). AVE was proposed by Fornell and Larcker (1981), and it is defined as the grand mean value of the squared loadings of the indicators divided by the number of indicators. Table 33 shows that AVE extracted for each construct was higher than the required value of 0.5 (50%), which indicates that each construct has a potential to explain more than half of the variance (Fornell and Larcker, 1981).

6.10.5 Measurement of validity (Discriminant validity)

“It is the extent to which a construct is truly distinct from other constructs by empirical standards. Thus, establishing discriminant validity implies that a construct is unique and captures phenomena not represented by other constructs in the model"(Hair Jr et al., 2013: p.104). There are two methods to measure discriminant validity, the first one is checking the outer loading by examining the cross loadings, in that an indicator's outer loading should be greater than all of its loading on other constructs. However, this method is considered to be more non-interventionist in terms of establishing discriminant validity (Hair et al., 2011). The second method is the Fornell-Larker criterion, which is more conservative than the first method and it compares the square root of the AVE with the latent variables correlations. The rule of thumb here is the AVE should be greater than the squared correlation with any other construct, because the logic of this method is based on the idea that each construct shares more variance with its associate indicators more with any other construct (Hair Jr et al., 2013).

Table 33 and 35 show that the current study's item loadings meet the standards for the PLS model measurement analysis.

Table 35: Discriminant Validity

	Decision	**Judgment**	**Perception**	**Leverage**	**Liquidity**	**Profitability**
Decision	0.9202					
Judgment	0.903	0.863				
Perception	0.884	0.824	0.835			
Leverage	-0.754	-0.696	-0.653	1.000		
Liquidity	0.804	0.732	0.723	-0.875	1.000	
Profitability	0.787	0.715	0.700	-0.851	0.993	1.000

6.10.6 PLS Results Significance

The statistical significance represents the probability that the researcher is willing to accept the hypothesis, which is also known as a type I error. Type I error occurs when the researcher accepts the alternative hypothesis when the null hypothesis is true (false positive). In other words, the possibility of mistake increases if the estimated coefficient is different from zero. As mentioned earlier, PLS is different from the covariance- based approaches in that non-parametric statistical tests are applied to evaluate the overall model fitting (Hair et al., 2006). The explanatory power in PLS is determined by using and observing R^2 value, path coefficient, and *p*-value.

6.10.7 Path Coefficient (β)

Path coefficient was used in the current study to examine the significance of the path relations in inner-mode and it works in estimating the path relationships between the constructs in the model (Hair Jr et al., 2013). Each of the path relationships correspond to standardized betas in a regression analysis and each path represents a hypothesis and it is based on t-value. In addition, the significance of path coefficient (β) was obtained by performing PLS bootstrap process to assess the t-value for each path in the structural model. The validity of the hypothesis is obtained by studying the significance of the t-value for its corresponding path and for accepting or rejecting a particular hypothesis. The significant level of 0.01 was chosen, since it is most common in experimental research (Hair Jr et al., 2013). In the current study, instead of t-values, the rest relies on "*p*-values that correspond to the probability of erroneously rejecting the null hypothesis given the data are at hand" (Hair Jr et al., 2013: p.172).

6.10.8 Coefficient of Determination (R^2 Value)

According to Hair Jr et al. (2013), the coefficient of determination R^2 is a measure of the model's predictive accuracy and it is the level of the latent variable explained variance. It is calculated as the squared correlation between a specific endogenous construct's actual and predicted variables. Coefficient of determination R^2 ranges between 0 and 1, indicating higher levels of predictive accuracy. However, there is no rule of thumb for acceptable R^2, as it depends on the model complexity and the field of study, but in general, scholars expect 0.75 or more (Hair Jr et al., 2013; Hair et al., 2011). In the current study, the values of R^2 of endogenous dependent variables ranged from 0.727 to 0.877 see Table 33 These values fall within the acceptable range (Hair et al., 2011; Hair Jr et al., 2013; Chin, 1998). The results generated by the PLS structural model analysis in order to test the model are presented in Table 36

Table 36: Pathways Coefficients for Information, Perception, Judgment, and Decision

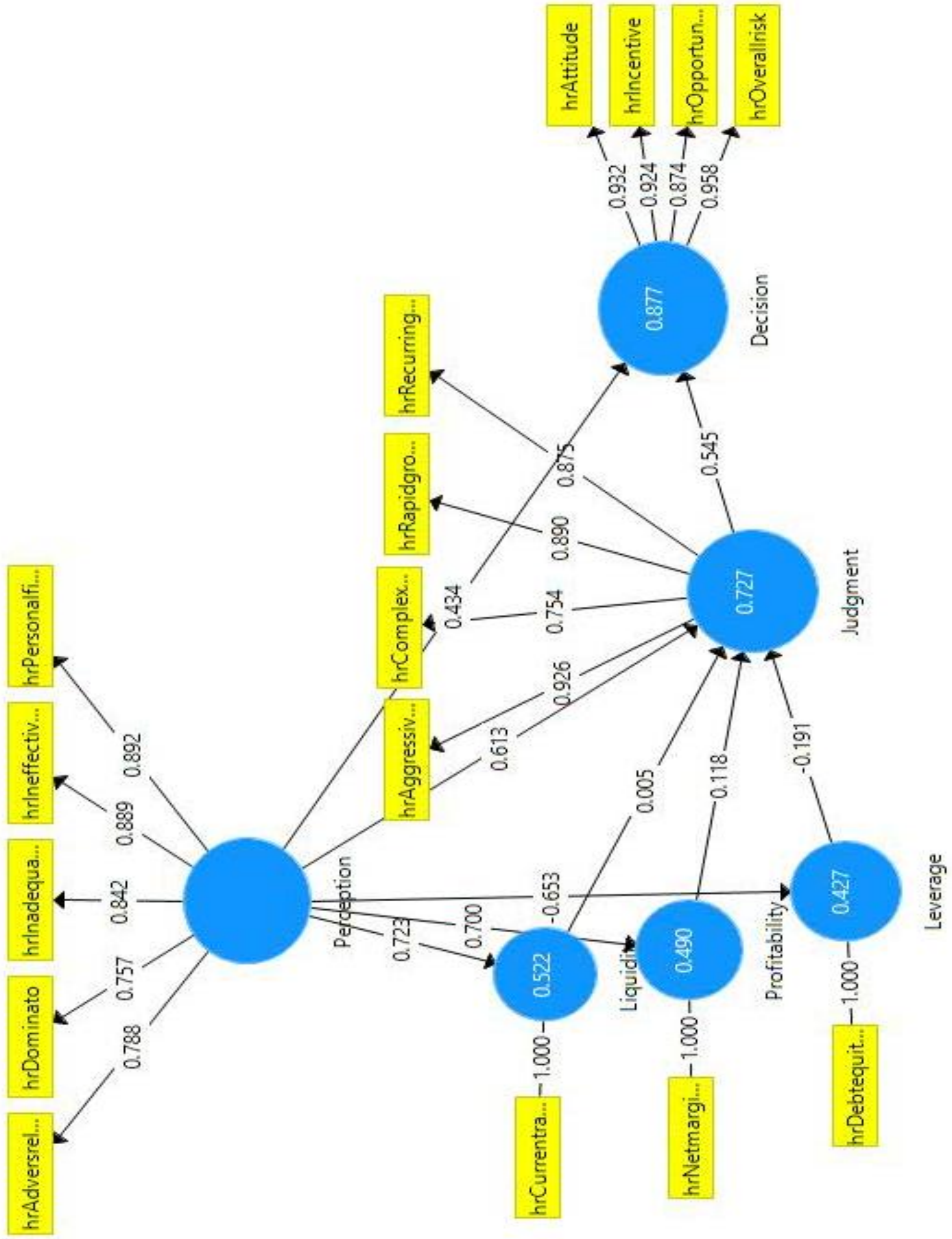
Pathways (regression weights)	**Information, Perception, Judgment and Decision (β Coefficient)**	***p*-values**
Judgment→ Decision	0.545	**0.000****
Perception→ Decision	0.434	**0.000****
Perception→ Judgment	0.613	**0.000****
Leverage→ Judgment	-0.191	0.160
Liquidity→ Judgment	0.005	0.993
Profitability→ Judgment	0.118	0.825
Perception→ Leverage	-0.653	**0.000****
Perception→ Liquidity	0.723	**0.000****
Perception→ Profitability	0.700	**0.000****

**$p < .01$

6.10.9 Model Testing

The PLS path coefficients for information, perception, judgment, and decision shown in Table 36 present the full picture of the whole model. Overall, the results suggest that Judgment (β = 0.545, p <.01) and Perception (β = 0.434, p < .01) have a positive significant effect on Decision. Likewise, Perception has a positive significant effect (β = 0.613, p < .01) on Judgment. While Perception has a positive significant effect on two financial indicators (Liquidity and Profitability) it has a negative significant effect on Leverage. Thus, the model is supported. In other words, the Throughput model is supported in this study in that there are significant relationships between the constructs in this model.

Figure 15: Screen Print of Smart PLS Path modeling



hrAttitude
hrIncentive
hrOpportun...
hrOverallrisk
0.932
0.924
0.874
0.958
0.877
Decision
hrRecurring...
hrRapidgro...
hrComplex...
hrAggressiv...
0.875
0.890
0.754
0.926
0.434
0.613
0.545
0.727
Judgment
hrPersonalfi...
hrIneffectiv...
hrInadequa...
hrDominato
hrAdversrel...
0.892
0.889
0.842
0.757
0.788
Perception
0.723
0.700
-0.653
0.005
0.118
-0.191
0.522
Liquidity
0.490
Profitability
0.427
Leverage
1.000
hrCurrentra...
hrNetmargi...
hrDebtequit...

6.11 Hypotheses Testing

6.11.1 Hypothesis 1

H1: Auditors' perception of financial information as well as SAS No. 99 fraud risk factors will significantly influence their judgment in high and low fraud risk conditions.

As can be seen from the screen print of Smart PLS that Perception of the SAS No. 99, fraud risk factors have a positive relation on the financial information of Liquidity (β = 0.723, $p < .01$) and Profitability (β =0.700, $p < .01$) and negative relation on Leverage (β = -0.653, $p < .01$). Since the β value shows the strength of the relationship between two variables, this result indicates that there is a strong relationship between Perception and financial information. These results also show that there is a strong influence of Perception on Judgment (β = 0.613, $p < .01$). In other words, the participants were influenced by the assessment of fraud risk factors in the perception stage when they were performing the task in the judgment stage. These results also confirm the findings of the Pearson coefficient correlation applied in this study to find out the relation between perception and financial information and perception and judgment. Finally, all these findings support H1, confirming that *there is a significant influence (positive association) between the perception of the financial information and the judgment stage.*

6.11.2 Hypothesis 2

H2a: Auditors' perception of SAS No. 99 significantly influences their decision choice in high and low risk condition.

H2b: Auditors' judgment significantly influences their decision choice in high and low risk condition.

The PLS results (β = 0.545, $p < .01$) denote that judgment has a significant positive association with decision stage. This finding predicts strong influence between judgment and decision. The relation between perception and judgment has been confirmed in the first hypothesis. However, because there is a strong positive correlation between perception and judgment (Perception→ Judgment), as well as between judgment and decision (Judgment→ Decision), along with a strong positive effect of perception on decision (Perception→ Decision). These findings indicate that there is a strong positive link among perception, judgment, and decision (Perception→ Judgment→ Decision). Therefore, these findings support H2a and H2b confirming that *Perception and Judgment of the SAS No. 99 fraud risk factors significantly affect the overall assessment (Decision).*

6.11.3 Hypothesis 3

H3: Auditors that make components assessments prior to overall assessments make overall fraud risk assessments that are more sensitive to opportunity and incentive risks in high attitude risk conditions than in low attitude risk conditions.

In the current study, the decomposition approach in the decision choice originally developed by Wilks and Zimbelman (2004) was replicated, as the intention was to test this hypothesis and explore whether the results of this current study are consistent with those yielded by previous studies. However, in this work, Wilks and Zimbelman's approach was extended by manipulating the attitude factor in both risk conditions (high, and low). Authors of previous studies have explored how auditors weigh fraud triangle components related to overall fraud risk assessment by regressing auditors' overall fraud risk assessments on the fraud triangle components (Wilks and Zimbelman, 2004a; Favere-Marchesi, 2013). However, in those studies, the two components of Incentive and Opportunity were manipulated into high and low fraud risk levels, while keeping the attitude risk level low. The current study responds to the call for a future research that examines what impact the decomposition will have on fraud risk assessment under other conditions, such as when attitude cues indicate high fraud risk (Wilks and Zimbelman 2004). Therefore, in this study, the three components of fraud triangle factors were manipulated to create both high and low fraud risk condition.

In order to test the third hypothesis, multiple regression has been performed following by supporting analysis by using Pearson correlation tests (conducted using SPSS v.20) to confirm the regression results.

6.11.3.1 Regression analysis

Multiple regression analysis is similar to the linear regression analysis. In the linear regression, only one independent variable and one dependent variable are used, whereas multiple regressions allow for more than one independent variable and one dependent variable (Sykes, 1993). Both regression analyses are used to predict the value of the dependent variable based on the value of the independent variable. Dependent variable is the variable the value of which is predicted by the model, whereas independent variable is used to predict the value of the dependent variable.

- R-square (R^2) value explains what percent of the variance in the dependent variable can be explained by the independent variable
- F-ratio in the ANOVA table indicates whether the overall regression model is a good fit or not for the data
- Estimated model coefficients are tabulated, as through t-value and *p*-value for each independent variable, it can be ascertained whether each independent variable is a significant predictor of the dependent variable. On the other hand, beta (β) coefficients are the point estimator of independent variables. Table 6.30 also contains the interval estimator of independent variable (Sykes, 1993).

Table 37: Association between high-risk incentive, opportunity, and attitude on overall risk decision

Independent Variables	**Unstandardized Coefficients**		**R Square**	**F-change**	**t-value**	**p-value**
	Beta	**SE**				
(Constant)	0.304	1.118	0.526	14.060	0.271	0.788
Incentive	0.517	0.132			3.919	**0.000****
Opportunity	0.333	0.096			3.451	**0.001****
Attitude	0.075	0.128			0.587	0.561

Dependent Variable: Overall risk decision, SE-Standard Error, $^{**}p < .01$

Table 37 presents the multiple regressions. The t-value and *p*-value for each independent variable tell whether the model significantly predicts the dependent variable or not. In this study, *p*-values are less than 0.05 for the incentive (β = 0.517, t = 3.919, $p < .01$) and opportunity (β = 0.333, t = 3.451, $p < .01$) on overall risk decision in high risk, indicating that two factors are used to predict the overall risk decision. In addition, the R-squares value indicates that 53% of variation can be explained in the dependent variable that can be explained by these two factors. All the estimated β values are positive. Hence, it can be concluded that increasing the incentive and opportunity is associated with an increased overall risk decision. In other words, auditors that took part in this study were more sensitive to the two components of fraud triangle factors (Incentive and Opportunity) in giving the overall assessment. This result is confirmed by the Pearson correlation table 39, which produced a significant result, in that incentive (r = 0.579, $p < .01$) and opportunity (r = 0.503, $p < .01$) play a more significant role in assessing overall assessment than does the attitude component. Therefore, in the current study, the auditors were more sensitive to the incentive and opportunity components and have paid their attention to these factors rather than to the attitude factor.

This finding is new in that authors of previous studies did not use attitude factor when it indicates high fraud risk. This result might be due to the fact that the attitude component has been manipulated to indicate high fraud risk level, which directs the auditors' attention to the incentive and opportunity components.

Table 38: Association between low-risk incentive, opportunity, and attitude on overall risk decision

Independent Variables	**Unstandardized Coefficients**		**R Square**	**F-change**	**t-value**	**p-value**
	Beta	**SE**				
(Constant)	-0.169	0.341	0.797	49.873	-0.496	0.623
Incentive	0.257	0.097			2.651	**0.012****
Opportunity	0.230	0.091			2.524	**0.016***
Attitude	0.582	0.122			4.750	**0.000****

Dependent Variable: Overall risk decision, SE-Standard Error, $^{**}p < .01$, $^{*}p < .05$

Table 38 presents the multiple regressions. In this study, *p*-values are less than 0.05 for incentive ($\beta = 0.257$, t = 2.651, $p < .01$), opportunity ($\beta = 0.230$, t = 2.524, $p = .016 < .05$) and attitude ($\beta = 0.582$, t = 4.750, $p < .01$) on overall risk decision in low risk, revealing that three factors are used to predict the overall risk decision. Also, the R-squared value indicates that 80% of variation in the dependent variable that can be explained by these three factors. All estimated β values are positive. Therefore, it can be concluded that increasing the incentive, opportunity, and attitude is associated with an increased overall risk decision. In other words, auditors were sensitive to all fraud triangle components in low fraud risk condition, in that they used these three components in predicting the overall fraud risk assessment. The Pearson correlation significant results in Table 40 confirm this finding in that Incentive (r = 0.756, $p < .01$), Opportunity (r = 0.696, $p < 0.01$), and Attitude (r = 0.836, $p < 0.01$) have a significant correlation with the overall fraud risk assessment in the low fraud risk condition.

However this finding is consistent with those reported by Wilks and Zimbelman (2004a). In other words, when attitude indicates low fraud risk, auditor pay attention to the opportunity and incentive fraud risk factors.

Table 39: Correlation between high-risk incentive, opportunity, attitude, and overall risk decision

High risk	**Incentive**	**Opportunity**	**Attitude**	**Overall risk decision**
Incentive	1	.129	**.452****	**.579****
Opportunity		1	**.351***	**.503****
Attitude			1	**.444****
Overall risk decision				1

**$p < .01$, *$p < .05$

Table 39 presents the Pearson correlation between incentive, opportunity, attitude, and overall risk decision for high risk, respectively. The correlation values in are significant at the 1% and 5% level. There is a significant positive correlation in high risk condition between incentive and attitude (r = 0.452, $p < .01$), as well as incentive and overall risk decision (r = 0.579, $p < .01$). The positive correlation indicates that the incentive increases the attitude and overall risk decision. There is also a significant positive correlation between opportunity and attitude (r = 0.351, $p < .01$), and opportunity and overall risk decision (r = 0.503, $p < 0.01$). The positive correlation indicates that the opportunity increases the attitude and overall risk decision. Finally, there is a significant positive correlation between attitude and overall risk decision (r = 0.444, $p <.01$). The bolded values in Table 39 are positive significant correlations.

Table 40: Correlation between low-risk incentive, opportunity, attitude, and overall risk decision

Low risk	**Incentive**	**Opportunity**	**Attitude**	**Overall risk decision**
Incentive	1	**.566****	**.683****	**.756****
Opportunity		1	**.597****	**.696****
Attitude			1	**.836****
Overall risk decision				1

$^{**}p < 0.01$

Table 40 present the Pearson correlations between incentive, opportunity, attitude, and overall risk decision for low risk condition, respectively. The correlation values are significant at the 1% and 5% level. There is significant positive correlation in low risk condition between incentive and opportunity (r = 0.566, $p < .01$), incentive and attitude (r = 0.683, $p <.01$), and incentive and overall risk decision (r = 0.756, $p <.01$). The positive correlation indicates that the incentive increases the opportunity, attitude, and overall risk decision. There is also a significant positive correlation between opportunity and attitude (r = 0.597, $p < .01$), opportunity and overall risk decision (r = 0.696, $p <.01$). The positive correlation indicates that the opportunity increases the attitude and overall risk decision. Similarly, there is a significant positive correlation between attitude and overall risk decision (r = 0.836, $p < .01$). The bolded values in Table 40 are positive significant correlations.

6.11.4 Hypothesis 4

6.11.4.1 Skepticism analysis

Table 41: Reliability Analysis for Skepticism Dimensions

Skepticism dimensions	**Number of items**	**Mean**	**SD**	**Range (Max-Min)**	**Cronbach's Alpha**
Self-determination	5	2.27	0.65	2.40 (3.40-1.00)	0.627
Curiosity	5	4.87	0.76	2.80 (6.00-3.20)	0.913
Self-confidence	5	4.26	0.47	1.60 (5.00-3.40)	0.885
Interpersonal skills	5	3.85	0.39	1.80 (4.60-2.80)	0.679
Deliberating	5	4.90	0.56	2.20 (5.80-3.60)	0.570
Questioning skills	5	4.59	0.59	2.60 (6.00-3.40)	0.525

SD- Standard Deviation; Max- Maximum, Min-Minimum

Table 41 presents the descriptive statistics for each dimension and the reliability analysis outcomes using the Cronbach's alpha method in order to measure the reliability of each item pertaining to the Skepticism dimensions (i.e. Self-determination, Curiosity, Self-confidence, Interpersonal skills, Deliberating, and Questioning skills) scale. From the results, it is evident that there is an acceptable reliability, with alpha coefficients ranging from 0.913 to 0.525.

Table 42: Ranking for Skepticism Dimension - Self-determination

Self-determination	**Mean**	**SD**	**Ranking**
I often accept other peoples' explanations without further thought	5.07	0.78	1.5
I tend to immediately agree what other people tell me	5.07	1.22	1.5
It is easy for other people to assure me	4.64	0.88	3
I usually accept things I see, read or hear at face value	4.60	1.15	4
Most often, I agree with what the others in my group think	4.29	1.07	5

Table 42 shows the descriptive statistics, along with the ranking of each item of self-determination. The ranking is based on the mean scores and the first two indicators have equal means. From the analysis, majority of the respondents agreed (Mean > 4) in all indicators in self-determining dimension. The items "I often accept other peoples' explanations without further thought", and "I tend to immediately accept what other people tell me" had the first rank and "Most often, I agree with what the others in my group think" had the last rank.

Table 43: Ranking for Skepticism Dimension - Curiosity

Curiosity	Mean	SD	Ranking
Discovering new information is fun	5.07	0.81	1
I like searching for knowledge	4.98	0.75	2
I think that learning is exciting	4.86	0.93	3
The prospect of learning excites me	4.79	1.00	4
I relish learning	4.64	0.91	5

Table 43 shows the descriptive statistics, along with the ranking of each item of curiosity. The ranking is based on the mean scores. From the analysis, the majority of the respondents agreed (Mean > 5) with the following items: "Discovering new information is fun", "I like searching for knowledge", "I think that learning is exciting", and "The prospect of learning excites me" and "I relish learning". The item "Discovering new information is fun" had the first rank and "I relish learning" had the last rank.

Table 44: Ranking for Skepticism Dimension – Self-confidence

Self-confidence	Mean	SD	Ranking
I am confident in my abilities	5.02	0.60	1
I have confidence in myself	4.95	0.80	2
I don't feel sure of myself	4.88	1.09	3
I feel good about myself	4.76	1.01	4
I am self-assured	4.45	1.09	5

Table 44 shows the descriptive statistics, along with the ranking of each item of self-confidence. The ranking is based on the mean scores. From the analysis, the majority of the respondents agreed (Mean > 5) with the following items: "I am confident in my abilities", "I have confidence in myself", "I don't feel sure of myself', "I feel good about myself", and "I am self-assured". The item "I am confident of my abilities" had the first rank and "I am self-assured" had the last rank.

Table 45: Ranking for Skepticism Dimension – Interpersonal skills

Interpersonal skills	Mean	SD	Ranking
I am interested in what causes people to behave the way that they do	4.81	0.83	1
I like to understand the reason for other peoples' presentation	4.76	0.82	2
The actions people take and the reasons for those actions are fascinating	4.62	0.83	3
Other peoples' behavior doesn't interest me	4.52	1.25	4
I seldom consider why people behave in an assured way	4.40	1.21	5

Table 45 shows the descriptive statistics along with the ranking of each item of interpersonal skills. The ranking is based on the mean scores. From the analysis, majority of the respondents agreed (Mean > 4) with all indicators in interpersonal skills dimension. The item "I am interested in what causes people to behave the way that they do" had the first rank and "I seldom consider why people behave in a certain way" had the last rank.

Table 46: Ranking for Skepticism Dimension – deliberating

Deliberating	Mean	S.D	Ranking
I wait to decide on issues until I can get more information	5.21	0.57	1
I like to ensure that I've considered most available information before making a decision	5.17	0.76	2
I take my time when making decisions	4.98	0.84	3
I don't like to choose until I've looked at all of the readily available information	4.79	0.95	4
I dislike having to make decisions quickly	4.33	1.32	5

Table 46 shows the descriptive statistics along with the ranking of each item of deliberating. The ranking is based on the mean scores. From the analysis, majority of the respondents agreed (Mean > 4) with all indicators in the deliberating dimension. The item "I wait to decide on issues until I can get more information" had the first rank and "I dislike having to make decisions quickly" had the last rank.

Table 47: Ranking for Skepticism Dimension – Questioning Skills

Questioning skills	Mean	SD	Ranking
I frequently question things that I see/ hear	4.88	0.71	1
I enjoy trying to determine if what I read or hear is true	4.79	0.81	2
My friends tell me that I repeatedly question things that I see or hear	4.52	0.86	3
I often reject statements unless I have proof that they are true	4.48	1.11	4
I usually notice inconsistencies in explanations	4.26	1.36	5

Table 47 shows the descriptive statistics along with the ranking of each item of questioning skills. The ranking is based on the mean scores. From the analysis, majority of the respondents agreed (Mean > 4) with all indicators of the questioning skills dimension. The item "I frequently question things that I see or hear" had the first rank and "I usually notice inconsistencies in explanations" had the last rank.

Independent samples t-test

As previously noted, independent samples t-test is used to find out whether the mean of two unrelated groups (independent variable) are equal or not based on the same dependent variable. The data should be in the following format (Kent University, 2015; Laird Statistics, 2015a):

- Independent variable must be in categorical format
- Dependent variable should be measured on a continuous scale (ratio / interval)
- The data should contain no outliers
- The data should follow approximately normal distribution for each group of the independent variables
- The variability of the independent variable is not distinct
- F-value and p-value for Levene's test are used to test the homogeneity of variances within two groups of the independent variable. Levene's test in Table 6.41 shows that the *p*-value is greater than 0.05, so the assumption of homogeneity is not violated here and the two groups have the same variances.
- Descriptive statistic (Mean, SD, and SE) for two groups should be based on the dependent variable
- t-value and *p*-value for the test are used for compare the mean of two groups based on a dependent variable

Table 48: Levene's Test for Equality of Variances

		Levene's Test for Equality of Variances	
		F	Sig
Self determining	Equal variances assumed	1.646	.207
	Equal variances not assumed		
Curiosity	Equal variances assumed	1.081	.305
	Equal variances not assumed		
Self Confidence	Equal variances assumed	.033	.858
	Equal variances not assumed		
Inter personal skills	Equal variances assumed	.217	.644
	Equal variances not assumed		
Delibrating	Equal variances assumed	.782	.382
	Equal variances not assumed		
Questioning	Equal variances assumed	.000	.986
	Equal variances not assumed		

Table 49: Mean Difference in Skepticism Dimensions between Genders

Skepticism dimensions	**Gender (*N* = 42)**		**t-value**	***p*-value**
	Male (*n* = 26)	**Female (*n* = 16)**		
	Mean±SD			
Self-determination	2.35±0.55	2.13±0.79	1.106	0.276
Curiosity	4.90±0.83	4.81±0.65	0.359	0.722
Self=confidence	4.35±0.48	4.13±0.44	1.502	0.141
Interpersonal skills	3.88±0.39	3.80±0.40	0.673	0.505
Deliberating	4.88±0.59	4.93±0.52	-0.268	0.790
Questioning skills	4.64±0.60	4.50±0.58	0.739	0.464

An independent samples t-test was performed comparing the mean Skepticism dimensions between male and female participants. Results reported in Table 49 indicate that none of the Skepticism dimensions namely, Self-determination (Male: M = 2.35, SD =0.55; Female: M= 2.13, SD=0.79, t= 1.106, p=0.276>0.05), Curiosity (Male: M = 4.90, SD =0.83; Female: M= 4.81, SD=0.65, t= 0.359, p=0.722>0.05), Self-confidence (Male: M = 4.35, SD =0.48; Female: M= 4.13, SD=0.44, t= 1.502, p=0.141>0.05), Interpersonal skills (Male: M = 3.88, SD =0.39; Female: M= 3.80, SD=0.40, t= 0.673, p=0.505>0.05), Deliberating (Male: M = 4.88, SD =0.59; Female M= 4.93, SD=0.52, t=

-0.268, p=0.790>0.05), and Questioning skills (Male: M = 4.64, SD = 0.60; Female: M= 4.50, SD=0.58, t= 0.739, p=0.464>0.05) were statistically significant in both male and female group. In other words, it can be concluded that gender does not affect the skepticism dimensions.

Analysis of Variance (ANOVA)

One-way ANOVA is one of the mean comparison tests. This test is used to ascertain whether the means of more than two groups (independent variables) are equal or not based on the dependent variable.

Table 50: Mean Difference in Skepticism Dimensions between Different Experience Levels

Skepticism dimensions	**Experience in years (n=42)**				**F-value**	**p-value**
	<=2.5 (n=11)	**2.6-5.0 (n=12)**	**5.1-17.0 (n=9)**	**>=17.1 (n=10)**		
	Mean±SD					
Self-determination	2.44±0.54	2.30±0.68	2.13±0.80	2.16±0.64	0.453	0.717
Curiosity	5.16±0.56	5.35±0.59	4.51±0.56	4.28±0.81	6.915	**0.001****
Self-confidence	4.31±0.56	4.35±0.40	4.16±0.49	4.20±0.47	0.370	0.775
Interpersonal skills	3.85±0.48	4.02±0.28	3.71±0.25	3.78±0.48	1.221	0.315
Delibrating	5.00±0.53	4.97±0.64	5.00±0.26	4.60±0.65	1.251	0.305
Questioning skills	4.55±0.71	4.55±0.45	4.67±0.66	4.60±0.60	0.085	0.968

**p<0.01

The obtained F-value and p-value from Table 50 for Curiosity are F=6.915 and p=0.001 respectively. Here, p-value is less than 0.05 and results in rejecting the null hypothesis and supporting the alternative hypothesis. Therefore, there is a statistically significant difference between years of experience and the respondent’s curiosity. In other words, curiosity among auditors with 2.6-5.0 years of experience is the greatest.

The p-value is greater than 0.05 for Self-determination, Self-confidence, Interpersonal skills, Deliberating, and Questioning skills, indicating that years of experience do not have significant effect on Self-determination, Self-confidence, Interpersonal skills, Deliberating and Questioning skills. In sum, the level of experience of the respondents did not affect these skepticism dimensions.

Table 51: Mean Difference in Skepticism Dimensions between levels of Experience in Assessing Fraud Risk (in months)

Skepticism dimensions	**Experience of assessing fraud risk (in months) (n=42)**				**F-value**	**p-value**
	<=1 (n=26)	**1-50 (n=10)**	**50-100 (n=3)**	**>=100 (n=3)**		
	Mean±SD					
Self-determination	2.36±0.60	2.22±0.62	1.2±0.2	2.6±0.60	3.806	**0.018***
Curiosity	4.9±0.71	5.04±0.88	4.86±0.23	3.8.±0.41	2.099	0.117
Self-confidence	4.2±0.48	4.30±0.45	4.6±0.45	3.9±0.41	1.038	0.387
Interpersonal skills	3.88±0.48	3.76±0.36	3.73±0.305	4.0±0.52	.457	0.714
Deliberating	50±0.47	4.68±0.70	4.93±0.305	4.60±0.87	1.139	0.346
Questioning skills	4.53±0.61	4.62±0.319	5.067±0.83	4.40±0.87	0.829	0.486

*p<0.05

The obtained F-value and p-value reported in Table 51 for self-determination are F=3.806 and p=0.018 respectively. Here, p-value is less than 0.05 and results in rejecting the null hypothesis and supporting the alternative hypothesis. Thus, there is a statistically significant difference between experience of assessing fraud risk in months and the respondent's self-determination dimension. However, there are no significant differences between the other skepticism dimensions (Curiosity, Self-confidence, Interpersonal skills, and Questioning skills) and the experience of assessing fraud risk in months where the p-value is greater than .05.

Table 52: Mean Difference in Skepticism Dimensions between Levels of Education

Skepticism dimensions	Highest level of education (n=42)			F-value	p-value
	Bachelors (n=10)	Masters (n=14)	Others (n=18)		
	Mean±SD				
Self-determination	2.46±0.63	2.47±0.70	2.00±0.57	2.865	0.069
Curiosity	4.86±0.83	5.29±0.62	4.54±0.69	4.367	**0.019***
Self-confidence	4.04±0.53	4.31±0.48	4.34±0.41	1.512	0.233
Interpersonal skills	3.80±0.33	3.94±0.40	3.81±0.43	0.547	0.583
Deliberating	4.82±0.70	4.96±0.54	4.89±0.52	0.170	0.844
Questioning skills	4.42±0.49	4.34±0.61	4.87±0.52	4.242	**0.022***

*p<0.05

The obtained F-value and p-value from Table 52 for Curiosity are F=4.367 and p=0.019 and those for Questioning skills are F= 4.242 and p= 0.022. These two skepticism dimensions, have p-value less than 0.05; this leads to rejecting the null hypothesis and supporting the alternative hypothesis. Therefore, there is a statistically significant difference between levels of education and curiosity and questioning skills. Curiosity has a higher mean of 5.29(0.62) with Master degree respondents compared to other levels of education. In Questioning skills, other levels of education (PhD) has a higher mean of 4.87(0.52) compared to Bachelors and Masters.

The p-value is greater than 0.05 for Self-determination, Self-confidence, Interpersonal skills, and Deliberating. Consequently, there is no significant difference in the following skepticism dimensions: Self-determination, Self-confidence, Interpersonal skills, and Deliberating based on the level of education.

Table 53: Mean Difference in Skepticism Dimensions between Professional Positions

Skepticism dimensions	Professional position (n=42)						F-value	p-value
	Staff (n=7)	Senior (n=9)	Supervisor (n=3)	Manager (n=9)	Partner (n=8)	Others (n=6)		
	Mean±SD							
Self-determination	2.23±0.47	2.04±0.82	2.80±0.35	2.36±0.84	2.38±0.56	2.10±0.47	0.745	0.595
Curiosity	4.91±0.46	5.02±0.74	5.20±0.35	4.67±0.95	4.60±0.89	5.07±0.81	0.570	0.722
Self-confidence	4.14±0.61	4.42±0.29	4.53±0.23	4.16±0.64	4.23±0.33	4.23±0.53	0.573	0.720
Interpersonal skills	3.77±0.39	3.89±0.48	3.93±0.23	3.98±0.42	3.63±0.38	3.97±0.27	0.912	0.484
Deliberating	5.03±0.60	4.80±0.56	5.33±0.31	5.00±0.35	4.70±0.76	4.77±0.59	0.802	0.556
Questioning skills	4.60±0.75	4.49±0.50	4.20±0.53	4.87±0.66	4.43±0.57	4.70±0.43	0.874	0.508

From Table 53, it can be seen that the p-value is greater than 0.05 for Self-determination, Curiosity, Self-confidence, Interpersonal skills, Deliberating, and Questioning skills. Therefore, there is no significant difference in means for Self-determination, Curiosity, Self-confidence, Interpersonal skills, Deliberating and Questioning skills between auditors holding different professional positions.

Chi-squared tests

The association between two definite variables is tested through Chi-squared test. "Chi-squared test serves both as a goodness-of-fit test, where the data are categorized along one dimension, and as a test for more common contingency table, in which categorization is across two or more dimensions" (Howell, 2011: p.250). The data should meet two conditions.

(i) The two variables should be in ordinal or nominal scale (i.e., categorical)

(ii) The two variables should consist of two or more independent groups

Chi-squared value and *p*-value give the information about whether there is an association between two categorical variables.

Phi-value and Cramer's V are used to ascertain the strength of the association between variables (whether positive or negative).

Table 54: Association between Level of Skepticism and Gender

Level of Skepticism	Gender (n=42)		Total
	Male (n=26)	Female (n=16)	
	n(%)		
Low skepticism	12(46.2)	8(50.0)	**20(47.6)**
High skepticism	14(53.8)	8(50.0)	**22(52.4)**
Total	**26(100.0)**	**16(100.0)**	**42(100.0)**

Chi-squared value: 0.059; p-value: 0.808>0.05

From Table 54, it can be seen that the obtained chi-squares value and *p*-values are 0.059 and 0.808, respectively. Here, the *p*-value is greater than 0.05, and the null hypothesis H_0 is accepted, while the alternative hypothesis H_1 is rejected. It can be concluded that there is no statistically significant relationship between the level of skepticism and gender. In other words, skepticism is independent of gender.

Table 55: Association between Level of Skepticism and Experience

Level of Skepticism	Experience in years (n=42)				Total
	<=2.5 (n=11)	2.6-5.0 (n=12)	5.1-17.0 (n=9)	>=17.1 (n=10)	
	n(%)				
Low skepticism	4 (36.4)	4 (33.3)	5 (55.6)	7 (70.0)	**20 (47.6)**
High skepticism	7 (63.6)	8 (66.7)	4 (44.4)	3 (30.0)	**22 (52.4)**
Total	**11 (100.0)**	**12 (100.0)**	**9 (100.0)**	**10 (100.0)**	**42 (100.0)**

Phi-value: 0.300 p-value: 0.278>0.05

Table 55 shows that, in this test, the frequencies are below 5. Very small expected frequencies indicate that the chi-square statistics values are relatively discrete (Howell, 2011). According to Cochran (1952), the general rule is that the smallest expected frequency should be at least 5. Thus, when this assumption is violated and value less than 5 is present in one or more of the cells, the first solution is the Fisher's exact test. However, this test is ideally suited to 2×2 table design (Fisher, 1935). In this case, Phi-value (0.300) is obtained to measure the strength of the association in case of a significant association, and because the χ^2 test assumption is violated, a *p*-value of the maximum likelihood ratio Chi-squares test should be used (McHugh, 2013). The advantage of using the maximum likelihood ratio chi-squared test is that it can be neatly decomposed into smaller components (Howell, 2011). Failing to use the appropriate test when χ^2 test assumption is violated will result in a Type II error (when the appropriate test may produce a significant result while the inappropriate test provides a result that is not statistically significant). In addition, it might result in Type I error (when the appropriate test may provide a non-significant result while inappropriate test may provide a significant result) (McHugh, 2013). Here, the *p*-value is 0.278, which is greater than 0.05, so the null hypothesis H_0 is accepted and the alternative hypothesis H_1 is rejected. The results confirm that there is no statistically significant association between level of skepticism and years of experience.

Table 56: Association between Level of Skepticism and Level of Education

Level of Skepticism	**Highest level of education (n=42)**			**Total**
	Bachelors (n=10)	**Masters (n=14)**	**Others (n=18)**	
	n (%)			
Low skepticism	5 (50.0)	7 (50.0)	8 (44.4)	**20 (47.6)**
High skepticism	5 (50.0)	7 (50.0)	10 (55.6)	**22 (52.4)**
Total	**10 (100.0)**	**14 (100.0)**	**18 (100.0)**	**42 (100.0)**

Phi-value: 0.055; *p*-value: .938 > .05

Table 56 includes the results of the chi-squared test between the skepticism levels and the levels of education. Here, the assumption of the expected frequency (χ^2 test assumption) is not violated, so the chi-squared significance level is used (p-value of 0.938, >.05) and the obtained Phi-value is 0.055. Here, the p-value is greater than 0.05, so the null hypothesis H_0 is accepted and the alternative hypothesis H_1 is rejected. It can be concluded that there is no statistically significant association between levels of skepticism and levels of education. In other words, there is no relation between the degree the respondents have and their level of skepticism.

Table 57: Association between Level of Skepticism and Professional Position

Level of Skepticism	Professional position (n=42)						Total
	Staff (n=7)	Senior (n=9)	Supervisor (n=3)	Manager (n=9)	Partner (n=8)	Others (n=6)	
	n(%)						
Low skepticism	3 (42.96)	4 (44.4)	1 (33.3)	5 (55.6)	4 (50.0)	3 (50.0)	**20 (47.6)**
High skepticism	4 (57.1)	5 (55.6)	2 (66.7)	4 (44.4)	4 (50.0)	3 (50.0)	**22(52.4)**
Total	**7 (100.0)**	**9(100.0)**	**3 (100.0)**	**9 (100.0)**	**8(100.0)**	**6(100.0)**	**42(100.0)**

Phi-value: 0.120; p-value: 0.988>0.05

As can be seen from Table 57, the χ^2 test assumption is violated, so the *p*-value is obtained from the likelihood ratio significant level (0.988). Here, the p-value is greater than 0.05, so the null hypothesis H_0 should be accepted and the alternative hypothesis H_1 rejected. It can be concluded that there is no statistically significant association between levels of skepticism and professional positions.

Table 58: Association between Level of Skepticism and Professional Certificate

Level of Skepticism	Professional certificate (n=42)			Total
	ACCA (n=21)	CFA (n=3)	Others (n=18)	
	n (%)			
Low skepticism	7 (33.0)	3 (100.0)	10 (55.6)	**20 (47.6)**
High skepticism	14 (64.0)	0 (00.0)	10 (44.4)	**22 (52.4)**
Total	**21 (100.0)**	**3 (100.0)**	**18 (100.0)**	**42 (100.0)**

Phi-value: 0.361; p-value: 0.036< 0.05

Table 58 shows the results of the chi-squared test of the association between the two levels of skepticism and the respondents' professional certificate. The expected frequency assumption (χ^2 test assumption) is also violated in this test, and the p-value of likelihood significant level of 0.036 is obtained, which is less than 0.05. Therefore, the alternative hypothesis (there is an association between the respondents' level of skepticism and their professional certificate) is accepted. In addition, the strength of the association is considered to be weak to moderate (Phi-value: 0.361) (McHugh, 2013).

Correlation

The strength and direction of the association between two variables are measured by Pearson correlation coefficient. The two variables must be measured on a continuous (interval) scale. The correlation coefficient (r) ranges from -1 to 1. Based on the sign of the correlation coefficient, it can be concluded:

- If $r_{X,Y}$ is positive – The two variables X and Y are in a positive relationship
- If $r_{X,Y}$ is negative – The two variables are in a negative relationship.
- If $r_{X,Y} = 0$, There is no relationship between X and Y
- Significance (p) value is used to determined whether the two variables are in a relationship or not
- Correlation coefficient (r) value is used to find out whether the two variables are a positive or negative relationship

Table 59: Correlation between Skepticism Dimensions

Skepticism dimensions	**Self-determination**	**Curiosity**	**Self-confidence**	**Interpersonal skills**	**Deliberating**	**Questioning skills**
Self-determination	1	-0.003	-0.055	-0.086	-0.114	**-0.423****
Curiosity		1	0.174	**0.364***	**0.341***	0.044
Self-confidence			1	0.257	0.133	**0.463****
Interpersonal skills				1	0.243	**0.338***
Deliberating					1	0.135
Questioning skills						1

**p<0.01, *p<0.05

Table 59 present the Pearson correlation between Skepticism dimension variables. The correlation values in the table are significant at the 1% and 5% level. There is a significant negative correlation between self-determination and Questioning skills ($r = -0.423$, $p < .01$), which was expected, as Hurtt used reverse items in self-determination

(Hurtt et al., 2008). The negative correlation indicates that as the self-determination increases, the questioning skill decreases. There is a significant positive correlation between curiosity and interpersonal skills (r = 0.364, $p < .05$), curiosity and deliberating (r = 0.341, $p < .01$). The positive correlation indicates that, as curiosity increases, so do interpersonal skills and deliberating. There is also a significant positive correlation between questioning skills and self-confidence (r = 0.463, $p < .01$), and questioning skills and interpersonal skills (r = 0.338, $p < 0.05$). The positive correlation indicates that, as questioning skills increase, so do self-confidence and interpersonal skills. The bolded value given in Table 59 indicate either positive or negative significant correlation.

Hypothesis Testing:

Independent sample t-test

H4: Implementing decision-aids will eliminate significant differences between high and low skepticism type auditors.

Table 60: Leven's test for Equality of Variances

		Levene's Test for Equality of Variances	
		F	Sig.
Perception-High risk	Equal variances assumed	.008	.929
	Equal variances not assumed		
Judgment	Equal variances assumed	.853	.361
	Equal variances not assumed		
Decision	Equal variances assumed	.032	.859
	Equal variances not assumed		
Perception-Low risk	Equal variances assumed	.746	.393
	Equal variances not assumed		
Judgment	Equal variances assumed	5.440	.025
	Equal variances not assumed		
Decision	Equal variances assumed	1.623	.210
	Equal variances not assumed		

Table 61: Mean Difference in Fraud Risk Factors between Levels of Skepticism

Fraud risk factors	**Level of Skepticism (n=42)**		**t-value**	**p-value**
	Low (n=20)	**High (n=22)**		
	Mean±SD			
High risk				
Perception	7.49±1.06	7.15±1.14	1.013	0.317
Judgment	6.75±1.51	6.49±1.12	0.641	0.525
Decision	7.43±1.38	7.55±1.07	-0.318	0.752
Low risk				
Perception	3.99±1.82	4.44±2.12	-0.728	0.471
Judgment	2.89±1.32	3.95±1.88	-2.105	**0.039***
Decision	3.28±1.60	3.77±1.86	-0.923	0.361

*p<0.05

Hypothesis 4 was tested by the independent samples t-test, as previously explained. Levene's test was also performed (Table 60) and yielded insignificant results, indicating that the assumption of homogeneity is not violated in this test (with the exception of Judgment). The obtained t-value and *p*-value (given in Table 61) for Judgment in low risk condition are -2.141 and 0.039, respectively. These figures have been obtained from the (equal variances is not assumed) column because of the violation of homogeneity assumption. Here, *p*-value is less than 0.05 and this is the only variable that shows that there is a significant difference between low and high skepticism respondents in assessing fraud risk in low risk condition. However, there is no significant difference between high and low skepticism auditors in assessing the fraud risk factors in perception, judgment, and decision stages in high fraud risk condition. In addition, there is no significant difference between high and low skepticism auditors in assessing the fraud risk in perception and decision stages in low risk condition. These results show that high and low skepticism auditors were both sensitive to the fraud factors indicating high risk condition. More specifically, auditors exhibiting both low and high skepticism gave high assessment of fraud risk in high fraud risk condition. In the perception stage, the mean difference of low skepticism auditors is 7.49 compared to 7.15 for high skepticism auditors, 6.75 in judgment stage vs. 6.49 for high skepticism auditors, and 7.43 compared to 7.55 by high skepticism auditors. On the other hand, low skepticism auditors and high skepticism auditors also gave low assessment of the low fraud risk factors in that the mean difference in perception stage was 3.99 vs. 4.44, 2.89 vs. to 3.95 and 3.28 vs. 3.77 for low and high skepticism auditors, respectively. Consequently, Hypothesis 4 is supported.

6.11.5 Additional Analyses

Table 62 shows the detailed independent sample t-tests for each single fraud risk factor used in this study. These detailed tests indicate which of the SAS No. 99 fraud risk factors are significant. In other words, they explain in which factor the two groups of auditors (high/ low) skepticism differ when assessing the fraud risk.

Table 62: Mean Difference between fraud risk factors in low and high risk condition between level of skepticism

Fraud risk factors	Low risk condition Level of Skepticism (n=42)		t-value	p-value	High risk condition Level of Skepticism(n=42)		t-value	p-value
	Low (n=20)	High (n=22)			Low (n=20)	High (n=22)		
	Mean±SD				Mean±SD			
Domination of management	5.10±2.79	5.27±2.88	-0.197	0.845	7.45±1.47	7.91±1.80	-0.901	0.373
Personal financial obligations	4.05±2.56	4.32±2.44	-0.347	0.730	8.30±1.56	7.55±1.99	1.357	0.183
Adverse relationship between company and employees	3.75±2.47	4.18±2.50	-0.562	0.577	6.95±2.35	6.59±2.20	0.512	0.612
Inadequate monitoring controls.	3.50±2.09	4.18±2.50	-0.953	0.361	7.55±1.76	7.36±1.71	0.348	0.730
Ineffective communications	3.55±2.14	4.23±2.56	-0.925	0.361	7.20±1.40	6.32±1.32	2.099	**0.042***
(Recurring management) Justifying marginal or inappropriate accounting based on materiality	2.60±1.05	3.27±2.10	-1.295	0.203	7.50±1.54	6.82±1.65	1.380	0.175
Rapid growth or unusual profitability	2.70±1.26	3.86±2.03	-2.204	**0.033***	6.30±2.03	6.77±1.90	-0.780	0.440
Complex or unstable organizational structure	2.80±2.02	4.23±2.56	-1.992	**0.053***	5.85±2.23	5.00±2.02	1.295	0.203
Aggressive or unrealistic forecasts	3.45±1.85	4.45±2.15	-1.614	0.114	7.35±2.13	7.36±1.65	-0.023	0.982
Risk attributable to **incentives**	3.55±2.28	4.45±2.15	0.278	0.782	7.85±1.66	7.91±1.31	-0.129	0.898
Risk attributable to **opportunities**	3.50±1.79	4.23±2.29	-1.139	0.261	7.05±1.99	7.91±1.31	-1.071	0.290
Risk attributable to **attitude**	3.05±1.54	3.50±1.92	-0.832	0.410	7.45±1.36	7.18±1.82	0.538	0.594
The overall risk	3.00±1.72	4.00±2.16	-1.650	0.107	7.35±1.81	7.41±1.30	-0.122	0.903

*p<0.05

The t-value and *p*-value reported in Table 62 for Rapid growth in low risk condition are -2.204 and 0.033, respectively. Here, p-value is less than 0.05, which suggests that there is significant difference between high and low skepticism when assessing this particular fraud risk. In this study, low skepticism auditors gave low assessment for the Rapid growth factor (2.7) compared to 3.86, which was given by high skepticism auditors. This result indicates that high skepticism auditors were more sensitive to this factor than the low skepticism auditors. Moreover, the t-value and *p*-value for Complex or unstable in low risk are -1.992 and 0.053, respectively, indicating that there is significant difference between high and low skepticism auditors when assessing Complex or unstable organizational structure factor. The low skepticism auditors gave low assessment (2.8) compared to 4.23, which is given by high skepticism auditors. Similarly, the obtained t-value and p-value for Ineffective in high risk condition are 2.099 and 0.042, respectively. Here, p-value is less than 0.05, indicating that there is significant difference between the two groups (low and high skepticism auditors) in assessing this particular fraud factor. More specifically, the low skepticism auditors gave the higher assessment of 7.20, compared to 6.32 that was assessed by high skepticism auditors in high fraud risk condition, indicating that low skepticism auditors were more sensitive to the high risk of the factor (ineffective communications, implementation, support or enforcement of ethical climate) than high skepticism auditors were.

The p-value is greater than 0.05 for the remaining fraud risk factors in high and low fraud risk conditions. Therefore, there is no significant difference between the two groups of high and low skepticism auditors when assessing the following SAS No. 99 factors: domination of management, personal financial obligation, adverse relationship between company and employees, inadequate monitoring control, ineffective communication, recurring management attempts to justify marginal or inappropriate accounting based on materiality, aggressive or unrealistic forecasts by management, risk attributable to the incentive, risk attributable to the opportunity, risk attributable to the attitude and overall risk in (low-risk) condition and domination of management, personal financial obligation, adverse relationship between company and employees, inadequate monitoring control, recurring management attempts to justify marginal or inappropriate accounting based on materiality, rapid growth or unusual profitability, complex or unstable organization structure, aggressive or unrealistic forecasts by management, risk attributable to the incentive, risk attributable to the opportunity, risk attributable to the attitude, and overall risk in the high risk condition.

6.12 Summary

This chapter provided statistical analyses to which experimental data were subjected, in order to test the study's hypotheses and investigate the relationships between dependent and independent variables. SPSS v.20 was used to screen the data for missing data and outliers. The data was also examined to validate all the main assumptions of normality, linearity, and multicollinearity. Regression analysis and comparison analysis tests, such as ANOVA and independent samples t-tests, have been also conducted using SPSS v.20.

PLS-SEM was applied to test the study's model and assess its performance when applied to the dataset of 42 cases. Reliability and validity tests were performed to confirm that all measurement scales were yielding satisfactory results. All the hypotheses in this study were supported.

The following chapter presents the detailed discussion of the study results.

Chapter 7 Discussion

7.1 Introduction

This chapter provides a detailed discussion on the findings yielded by the present study, which were presented in the last chapter. The purpose of this chapter is to discuss and explore the theoretical contributions made by this current study to the literature on the auditing fraud risk assessments. This chapter starts with a general discussion of the variables included in this study, followed by a discussion about the hypothesis testing that leads to the finalization of the theoretical model initially proposed in this research.

7.2 General Discussion

The study sample comprised of 42 professional auditors (62% of whom were male and 38% were female, gender imbalance is a common issue in most private firms specifically auditing firms, due to long working hours, and household responsibilities). However, regardless of gender, auditors are required to be adequately sensitive to fraud risk issues when performing fraud risk assessments (AICPA, 1997a). The issue that was addressed in prior research reported in the ethics, business, and psychology literature is whether female auditors are more sensitive to ethical issues or whether they exhibit greater levels of moral reasoning and moral development than do males. Authors of some past studies found that the effect of demographic factors, such as gender, on the accuracy of audit judgment is significant, given the complexity of many audit tasks. They observed a difference on judgment accuracy between genders, whereby females were more accurate than males when processing complex audit tasks (Chung and Monroe, 2001; Chung and Monroe, 1998; Meyers-Levy, 1986; Shaub, 1995). They justify this finding by positing that females tend to be detailed processers who process most of the available information cues, whereas males generally do not make use of all available information. Additionally, in a complex judgmental task, females tend to be more efficient as information load increases, and males tend to take more time than do females to complete the task (Chung and Monroe, 2001). Moreover, females tend to be more risk averse and process information more comprehensively than men do (Meyers-Levy, 1986; Broder, 1993).

The current study results show that, in general, there are no differences in the performance of fraud risk assessment when it is decomposed in the process thinking model. The current research results are consistent with those reported by Owhoso

(2002) and Smith et al. (2005), in that gender had no effect on the sensitivity or fraud risk assessment or on auditors' perceptions. O'Fallon and Butterfield (2005: p.379) concluded that "the literature examining gender continues to produce fairly consistent findings, there are often no differences found between males and females, but when differences are found, female are more ethical than males". Owhoso (2002) justified the insignificant differences between males and females noting that, when auditors are given positive ethical signals, both genders might be equally sensitive in their fraud risk assessment task. The average full time audit experience the participants in this study have is 11.7 years (with a maximum of 45 years), and other scholars examined auditors with similar years of experience (Asare and Wright, 2004; Carpenter, 2007; Knapp and Knapp, 2001; Wilks and Zimbelman, 2004a).

To perform a critical task such as fraud risk assessment, it is very important that engagement teams have the necessary knowledge, skills, and ability and that is achieved by appropriate technical training and experience (Boyle and Carpenter, 2015; Wright and Bedard, 2000; Ríos-Figueroa and Cardona, 2013). Moreover, past research suggests that an individual knowledge structure changes as the years of experience increase (Chi and Glaser; Libby and Frederick, 1990; Tubbs, 1992). The current study results show that the interaction between the level of experience and fraud risk assessments is significant in the perception stage when the level of fraud risk suggests high likelihood of fraud, and it is also significant in low fraud risk condition in both judgment and decision stages. In other words, these results indicate that more experienced auditors are more effective in perceiving high fraud risk and assess it highly, as well as give lower assessment in the judgment and decision when fraud risk condition is low. These results are in line with those reported elsewhere (Knapp and Knapp, 2001; Owusu-Ansah et al., 2002; Moyes and Hasan, 1996; Choo and Trotman, 1991). Authors of these studies justify their results by noting that the knowledge difference will likely affect auditors' understanding and interpretation of information during complex task judgment, which enhances their ability to effectively assess the risk of financial statement fraud (Knapp and Knapp, 2001; Owusu-Ansah et al., 2002; Moyes and Hasan, 1996; Choo and Trotman, 1991).

Bierstaker and Wright (2001) examined innate ability and experience and found that both experience and innate ability are important factors for audit decisions. However, in the present study, no significant differences were noted between the level of experience and judgment and decision stage in high fraud risk condition, which might be due to the presence of explicit fraud risk assessment processes that enhance auditors' judgmental process. In addition, this particular result is in line with those obtained by Apostolou et al. (2001), who suggested that providing a decision model might prompt auditors to pay more attention to the factors related to management characteristics, in that auditors with different levels of experience employed the assessment procedures similarly. Also, the lack of correlation between the levels of experience in the judgment and decision stage (high fraud risk) and perception stage (low fraud risk) is consistent with Smith et al. (2005) findings, in that they found that years of experience or type of auditing firm did not influence the perception of auditors when responding to the assessment of fraud risk indicators. Moreover, the results of this present study support those reported by Lehmann and Norman (2006), indicating that the concepts explained in the problem representation were associated with judgment variables rather than experience level.

Along with experience, education is also important and all the participants of this study had at least a Bachelor's graduate degree, with many also holding Master's, MPhil and PhD. However, analyses revealed that educational attainment did not have significant effect on the fraud risk assessment in perception, judgment, and decision stages in both fraud risk conditions (high and low). This result is similar to that obtained by Shaub (1995), in that moral reasoning does not relate to general education, whereas the other factors, such as gender, GPA, and ethics education impact on moral reasoning. The explanation of these finding is that the association of moral reasoning level with GPA rather than experience and education indicates that this might measure the academic ability or certain cognitive skills to a greater extent than it does developmental process in auditing students and auditors. Moreover, auditors are not familiar with ethical theory and consequential terminology, which makes it difficult for them to recognize misleading statements regarding ethics even when those auditors are cognitively mature. Literature review of 11 studies, which compare years of education, employment or work experience, failed to reveal any significant or even marginal influence of these factors on ethical decision-making (Wu, 2003).

Additionally, in the current study, the impact of auditors' professional position on fraud risk assessment in the process thinking stages was examined. The majority of the participants in this study are seniors and managers. Christ (1993) examined auditors' planning knowledge and found significant differences in the knowledge structures of audit managers and partners comparing to senior and junior auditors. Knapp and Knapp (2001) found that auditor managers assess the risk of fraud more accurately than audit seniors do when using analytical procedures. In general, professional position is linked to the experience, whereby knowledge differences between seniors and managers affect auditors' understanding and how they perceive the fraud indicators and enhance their ability to assess the fraud risk. However, the results yielded by the current study show that auditors holding professional positions (staff, senior, manager, partner, and supervisor) did not make different fraud risk assessments in perception, judgment, and decision stages in both fraud risk conditions (high and low). These results are justified in this current study, in that when auditors are provided with decision making model that enhances their ability and increases their sensitivity to the fraud risk factors, this improves their fraud risk assessment regardless of their professional position (Apostolou et al., 2001).

7.3 Discussion of Hypothesis Testing

This section provides a detailed discussion of the study's results in relation to the tests performed on the study's model, hypotheses, and research questions. This section is categorized into sub-sections according to the hypotheses. However, H_1 and H_2 will be discussed jointly, as both are linked to the discussion of the process thinking (Throughput) model. H_3 and H_4 will be discussed separately.

7.3.1 Impact of perception of financial information and fraud risk factors in the process of judgment (H_1)

This section discusses the results pertaining to the direct effect of the independent variables drawn from the Throughput model (perception, financial information) on the dependent variable (Judgment).

***Perception of the financial information and SAS No. 99 fraud risk factors has a positive association with judgment*.**

The statistical results of this study support the positive association between the perception and financial information and between perception and judgment. The experimental results are given in the previous chapter. The participants' perceptual process of financial information (profitability, liquidity, leverage) and SAS No. 99 fraud risk factors influenced their analysis and judgmental processes. The results of the correlation report a positive correlation between perception and judgment. The results of the PLS structural model analysis also indicate a positive relationship between perception and financial information, financial information of Liquidity ($\beta = 0.723$, $p < .01$), Profitability ($\beta = 0.700$, $p < .01$), and Leverage ($\beta = -0.653$, $p < .01$). The PLS results also reveal a positive relationship between perception and judgment ($\beta = 0.613$, $p < .01$). These results thus support H_1.

7.3.2 Impact of perception and judgment of fraud risk factors provided by SAS No. 99 on the decision (H_2)

Perception and judgment of SAS No. 99 fraud risk factors have a positive association with decision.

The study results also support the positive association between perception, judgment, and decision. The process of the perception and the analysis of the categorized fraud risk factors have influenced the process of the assessment in the decision stage. The results of the PLS model confirm this influence between perception and decision (Perception→ Decision) ($\beta = 0.434$, $p < .01$) and between judgment and decision (Judgment→ Decision) ($\beta = 0.545$, $p < .01$). Thus, the effect of perception and judgment on decision is significant (Perception→ Judgment→ Decision). The correlation test supports this result, as it shows a positive significant relation between these three dominant concepts (perception, judgment, and decision).

Authors of extant studies have used the same indicators for information to indicate the financial health of the firm. For example, Johnstone and Bedard (2004) chose firm's profitability, liquidity, and leverage in formation to capture the financial health. Similarly, Rodgers et al. (2013) used the same indicators and stated that firm can suffer from shortfall of cash flow and not be able to survive if it cannot meet its debt obligations, which is why it is very important to capture different dimensions of a firm's financial health. Using the financial health construct with three indicators (profitability, liquidity, and Leverage) provides a more comprehensive measure of the firm's performance than a single profitability measure (Rodgers et al., 2013).

The results of H_1 testing suggest that the participants' analysis of SAS No. 99 fraud risk factors was influenced by the perception of financial health information and the impression of some of SAS No. 99 fraud risk factors. Similarly, H_2 predicts that the process of perceiving fraud risk factors and the judgmental process influence the decision outcome in the level of fraud risk assessment. The results of these hypotheses are similar to Rodgers et al. (2013) in that they have used the same decision making model (Throughput) and their results confirmed that the process of perceiving firm's commitment to meet CSR (Corporate Social Responsibility) contributes both directly to the firm's market value (decision) and indirectly to financial status of the firm (judgment). In their study, Foss and Rodgers (2011) employed Throughput as decision-making model, focusing on important factors in the decision-makers' information processing that might improve and strengthen their ability to use information in their decision process. Their model constructs were identical to those employed in the current study, whereby they used two-stage causal model to determine the effects of perception, background information, involvement, and judgment on line managers' decision choices. The results of their study show that all relations in the model are significant, which indicates that the interaction between information and perception is significant, and that the perception of the role of auditors had a statistical impact on their judgment and skills. In an earlier work, Culbertson and Rodgers (1997) used the same phases of the TP model which as those implemented in the current study and their results indicate casual relationships between perception and experience and judgment, and between perception and decisions.

However, authors of these studies employed the Throughput model in using concepts other than fraud risk assessment. Nonetheless, this current study results reveal that the throughput model is significant. "Different decision-makers use different metal processes and will not necessarily use the same information or reach similar decisions using the same information" (Foss and Rodgers, 2011: p.689).

Guiral et al. (2010) proposed the same modeling approach as that adopted in the current study (TP), and used similar variables to examine the auditor independency in giving the final decision about the audit report. The authors employed three main ethical dilemmas—the self-fulfilling prophecy effect, the fear to be sued, and the responsibility of providing warning signals—which auditors usually face when evaluating the ability of their clients remain operational. However, their results revealed that negative evidence did not influence the judgment, which supports the argument that the fear of client bankruptcy directed auditors to ignore or underestimate this type of evidence. Moreover, the results also reveal that positive evidence had a direct impact on the judgment stage, although it was not correlated with any of the auditors' perceptions. The same data that Guiral et al. (2010) employed was subsequently analyzed by Guiral et al. (2015), and yielded the same results, in that that auditors tended to underestimate the negative evidence and were reluctant to issue going concern opinions. However, the current study results show that auditors were able to assess fraud risk according to the suggested risk level and that the process thinking model (TP) reduced the load of fraud risk factors given at once, which were instead given in stages, thus enhancing the auditors' judgmental process.

The result of the TP model in this current study is also in line with those reported by Rodgers (1992), who used this model to predict and explain individuals' decision making by relating the effects of accounting information, perceptual processes, and judgmental processes to decision choice. The findings of his study indicate that the effect of perception on judgment was significant, as was the effect of perception on decision choice, in the two behavior models employed in the study. Additionally, the driven types' judgment was significantly affected by liquidity and profitability, but liquidity was only significant in the data-driven types' judgments. However, the TP model was supported in his study, as Rodgers mentioned in the paper that the users of accounting information depend upon past information to influence their decisions without going through an in-depth analysis of the presented information. He added that the model was useful, as it revealed the impact of accounting information on users' cognitive processes.

The present research model testing results are also consistent with those of Rodgers and Housel (1987), who tested a two-stage cognitive processing model of decision making that tests a direct effects of perception affecting judgment and indirect effect of perception affecting judgment, which affects decision choice. They used covariance structural model analysis, which was tested by LISREL and the findings revealed that there is a significant direct effect of perception on judgment, as well as a indirect effect of judgment and three kinds of information (liquidity, income, leverage) have significantly indirect affect on decision choice. Another study by Rodgers (1999) was similar to the current study and the model was also tested using PLS. His study findings were also similar to the current study findings, in that the effect of perception and the financial information (liquidity, income, risk) were found to be significant and that representation processes significantly influenced the decision choice. Rodgers (1999) concluded that his findings extend Rodgers and Housel (1987) study, in that decision makers may use different pathways before arriving at a decision. Rodgers and Housel (2004), utilized the Throughput model, and found that auditors' perception of environmental risk information, as well as financial statement, significantly influence their judgment, and the auditors' perception and judgment significantly influenced their decision choice, in line with the current study.

Moreover, the results from the significant TP pathways provide evidence that the virtue driven-pathway is not significant. In other words, auditors used their financial information to formulate the perception, which influence judgment en route to the decision assessment. The results of the model testing showed that auditors followed different direction from what was proposed, the auditors used their information (I) to enhance the rule- based pathway (P→J→D) and extends it by considering the change in environment and circumstances by gathering reliable and relevant information that might shed light on any overlooked areas (Rodgers, 2009a). This path way enables information sources to modify and enhance the perception function, which influence analysis (judgment) before a decision is made.

However, this unexpected behaviour can be explained by the ethics of care pathway (I→P→J→D) which is similar to the so-called stakeholder theory that entails companies' actions are roofed by benefiting and not harming any stakeholders (Rodgers, 2009b). The justifications of why auditors followed this pathway might be first because of the audit fraud context. When auditors are placed with a high litigation risk exposure such as fraud risk they tend to protect third parties interests along with professional standards compliance (Rodgers, 2009b). This high risk exposure can result in a loss of reputation that could result in auditors losing present clients and become non competitive in bidding for future clients. According to LaSalle et al. (1996), auditors' exposure risk linked to the chances of being used by their clients or third parties. So the auditors in fraud context had the incentives to prefer the ethical behaviour based on deontology (P→J→D) and ethics of care (I→P→J→D). In that ethics of care highlights auditors' independence and objectivity as important factors to assist in avoiding harm to third party interest, so this position allows for all relevant and reliable information to improve or modify auditors' perceptions before an analysis is performed en route to a decision. Also, the deontology path way emphasizes auditors' behaviour to fraud risk assessment to release a warning signal to financial statement users (Rodgers, 2009b). Thus, in the absence of moral seduction and conflict of interest, both ethics of care and deontology viewpoints would be the ethical decision making pathways in auditors' fraud risk assessments.

The result also revealed that the ethics of egoism (P→D) is significant which explains that auditors' decisions would be strongly influenced by the assessment procedures in the perception stage. However, in a complex task such as fraud risk assessment auditors analyze and evaluate the fraud signals in order to reach to overall assessment. Although the result is significant the relation is not strong (β Coefficient is 0.434).

The utilization of the Throughput model in this current study enhanced auditors' thinking by including all the factors in their judgmental process. The success of this model in the current study is likely due to dividing the decision making into stages, which simplifies the judgmental process. According to Chewning and Harrell (1990: p.527, 536), "further increases in the amount of information provided to a decision maker results in a decrease in the amount of information actually integrated into the individual's decision output,.. information overload will be accompanied by a decline in decision consistency in addition to a decline in cue usage".

Eining et al. (1997b) examined three types of decision aid, one of which was an expert system, which is similar to the current study model in that it gives specific assessments of the risk of management fraud. They found that auditors who used the expert system where able to assess management fraud significantly better than those who were provided with checklists or those without a decision aid. Throughput model in the current study separated the fraud risk assessment into four different stages, which simplify the process of fraud risk assessment. According to Zimbelman (1997), the use of separate, explicit fraud risk assessment on audit effectiveness will require auditors to activate knowledge linked to fraud, which eventually enhances their audit plan.

The current research model is a two-phase model, whereby the first phase pertains to the perceptual framing and includes encoding, where a set of facts processed by the decision makers as a part of his/her declarative knowledge. In the second phase, the decision makers use this declarative knowledge in combination with their analysis and solving procedures that are modified by selective procedural knowledge that enables participants or decision makers to decide on the overall assessment of fraud risk (Rodgers and Housel, 2004). The results of testing these two phases in the current study reveal that auditors used their declarative knowledge, which had an impact on their procedural knowledge. Herz and Schultz Jr (1999) reported findings that provide support for the role that declarative and procedural knowledge that plays in accounting arena. These results also suggest that more emphasis should be given to declarative and procedural knowledge aspects that might help to build an expert system. Declarative knowledge is the knowledge of facts, such as ratio analysis (current ratio, gross margin ratio, debt to equity ratio), whereas procedural knowledge consists of rules or stages needed to perform skilled tasks (Ye et al., 2014). Bonner and Walker (1994) found that participants with no experience or practice alone were not able to convert declarative knowledge to procedural knowledge unless they were given feedback and instructions.

Pitz and Sachs (1984) described cognitive process as a process that leads to judgments, as it includes representation of the problem, identification of relevant issues of the problem, recall of information from memory and then evaluation of relevant information. In this current research, the Throughput model is viewed as a framework that directs these cognitive activities. This framework also works along with auditors' experience of attaining their understanding in their declarative knowledge, which is converted to the procedural knowledge in the decision choice. Kemer et al. (2014) found that expert supervisors' thinking is based on supervision models (declarative knowledge), along with experience that they transform into complex structured frameworks (procedural knowledge). In general, with fraud risk evaluation and given the complexity of this task, the auditing literature suggests that procedural knowledge that is developed over many experiments is fundamental in dealing with such complexity (Bonner and Walker, 1994; Herz and Schultz Jr, 1999). According to Zimbelman (2001: p.20), procedural knowledge "frees greater cognitive resources to consider knowledge germane to the immediate task". However, the cognitive psychology literature indicates that the amount of acquired declarative or procedural knowledge is not as important as organizing this knowledge (Eining et al., 1997b; Rose and Wolfe, 2000; Dorr, 1995). Decision aids represent tools and mechanisms that work to promote and improve auditors' judgmental process, whereby standard checklists have been found to obstruct the effectiveness of auditors' judgment (Asare and Wright, 2004; Pincus, 1989). Additionally, according to prior research, the design of decision aids is a vital determinant of the ability of users to acquire knowledge through decision aid (Eining et al., 1997b; Rose and Wolfe, 2000; Dorr, 1995). These studies confirm that the knowledge structure achieved by auditors in this current research, where the auditors were provided with a decision-making model that divided SAS No. 99 factors into perception process, judgment, and decision.

According to Smedley and Sutton (2007), there is evidence that explanations and structure in decision aids might hinder or promote the acquisition, depending on how the decision aid is designed. Rose et al. (2012) examined the ability of decision aids in improving judgment process of expert and novice accounting practitioners in assessing fraud risk. Their study is similar to this current study in that they used the categorized fraud risk factors in SAS No.99. Their findings indicate that, when fraud risk factors are organized to represent the knowledge structure of experts, novice auditors develop knowledge structure that is more similar to the experts' knowledge structure embedded in the aid. In other words, those novices decision makers tend to make decisions comparable to those who are experts and these benefits are recognized even in the absence of instructions while using the decision aid and persist over time.

Rose et al. (2012) justified their decision aid accomplishment in that they used fraud cues from SAS No. 99, as was done in the current study. They used 15 cues that are believed to allow for robust differentiation between individual's knowledge structures. However, the current study included 9 cues that are deemed necessary to adequately describe a decision domain for the purpose of fraud risk assessment (Wilks and Zimbelman, 2004a; Cooke, 1994). Those cues are decomposed into series of smaller judgment that require fewer elements of information and are apparently more easily and reliably carried out. Better judgment can be obtained by first decomposing the problem into smaller questions related to the most important related information that required making the overall judgment (Favere-Marchesi, 2013). Zimbelman (1997) also found that the decomposed judgment process helped auditors pay attention on fraud cues and consequently improved audit decisions. They also revealed that decomposition of a separate fraud risk assessment did direct auditors' attention toward fraud red flags.

Wilks and Zimbelman (2004) included attitude constant in their study, so no attitude cues were provided in their experimental materials. However, the current study included three attitude factors to better present the fraud triangle and the risk assessment recommendation of SAS No. 99 (AICPA, 2002).

7.3.3 The impact of the fraud triangle components (incentive, opportunity, and attitude) on overall fraud triangle factors

The current study replicates Wilks and Zimbelman (2004) test of the main effect of decomposition in fraud triangle components on overall assessment of fraud risk. Wilks and Zimbelman (2004) proposed a decomposition approach to the components of the fraud triangle (management attitude, incentive, and opportunity) before giving the overall assessment of fraud risk. They suggested that this decomposition approach might increase auditors' attention to incentive and opportunity cues. Wilks and Zimbelman (2004) justified the use of decomposition approach because the regulators and practitioners have expressed concern, claiming that auditors rely heavily on indicators of management attitude when those indicators suggest low fraud risk.

"Although the risk of material misstatement due to fraud may be greatest when all the three fraud conditions (e.g attitude, opportunity and incentive) are observed or evident, the auditor cannot assume that the inability to observe one or two of these conditions means there is no risk of material misstatement due to fraud. In fact, observing that individuals have the requisite attitude to commit fraud, or identifying factors that indicate a likelihood that management or other employees will rationalize committing a fraud, is difficult at best" AICPA (2002 par. 35). In other words, if auditors depend on low risk attitude, they will assume that opportunity and incentive also indicate low fraud risk, which will result in overlooking high levels of opportunity and incentive factors that show high fraud risk.

However, the current auditing standards advise auditors to consider the categorization into fraud triangle factors when assessing fraud risk level, whereby that the decomposition of fraud risk assessments along with the categorization of incentive, opportunity, and attitude is not required. Wilks and Zimbelman (2004b) stated that while categorization is a helpful strategy that help auditors to think more broadly, previous research suggests that auditors' sensitivity to these cues might be enhanced by separate component risk assessment for each element of the fraud triangle. Prior research has revealed differences between decomposition and categorization approaches, whereby the decomposition approach was found to be more appropriate in reflecting the level of incentive/opportunity cues, which is not the case with the categorization approach (Wilks and Zimbelman, 2004a; Favere-Marchesi, 2009, 2013).

This current study replicates the work of Wilks and Zimbelman (2004a), by examining how a fraud-triangle decomposition directly affects the overall fraud risk assessments. It also extends their research by manipulating all the three components into high and low fraud risk. The author of this thesis believes that this structure helps to highlight all components of fraud triangle factors, as it reduces the effort needed to assimilate the fraud risk factors (Jiambalvo and Waller, 1984). Moreover, to the scholar's knowledge, very limited number of researchers have previously tested this decomposition when attitude cues suggest high fraud risk (Wilks and Zimbelman, 2004a; Favere-Marchesi, 2013).

The results of this present study reveal that, in high fraud risk condition, the two factors of fraud triangle (incentive and opportunity) have a significant impact on overall fraud risk assessment ($\beta = 0.517$, $t = 3.919$, $p < .01$) and ($\beta = 0.333$, $t = 3.451$, $p < .01$), respectively. The results of the Pearson correlation confirm that all the components of fraud triangle factors have a positive association with fraud triangle components, but attitude factor has the weakest association among the other components. These results are in line with those reported by Wilks and Zimbelman (2004a: p.16), who noted that "anticipation of a fraud triangle decomposition makes auditors component assessments more sensitive to opportunity and incentive risks". However, Wilks and Zimbelman (2004) reported results indicating that decomposition does make auditors more sensitive to the two of fraud triangle factors (incentive and opportunity) but only when the fraud risk suggests low fraud risk condition.

On the other hand, the findings of this present study show that auditors were sensitive to the incentives and opportunities when the fraud risk condition suggested high level in all three components (attitude, incentive, and opportunities). These results might indicate that auditors perceive attitude cues as more important than opportunity and incentive risk factors, and decomposition helped in making a high attitude risk more salient. Hence, this decomposition of fraud risk assessment will be more sensitive to changes in opportunity and incentive risks when the attitude suggests high level risk than when the attitude suggests low fraud risk (Heiman-Hoffman et al., 1996; Shelton et al., 2001). Thus, when attitude suggests high fraud risk, it attracts auditors' attention to incentive and opportunity cues.

However, this current study also examined the impact of the fraud triangle on overall fraud risk when the fraud risk conditions suggest low fraud risk. The regression results indicate that auditors were sensitive to the fraud triangle factors (incentive, opportunity, and attitude) equally, i.e., incentive ($\beta = 0.257$, $t = 2.651$, $p < .01$), opportunity ($\beta = 0.230$, $t = 2.524$, $p = .016 < .05$), and attitude ($\beta = 0.582$, $t = 4.750$, $p < .01$). These results were confirmed by Pearson correlation, which shows that there is a positive association between the fraud triangle components and overall fraud risk assessments, where the attitude had the strongest relation with overall fraud risk in low fraud risk condition. These results are in line with Wilks and Zimbelman's (2004) findings suggesting that decomposition does make auditors more sensitive to opportunity and incentive factors when those indicators suggest low fraud risk. Thus, in general, the results of this current study support their findings, confirming that auditors who anticipate making component assessments before the overall assessment make component assessments that are more sensitive to variations in opportunity and incentive risks.

Wilks and Zimbelman (2004) explained why decomposition might not increase auditors' sensitivity to high risk opportunity and incentives factors. The first reason they gave is that, as the risk business environment already attracted auditors to heightened fraud risk, the decomposition approach may not add any more sensitivity to high risk opportunity and incentive factors. However, the data in their study were collected in December 2001 and, at that time, the issues related to Enron and Andersen were prominent in the business news and the impact of this issue affected all accounting firms at that time. In addition, Wilks and Zimbelman observed that auditors that participated in their later study they reported higher components and overall fraud risk assessments, which is in line with the audit environment with increasing risk and uncertainty. The current study results in high fraud risk conditions were also consistent with audit environment risk, as the auditors that took part in the experiments were more trained and experienced with identifying fraud risk factors, as well as familiar with a business climate that resulted from the big Wall Street scandals. However, Favere-Marchesi (2013) conducted their study in a similar risk environment to the current study but found that auditors were still not sensitive to the high level of incentive and opportunity. The second reason Wilks and Zimbelman (2004) gave to justify the insensitivity to high risk incentive and opportunity cues is the ceiling effect, which means that they have given too many high risk opportunity and incentive in their case, so that even auditors in the holistic approach may have strongly responded to those indicators. However, the current study included equal number of cues, three fraud risk factors for each of incentive, opportunities, and attitude, so this is might be the reason for auditors being highly sensitive to incentive and opportunity indicators.

The last reason Wilks and Zimbelman (2004) gave to explain why decomposition approach failed to increase auditors’ sensitivity to opportunity and incentive cues in high risk condition is that this approach might have helped auditors to perceive that attitude risk factors were at high levels. Thus, auditors realize the low risk of attitude, which counterbalance the increased sensitivity to the opportunity and incentive factors. Additionally, their analysis also suggests that decomposition might attract auditors’ attention more to the perception of high management integrity, which results in compensating for any concerns raised by the increased sensitivity to high risk opportunity and incentive cues.

Favere-Marchesi (2009) conducted one of the very few studies that examined decomposition impacts on fraud risk assessment when attitude indicates high fraud risk, as well as when attitude indicates low fraud risk condition. Their results are in line with those yielded by the current study, in that decomposition made participants more sensitive to opportunity and incentive risks in both low and high risk conditions. Moreover, the current results concur with those of Favere-Marchesi (2009) in that participants who evaluate the incentive and opportunity components of risk when management attitude risk level is high are more sensitive to opportunity and incentive risks than when attitude suggests low fraud risk. The findings reported by Favere-Marchesi (2009) also support those obtained in the W&Z model regarding the expectation about the audit environment risk, which is characterized by a high risk level related to management attitude, in that management attitude toward the risk level made managers more sensitive to opportunity and incentive risks in both low and high risk condition.

The regression analysis results in this current study provide different pattern of weighting from that noted by Norman et al. (2010), in that the internal auditors in their study significantly weighted attitude component in low risk condition. On the other hand, external auditors in this study weighted the two components of incentive and opportunity in low fraud risk. Similar to the prior studies, this current study highlights important facts that the risk of fraud regarding management attitude or character is not necessary to heighten an overall fraud risk assessment, but it did alert auditors to the fraud risk factors related to incentive and opportunity (Wilks and Zimbelman, 2004a; Favere-Marchesi, 2013, 2009). However, auditors found these factors to be at low level when management attitude is low, which lead them to assess the overall fraud risk level lower than it should be.

7.3.4 Analysis of Hurtt's professional skepticism scale

In the current research, Hurtt (2010) professional skepticism scale was used to measure the level of skepticism for the participants of this study and accordingly divide them in two groups (high and low skepticism). Hurtt (2010) developed a scale to measure the level of auditors' skepticism and provided an explanation of professional skepticism in terms of different characteristics of skeptics, including questioning mind, curiosity, self-determination, interpersonal skills, deliberating, and self-confidence. Reliability tests have been conducted in this study to measure the reliability for each dimension of Hurtt's professional skepticism scale. The total reliability of the Hurtt's scale in this study is 0.70, while Hurtt's reliability analysis with professional subjects was 0.86. That for the deliberating and questioning skills was 0.57 and 0.52, respectively, while in Hurtt's scale the same dimensions were 0.83 and 0.67. These differences can be justified because of the audit environment differences, as the auditors in the current study are in different environment, so the effect of culture on the professional skepticism may vary when performing audit work. The Auditing Practices Board (2010) in the United Kingdom has raised a concern about the issue of the possible influence of country environment, such as the effect of culture on the professional skepticism. In general, authors of past studies examined the impact of cultural differences on professional skepticism and reached the conclusion that the skeptical attitude of an individual auditor may be influenced by cultural environment (Ferrell and Gresham, 1985; Hamilton, 2011; Endrawes and Monroe, 2010; Hussin et al., 2013).

An independent samples t-test was performed to analyze the differences in skepticism between genders. The results of this test indicate that auditors' gender does not affect skepticism level. In other words, there are no differences between females and males when responding to professional skepticism scale dimensions. This result is in line with that noted by Hurtt et al. (2008), as their analysis shows that gender as covariance provides weaker results with regard to skepticism and skepticism inducing. In addition, the current research results regarding gender effect on skepticism are also consistent with those of Chung et al. (2005) who found no significant interaction effects between gender and mood on professional skepticism. Other prior studies also revealed that there are no significant differences between professional skepticism scores of males and females (Endrawes and Monroe, 2010; Peytcheva, 2013). In addition, chi-squared test was conducted to test the association between levels of skepticism and gender. The results of this test confirm those of the independent samples t-test between skepticism dimensions and gender, in that no associations between skepticism levels (high and low) and the gender of auditors were found.

Analysis of variance (ANOVA) was also conducted to test the effect of audit experience, experience of assessing fraud risk, levels of education, and professional position on the skepticism dimensions. The results of these tests reveal that the number of years of audit experience had no bearing on skepticism level, except curiosity. This result is consistent with those reported in many previous studies (Endrawes and Monroe, 2010; Peytcheva, 2013; Chung et al., 2005; Hurtt et al., 2008). However, Popova (2012) examined the presence or absence of auditor-client specific experience (CSE), and found that more skeptical auditors with negative CSE have reached a saturation point on their fraud assessment and that less skeptical auditors with positive CSE have small belief revision for final judgment.

Since auditor's professional position is linked to the number of years of experience, the ANOVA analysis results between professional position and skepticism indicate that professional position has no significant influence on the skepticism dimension. Similarly, the chi-squared tests revealed no significant association between the two levels of skepticism (high and low) and the years of audit experience and professional position.

Authors of previous studies found that senior auditors were less skeptical than staff auditors (Shaub and Lawrence, 1999; Payne and Ramsay, 2005; Vinten et al., 2005b). Vinten et al. (2005b) examined the effects of general audit experience on professional skepticism and the results indicate that the level of skepticism exhibited by the participants relied on the experience of the auditor, although they noted that seniors were significantly less skeptical. In addition, this finding was not significantly different for the moderate and high risk groups. These findings might indicate that senior auditors have audit knowledge that increases their confidence and reduces their skepticism, as well as pay less attention on ethical reasoning and thus have lower level of skepticism (Ponemon, 1990).

Payne and Ramsay (2005) conducted an experiment in which staff auditors and seniors took part to test the impact of experience on professional skepticism. Their findings indicate that the group that was provided with information about fraud risk factors was more skeptical than the group that was given no information. They asserted that "these results suggest that auditors anchor on low fraud risk assessments, which has an undesirable effect on the level of professional skepticism displayed when later presented with a new fraud risk factor. This type of response may potentially have serious adverse effects on the quality of audit work performed" (Payne and Ramsay (2005: p.326). In other words, when auditors are provided with a decision-making model that guides them and supplements them with information about different fraud risk factors, this will enhance and heighten auditors' skepticism. The current study provided auditors with decomposition approach that helped auditor to pay attention to the important fraud risk factors.

However, prior researchers argued that experienced auditors are not good in detecting fraud because, in typical audit engagement, auditors do not normally encounter fraud (Toba, 2012; Zimbelman, 2001; Carpenter et al., 2002; Montgomery et al., 2002). In addition, Carpenter et al. (2002) suggested that, since skepticism and knowledge are vital factors in fraud detection, it is an individual's experience (defined as practice and feedback) with fraud detection, rather than his/her experience with auditing financial statements, that allows him/her to effectively detect fraud.

High professional skepticism level should lead auditors to question evidence that does not make sense and to obtain additional management representations (Toba, 2012). However, requesting auditors to be more skeptical may not lead them to effectively assess fraud risk; instead, the experience or familiarity with fraud may play an effective role in enhancing their skepticism. According to Tversky and Kahneman (1974), the experience of an event makes this event more available in the memory, so the possibility or probability assessed by an auditor that a fraud has been committed should be directly related to the recall ability of a number of cases of fraud within his/her own environment. Similarly, Bonner and Walker (1994) suggested that knowledge of fraud is obtained when instruction is combined with experience, which is defined as 'practice with experience'.

Carpenter et al. (2002) noted that audit novices who were provided with practice and feedback that helped them build knowledge about fraud exhibited greater skepticism compared to the auditors who had auditing experience. The results of their study also indicate that the instruction provided by SAS No. 99 should be followed by training programs that involve practice and feedback before evaluating auditor's performance in fraud detection. On the other hand, prior experience with the same client reduced the chance of detecting fraud because of reduced level of professional skepticism (Nieschweitz et al., 2000). Loebbecke et al. (1989) also found that a quarter of all fraud cases were discovered in the first year of an audit, as audit firms might use unpredictable tests when accepting a client for the first time. However, the results of ANOVA in this current study pertaining to the skepticism dimensions and experience of assessing fraud risk reveal that the knowledge of fraud has a significant effect on just one of the skepticism dimensions which is "self-determination", and it has no impact on the remaining five dimensions of skepticisms (curiosity, self-confidence, interpersonal skills, deliberating, and questioning skills).

Shaub and Lawrence (1996) findings indicate that CPAs and highly experienced auditors are less likely to support situation ethics as an approach to ethical decision making. They also noted that, while greater number of years of public accounting should lead to higher levels of skepticism, CPAs were less likely than their uncertified colleagues to carry out additional testing and to confront the client and exhibited lower skepticism. However, the chi-squared test conducted in the current study for the association between the two levels of skepticisms (high and low) and the auditor's professional certificate indicated that there is a significant positive association between the level of skepticism and the professional certificate the auditor holds.

In addition, the results of ANOVA test of the mean difference in skepticism dimensions between levels of education indicate that there are significant difference in curiosity and questioning skills dimensions between auditors with different levels of education. The audit literature suggests that education is important factor affecting skepticism in audit judgment. According to Joyce (1976: p.30), "because strict guidelines for information collection and evaluation do not exist, there are no clear-cut right judgments available with which to compare individual professional judgments in most audit tasks; yet, if there exists a common core of audit knowledge germane to auditing, and if education, certification, and training process auditors undergo are successful in imparting that knowledge, one would expect to find agreement among the judgments of different auditors in the same audit situations". However, the current study's chi-squared test revealed no association between education levels and skepticism levels (high and low). This result can be justified in that the problem solving is not necessarily an important part of the education system; instead experience, training, and the type of audit engagement might have more impact on auditor's skeptical thinking (Joyce, 1976). However, education system can be considered as subculture that enhances the development of important skills related to audit judgment (Ostrosky-Solís et al., 2004).

7.3.5 Comparison analysis between low and high skepticism auditors when auditors are provided with decision-making process when assessing fraud risk

The findings of this current research indicate that there is no significant difference between the two groups of auditors (high and low skepticism) in both fraud risk conditions (high and low) when assessing fraud risk in the three process thinking stages (perception, judgment, and decision). One exception to this finding is that one significant difference was found in the judgment stage in low fraud risk condition. The result of this independent t-test is consistent with the initial expectation about the fraud risk assessment level in this study, in that the TP model helped both low and high skepticism groups to maintain the required skeptical thinking in assessing fraud risk. To justify this finding in the current research, it is worth mentioning what Toba (2011: p.108) concluded that "the only way to prepare auditors to recognize fraud is to sharpen their inquisitiveness, to increase their sensitivity to fraud, and to put it another way, to strengthen the depth of professional skepticism". Prior research provides evidence that skepticism inducing manipulations enhance skeptical judgment by auditors (Mueller and Anderson, 2002; Asare and McDaniel, 1996). Kadous and Zhou (2015) found that using many methods of judgment and decision making can help to isolate where the auditor's decision problems lie. Therefore, the TP employed in this study has sharpened the auditors' curiosity and questioning mind, in that even low risk auditors give high fraud risk in high risk condition.

Authors of previous studies also found that high professional skepticism leads auditors to perform greater amount of audit work, to assess greater possibility of fraud and that high professional skepticism is not necessary to improve the quality of the audit; instead, it might lead to increased quantity of audit work and cost (Popova, 2012; Quadackers et al., 2009; Fullerton and Durtschi, 2004; Hammersley et al., 2011; Kadous and Zhou, 2015). Thus, the findings in this present research confirm that highly skeptical auditors were able to give low assessment to low fraud risk condition.

The findings yielded by the current study are in line with those reported in prior auditing research in which researchers used different judgment framework and provided task-specific instructions and documentation requirements and found that the quality of fraud judgment improved (Hammersley et al., 2010; Bowlin et al., 2015; Rasso, 2013; Backof et al., 2013b; Backof et al., 2013a). The justification for these findings is that improving critical thinking is the key to improved auditors' judgment, rather than increased doubt that will result in increased amount of audit work (Hammersley et al., 2011; Hammersley, 2011). " We view critical thinking as a key determinant of whether auditors know what skeptical action, and so whether they can take appropriate skeptical action" (Griffith et al., 2015: p.55). This finding is also consistent with the results of Plumlee et al. (2012) study, where they trained auditors to be more skeptical and think critically, and their findings indicated that using divergent and convergent thinking training enhances both the number and the quality of explanations generated and leads to the possibility of choosing the accurate explanation. Divergent thinking needs auditors to mentally produce explanations for evidence or circumstances that recognize as unusual, and convergent thinking necessitates them to assess the plausibility of the explanations they create (Plumlee et al., 2012).

According to (PCAOB., 2006) one possible explanation for auditors' failure is that auditors are not provided with instructed process thinking that would lead them to exercise "a questioning mind". Hurley (2015) suggested that the frameworks that do not increase cognitive load are preferred to those that do because, when auditors work harder on one task, it is likely to impair their performance on the following task. Auditors in the current study made a use of the decomposing approach of SAS No. 99 in perception, judgment, and decision, in that the level of fraud risk being retrieved from memory after completing perception and judgment stage and was used in the decision stage. Thus, high and low skepticism groups in the current study were guided by simplifying approach that gave them a comprehensive overview of all fraud risk factors. This finding is also in line with the results noted by Koonce et al. (1993) who employed a framework similar to the current study in that auditors were asked to make analytical review based on four components: mental representation, hypothesis generation, information search, and hypothesis evaluation. They found that the reasons for unexpected fluctuations are assumed to be retrieved from memory from the assessment of these four components. Scott et al. (2004) conducted a meta analysis of 72 studies about the effectiveness of creativity training and found that the use of approaches that stress cognitive thinking activities are positively related to the good quality judgment.

Similar studies that presented auditors with judgment frameworks (task-specific instruction) to enhance auditors' assessment to the evidence provided revealed that judgment frameworks can effectively guide auditors to perform a task in a specified way and recognize various considerations (Backof et al., 2013a; Rasso, 2013). However, Griffith et al. (2015) argued that it is unclear that these frameworks influence auditors' critical thinking (professional skepticism) about the available evidence or simply provide them with specific cues to guide them to the required assessment. They added "thus, it is unclear whether auditor judgments are really improved (or are merely more conservative) and, if improved, whether the improvement generalizes to other situations and whether it can be sustained" (Griffith et al., 2015: p.56). Since the current study employed a framework that provided auditors with specific fraud cues that are related to a hypothetical client, the results cannot be generalized to other situations or other client firms.

In conclusion, professional skepticism has been found to be missing in audit practice and has not been effectively enhanced in experimental settings. On the other hand, scholars have found that some auditors are skeptical by nature and behave as the standards require, while others are not naturally skeptical and do not behave in skeptical way (Hurtt, 2010; Hurtt et al., 2012). The lack of skepticism reflects on auditors' propensity to reach a conclusion without obtaining sufficient appropriate audit evidence to support their audit opinion, without gaining a careful understanding of management assumptions and methodology, and without taking into consideration all available audit evidence (Griffith et al., 2015). The best way to deal with this issue is by formally training and encouraging auditors to be professionally skeptical (Plumlee et al., 2012). This current research extends prior literature that explored auditors' information processing behavior by focusing on a cognitive strategy that decomposes SAS No. 99 fraud risk factors into process thinking stages that led auditors to provide high quality assessment irrespective of the level of auditors' skepticism. The findings yielded by the analyses conducted as a part of this study provide empirical evidence on how these stages of the TP mode affect the information processing behaviors, audit judgment, and audit quality.

7.4 Summary

The main objective of this chapter was to explain and discuss the findings within the context of the extant literature. All the hypotheses developed in this study have been derived from pertinent literature; therefore, the discussions of the findings were linked to these literature sources. In sum, the study findings were found consistent with those reported by other researchers. The independent predictors were found to have an impact on dependent variables, which helped to draw and corroborate the final conclusions in this chapter.

The following chapter presents the conclusions and limitations of this study and provides some suggestions for avenues for future study.

Chapter 8 Conclusions

8.1 Introduction

This final chapter aims to sum up the study in relation to its questions, objectives, and findings. It begins with a summary of the study and then the main research findings are discussed. This chapter concludes with the limitations of the study and suggestions for future research.

8.2 Summary of the Study

Occurrences of fraud at big organizations such as Enron and WorldCom have given a wakeup call to the accounting profession in regards to the devastating effects of fraud. Auditor's responsibility to detect fraud is one of the objectives of the auditing profession and it has come to be the most important part of the audit experience after these highly publicized scandals. The fraud risk assessments are complex, critical, and multi-attribute judgment tasks that require intensive cognitive process to cope with conflicting information. Several studies have focused on fraud risk assessment process, some of which examined the effects of making separate assessment for fraud as different to holistic audit risk assessment and also decomposing the risk assessment (Zimbelman, 1997; Wilks and Zimbelman, 2004a). The decomposition approach has been viewed as a type of structure that helps and enhances auditors' ability in their judgmental process to reach effective and efficient audit results. The purpose of this study was to extend the work in this area, in that the goal was to examine whether decomposed process thinking affects the level of professional skepticism exhibited by auditors as they perform fraud risk assessment. Also, this study examined whether the components assessment of attitude, opportunity, and incentive influence the overall fraud risk assessments in the decision stage of the TP model. This study confirms that the TP model can work as a decision aid, following the recommendation in SAS No. 82 and 99/ ISA 240, along with fraud triangle factors. In addition, this dissertation addresses the research question of the impact of the decomposition approach and the requirement and recommendation under SAS No.99. The standard encourages auditors to consider factors along with opportunity, incentive, and attitude components of the fraud triangle factors when responding to the critical task like fraud risk assessments. From previous literature, decomposition might lead and help auditors to enhance their accuracy in their risk assessments without the need to modify or adjust the nature, time, or extent of their audit plans (Wilks and Zimbelman, 2004a). This study revealed that the employment of decomposition approach based on the categorization required under SAS No. 99, and the consideration of fraud risk attributes recommended under SAS No. 99, assisted auditors in fraud risk assessments. Thus, the procedures involved in fraud risk assessment provide reasoning instructions that motivate auditors to engage in systematic information processing and accordingly enhance the quality of fraud risk assessment. Auditors in this study were required to give separate assessment of the SAS No. 99 fraud risk factors, which were provided in a three-stage decision-making process. First, they were required to examine the fraud risk factors in the perception stage that should be influenced from the information provided in the hypothetical study. Next, they were required to analyze some of SAS No. 99 fraud risk factors in the judgment stage, and finally auditors were required to give separate assessment to each of fraud triangle components before giving an overall fraud risk assessment.

This research was conducted as a comparison study between high and low skepticism groups in their assessment of fraud risk factors in two levels of high and low fraud risk conditions. This comparison aimed to answer the research question if a decision aid, such as the decomposition of the SAS No.99 fraud risk factors in process thinking model, is going to enhance low skepticism auditors in their assessment of high risk fraud factors. The aim was also to establish if this decision aid is going to help high skepticism auditors maintain appropriate balance between high and low fraud risk factors. In other words, they should be giving low assessments level when the fraud condition suggests low fraud risk, and high assessments level when fraud risk suggests high fraud risk condition. Individual differences in skepticism influenced how auditors apply their cognitive effort to perform fraud risk assessments. Although skepticism and the ability to identify fraud are highly and positively correlated, authors of previous research found that high skepticism auditors might over-assess the fraud risk and also might lower the assessment of fraud risk because of strong contextual factors. Low skepticism auditors apply as much cognitive effort as do high skepticism auditors when they receive a cognitive guide into fraud risk assessment. Accordingly, this study confirmed that the decomposition approach in process thinking reduces the influence of skepticism on fraud risk assessments. In other words, high and low skepticism auditors both followed process thinking model that enhanced their fraud risk assessments.

To investigate the effect of SAS No. 99 factors that has been decomposed in the TP model, an experimental study is a suitable research method. Forty two auditors participated in the 2×2 between subjects design with two fraud risk levels (high, low) and two groups of auditors (high, low).

Before testing the study hypotheses, preliminary analyses were conducted to test the method bias and normality assumptions. The results show that method bias was not an issue in this study and the reliability of the scales was sufficient. All the assumptions underlying all the tests have been met.

8.3 Summary of the Research Findings

The finding of this study in general advocate that this decision aid is beneficial in the performance of comprehensive fraud risk assessments, and it has directed auditors' attention to wide classes of problems, especially when they are associated with the SAS No. 99 requirements. This study employed one of the ethical pathways in the TP model, which is explained in the literature as virtue ethics theory. The auditor would support his/her perception by collecting information that will be filtered also by perception, and go to the judgment and analysis level to reach a decision choice about the level of fraud risk.

The results of this research indicated that auditor's perception of the fraud indicators provided from SAS No. 99 and their memory of the financial information ratios of liquidity, profitability, and leverage have a significant influence on auditors' judgment of SAS No. 99 fraud factors. On the other hand, auditors' assessment of the fraud triangle components and the overall assessment were influenced by the judgment stage. In other words, auditors used their declarative knowledge and procedural knowledge to help them give assessment of Incentive, Opportunity, and Attitude before proceeding to the overall assessment. These results confirm those yielded by extant studies, indicating that breaking down the assessment into stages for the given fraud cues helps auditors to think more broadly about fraud risk factors (Wilks and Zimbelman, 2004a; Turkson and Riley, 2008; Johnson and Weber, 2009). Moreover, the results related to the pathways provide evidence that the virtue-driven pathway is not significant. In other words, auditors used the financial information to formulate their perception and had an influence on judgment that has been shown to affect the decision assessment.

The results of the regression analysis indicate that, when the fraud triangle components suggest high fraud risk, auditors were more sensitive to incentive and opportunity factors in assessing the overall fraud risk level. However, the experimental design used in this work is different from that adopted in Wilks and Zimbelman (2004a) and Favere-Marchesi (2013) studies as they manipulated incentive and opportunity factors into high and low fraud risk while keeping attitude constant (at low fraud risk). In addition, they were comparing between categorization assessment and decomposition assessment, whereas in this study, the effect of the fraud triangle components on the overall fraud risk assessment was tested. Therefore, the current study results suggest that, when attitude factor suggests high fraud risk, auditors pay more attention on the incentive and opportunity to drive the final assessment. However, when attitude suggests low risk, the results yielded by the present study are in line with those of Wilks and Zimbelman (2004a) and Favere-Marchesi (2013), in that auditors gave low assessment to incentive and opportunity and consequently low assessment to the overall fraud risk level. Also, auditors were sensitive to all three components of fraud triangle factors in low fraud condition.

After testing the third hypothesis, a Pearson correlation analysis was performed to determine whether incentive, opportunity, and attitude assessments were correlated with the overall fraud risk assessments. This step was necessary to confirm the results of the regression analysis and to provide evidence that component factors affect overall fraud risk assessments. Moreover, Pearson correlation analysis was used for testing the sensitivity of each component that flows from components risk assessment to overall fraud risk assessments. The Pearson correlation table in high risk condition confirms that fraud triangle components significantly correlate with overall assessment, and incentive and opportunity play the critical role in the overall fraud risk assessment. Conversely, attitude factor was more correlated to the overall fraud risk assessment than incentive and opportunity components.

Audit standards and audit professionals require auditors to exercise professional skepticism, which means having a questioning attitude and critical assessment of audit evidence (AICPA, 2002). SAS No. 99 requires auditors to put aside the prior positive beliefs pertaining to management integrity. Previous studies confirm that the auditor with more skeptical attitude or belief in the possibility of fraud should perceive a higher initial likelihood that fraud exists (Carpenter et al., 2002). Others argued that auditors need to experience fraud to increase their possibility of deducting fraud (Tversky and Kahneman, 1974). As a part of this study, a comparison analysis between two groups (high and low) skepticism auditors in two level of fraud risk (high and low) was performed. The purpose of this comparison was to examine the effect of the process thinking decomposition approach on the auditors' skepticism. The aim was also to test whether this approach enhances auditors' fraud risk assessments regardless of the level of skepticism they exhibit. Auditors seem to show differential judgment and decision making based on their level of skepticism; however, following structured process of thinking stages in fraud risk assessments induces or reduces skepticism to enhance the quality of the overall fraud risk assessment at the end of the task. The past auditing studies show that experience with many different kinds of fraud schemes may not be sufficient to prepare auditors to recognize other schemes (Toba, 2012). This study tested the relation between auditors' skepticism and auditors' experience and other demographic variables, such as gender, education, and professional position.

The findings indicate that, in general, auditors' skepticism was unrelated to the level of experience, educational attainment, professional position, and professional certificates. These findings can be justified because both high and low skepticism auditors where provided with structured guidance and process thinking stages that allow them to pay attention to every single element of the SAS No. 99 fraud risk factors. Accordingly, auditors with different levels of experience, education, and certificates where similar in responding to the fraud risk assessments. Additionally, this study comparison analysis shows that high and low skepticism auditors were not significantly different when performing fraud risk assessment. Thus, the cognitive decomposition approach was successful in enhancing their assessment level, whereby they gave high assessment when fraud risk suggested high fraud risk and low assessment when the condition suggested low fraud risk level. Auditors were able to recognize the relevance of some pieces of information and avoided depending on irrelevant information, which helped them to accurately respond to fraud risk assessments. Similar to Carpenter et al. (2002), the results of this study support the idea that experience should not be a function of years of work; instead, experience can be simulated in the appropriate training environment that combines practice with feedback.

The current auditing standards (AICPA, 2002; IAASB, 2004) urge auditors to consider assessing fraud risk factors through three separate assessment stages. Yet, they do not emphasize the power that comes from decomposing the judgment process into several parts (Favere-Marchesi, 2013). This study examined whether a decision-making model that separates the fraud risk assessment into three stages of perception, judgment, and decision can help auditors simplify their fraud risk assessment. In general, the results show that auditors used these decomposed stages in their judgmental process to assess the overall fraud risk assessments.

Overall, the results of this study confirm the need for increased attention on professional skepticism, since it is one of the requirements of SAS No. 99. There is a need to consider ways and efforts to enhance auditors' professional skepticism, such as training for auditors in exercising the Throughput (TP) decision-making stages when responding to complex tasks such as fraud risk assessments.

8.4 Limitations and Avenues for Future Research

The current study aimed to establish practical evidence of the effectiveness of a decision-making model (Throughput Model). While the findings support the relationship between fraud assessment process and process thinking stages that enhance the quality of fraud risk assessment, limitations in the present study should be considered carefully before seeking to generalize the findings. Generalizability refers to the level to which any given results are representative of the population as a whole. First, the present study was based on data collected from one country; therefore, the interpretations of results can just be generalized to other countries that include similar systems to the UK.

Second, both of the hypothetical clients' information and task requirement in the experiment were deliberately limited to necessary information to complete the task, in order to enhance internal validity. Particularly, the evidence reported here is not, by itself, adequate to reject the possible sensitivity of the results to characteristics of the decision circumstance or to changes in environmental conditions. Actual audit environments contain richer information than the information provided to the subjects in the current study. Moreover, there are environmental factors that may influence audit judgments in different cultures. However, using experimental approach rather than surveys will lower the affect of these factors (Bagranoff et al., 1994). Third, obtaining data and information in any type of research depends to a great extent on the cooperation of organizations or individuals to provide accurate, adequate, and reliable information. Thus, the sample size in this study, though it was sufficient for testing the research hypotheses, was still comparatively small. Auditors in local auditing firms in East Riding, Yorkshire, were not easy to reach, and many auditors received the instrument but failed to complete it. The instruments were distributed to 40 auditing firms; therefore, the researcher could only send remainders and follow-up messages to the auditors working for these firms. It is worth noting that there was no economic incentive offered to the participants and that the study participation was voluntary.

On the other hand, other unmeasured variables may have an influence on the participants' judgment performance. In addition, the differences in skepticism scale between two groups may not be significant to represent the high and low skepticism level. Nevertheless, the median split seems to be successful to a certain degree in differentiating two levels of skepticism. Moreover, in this work, Hurtt's scale was employed to measure auditors' professional skepticism, as the researcher believes this is appropriate, given that this scale was used in many prior studies (Carpenter et al., 2011a). However, there is reasonable argument on the exact meaning of professional skepticism and some readers' perceptive of the term may be different than the one in the current study.

Additionally, there was no direct manipulation check for the study variables; thus, the check of whether the manipulation worked depends on how auditors perceive the background information of the hypothetical client. The manipulation of study variables was based primarily on the hypothetical client history and how auditors perceive the fraud risk level. The manipulation used in the literature is frequently time consuming and was not practical for use with busy professionals. This study manipulation is simple to use and applicable to the audit context, yet it is independent of the audit task's content, so it is likely to be successful for a variety of audit tasks.

Finally, the research model was not compared to other decision-making models or even to a holistic approach. That, combined with of the small number of respondents, is a fruitful area for future research. The findings in this study provide support for the relationship between assessment stages of fraud risk assessments; however, many other questions remain unanswered. In addition, the associations between fraud triangle components and overall fraud risk assessments are not well understood. Thus, scholars are encouraged to replicate the fraud risk assessment procedures in different contexts and recruit different participants, which will help to enhance the understanding of different underlying judgment processes. Future research should consider choosing fraud risk factors that match the client context and environmental situations and should maintain the number of fraud risk factors and the extent to which fraud risk factors are attributable to fraudulent reporting. This study examined the effects of ethical dispositional pathway (virtue-based pathway) to help understand and explain complex relationships. Future research can be based on other factors that influence auditors' professional skepticism that provide insight into why they perform the audit the way they do. In addition, future research can apply the same existing study using auditors from different sized firms as participants.

Scholars and professionals in auditing focus their efforts on maximizing auditors' ability to engage in strategic reasoning. This reasoning plays a critical role in a fraud setting, which may help and support auditors to differently evaluate the fraud cues such as attitude or opportunity cues (Wilks and Zimbelman, 2004a). This reasoning process, if it starts from the audit planning stage, will be more effective at considering the ways management is manipulating and detect frauds that are less likely to be detected using normal audit procedures. Future research can investigate different strategic reasoning approaches that enhance auditors' ability to detect fraud. Moreover, this study raises other issues for future research in that the information used in this study included just three financial ratios (liquidity, profitability, and leverage); the information could be extended to include other internal information that might provide additional insight into likelihood of fraudulent financial reporting. Moreover, auditors in this study were required to give a separate fraud risk assessment to perception, judgment, and separate assessment to fraud triangle components before assessing the overall risk level. This process takes significantly more time to attend fraud risk factors. In future studies, researchers can make comparisons of budgeted hours between different stages of the fraud risk assessment process that follows the process thinking model and a holistic approach, where the fraud risk factors are listed with an overall fraud risk assessments to be assessed at the end.

References

Abbott, L. J., Parker, S. & Peters, G. F. (2002), Audit committee characteristics and financial misstatement: A study of the efficacy of certain blue ribbon committee recommendations. Availableat SSRN 319125

Abdullatif, M. (2013), "Fraud risk factors and audit programme modifications: Evidence from Jordan." Australasian Accounting, Business and Finance Journal, Vol. 7, No.1: pp. 59-77.

Agoglia, C. P., Beaudoin, C. & Tsakumis, G. T. (2009), "The effect of documentation structure and task-specific experience on auditors' ability to identify control weaknesses." *Behavioral Research in Accounting,* Vol. 21, No.1: pp. 1-17.

Ahadiat, N. & Mackie, J. J. (1993), "Ethics education in accounting: An investigation of the importance of ethics as a factor in the recruiting decisions of public accounting firms." *Journal of Accounting Education,* Vol. 11, No.2: pp. 243-257.

Ahadiat, N. & Smith, K. J. (1994), "A factor-analytic investigation of employee selection factors of significance to recruiters of entry-level accountants." *Issues in Accounting Education,* Vol. 9, No.1: pp. 59.

AICPA, A. I. o. C. (2005), AICPA professional standards. *(Vol. 2). New York: AICPA.*

AICPA, A. I. o. C. P. A. (1996), "Professional Standards." *U.S. Auditing Standards as of June 1,* Vol. 1, No.New York: AICPA ,1996.

AICPA, A. I. o. C. P. A. (1997a), Consideration of Fraud in a Financial Statement Audit. Statement on Auditing Standards No.82. New York, NY: AICPA.

AICPA, A. I. o. C. P. A. (1997b), "Statement on Auditing Standards No. 82: Consideration of fraud in Financial Statement Audit, ." New York: AICPA.

AICPA, A. I. o. C. P. A. (2002), Consideration of Fraud in a Financial Statement Audit. Statement on Auditing Standards No. 99. AICPA New York, NY.

AICPA, A. I. o. C. P. A. (2007), American Institute of Certified Public Accountants (AICPA). New York, NY: AICPA.

AICPA, N. C. o. F. F. R. (1987), "Report of the National Commission on Fraudulent Financial Reporting," The Commission.

AICPA, S. o. A. S. N. (1988), "The Auditors' Responsibility to Detect and report errors and irregularities." The Auditors' Responsibility to Detect and report errors and irregularities.

AICPA., A. I. o. C. P. A. (1997), "Statement on Auditing Standards No. 82: Consideration of fraud in Financial Statement Audit, ." New York: AICPA.

Ajzen, I. (1991), "The theory of planned behavior." Organizational behavior and human d*ecision processes,* Vol. 50, No.2: pp. 179-211.

Albrecht, W. S., Albrecht, C. & Albrecht, C. C. (2008), "Current trends in fraud and its detection." *Information security journal: A global perspective,* Vol. 17, No.1: pp. 2-12.

Albrecht, W. S. & Albrecht., C. O. (2003), Fraud Examination and Prevention. March 21. Mason, OH:Thompson-Southwestern.

Albrecht, W. S., Hill, N. C. & Albrecht, C. C. (2006), "The ethics development model applied to declining ethics in accounting." Australian Accounting Review, Vol. 16, No.38: pp. 30-40.

Albrecht, W. S., Romney, M. B., Cherrington, D., Payne, I., Roe, A. & Romney, M. (1986), "Red-flagging management fraud: A validation." Advances in Accounting, Vol. 3, No.323-333.

Altman, D. G. (1980), "Statistics and ethics in medical research. Misuse of statistics is unethical." *BMJ,* Vol. 281, No.6249: pp. 1182-1184.

Ames, D., Brazel, J. F., Jones, K. L., Rich, J. S. & Zimbelman, M. F. (2012), "Using Nonfinancial Measures to Improve Fraud Risk Assessments." *Current Issues in Auditing,* Vol. 6, No.1: pp. C28-C34.

Anandarajan, A. & Kleinman, G. (2011), "The impact of cognitive biases on fraudulent behaviour: the Leeson case." *International Journal of Behavioural Accounting and Finance,* Vol. 2, No.1: pp. 40-55.

Anderson, J. R. (1990), "*Cognitive psychology and its implications,"* WH Freeman/Times Books/Henry Holt & Co.

Anderson, J. R. (2013), "*Language, memory, and thought,"* Psychology Press.

Andersson, P. (2004), "Does experience matter in lending? A process-tracing study on experienced loan officers' and novices' decision behavior." *Journal of Economic Psychology,* Vol. 25, No.4: pp. 471-492.

Apostolou, B. A., Hassell, J. M., Webber, S. A. & Sumners, G. E. (2001), "The relative importance of management fraud risk factors." *Behavioral Research in Accounting,* Vol. 13, No.1: pp. 1-24.

Apostolou, N. & Crumbley, D. L. (2008), "Auditor's Responsibilities with Respect to Fraud: A Possible Shift?" *CPA JOURNAL,* Vol. 78, No.2: pp. 32.

Arens, A., Alvin, R. J. E., Mark, S. & Beasley, A. (2003), "*Assurance Service: An Integrated Approach,"* USA: Pearson Education, Inc.

Arkes, H. R., Shaffer, V. A. & Dawes, R. M. (2006), "Comparing holistic and disaggregated ratings in the evaluation of scientific presentations." *Journal of Behavioral Decision Making,* Vol. 19, No.5: pp. 429-439.

Armstrong, J. S., W. Denniston & Gordon, M. (1975), "The use of the decomposition principle in making judgments." *Organizational Behavior and Human Performance,* Vol. 14, No.257-263.

Asare, S. K., Davidson, R. A. & Gramling, A. A. (2008), "Internal auditors' evaluation of fraud factors in planning an audit: The importance of audit committee quality and management incentives." *International Journal of Auditing,* Vol. 12, No.3: pp. 181-203.

Asare, S. K. & McDaniel, L. S. (1996), "The effects of familiarity with the preparer and task complexity on the effectiveness of the audit review process." *Accounting Review*, No.139-159.

Asare, S. K., Wright, A. & Zimbelman, M. F. (2015), "Challenges Facing Auditors in Detecting Financial Statement Fraud: Insights from Fraud Investigations." *Journal of Forensic & Investigative Accounting,* Vol. 7, No.2: pp. 63-112

Asare, S. K. & Wright, A. M. (2004), "The Effectiveness of Alternative Risk Assessment and Program Planning Tools in a Fraud Setting*." *Contemporary Accounting Research,* Vol. 21, No.2: pp. 325-352.

Ashari, A. (2013), "Corruption Awareness, Ethical Sensitivity, Professional Skepticism and Risk of Corruption Assessment: Exploring the Multiple Relationship in Indonesian Case," *2013*, at Financial Markets & Corporate Governance Conference.

Auditing Practices Board, U. A. (2010), Discussion Paper – Auditor Scepticism: Raising the Bar.

Avolio, B. J., Yammarino, F. J. & Bass, B. M. (1991), "Identifying common methods variance with data collected from a single source: An unresolved sticky issue." *Journal of Management,* Vol. 17, No.3: pp. 571-587.

Backof, A., CARPENTER, T. & THAYER, J. (2013a), Auditing Fair Value Estimates: The Effect of Management's Supporting Evidence on Auditors' Assessments of Aggressive Assumptions. *WorNing paper, University of Virginia.*

Backof, A. G., Bamber, E. M. & Carpenter, T. D. (2013b), "More precise versus less precise accounting standards: The effect of auditor judgment frameworks in constraining aggressive reporting." *University of Georgia*.

Bagozzi, R. P. & Yi, Y. (1991), "Multitrait-multimethod matrices in consumer research." *Journal of Consumer Research*, No.426-439.

Bagranoff, N. A., Houghton, K. A. & Hronsky, J. (1994), "The structure of meaning in accounting: A cross-cultural experiment." *Behavioral Research in Accounting,* Vol. 6, No.Supplement: pp. 35-57.

Baker, D., Bridges, D., Hunter, R., Johnson, G., Krupa, J., Murphy, J. & Sorenson, K. (2002), "Guidebook to decision-making methods." *Department of Energy, USA*.

Baron, R. M. & Kenny, D. A. (1986), "The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations." *Journal of personality and social psychology,* Vol. 51, No.6: pp. 1173.

Beach, L. R., Townes, B. D., Campbell, F. L. & Keating, G. W. (1976), "Developing and testing a decision aid for birth planning decisions." *Organizational Behavior and Human Performance,* Vol. 15, No.1: pp. 99-116.

Beasley, M. S. (1996), "An empirical analysis of the relation between the board of director composition and financial statement fraud." *Accounting Review*, No.443-465.

Beasley, M. S., Carcello, J. V., Hermanson, D. R. & Lapides, P. D. (2000), "Fraudulent financial reporting: Consideration of industry traits and corporate governance mechanisms." *Accounting Horizons,* Vol. 14, No.4: pp. 441-454.

Beauchamp, T. L. B., N.E. (1997), Ethical theory and business. Upper Saddle River,
NJ: Prentice Hall (Eds.).

Bedard, J. C. & Graham, L. (1994), AUDITORS KNOWLEDGE ORGANIZATION-OBSERVATIONS FROM AUDIT PRACTICE AND THEIR IMPLICATIONS. AMER ACCOUNTING ASSOC 5717 BESSIE DR, SARASOTA, FL 34233.

Bedard, J. C. & Graham, L. E. (2002), "The effects of decision aid orientation on risk factor identification and audit test planning." Auditing: A Journal of Practice & Theory, Vol. 21, No.2: pp. 39-56.

Bell, T. B. & Carcello, J. V. (2000), "A decision aid for assessing the likelihood of fraudulent financial reporting." Auditing: A Journal of Practice & Theory, Vol. 19, No.1: pp. 169-184.

Bell, T. B., Peecher, M. E. & Solomon, I. (2005), "The 21st Century Public Company Audit: Conceptuals Elements of KPMG's Global Audit Methodology," KPMG International.

Bendat, J. S. & Piersol, A. G. (2011), "Random data: analysis and measurement procedures," John Wiley & Sons.

Beneish, M. D. (1997), "Detecting GAAP violation: Implications for assessing earnings management among firms with extreme financial performance." Journal of accounting and public policy, Vol. 16, No.3: pp. 271-309.

Bentham, J. (1789), "A utilitarian view." *Animal rights and human obligations*, No.25-26.

Berk, R., Barnes, G., Ahlman, L. & Kurtz, E. (2010), "When second best is good enough: a comparison between a true experiment and a regression discontinuity quasi-experiment." *Journal of Experimental Criminology,* Vol. 6, No.2: pp. 191-208.

Bernard, E. & Whitley, J. (2002), Principles of research in behavioral science. New York: McGraw-Hill.

Bernardi, R. A. (1994), "Fraud detection: The effect of client integrity and competence and auditor cognitive style." *Auditing,* Vol. 13, No.68.

Bierstaker, J. L., Brazel, J., Caster, P. & Reed, B. J. (2010a), "American Institute of Certified Public Accountants'(AICPA) Professional Ethics Executive Committee's (PEEC) Omnibus Proposal of Professional Ethics Division Interpretations and Rulings." *Current Issues in Auditing,* Vol. 4, No.1: pp. C10-C11.

Bierstaker, J. L., Seol, I., Alon, A. & Dwyer, P. (2010b), "The impact of groups and decision aid reliance on fraud risk assessment." *Management Research Review,* Vol. 33, No.3: pp. 240-256.

Bierstaker, J. L. & Wright, S. (2001), "A research note concerning practical problem-solving ability as a predictor of performance in auditing tasks." *Behavioral Research in Accounting,* Vol. 13, No.1: pp. 49-62.

Birnberg, J. G. & Shields, M. D. (1984), "The role of attention and memory in accounting decisions." *Accounting, Organizations and Society,* Vol. 9, No.3: pp. 365-382.

Bloomfield, R. (1995), "Strategic dependence and inherent risk assessments." *Accounting Review*, No.71-90.

Blum, L. A. (1988), "Gilligan and Kohlberg: Implications for moral theory." *Ethics,* Vol. 98, No.3: pp. 472-491.

Blumberg, B., Cooper, D. & Schindler, P. (2005), "Survey Research." *Business research methods*, No.243-276.

Boatsman, J. R., Moeckel, C. & Pei, B. K. (1997), "The effects of decision consequences on auditors' reliance on decision aids in audit planning." *Organizational Behavior and Human Decision Processes,* Vol. 71, No.2: pp. 211-247.

Boldizar, A. & Korhonen, O. (1999), "Ethics, morals and international law." *European Journal of International Law,* Vol. 10, No.2: pp. 279-311.

Bonner, S. E. (2007), "*Judgment and decision making in accounting,"* Prentice Hall.

Bonner, S. E. (2008), "*Judgment and decision making in accounting,"* Prentice Hall.

Bonner, S. E., Libby, R. & Nelson, M. W. (1996), "Using decision aids to improve auditors' conditional probability judgments." *Accounting Review*, No.221-240.

Bonner, S. E. & Walker, P. L. (1994), "The effects of instruction and experience on the acquisition of auditing knowledge." *Accounting Review*, No.157-178.

Boritz, J. E. & Timoshenko, L. M. (2014), "On the use of checklists in auditing: A commentary." *Current Issues in Auditing,* Vol. 8, No.1: pp. C1-C25.

Bowlin, K. O., Hobson, J. L. & Piercey, M. D. (2015), "The effects of auditor rotation, professional skepticism, and interactions with managers on audit quality." *The Accounting Review,* Vol. 90, No.4: pp. 1363-1393.

Boyle, D. M. & Carpenter, B. W. (2015), "Demonstrating Professional Skepticism." *The CPA Journal,* Vol. 85, No.3: pp. 31.

Bradley, W. & Oaks, K. S. T. (1999), The uses and misuses of data and models. The mathematization of the human sciences. Wiley Online Library.

Brass, D. J., Butterfield, K. D. & Skaggs, B. C. (1998), "Relationships and unethical behavior: A social network perspective." *Academy of Management Review,* Vol. 23, No.1: pp. 14-31.

Braun, R. L. (2000), "The effect of time pressure on auditor attention to qualitative aspects of misstatements indicative of potential fraudulent financial reporting." *Accounting, Organizations and Society,* Vol. 25, No.3: pp. 243-259.

Brazel, J. F., Carpenter, T. & Jenkins, G. (2007), A field investigation of auditors' use of brainstorming in the consideration of fraud. *Available at SSRN 965453.*

Brazel, J. F., Jones, K. L. & Zimbelman, M. F. (2009), "Using nonfinancial measures to assess fraud risk." *Journal of Accounting Research,* Vol. 47, No.5: pp. 1135-1166.

Bressler, M. S. & Bressler, L. A. (2007), "A model for prevention and detection of criminal activity impacting small business." *The Entrepreneurial Executive,* Vol. 12, No.23-36.

Broadie, S. (1991), Ethics with Aristotle.

Brockman, M. & Russell, S. (2009), Decision-making/reasoning skills.

Broder, I. E. (1993), "Review of NSF economics proposals: Gender and institutional patterns." *The American Economic Review,* Vol. 83, No.4: pp. 964-970.

Brown-Liburd, H. L., Cohen, J. & Trompeter, G. (2013), "Effects of earnings forecasts and heightened professional skepticism on the outcomes of client–auditor negotiation." *Journal of business ethics,* Vol. 116, No.2: pp. 311-325.

Brown, C. E. & Murphy, D. S. (1990), "The use of auditing expert systems in public accounting." *Journal of Information Systems,* Vol. 4, No.3: pp. 63-72.

Bryman, A. & Bell, E. (2007), Business research strategies. *Business research methods.*

Bryman, A. & Bell, E. (2015), "*Business research methods,"* Oxford University Press, USA.

Bunge, M. (1991), "A skeptic's beliefs and disbeliefs." *New Ideas in Psychology,* Vol. 9, No.2: pp. 131-149.

Burns, N. & Kedia, S. (2006), "The impact of performance-based compensation on misreporting." *Journal of financial economics,* Vol. 79, No.1: pp. 35-67.

Campbell, D. T. & Fiske, D. W. (1959), "Convergent and discriminant validation by the multitrait-multimethod matrix." *Psychological bulletin,* Vol. 56, No.2: pp. 81.

Caputo, G. A. (2000), "The “voice of justice” vs. the “voice of care” in the assignment of criminal sanctions." *Current Psychology,* Vol. 19, No.1: pp. 70-81.

Carcello, J. V. & Palmrose, Z.-V. (1994), "Auditor litigation and modified reporting on bankrupt clients." *Journal of Accounting Research*, No.1-30.

Carpenter, T., Durtschi, C. & Gaynor, L. M. (2002), "The role of experience in professional skepticism, knowledge acquisition, and fraud detection." *Retrieved February,* Vol. 17, No.2012.

Carpenter, T. & Reimers, J. L. (2009), "Professional skepticism: the effects of a partner’s influence and the presence of fraud on auditors’ fraud judgments and actions.".

Carpenter, T. D. (2007), "Audit team brainstorming, fraud risk identification, and fraud risk assessment: Implications of SAS No. 99." *The Accounting Review,* Vol. 82, No.5: pp. 1119-1140.

Carpenter, T. D., Durtschi, C. & Gaynor, L. M. (2011a), "The incremental benefits of a forensic accounting course on skepticism and fraud-related judgments." *Issues in Accounting Education,* Vol. 26, No.1: pp. 1-21.

Carpenter, T. D., J. L. Reimers, a. & Fretwell, P. Z. (2006), Improving auditors’ fraud risk assessments: Thebenefits of brainstorming in groups. Working paper, University of Georgia.

Carpenter, T. D. & Reimers, J. L. (2013), "Professional Skepticism: The Effects of a Partner's Influence and the Level of Fraud Indicators on Auditors' Fraud Judgments and Actions." Behavioral Research in Accounting, Vol. 25, No.2: pp. 45-69.

Carpenter, T. D., Reimers, J. L. & Fretwell, P. Z. (2011b), "Internal auditors' fraud judgments: The benefits of brainstorming in groups." Auditing: A Journal of Practice & Theory, Vol. 30, No.3: pp. 211-224.

Carse, A. L. (1991), "The ‘voice of care’: implications for bioethical education." *Journal of Medicine and Philosophy,* Vol. 16, No.1: pp. 5-28.

Casabona, P. & Grego, M. J. (2003), "SAS 99-Consideration of fraud in a financial statement audit: A revision of statement on auditing standards 82." *Review of Business, Spring*, No.16-20.

Caylor, M. L. (2010), "Strategic revenue recognition to achieve earnings benchmarks." *Journal of Accounting and Public Policy,* Vol. 29, No.1: pp. 82-95.

Champney, H. & Marshall, H. (1939), "Optimal refinement of the rating scale." *Journal of Applied Psychology,* Vol. 23, No.3: pp. 323.

Chapman, G. B. & Johnson, E. J. (2002), "Incorporating the irrelevant: Anchors in judgments of belief and value." *Heuristics and biases: The psychology of intuitive judgment*, No.120-138.

Charness, G., Gneezy, U. & Kuhn, M. A. (2012), "Experimental methods: Between-subject and within-subject design." *Journal of Economic Behavior & Organization,* Vol. 81, No.1: pp. 1-8.

Check, J. & Schutt, R. (2012), "Survey research." *Research methods in education. Thousand Oaks, CA:: Sage Publications*, No.159-185.

Chen, W. & Hirschheim, R. (2004), "A paradigmatic and methodological examination of information systems research from 1991 to 2001." *Information systems journal,* Vol. 14, No.3: pp. 197-235.

Chen, W., Khalifa, A. S. & Trotman, K. T. (2014), "Facilitating Brainstorming: Impact of Task Representation on Auditors' Identification of Potential Frauds." *AUDITING: A Journal of Practice & Theory,* Vol. 34, No.3: pp. 1-22.

Cheney, G. (2005), "New guidance on SAS 99: do auditors get enough?" *Accounting Today,* Vol. 19, No.1: pp. 3-4.

Chewning, E. G. & Harrell, A. M. (1990), "The effect of information load on decision makers' cue utilization levels and decision quality in a financial distress decision task." *Accounting, Organizations and Society,* Vol. 15, No.6: pp. 527-542.

Chi, M. & Glaser, R. Rees ,E., 1982: Expertise in problem solving. S. 7-75 in RJ Sternberg (Hrsg.), Advances in the psychology of human intelligence (Vol. 1). Hillsdale, NJ: Erlbaum.

Chin, W. W. (1998), "The partial least squares approach to structural equation modeling." *Modern methods for business research,* Vol. 295, No.2: pp. 295-336.

Chippendale, P. (2001), "On values, ethics, morals & principles." *URL: www. minessence. net (Accessed 19 December 2009)*.

Choo, F. & Trotman, K. T. (1991), "The relationship between knowledge structure and judgments for experienced and inexperienced auditors." *Accounting Review*, No.464-485.

Choudrie, J. & Dwivedi, Y. K. (2005), "Investigating the research approaches for examining technology adoption issues." *Journal of Research Practice,* Vol. 1, No.1: pp. 1.

Christ, M. Y. (1993), "Evidence on the nature of audit planning problem representations: An examination of auditor free recalls." *Accounting Review*, No.304-322.

Christensen, L. B., Breakwell, G., Hammond, S. & Fife-Schaw, C. (2001), Experimental Methodology, (2001).

Christensen, L. B., Johnson, B. & Turner, L. A. (2011), "*Research methods, design, and analysis,"* Allyn & Bacon.

Chui, L. & Pike, B. (2013), Auditors' responsibility for fraud detection: New wine in old bottles? *Journal of Forensic and Investigative Accounting.*

Chung, J., Cohen, J. & Monroe, G. S. (2005), "A research note on the effect of mood states on professional skepticism," *AAA 2005 Annual Meeting,*, at San Francisco.

Chung, J. & Monroe, G. (1998), "Gender differences in information processing: an empirical test of the hypothesis-confirming strategy in an audit context." *Accounting & Finance,* Vol. 38, No.2: pp. 265-279.

Chung, J. & Monroe, G. S. (2001), "A research note on the effects of gender and task complexity on an audit judgment." *Behavioral Research in Accounting,* Vol. 13, No.1: pp. 111-125.

Chung, J. O., Cohen, J. R. & Monroe, G. S. (2008), "The effect of moods on auditors' inventory valuation decisions." Auditing: A Journal of Practice & Theory, Vol. 27, No.2: pp. 137-159.

Churchill, G. A. & Iacobucci, D. (2010), Marketing research: methodological foundations.

Churchill Jr, G. A. (1979), "A paradigm for developing better measures of marketing constructs." Journal of marketing research, No.64-73.

Chye Koh, H. & Woo, E.-S. (1998), "The expectation gap in auditing." Managerial Auditing Journal, Vol. 13, No.3: pp. 147-154.

CICA, C. I. o. C. A. (2004), General Assurance and Auditing Section 5135:The Auditor’s Responsibility to Consider Fraud and Error. Toronto, ON: CICA.

Cochran, W. G. (1952), "The χ2 test of goodness of fit." The Annals of Mathematical Statistics, No.315-345.

Cohen, F. (2002), "Computer fraud scenarios: Robbing the rich to feed the poor." *Computer Fraud & Security,* Vol. 2002, No.12: pp. 5-6.

Cohen, J. (1992), "A power primer." *Psychological bulletin,* Vol. 112, No.1: pp. 155.

Cohen, J. R., Dalton, D. W. & L Harp, N. (2014), The Effect of Professional Skepticism on Job Attitudes and Turnover Intentions within the Audit Profession.

Cohen, L., Manion, L. & Morrison, K. (2013), "*Research Methods in Education [7 th edn] London: Routledge Falmer."*

Cohen, M. A. (1988), "SOME NEW EVIDENCE ON THE SERIOUSNESS OF CRIME*." *Criminology,* Vol. 26, No.2: pp. 343-353.

Cohen, S. G. & Ledford, G. E. (1994), "The effectiveness of self-managing teams: A quasi-experiment." *Human Relations,* Vol. 47, No.1: pp. 13-43.

Coleman, J. W. (1987), "Toward an integrated theory of white-collar crime." *American Journal of Sociology*, No.406-439.

Coleman, J. W. (1992), "The theory of white-collar crime: From Sutherland to the 1990s." *White-collar crime reconsidered*, No.53-77.

Collis, J. & Hussey, R. (2013), "*Business research: A practical guide for undergraduate and postgraduate students,"* Palgrave macmillan.

Commission, C. (1978), "The Commission on Auditors' Responsibilities: Report, Conclusions, and Recommendations." *New York*,.

Cook, R. D. & Olive, D. J. (2012), A note on visualizing response transformations in regression. *Technometrics.*

Cooke, N. J. (1994), "Varieties of knowledge elicitation techniques." *International Journal of Human-Computer Studies,* Vol. 41, No.6: pp. 801-849.

Cooper, D. R., Schindler, P. S. & Sun, J. (2006), Business research methods.

Cordeiro, C., Machás, A. & Neves, M. M. (2010), "A Case Study of a Customer Satisfaction Problem: Bootstrap and Imputation Techniques." *Handbook of Partial Least Squares.* Springer: pp. 279-287.

Cosmides, L. & Tooby, J. (2008), "Can a general deontic logic capture the facts of human moral reasoning? How the mind interprets social exchange rules and detects cheaters." *Moral psychology,* Vol. 1, No.53-119.

Cowperthwaite, P. (2012), "Are checklists killing our profession." *CA Magazine*, No.38-39.

Craighead, C. W., Ketchen, D. J., Dunn, K. S. & Hult, G. T. M. (2011), "Addressing common method variance: guidelines for survey research on information technology, operations, and supply chain management." *Engineering Management, IEEE Transactions on,* Vol. 58, No.3: pp. 578-588.

Cressey, D. R. (1950), "The criminal violation of financial trust." *American Sociological Review*, No.738-743.

Creswell, J. (2003), Research Design: Qualitative, Quantitative Aand Mixed-Methods. Thousand Oaks, CA.: Sage Publications.

Creswell, J. W. (2002), "*Educational research: Planning, conducting, and evaluating quantitative,"* Prentice Hall.

Creswell, J. W. & Clark, V. L. P. (2007), Designing and conducting mixed methods research.

Crocker, L. M. & Algina, J. (1986), "*Introduction to classical and modern test theory,"* JSTOR.

Cronbach, L. J. (1951), "Coefficient alpha and the internal structure of tests." *psychometrika,* Vol. 16, No.3: pp. 297-334.

Cronbach, L. J. (1957), "The two disciplines of scientific psychology." *American psychologist,* Vol. 12, No.11: pp. 671.

Culbertson, A. & Rodgers, W. (1997), "Improving Managerial Effectiveness in the Workplace: The Case of Sexual Harassment of Navy Women1." *Journal of Applied Social Psychology,* Vol. 27, No.22: pp. 1953-1971.

Curtis, M. B. (2010), An experimental examination of the effects of fraud specialist and audit mindsets on fraud risk assessments and on the development of fraud-related problem representations. University of North Texas.

Curtis, M. J., Bond, R. A., Spina, D., Ahluwalia, A., Alexander, S., Giembycz, M. A., Gilchrist, A., Hoyer, D., Insel, P. A. & Izzo, A. A. (2015), "Experimental design and analysis and their reporting: new guidance for publication in BJP." *British journal of pharmacology,* Vol. 172, No.14: pp. 3461-3471.

Curtis, R. K. (2014), "*Breaking the Barrier–An Examination into the Current State of Professional Skepticism,"* Honors Scholar Theses. No of pages:340.

Cushing, B. E., Loebbecke, J. K. & Association, A. A. (1986), "*Comparison of audit methodologies of large accounting firms,"* American accounting association.

Daniel, S. J. (1988), SOME EMPIRICAL-EVIDENCE ABOUT THE ASSESSMENT OF AUDIT RISK IN PRACTICE. AMER ACCOUNTING ASSOC 5717 BESSIE DR, SARASOTA, FL 34233.

Daukas, N. (1994), "Scepticism and the framework-relativity of enquiry." *Ratio,* Vol. 7, No.2: pp. 95-110.

Davion, V. (1993), "Autonomy, integrity, and care." *Social Theory and Practice,* Vol. 19, No.2: pp. 161-182.

DAVIS, D. & Cosenza, R. M. (2005), "*Business Research For Decision Making/Duane Davis And Robert M. Cosenza.*"

Davis, G. B. & Olson, M. H. (1984), "Management information systems: conceptual foundations, structure, and development," McGraw-Hill, Inc.

Dawes, J. G. (2008), "Do data characteristics change according to the number of scale points used? An experiment using 5 point, 7 point and 10 point scales." International journal of market research, Vol. 51, No.1: pp.

Dawes, R. M., Faust, D. & Meehl, P. E. (1993), Statistical prediction versus clinical prediction: Improving what works. A handbook for data analysis in the behavioral sciences: Methodological issues Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc

De Dreu, C. K., Nijstad, B. A. & van Knippenberg, D. (2008), "Motivated information processing in group judgment and decision making." Personality and Social Psychology Review, Vol. 12, No.1: pp. 22-49.

Dechow, P. M., Sloan, R. G. & Sweeney, A. P. (1996), "Causes and consequences of earnings manipulation: An analysis of firms subject to enforcement actions by the sec*." Contemporary accounting research, Vol. 13, No.1: pp. 1-36.

Desai, N. (2008), "Brainstorming and Auditors' Fraud Risk Assessments in the Presence of Pressures and Opportunities," ProQuest.

Desai, N. (2015a), The Effects of Fraud Risk Factors and Client Characteristics on Audit Procedures. Indian Institute of Management Ahmedabad, Research and Publication Department.

Desai, N. (2015b), The Effects of Group Brainstorming on the Auditor’s Search for Potential Misstatements and Assessment of Fraud Risk in the Presence of Pressures and Opportunities. Indian Institute of Management Ahmedabad, Research and Publication Department

Desai, N. & Gupta, V. (2015), Selective Perceptions and Group Brainstorming: An Investigation of Auditors’ Fraud Risk Assessment. Indian Institute of Management Ahmedabad, Research and Publication Department.

Deutsch, M. (1958), "Trust and suspicion." Journal of conflict resolution, No.265-279.

DiGabriele, J. A. (2009), "Implications of regulatory prescriptions and audit standards on the evolution of forensic accounting in the audit process." Journal of Applied Accounting Research, Vol. 10, No.2: pp. 109-121.

Diggle, P. J. (1988), "An approach to the analysis of repeated measurements." Biometrics, No.959-971.

Dillman, D. A., Smyth, J. D. & Christian, L. M. (2014), "*Internet, phone, mail, and mixed-mode surveys: the tailored design method,"* John Wiley & Sons.

Dobson, J. & Armstrong, M. (1995), "Application of virtue ethics theory: a lesson from architecture." *Research on Accounting Ethics,* Vol. 1, No.187-202.

Dorminey, J., Fleming, A. S., Kranacher, M.-J. & Riley Jr, R. A. (2012), "The evolution of fraud theory." *Issues in Accounting Education,* Vol. 27, No.2: pp. 555-579.

Dorr, P. E. (1995), "The impact of elaboration-based expert system interfaces on de-skilling: An epistemological issue." *Journal of information Systems,* Vol. 9, No.5: pp. 1-17.

Dowie, J. (1993), "Clinical decision analysis: background and introduction." *Analysing how we reach clinical decisions*.

Dror, I. E. (2005), "Perception is far from perfection: the role of the brain and mind in constructing realities." *Behavioral and Brain Sciences,* Vol. 28, No.06: pp. 763-763.

Dror, I. E. & Fraser-Mackenzie, P. (2008a), "Cognitive biases in human perception, judgment, and decision making: Bridging theory and the real world." *In, Criminal Investigative Failures Taylor & Francis*, No.53-67.

Dror, I. E. & Fraser-Mackenzie, P. (2008b), "Cognitive biases in human perception, judgment, and decision making: Bridging theory and the real world." No.53-67.

Dubinsky, A. J. & Loken, B. (1989), "Analyzing ethical decision making in marketing." *journal of Business Research,* Vol. 19, No.2: pp. 83-107.

Dunlap, W. P., Cortina, J. M., Vaslow, J. B. & Burke, M. J. (1996), "Meta-analysis of experiments with matched groups or repeated measures designs." *Psychological Methods,* Vol. 1, No.2: pp. 170.

Dunn, P. (2004), "The impact of insider power on fraudulent financial reporting." *Journal of management,* Vol. 30, No.3: pp. 397-412.

Easterby-Smith, M., Thorpe, R. & Jackson, P. R. (2012), "*Management research,"* Sage.

Ebimobowei, A., Kereotu, O. J. & Brass Island, P. (2011), "Role theory and the concept of audit expectation gap in South-South, Nigeria." *Current Research Journal of Social Sciences,* Vol. 3, No.6: pp. 445-452.

Edgley, C., Jones, M. J. & Atkins, J. (2015), "The adoption of the materiality concept in social and environmental reporting assurance: A field study approach." *The British Accounting Review,* Vol. 47, No.1: pp. 1-18.

Edwards, J. R. & Lambert, L. S. (2007), "Methods for integrating moderation and mediation: a general analytical framework using moderated path analysis." *Psychological methods,* Vol. 12, No.1: pp. 1.

Edwards, W. (1966), Nonconservative probabilistic information processing systems. DTIC Document.

Efendi, J., Srivastava, A. & Swanson, E. P. (2007), "Why do corporate managers misstate financial statements? The role of option compensation and other factors." *Journal of Financial Economics,* Vol. 85, No.3: pp. 667-708.

Eichhorn, B. R. (2014), Common Method Variance Techniques. IN AA11-2014, P. (Ed.).

Einhorn, H. J. (1972), "Expert measurement and mechanical combination." *Organizational behavior and human performance,* Vol. 7, No.1: pp. 86-106.

Einhorn, H. J. (1974), "Expert judgment: Some necessary conditions and an example." *Journal of Applied Psychology,* Vol. 59, No.5: pp. 562.

Einhorn, H. J. & Hogarth, R. M. (1981a), "Behavioral decision theory: Processes of judgment and choice." *Journal of Accounting Research*, No.1-31.

Einhorn, H. J. & Hogarth, R. M. (1981b), "Behavioral decision theory: Processes of judgment and choice." *Journal of Accounting Research,* Vol. 32, No.31: pp. 53-88.

Eining, M. M., Jones, D. R. & Loebbecke, J. K. (1997a), "Reliance on decision aids: An examination of auditors' assessment of management fraud." *Auditing: A Journal of Practice & Theory,* Vol. 16, No.2: pp. 1-19.

Eining, M. M., Jones, D. R. & Loebbecke, J. K. (1997b), "Reliance on decision aids: An examination of auditors’ assessment of management fraud." *Auditing: A Journal of Practice & Theory,* Vol. 16.

Endrawes, M. & Monroe, G. S. (2010), "*Professional Scepticism of Auditors: A Cross-Cultural Experiment,"* University of Western Sydney.

Evans, J. S. B. (1989), "*Bias in human reasoning: Causes and consequences,"* Lawrence Erlbaum Associates, Inc.

F. Hair Jr, J., Sarstedt, M., Hopkins, L. & G. Kuppelwieser, V. (2014), "Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research." *European Business Review,* Vol. 26, No.2: pp. 106-121.

Farber, D. B. (2005), "Restoring trust after fraud: Does corporate governance matter?" The Accounting Review, Vol. 80, No.2: pp. 539-561.

Favere-Marchesi, M. (2009), "Cognitive effects of decomposition on fraud-risk assessments," at CAAA Annual Conference

Favere-Marchesi, M. (2013), "Effects of Decomposition and Categorization on Fraud-Risk Assessments." AUDITING: A Journal of Practice & Theory, Vol. 32, No.4: pp. 201-219.

Favere-Marchesi, M. & Pincus, K. V. (2006), "The impact of accountability on the processing of nondiagnostic evidence." Advance in Accounting Behavioral Research, No.1-25.

Ferrell, O. C. & Gresham, L. G. (1985), "A contingency framework for understanding ethical decision making in marketing." The Journal of Marketing, No.87-96.

Field, A. (2000), Discovering statistics using SPSS for Windows: Advanced techniques for beginners (Introducing Statistical Methods series). SAGE publications Ltd.

Field, A. (2009), "Discovering statistics using SPSS," Sage publications.

Field, A. (2013), "Discovering statistics using IBM SPSS statistics," Sage.

Fink, A. (2012), "How to Conduct Surveys: A Step-by-Step Guide: A Step-by-Step Guide," Sage Publications.

Fisher, R. A. (1935), "The logic of inductive inference." *Journal of the Royal Statistical Society,* Vol. 98, No.1: pp. 39-82.

Fiske, D. W. (1982), "Convergent-discriminant validation in measurements and research strategies." *New Directions for Methodology of Social & Behavioral Science,* Vol 12, No.77-92.

Fornell, C. & Larcker, D. F. (1981), "Evaluating structural equation models with unobservable variables and measurement error." *Journal of marketing research*, No.39-50.

Foss, K. & Rodgers, W. (2011), "Enhancing information usefulness by line managers' involvement in cross-unit activities." *Organization Studies,* Vol. 32, No.5: pp. 683-703.

Foster, D. (2009), The Ethics of Caring.

Francis, J. R. (1990), "After virtue? Accounting as a moral and discursive practice." *Accounting, Auditing & Accountability Journal,* Vol. 3, No.3: pp.

Frankfort, C. & Nachmias, D. (1996), Research methods in the social sciences. New York, St. Martin's Press.

Frazier, P. A., Tix, A. P. & Barron, K. E. (2004), "Testing moderator and mediator effects in counseling psychology research." *Journal of counseling psychology,* Vol. 51, No.1: pp. 115.

Fullerton, R. & Durtschi, C. (2004), The effect of professional skepticism on the fraud detection skills of internal auditors. *Available at SSRN 617062.*

Gauthier, D. (1979), "Thomas Hobbes: moral theorist." *The journal of Philosophy,* Vol. 76, No.10: pp. 547-559.

Geiger, M. A. & Raghunandan, K. (2002), "Auditor tenure and audit reporting failures." *Auditing: A Journal of Practice & Theory,* Vol. 21, No.1: pp. 67-78.

George, D. & Mallery, P. (2003), "Reliability analysis." *SPSS for Windows, step by step: a simple guide and reference, 14th edn. Boston: Allyn & Bacon*, No.222-232.

Gilbert, N. (2001), "WRITING ABOUT SOCIAL RESEARCH 21." *Researching social life*, No.361.

Gillett, P. R. & Uddin, N. (2005), "CFO intentions of fraudulent financial reporting." *Auditing: A Journal of Practice & Theory,* Vol. 24, No.1: pp. 55-75.

Gilligan, C. (1982), In another voice: Psychological theory and women's development. Cambridge: Harvard University Press.

Gilovich, T., Griffin, D. & Kahneman, D. (2002), "*Heuristics and biases: The psychology of intuitive judgment,"* Cambridge University Press.

Glover, S. M. & Prawitt, D. F. (2014), "Enhancing auditor professional skepticism: The professional skepticism continuum." *Current Issues in Auditing,* Vol. 8, No.2: pp. P1-P10.

Glover, S. M., Prawitt, D. F., Schultz Jr, J. J. & Zimbelman, M. F. (2003), "A test of changes in auditors' fraud-related planning judgments since the issuance of SAS No. 82." *Auditing: A Journal of Practice & Theory,* Vol. 22, No.2: pp. 237-251.

Goldschmidt, L. (2004), "The role of boards in preventing economic crime." *Journal of Financial Crime,* Vol. 11, No.4: pp. 342-346.

Gowans, C. (2015), ""Moral Relativism"." *The Stanford Encyclopedia of Philosophy (Fall 2015 Edition), ,* Vol. Edward N. Zalta (ed.), URL=<http://plato.stanford.edu/archives/fall2015/entries/moral-relativism/>. .

Graham, L. & Bedard, J. C. (2003), "Fraud risk and audit planning." *International Journal of Auditing,* Vol. 7, No.1: pp. 55-70.

Grenier, J. H. (2015), "Encouraging professional skepticism in the industry specialization era." *Available at SSRN 1533622*.

Griffith, E. E., Hammersley, J. S., Kadous, K. & Young, D. (2015), "Auditor mindsets and audits of complex estimates." *Journal of Accounting Research,* Vol. 53, No.1: pp. 49-77.

Guiral-Contreras, A., Gonzalo-Angulo, J. A. & Rodgers, W. (2007), "Information content and recency effect of the audit report in loan rating decisions." *Accounting & Finance,* Vol. 47, No.2: pp. 285-304.

Guiral, A. & Esteo, F. (2006), "Are Spanish auditors skeptical in going concern evaluations?" *Managerial Auditing Journal,* Vol. 21, No.6: pp. 598-620.

Guiral, A., Rodgers, W., Ruiz, E. & Gonzalo-Angulo, J. A. (2015), "Can expertise mitigate auditors' unintentional biases?" *Journal of International Accounting, Auditing and Taxation,* Vol. 24, No.105-117.

Guiral, A., Rodgers, W., Ruiz, E. & Gonzalo, J. A. (2010), "Ethical dilemmas in auditing: Dishonesty or unintentional bias?" *Journal of business ethics,* Vol. 91, No.1: pp. 151-166.

Gullkvist, B. & Jokipii, A. (2013), "Perceived importance of red flags across fraud types." *Critical Perspectives on Accounting,* Vol. 24, No.1: pp. 44-61.

Hackenbrack, K. (1992), "Implications of seemingly irrelevant evidence in audit judgment." *Journal of Accounting Research,* Vol. 30, No.1: pp. 126-136.

Hackenbrack, K. (1993), "The effect of experience with different sized clients on auditor evaluations of fraudulent financial reporting indicators." *Auditing,* Vol. 12, No.1: pp. 99.

Hair, J., Hult, G. & Ringle, C. (2014), Sarstedt. M.(2014). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Thousand Oaks (CA): Sage Publications.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. & Tatham, R. L. (2006), "*Multivariate data analysis,"* Pearson Prentice Hall Upper Saddle River, NJ.

Hair, J. F., Ringle, C. M. & Sarstedt, M. (2011), "PLS-SEM: Indeed a silver bullet." *Journal of Marketing theory and Practice,* Vol. 19, No.2: pp. 139-152.

Hair, J. F., Sarstedt, M., Pieper, T. M. & Ringle, C. M. (2012a), "The use of partial least squares structural equation modeling in strategic management research: a review of past practices and recommendations for future applications." *Long range planning,* Vol. 45, No.5: pp. 320-340.

Hair, J. F., Sarstedt, M., Ringle, C. M. & Mena, J. A. (2012b), "An assessment of the use of partial least squares structural equation modeling in marketing research." *Journal of the academy of marketing science,* Vol. 40, No.3: pp. 414-433.

Hair Jr, J. F., Hult, G. T. M., Ringle, C. & Sarstedt, M. (2013), "*A primer on partial least squares structural equation modeling (PLS-SEM),"* Sage Publications.

Hamilton, J. (2011), "Big four firms comment on u.k. proposals on professional skepticism." *International Developments, April 2011*.

Hamilton, R. W., Puntoni, S. & Tavassoli, N. T. (2010), "Categorization by groups and individuals." *Organizational Behavior and Human Decision Processes,* Vol. 112, No.1: pp. 70-81.

HAMM, R. J., PIKE, B. R., O'DELL, D. M., LYETH, B. G. & JENKINS, L. W. (1994), "The rotarod test: an evaluation of its effectiveness in assessing motor deficits following traumatic brain injury." *Journal of neurotrauma,* Vol. 11, No.2: pp. 187-196.

Hammersley, J. S. (2011), "A review and model of auditor judgments in fraud-related planning tasks." *Auditing: A Journal of Practice & Theory,* Vol. 30, No.4: pp. 101-128.

Hammersley, J. S., Bamber, E. M. & Carpenter, T. D. (2010), "The influence of documentation specificity and priming on auditors' fraud risk assessments and evidence evaluation decisions." *The Accounting Review,* Vol. 85, No.2: pp. 547-571.

Hammersley, J. S., Johnstone, K. M. & Kadous, K. (2011), "How do audit seniors respond to heightened fraud risk?" *Auditing: A Journal of Practice & Theory,* Vol. 30, No.3: pp. 81-101.

Hansen, J., McDonald, J. B., Messier Jr, W. & Bell, T. B. (1996), "A generalized qualitative-response model and the analysis of management fraud." *Management Science,* Vol. 42, No.7: pp. 1022-1032.

Haralambos, M., HOLBORN, M. & HEATH, R. (2000), "Sociology: themes and perspectives (London, Collins)." *HaralambosSociology: themes and perspectives2000*.

Hardie, W. F. R. (1980), "*Aristotle's Ethical Theory,"* Oxford University Press.

Harman, G. (1975), "Moral relativism defended." *The Philosophical Review,* Vol. 84, No.1: pp. 3-22.

Harman, G. (1978), "What is moral relativism?" *Values and Morals.* Springer: pp. 143-161.

Harrison, C. (2009), "*International Standard on Auditing (UK and Ireland) 700,"* Kluwer.

Harvey, N. (2007), "Use of heuristics: Insights from forecasting research." *Thinking & reasoning,* Vol. 13, No.1: pp. 5-24.

Heiman-Hoffman, V. B., Morgan, K. P. & Patton, J. M. (1996), "The warning signs of fraudulent financial reporting." *Journal of Accountancy,* Vol. 182, No.4: pp. 75.

Held, V. (2005), "*The ethics of care: Personal, political, and global,"* Oxford University Press.

Held, V. (2006), "*The ethics of care: Personal, political, and global,"* Oxford University Press.

Herington, C. & Weaven, S. (2008), "Improving consistency for DIT results using cluster analysis." *Journal of Business Ethics,* Vol. 80, No.3: pp. 499-514.

Hertzog, M. A. (2008), "Considerations in determining sample size for pilot studies." *Research in nursing & health,* Vol. 31, No.2: pp. 180-191.

Herz, P. J. & Schultz Jr, J. J. (1999), "The role of procedural and declarative knowledge in performing accounting tasks." *Behavioral Research in Accounting,* Vol. 11, No.1.

Hinkelmann, K. & Kempthorne, O. (2012), "*Design and Analysis of Experiments, Special Designs and Applications,"* John Wiley & Sons.

Hinman, L. M. (2001), "Utilitarianism." *Retrieved on March,* Vol. 9, No.2006.

Hirschheim, R. & Klein, H. K. (1992), "Paradigmatic Influences on Information Systems Development." *Advances in computers,* Vol. 34, No.293.

Hoffman, V. B. & Patton, J. M. (1997), "Accountability, the dilution effect, and conservatism in auditors' fraud judgments." *Journal of Accounting Research,* Vol. 35, No.2: pp. 227-237.

Hoffman, V. B. & Zimbelman, M. F. (2009), "Do strategic reasoning and brainstorming help auditors change their standard audit procedures in response to fraud risk?" *The Accounting Review,* Vol. 84, No.3: pp. 811-837.

Hoffman, V. B. & Zimbelman, M. F. (2012), "How strategic reasoning and brainstorming can help auditors detect fraud." *Current Issues in Auditing,* Vol. 6, No.2: pp. P25-P33.

Hogan, C. E., Rezaee, Z., Riley Jr, R. A. & Velury, U. K. (2008), "Financial statement fraud: Insights from the academic literature." *Auditing: A Journal of Practice & Theory,* Vol. 27, No.2: pp. 231-252.

Hogarth, R. M. (1991), "A perspective on cognitive research in accounting." *Accounting Review*, No.277-290.

Holmbeck, G. N. (1997), "Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: examples from the child-clinical and pediatric psychology literatures." *Journal of consulting and clinical psychology,* Vol. 65, No.4: pp. 599.

Holton, C. (2009), "Identifying disgruntled employee systems fraud risk through text mining: A simple solution for a multi-billion dollar problem." *Decision Support Systems,* Vol. 46, No.4: pp. 853-864.

Horwath, C. (2011), Putting the Freud in Fraud: Why the Fraud Triangle Is No Longer Enough, IN Horwath, Crowe.

Howe, C., Tolmie, A., Duchak-Tanner, V. & Rattray, C. (2000), "Hypothesis testing in science: Group consensus and the acquisition of conceptual and procedural knowledge." *Learning and Instruction,* Vol. 10, No.4: pp. 361-391.

Howell, D. C. (2011), "Chi-square test: analysis of contingency tables." *International Encyclopedia of Statistical Science.* Springer: pp. 250-252.

Hume, D. (2010), "*Moral and political philosophy,"* Simon and Schuster.

Hume, D. (2012), "Emotions and moods." *Organizational Behavior*, No.258-297.

Hurley, P. J. (2015), "Ego depletion: Applications and implications for auditing research." *Journal of Accounting Literature,* Vol. 35, No.47-76.

Hursthouse, R. (1999a), "*On virtue ethics,"* Oxford University Press.

Hursthouse, R. (1999b), "Virtue ethics and human nature." *Hume Studies,* Vol. 25, No.1: pp. 67-82.

Hursthouse, R. (2013), "Normative virtue ethics." *ETHICA*, No.645.

Hurtt, K., Eining, M. M. & Plumlee, D. (2008), "An experimental examination of professional skepticism." *Available at SSRN 1140267*, No.

Hurtt, R., Eining, M. & Plumlee, D. (2012), Linking professional skepticism to auditors' behaviors. Working paper, Baylor University, and The University of Utah.

Hurtt, R. K. (2010), "Development of a scale to measure professional skepticism." *Auditing: A Journal of Practice & Theory,* Vol. 29, No.1: pp. 149-171.

Hurtt, R. K., Brown-Liburd, H., Earley, C. E. & Krishnamoorthy, G. (2013), "Research on auditor professional skepticism: Literature synthesis and opportunities for future research." *Auditing: A Journal of Practice & Theory,* Vol. 32, No.sp1: pp. 45-97.

Hussin, H. S., Alwee, S. & Iskandar, T. M. (2013), "Exploratory Factor Analysis on Hurtt's Professional Skepticism Scale: A Malaysian Perspective." Asian Journal of Accounting & Governance, Vol. 4.

IAASB, I. A. a. A. S. B. (2004), "The Auditor's Responsibility to Consider Fraud and Error in an Audit of Financial Statements." International Standard on *Auditing,* Vol. No. 240, No.New York, NY: IAASB..

ISA240, I. S. o. A. N. (2009), "The Auditor's Responsibilities Related to Fraud in an Audit of Financial Statements." *International Federation of Accountants*.

Jacobs, J. & Halwani, R. (2007), Virtuous Liaisons: Care, Love, Sex, and Virtue Ethics. JSTOR.

Jaffar, N. (2009), "Fraud Detection: The moderating role of fraud risk level." *Journal of Business and Public Affairs,* Vol. 3, No.1: pp. 1-15.

Jaffar, N., Haron, H., Iskandar, T. M. & Salleh, A. (2011), "Fraud Risk Assessment and Detection of Fraud: The Moderating Effect of Personality." *International Journal of Business and Management,* Vol. 6, No.7: pp. p40.

Jaffar, N., Salleh, A., Iskandar, M. & Haron, H. (2008), "The Effect of the External Auditors‟ Ability to Assess Fraud Risk on Their Ability to Detect the Likelihood of Fraud." *International Journal of Management Perspectives,* Vol. 1, No.1: pp. 49-70.

Jakobsen, M. & Jensen, R. (2015), "Common method bias in public management studies." *International Public Management Journal,* Vol. 18, No.1: pp. 3-30.

Jamal, K. (2008), "Mandatory audit of financial reporting: A failed strategy for dealing with fraud." *Accounting Perspectives,* Vol. 7, No.2: pp. 97-110.

Jarvenpaa, S. L. & Majchrzak, A. (2008), "Knowledge collaboration among professionals protecting national security: Role of transactive memories in ego-centered knowledge networks." *Organization Science,* Vol. 19, No.2: pp. 260-276.

Jiambalvo, J. & Waller, W. (1984), Decomposition and assessments of audit risk. AMER ACCOUNTING ASSOC 5717 BESSIE DR, SARASOTA, FL 34233.

Joe, J. R. & Vandervelde, S. D. (2007), "Do auditor-provided nonaudit services improve audit effectiveness?" *Contemporary Accounting Research,* Vol. 24, No.2: pp. 467.

Johnson, B. & Christensen, L. (2008), "*Educational research: Quantitative, qualitative, and mixed approaches,"* Sage.

Johnson, E. J. & Weber, E. U. (2009), "Mindful judgment and decision making." *Annual review of psychology,* Vol. 60, No.53.

Johnson, O. A. (1978), "*Skepticism and cognitivism: a study in the foundations of knowledge,"* Univ of California Press.

Johnson, S. A., Ryan, H. E. & Tian, Y. S. (2003), "Executive compensation and corporate fraud." *Unpublished paper (Lousiana State University, Baton Rouge, LA)*.

Johnstone, K. M. & Bedard, J. C. (2004), "Audit firm portfolio management decisions." *Journal of Accounting Research,* Vol. 42, No.4: pp. 659-690.

Jonas, E., Schulz-Hardt, S., Frey, D. & Thelen, N. (2001), "Confirmation bias in sequential information search after preliminary decisions: an expansion of dissonance theoretical research on selective exposure to information." *Journal of personality and social psychology,* Vol. 80, No.4: pp. 557.

Jonassen, D. H. (1991), "Objectivism versus constructivism: Do we need a new philosophical paradigm?" *Educational technology research and development,* Vol. 39, No.3: pp. 5-14.

Jonassen, D. H., Campbell, J. P. & Davidson, M. E. (1994), "Learningwith media: Restructuring the debate." *Educational technology research and development,* Vol. 42, No.2: pp. 31-39.

Jones, J., Massey, D. W. & Thorne, L. (2003), "AUDITORS'ETHICAL REASONING: INSIGHTS FROM PAST RESEARCH AND IMPLICATIONS FOR THE FUTURE." *Journal of Accounting Literature,* Vol. 22, No.45.

Jones, K. L. (2004), "Improving fraud risk assessments through analytical procedures.".

Jones, M. (2009), ISA 240 (Redrafted), Auditors and Fraud-and the End of Watchdogs and Bloodhounds.

Joppe, M. (2000), The Research Process. Retrieved February 25, 2006.

Joreskog, K. (1978), "Structural analysis of covariance and correlation matrices, Psychometrika,(43), 443-477." *Jöreskog44343Psychometrika1978*.

Joyce, E. J. (1976), "Expert judgment in audit program planning." *Journal of Accounting Research,* Vol. 14, No.29-60.

Kadous, K. & Zhou, Y. D. (2015), "Motivating Auditor Skepticism." *Available at SSRN 2576984*.

Kahn, W. A. (1990), "Toward an agenda for business ethics research." *Academy of Management Review,* Vol. 15, No.2: pp. 311-328.

Kahneman, D. (2011), "*Thinking, fast and slow,"* Macmillan.

Kalin, J. (1975), "Two Kinds of Moral Reasoning: Ethical Egoism as a Moral Theory." *Canadian Journal of Philosophy,* Vol. 5, No.3: pp. 323-356.

Kaminski, K. A., Sterling Wetzel, T. & Guan, L. (2004), "Can financial ratios detect fraudulent financial reporting?" *Managerial Auditing Journal,* Vol. 19, No.1: pp. 15-28.

Kanagaretnam, K., Lobo, G. J. & Mathieu, R. (2003), "Managerial incentives for income smoothing through bank loan loss provisions." *Review of Quantitative Finance and Accounting,* Vol. 20, No.1: pp. 63-80.

Kanagaretnam, K., Lobo, G. J. & Mathieu, R. (2004), "Earnings management to reduce earnings variability: evidence from bank loan loss provisions." *Review of Accounting and Finance,* Vol. 3, No.1: pp. 128-148.

Kant, I. (1938), "The Fundamental Principles of the Metaphysic of Ethics (O. Manthey-Zorn, Trans.). New York: Appleton-Century-Crofts." *Inc.(Original work published in 1797)*.

Kant, I. & Gregor, M. J. (1996), "Practical Philosophy (The Cambridge Edition of the Works of Immanuel Kant)." *Trans. MJ Gregor. The Cambridge Edition of the Works of Immanuel Kant. Cambridge: Cambridge University Press*.

Kanter, H. A., McEnroe, J. E. & Kyes, M. C. (1990), "Developing and installing an audit risk model." *Internal auditor,* Vol. 47, No.6: pp. 51-55.

Kaplan, R. & Saccuzzo, D. (2012), "*Psychological testing: Principles, applications, and issues,"* Cengage Learning.

Kaplan, S. & Reckers, P. M. (1995), "Auditors' reporting decisions for accounting estimates: the effect of assessments of the risk of fraudulent financial reporting." *Managerial Auditing Journal,* Vol. 10, No.5: pp. 27-36.

Kassem, R. & Higson, A. (2012a), "Financial Reporting Fraud: Are Standards' Setters and External Auditors Doing Enough?" *International Journal of Business and Social Science,* Vol. 3, No.19: pp. 283-290.

Kassem, R. & Higson, A. (2012b), "The new fraud triangle model." *Journal of Emerging Trends in Economics and Management Sciences (JETEMS),* Vol. 3, No.3: pp. 191-195.

Kemer, G., Borders, L. D. & Willse, J. (2014), "Cognitions of expert supervisors in academe: A concept mapping approach." *Counselor Education and Supervision,* Vol. 53, No.1: pp. 2-18.

Kinney, W. R. & McDaniel, L. S. (1989), "Characteristics of firms correcting previously reported quarterly earnings." *Journal of accounting and economics,* Vol. 11, No.1: pp. 71-93.

Kirk, J. & Miller, M. L. (1986), "*Reliability and validity in qualitative research,"* Sage.

Klein, L. R. & Nakamura, M. (1962), "Singularity in the equation systems of econometrics: some aspects of the problem of multicollinearity." *International Economic Review,* Vol. 3, No.3: pp. 274-299.

Kleinmuntz, D. N., Fennema, M. & Peecher, M. E. (1996), "Conditioned assessment of subjective probabilities: Identifying the benefits of decomposition." *Organizational Behavior and Human Decision Processes,* Vol. 66, No.1: pp. 1-15.

Kline, R. B. (2005), "Principles and practice of structural equation modeling. Guilford Press." *New York*, No.59.

Kline, T. J. (1999), "The team player inventory: Reliability and validity of a measure of predisposition toward organizational team-working environments." *Journal for specialists in Group Work,* Vol. 24, No.1: pp. 102-112.

Kluckhohn, F. R. & Strodtbeck, F. L. (1961), "Variations in value orientations.".

Knapp, B. (2006), "Major Legal News and Significant Court Cases in Canada from August 2006 to November 2006." *Law & Bus. Rev. Am.,* Vol. 13, No.487.

Knapp, C. A. & Knapp, M. C. (2001), "The effects of experience and explicit fraud risk assessment in detecting fraud with analytical procedures." *Accounting, Organizations and Society,* Vol. 26, No.1: pp. 25-37.

Knapp, M. C. (2012), "*Contemporary Auditing,"* Cengage Learning.

Knox, K. (2004), "A researcher's dilemma-philosophical and methodological pluralism." *Electronic journal of business research methods,* Vol. 2, No.2: pp. 119-128.

Kochetova-kozloski, N., Messier Jr, W. F. & Eilifsen, A. (2011), "Improving Auditors' Fraud Judgments Using a Frequency Response Mode*." *Contemporary Accounting Research,* Vol. 28, No.3: pp. 837-858.

Koehn, D. (2000), "What Is Practical Judgement?" *Professional Ethics, A Multidisciplinary Journal,* Vol. 8, No.3/4: pp. 3-18.

Koerber, C. P. & Neck, C. P. (2006), "Religion in the workplace: Implications for financial fraud and organizational decision making." *Journal of Management, Spirituality & Religion,* Vol. 3, No.4: pp. 305-318.

Koonce, L., Walker, N. R. & Wright, W. F. (1993), "A cognitive characterization of audit analytical review; Discussion." *Auditing,* Vol. 12, No.57.

Kowalczyk, T. K., Wolfe, C. J. & Prawitt, D. F. (1998), "Anchoring Effects Associated With Recommendations From Expert Decision Aids: An Experimental Analysis/COMMENTARY ON Anchoring Effects Associated With Recommendations From Expert Decision Aids: An Experimental Analysis." *Behavioral Research in Accounting,* Vol. 10, No.147.

Kraemer, H. C., Mintz, J., Noda, A., Tinklenberg, J. & Yesavage, J. A. (2006), "Caution regarding the use of pilot studies to guide power calculations for study proposals." *Archives of General Psychiatry,* Vol. 63, No.5: pp. 484-489.

Krambia-Kapardis, M. (2002), "A fraud detection model: A must for auditors." *Journal of Financial Regulation and Compliance,* Vol. 10, No.3: pp. 266-278.

Krishnan, G. V. (2003), "Does Big 6 auditor industry expertise constrain earnings management?" *Accounting horizons,* Vol. 17, No.1.

Kung, F.-H. & Li Huang, C. (2013), "Auditors' moral philosophies and ethical beliefs." *Management Decision,* Vol. 51, No.3: pp. 479-500.

Kupperman, J. J. (2009), "Virtue in virtue ethics." *The Journal of ethics,* Vol. 13, No.2-3: pp. 243-255.

Kurtz, P. (1992), "The new skepticism." *Amherst, NY: Prometheus Books*.

Laffont, J.-J. (1999), "Political economy, information and incentives." *European Economic Review,* Vol. 43, No.4: pp. 649-669.

Lancaster, G. A., Dodd, S. & Williamson, P. R. (2004), "Design and analysis of pilot studies: recommendations for good practice." *Journal of evaluation in clinical practice,* Vol. 10, No.2: pp. 307-312.

LaSalle, R. E., Anandarajan, A. & Miller, A. F. (1996), "Going concern uncertainties: Disclaimer of opinion versus unqualified opinion with modified wording." *Auditing,* Vol. 15, No.2: pp. 29.

Latshaw, C. A. & Elifoglu, I. H. (2003), "Consideration of fraud in a financial statement audit." *Bank Accounting & Finance,* Vol. 16, No.3: pp. 27-33.

Lau, A. H.-L. (1987), "A five-state financial distress prediction model." *Journal of Accounting Research*, No.127-138.

Laufer, D. (2011), "Small Business Entrepreneurs: A Focus on Fraud Risk and Prevention." *American Journal of Economics and Business Administration,* Vol. 3, No.2: pp. 401-404.

Lee, L., Petter, S., Fayard, D. & Robinson, S. (2011), "On the use of partial least squares path modeling in accounting research." *International Journal of Accounting Information Systems,* Vol. 12, No.4: pp. 305-328.

Lee, T. H., Ali, A. M. & Bien, D. (2009), "Towards an Understanding of the Audit Expectation Gap." *ICFAI Journal of Audit Practice,* Vol. 6, No.1: pp.

Lehmann, C. M. & Norman, C. S. (2006), "The effects of experience on complex problem representation and judgment in auditing: An experimental investigation." *Behavioral Research in Accounting,* Vol. 18, No.1: pp. 65-83.

Lesage, C., Stolowy, H., Cohen, J. & Ding, Y. (2015), Media Bias and the Persistence of the Expectation Gap: An Analysis of Press Articles on Corporate Fraud. HEC Paris.

Libby, R. (1985), "Availability and the generation of hypotheses in analytical review." *Journal of Accounting Research*, No.648-667.

Libby, R. & Frederick, D. M. (1990), "Experience and the ability to explain audit findings." *Journal of Accounting Research*, No.348-367.

Libby, R. & Libby, P. A. (1989), "Expert measurement and mechanical combination in control reliance decisions." *Accounting Review*, No.729-747.

Libby, R. & Luft, J. (1993), "Determinants of judgment performance in accounting settings: Ability, knowledge, motivation, and environment." *Accounting, Organizations and Society,* Vol. 18, No.5: pp. 425-450.

Libby, R. & Tan, H.-T. (1994), "Modeling the determinants of audit expertise." *Accounting, Organizations and Society,* Vol. 19, No.8: pp. 701-716.

Libby, T. & Thorne, L. (2004), "The identification and categorization of auditors' virtues." *Business Ethics Quarterly,* Vol. 14, No.03: pp. 479-498.

Libby, T. & Thorne, L. (2007), "The development of a measure of auditors' virtue." *Journal of Business Ethics,* Vol. 71, No.1: pp. 89-99.

Lie, E. (2005), "On the timing of CEO stock option awards." *Management Science,* Vol. 51, No.5: pp. 802-812.

Liggio, C. D. (1974), "EXPECTATION GAP-ACCOUNTANTS LEGAL WATERLOO." *Journal of Contemporary Business,* Vol. 3, No.3: pp. 27-44.

Likert, R. (1932), "A technique for the measurement of attitudes." *Archives of psychology*.

Lindberg, D. L. (1999), "Instructional case: Lakeview Lumber, Inc.: A study of auditing issues related to fraud, materiality and professional judgment." *Issues in Accounting Education,* Vol. 14, No.3: pp. 497-515.

Lindell, M. K. & Whitney, D. J. (2001), "Accounting for common method variance in cross-sectional research designs." *Journal of applied psychology,* Vol. 86, No.1: pp. 114.

Lindsay, P. & Norman, D. (2009), "Human Information Processing: An Introduction to Psychology. 1977." *Retrieved June,* Vol. 15.

Lindsay, P. H. & Norman, D. A. (2013), "*Human information processing: An introduction to psychology,"* Academic Press.

Litman, J. A. & Silvia, P. J. (2006), "The latent structure of trait curiosity: Evidence for interest and deprivation curiosity dimensions." *Journal of Personality Assessment,* Vol. 86, No.3: pp. 318-328.

Little, R. J. (1988), "A test of missing completely at random for multivariate data with missing values." *Journal of the American Statistical Association,* Vol. 83, No.404: pp. 1198-1202.

Loebbecke, J. K., Eining, M. M. & Willingham, J. J. (1989), "AUDITORS EXPERIENCE WITH MATERIAL IRREGULARITIES-FREQUENCY, NATURE, AND DETECTABILITY." *AUDITING-A JOURNAL OF PRACTICE & THEORY,* Vol. 9, No.1: pp. 1-28.

Lohmöller, J.-B. (1989), "Predictive vs. Structural Modeling: PLS vs. ML." *Latent Variable Path Modeling with Partial Least Squares.* Springer: pp. 199-226.

Lokanan, M. E. (2015), "Challenges to the fraud triangle: Questions on its usefulness," at Accounting Forum

Loken, B., Pirie, P., Virnig, K., Hinkle, R. L. & Salmon, C. T. (1987), "The use of 0-10 scales in telephone surveys." Journal of the market Research Society, Vol. 29, No.3: pp. 353-362.

Lom, P. (2014), "The limits of doubt: The moral and political implications of skepticism," SUNY Press.

Lord, A. T. & DeZoort, F. T. (2001), "The impact of commitment and moral reasoning on auditors' responses to social influence pressure." Accounting, Organizations and Society, Vol. 26, No.3: pp. 215-235.

Lou, Y.-I. & Wang, M.-L. (2011), "Fraud risk factor of the fraud triangle assessing the likelihood of fraudulent financial reporting." Journal of Business & Economics Research (JBER), Vol. 7, No.2: pp.

Luck, D. J. & Rubin, R. S. (1987), "Instructor's Manual with Tests and Transparency Masters Marketing Research," Prentice-Hall.

Lund, A. & Lund, M. (2015), "One-way repeated measures ANOVA in SPSS statistics." Laerd Stat. https://statistics. laerd. com/premium/rma/repeated-measures-anova-in-spss. php. Accessed, Vol. 9.

Lynch, A. L., Murthy, U. S. & Engle, T. J. (2009), "Fraud brainstorming using computer-mediated communication: The effects of brainstorming technique and facilitation." *The Accounting Review,* Vol. 84, No.4: pp. 1209-1232.

Mack, P. (2004), "Utilitarian ethics in healthcare." *International Journal of The Computer, the Internet and Management,* Vol. 12, No.3: pp. 63-72.

Mackevicius, J. & Giriunas, L. (2013), "TRANSFORMATIONAL RESEARCH OF THE FRAUD TRIANGLE." *Ekonomika,* Vol. 92, No.4: pp. 150.

Maguire, S. (1997), "Business ethics: A compromise between politics and virtue." *From the Universities to the Marketplace: The Business Ethics Journey.* Springer: pp. 201-208.

Malhotra, N. & Peterson, M. (2006), Basic Research Marketing: A Decision-Making Approach. New Jersey: Pearson Education, Inc.

Malhotra, N. K., Kim, S. S. & Patil, A. (2006), "Common method variance in IS research: A comparison of alternative approaches and a reanalysis of past research." *Management Science,* Vol. 52, No.12: pp. 1865-1883.

Marczewski, D. C. & Akers, M. D. (2005), "CPAs' Perceptions of the Impact of SAS 99." *Accounting Faculty Research and Publications*, No.13.

Marley, R. N. (2011), "An Empirical Investigation of Decision Aids to Improve Auditor Effectiveness in Analytical Review."

Marquardt, C. A. & Wiedman, C. I. (2004), "How Are Earnings Managed? An Examination of Specific Accruals*." *Contemporary Accounting Research,* Vol. 21, No.2: pp. 461-491.

Matell, M. S. & Jacoby, J. (1971), "Is There an Optimal Number of Alternatives for Likert Scale Items? Study." *Educational and psychological measurement,* Vol. 31, No.657-674.

Maule, A. J. (2001), "Studying judgement: Some comments and suggestions for future research." *Thinking & reasoning,* Vol. 7, No.1: pp. 91-102.

McEnroe, J. E. & Martens, S. C. (2001), "Auditors' and investors' perceptions of the “expectation gap”." *Accounting Horizons,* Vol. 15, No.4: pp. 345-358.

McHugh, M. L. (2013), "The chi-square test of independence." *Biochemia Medica,* Vol. 23, No.2: pp. 143-149.

McKee, T. (2010), "The “cry wolf” problem in current fraud auditing standards." *The CPA Journal,* Vol. 80, No.1: pp. 60-62.

McKee, T. E. (2006), "Increase your fraud auditing effectiveness by being unpredictable!" *Managerial Auditing Journal,* Vol. 21, No.2: pp. 224-231.

McLaren, M. A. (2001), "Feminist ethics: Care as a virtue."

McMillan, J. H. & Schumacher, S. (2014), "*Research in education: Evidence-based inquiry,"* Pearson Higher Ed.

McMillan, J. J. & White, R. A. (1993), "Auditors' belief revisions and evidence search: The effect of hypothesis frame, confirmation bias, and professional skepticism." *Accounting Review*, No.443-465.

Melé, D. (2005), "Ethical education in accounting: Integrating rules, values and virtues." *Journal of Business Ethics,* Vol. 57, No.1: pp. 97-109.

Messier Jr, W. F. & Austen, L. A. (2000), "Inherent risk and control risk assessments: Evidence on the effect of pervasive and specific risk factors." *Auditing: A Journal of Practice & Theory,* Vol. 19, No.2: pp. 119-131.

Messier, W. (1995), "Research in and development of audit decision aids." *Judgment and decision making research in accounting and auditing*, No.207-228.

Meyers-Levy, J. (1986), "*Gender differences in information processing: A selectivity interpretation,"* Northwestern University.

Milkman, K. L., Chugh, D. & Bazerman, M. H. (2009), "How can decision making be improved?" *Perspectives on Psychological Science,* Vol. 4, No.4: pp. 379-383.

Mill, J. S. (1863), "Utilitarianism. Collected Works of John Stuart Mill, Vol. 10." *Essays on Ethics, Religion, and Society*.

Miller, R. (2005), "Moral courage: Definition and development." *Retrieved December,* Vol. 20, No.2009.

Mingers, J. (2003), "A classification of the philosophical assumptions of management science methods." *Journal of the Operational Research Society,* Vol. 54, No.6: pp. 559-570.

Mintz, S. M. (2006), "Accounting ethics education: Integrating reflective learning and virtue ethics." *Journal of Accounting Education,* Vol. 24, No.2: pp. 97-117.

Mock, T. J. & Turner, J. L. (2005), "Auditor identification of fraud risk factors and their impact on audit programs." *International Journal of Auditing,* Vol. 9, No.1: pp. 59-77.

Mock, T. J. & Wright, A. M. (1999), "Are audit program plans risk-adjusted?" *Auditing: A Journal of Practice & Theory,* Vol. 18, No.1: pp. 55-74.

Moehrle, S. R. (2002), "Do firms use restructuring charge reversals to meet earnings targets?" *The Accounting Review,* Vol. 77, No.2: pp. 397-413.

Montgomery, D. D., Beasley, M. S., Menelaides, S. L. & Palmrose, Z.-V. (2002), "Auditors' New Procedures for Detecting Fraud; ED's Proposed Changes Address Fraudulent Financial Statements." *Journal of Accountancy,* Vol. 193, No.5: pp. 63.

Morgan, A. G. & Poulsen, A. B. (2001), "Linking pay to performance—compensation proposals in the S&P 500." *Journal of financial economics,* Vol. 62, No.3: pp. 489-523.

Morris, M. G. & Venkatesh, V. (2000), "Age differences in technology adoption decisions: Implications for a changing work force." *Personnel psychology,* Vol. 53, No.2: pp. 375-403.

Morton, J. & Felix Jr, W. (1991), "A critique of statement on auditing standards no. 55." *Accounting Horizons,* Vol. 5, No.1: pp. 1-10.

Moyes, G. D. & Hasan, I. (1996), "An empirical analysis of fraud detection likelihood." *Managerial Auditing Journal,* Vol. 11, No.3: pp. 41-46.

Moyes, G. D., Lin, P., Landry, R. M. & Vicdan, H. (2006), "Internal Auditors' Perceptions of the Effectiveness of Red Flags to Detect Fraudulent Financial Reporting." *Available at SSRN 961457*, No.

Mueller, J. M. & Anderson, J. C. (2002), "Decision aids for generating analytical review alternatives: The impact of goal framing and audit-risk level." *Behavioral Research in Accounting,* Vol. 14, No.1: pp. 157-177.

Naddings, N. & Caring, A. (1984), A Feminine Approach To Ethics & Moral Education. University of California Press.

Nelson, M. & Tan, H.-T. (2005), "Judgment and decision making research in auditing: A task, person, and interpersonal interaction perspective." *Auditing: A Journal of Practice & Theory,* Vol. 24, No.s-1: pp. 41-71.

Nelson, M. W. (2009), "A Model and Literature Review of Professional Skepticism in Auditing." *AUDITING: A Journal of Practice & Theory,* Vol. 28, No.2: pp. 1-34.

Nelson, M. W., Elliott, J. A. & Tarpley, R. L. (2002), "Evidence from auditors about managers' and auditors' earnings management decisions." *The accounting review,* Vol. 77, No.s-1: pp. 175-202.

Nelson, M. W., Libby, R. & Bonner, S. E. (1995), "Knowledge structure and the estimation of conditional probabilities in audit planning." *Accounting Review*, No.27-47.

Nelson, M. W. & Tayler, W. B. (2007), "Information pursuit in financial statement analysis: Effects of choice, effort, and reconciliation." *The Accounting Review,* Vol. 82, No.3: pp. 731-758.

Newell, B. R. & Shanks, D. R. (2014), "Unconscious influences on decision making: A critical review." *Behavioral and Brain Sciences,* Vol. 37, No.01: pp. 1-19.

Newton, L. (1992), "Virtue and role: reflections on the social nature of morality." *Business Ethics Quarterly,* Vol. 2, No.03: pp. 357-365.

Nickerson, R. S. (1998), "Confirmation bias: A ubiquitous phenomenon in many guises." *Review of general psychology,* Vol. 2, No.2: pp. 175.

Nieschweitz, R., Schultz, J. & Zimbelman, M. F. (2000), "Empirical research on external auditors' detection of financial statement fraud." *Journal of Accounting Literature,* Vol. 19, No.190-246.

Nietzsche, F. (2007), "Beyond Good and Evil. ." *New York: Nu Vision, 1886,* Vol. pp. 15,36, 51.

Norman, C. S., Rose, A. M. & Rose, J. M. (2010), "Internal audit reporting lines, fraud risk decomposition, and assessments of fraud risk." *Accounting, Organizations and Society,* Vol. 35, No.5: pp. 546-557.

Noviyanti, S. & Winata, L. (2015), "The Role of" Tone at The Top" and Knowledge of Fraud on Auditors' Professional Skeptical Behavior." *Contemporary Management Research,* Vol. 11, No.1: pp.

Nunnally, J. C. & Bernstein, I. (1994), "The assessment of reliability." *Psychometric theory,* Vol. 3, No.248-292.

Nunnally Jum, C. & Bernstein Ira, H. (1978), Psychometric theory. 2nd edition., New York: McGraw-Hill.

Nusbaum, E. E. (2007), "Top 10 wish list for audit research." *Current Issues in Auditing,* Vol. 1, No.1: pp. C3-C9.

O'Donnell, E., Koch, B. & Boone, J. (2005), "The influence of domain knowledge and task complexity on tax professionals' compliance recommendations." *Accounting, Organizations and Society,* Vol. 30, No.2: pp. 145-165.

O'Shaughnessy, D. B. (2014), "Tax compliance determinants: A proposed model for cross-country analysis." *PhD dissertation. University of Texas, El Paso, USA*.

O'Fallon, M. J. & Butterfield, K. D. (2005), "A review of the empirical ethical decision-making literature: 1996–2003." *Journal of business ethics,* Vol. 59, No.4: pp. 375-413.

Ohlsson, S. (1994), "Declarative and procedural knowledge." *The international encyclopedia of education,* Vol. 3, No.1432-1434.

Ojo, M. (2006), "Eliminating the Audit Expectations Gap: Myth or Reality?".

Okafor, C. & Otalor, J. I. (2013), "Narrowing the Expectation Gap in Auditing: The Role of the Auditing Profession." *Research Journal of Finance and Accounting,* Vol. 4, No.2: pp. 43-52.

Omar, N. B., Din, M. & Faizal, H. (2010), "Fraud diamond risk indicator: An assessment of its importance and usage," at Science and Social Research (CSSR), 2010 International Conference.

Orlikowski, W. J. & Baroudi, J. J. (1991), "Studying information technology in organizations: Research approaches and assumptions." *Information systems research,* Vol. 2, No.1: pp. 1-28.

Ortegren, M., Downen, T. & Kim, S. (2016), "Linking Skeptical Judgment with Skeptical Action: Consideration of Potentially Influential Client and Professional Factors." *Available at SSRN 2727864*.

Ostrosky-Solís, F., Ramírez, M., Lozano, A., Picasso, H. & Velez, A. (2004), "Culture or education? Neuropsychological test performance of a Maya indigenous population." *International Journal of Psychology,* Vol. 39, No.1: pp. 36-46.

Owhoso, V. (2002), "Mitigating gender-specific superior ethical sensitivity when assessing likelihood of fraud risk." *Journal of Managerial Issues*, No.360-374.

Owusu-Ansah, S., Moyes, G. D., Babangida Oyelere, P. & Hay, D. (2002), "An empirical analysis of the likelihood of detecting fraud in New Zealand." *Managerial Auditing Journal,* Vol. 17, No.4: pp. 192-204.

Özkul, F. U. & Pamukçu, A. (2012), "Fraud Detection and Forensic Accounting." *Emerging Fraud.* Springer: pp. 19-41.

Pagano, R. (2012), "*Understanding statistics in the behavioral sciences,"* Cengage Learning.

Pakdel, A. & Sadeghi, P. (2012), "Auditors' individual characteristics and Decision Aid Check List (Evidence from Iranian Certificate Public Accounting (ICPA))." *Australian Journal of Basic & Applied Sciences,* Vol. 6, No.7.

Pallant, J. (2007), "SPSS survival manual: A step-by-step guide to data analysis using SPSS version 15." *Maidenhead, Berkshire, England: McGraw-Hill Education*.

Palmrose, Z.-V. (1987), "Litigation and Independent Auditors-The Role of Business Failures and Management Fraud." *AUDITING-A JOURNAL OF PRACTICE & THEORY,* Vol. 6, No.2: pp. 90-103.

Patton, M. Q. (1990), "*Qualitative evaluation and research methods,"* SAGE Publications, inc.

Payne, E. A. & Ramsay, R. J. (2005), "Fraud risk assessments and auditors' professional skepticism." *Managerial Auditing Journal,* Vol. 20, No.3: pp. 321-330.

Payne, J. W., Bettman, J. R. & Johnson, E. J. (1993), "*The adaptive decision maker,"* Cambridge University Press.

Payne, S. R. (2006), "Utilitarianism as Secondary Ethic." *Yale Divinity School, December,* Vol. 30, No.2006.

PCAOB, P. C. A. O. B. (2007), Observations on Auditors' Implementation of PCAOB Standards Relating to Auditors' Responsibilities with Respect to Fraud. Release No. 2007-01. PCAOB Washington, DC.

PCAOB., P. C. A. O. B. (2006), "AU Section 316- Consideration of Fraud in a Financial Statement Audit.," Available at http://www.pcaobus.org/standards/interim_standards/auditing_standards/index.

Peecher, M. E. (1996), "The influence of auditors' justification processes on their decisions: A cognitive model and experimental evidence." Journal of Accounting Research, No.125-140.

Peng, D. X. & Lai, F. (2012), "Using partial least squares in operations management research: A practical guideline and summary of past research." Journal of Operations Management, Vol. 30, No.6: pp. 467-480.

Persons, O. S. (2011), "Using financial statement data to identify factors associated with fraudulent financial reporting." *Journal of Applied Business Research (JABR),* Vol. 11, No.3: pp. 38-46.

Peter, J. P. (1979), "Reliability: A review of psychometric basics and recent marketing practices." *Journal of marketing research*, No.6-17.

Peytcheva, M. (2013), "Professional skepticism and auditor cognitive performance in a hypothesis-testing task." *Managerial Auditing Journal,* Vol. 29, No.1: pp. 27-49.

Phellas, C. N., Bloch, A. & Seale, C. (2011), "Structured methods: interviews, questionnaires and observation." *Researching society and culture,* Vol. 3.

Pickens, J. (2005), "Attitudes and perceptions." *Organizational Behavior in Health Care. Sudbury, MA: Jones and Bartlett Publishers*, No.43-75.

Pierce, B. & Kilcommins, M. (1996), "The audit expectations gap: The role of auditing education."

Pincoffs, E. (1986), "Quandaries and Virtues (UniversityPress of Kansas, Lawrence, KS)." No.

Pincus, K. V. (1989), "The efficacy of a red flags questionnaire for assessing the possibility of fraud." *Accounting, Organizations and Society,* Vol. 14, No.1: pp. 153-163.

Pitt, H. (2002a), "2002. Remarks made to the SEC Speaks Conference."

Pitt, H. L. (2002b), "Testimony Concerning the Corporate and Auditing Accountability, Responsibility, and Transparence Act." *Before the Committee of Financial Services United States House of Representatives. Washington, DC*.

Pitz, G. F. & Sachs, N. J. (1984), "Judgment and decision: Theory and application." *Annual review of psychology,* Vol. 35, No.1: pp. 139-164.

Plumlee, D., Rixom, B. A. & Rosman, A. J. (2012), Training auditors to think skeptically. Working paper, The University of Utah, and University of Connecticut.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y. & Podsakoff, N. P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies." *Journal of applied psychology,* Vol. 88, No.5: pp. 879.

Ponemon, L. A. (1990), "Ethical judgments in accounting: A cognitive-developmental perspective." *Critical Perspectives on Accounting,* Vol. 1, No.2: pp. 191-215.

Ponemon, L. A. (1992), "Auditor underreporting of time and moral reasoning: An experimental lab study*." *Contemporary Accounting Research,* Vol. 9, No.1: pp. 171-189.

Popkin, R. H. (1979), "*The history of scepticism from Erasmus to Spinoza,"* Univ of California Press.

Popkin, R. H. (2002), "*Skeptical philosophy for everyone,"* Prometheus Books.

Popova, V. (2012), "Exploration of skepticism, client-specific experiences, and audit judgments." *Managerial Auditing Journal,* Vol. 28, No.2: pp. 140-160.

Porac, J. F. & Thomas, H. (1994), "Cognitive categorization and subjective rivalry among retailers in a small city." *Journal of Applied Psychology,* Vol. 79, No.1: pp. 54.

Porter, B. (1997), "Respect to Corporate Fraud-A Controversial Issue." *Current Issues in Auditing: SAGE Publications*, No.31.

Porter, B. (1993). "An empirical study of the audit expectation-performance gap." *Accounting and Business Research 2*4 No. 93, pp.49-68.

Porter, B., Simon, J. & Hatherly, D. (2008), "Principles of External Auditing edition." *A John Wiley & Sons, UK*.

Prendergast, G., Liu, P.-y. & Poon, D. T. (2009), "A Hong Kong study of advertising credibility." *Journal of consumer marketing,* Vol. 26, No.5: pp. 320-329.

Prior, W. J. (1991), "Virtue and knowledge: an introduction to ancient Greek ethics.".

Puka, B. (1990), "The Liberation of Caring; A Different Voice For Gilligan's “Different Voice”." *Hypatia,* Vol. 5, No.1: pp. 58-82.

Punch, K. F. (2009), "*Introduction to research methods in education,"* Sage.

Quadackers, L., Groot, T. & Wright, A. (2009), Auditors' skeptical characteristics and their relationship to skeptical judgments and decisions. *Available at SSRN 1478105.*

Quadackers, L., Groot, T. & Wright, A. (2014), "Auditors' professional skepticism: Neutrality versus presumptive doubt." *Contemporary Accounting Research,* Vol. 31, No.3: pp. 639-657.

Quadackers, L., Mock, T. J. & Maijoor, S. (1996), "Audit risk and audit programmes: archival evidence from four Dutch audit firms." *European Accounting Review,* Vol. 5, No.2: pp. 217-237.

Rachels, J. & Rachels, S. (1993), "The elements of moral philosophy." 6th ISBN: 978-0-07-338671-3.

Rae, K. & Subramaniam, N. (2008), "Quality of internal control procedures: Antecedents and moderating effect on organisational justice and employee fraud." *Managerial Auditing Journal,* Vol. 23, No.2: pp. 104-124.

Raiffa, H. (1968), Decision Analysis: Lectures on Choices Under Uncertainty. Addison-Wesley, Reading, Mass.

Rasso, J. T. (2013), "The influence of mindsets on professional skepticism in auditors." *WorNing paper, Georgia State University*, No.

Ravlin, E. C. & Meglino, B. M. (1987), "Effect of values on perception and decision making: A study of alternative work values measures." *Journal of Applied psychology,* Vol. 72, No.4: pp. 666.

Rego, A., Leal, S., Cunha, M. P., Faria, J. & Pinho, C. (2010), "How the perceptions of five dimensions of corporate citizenship and their inter-inconsistencies predict affective commitment." *Journal of Business Ethics,* Vol. 94, No.1: pp. 107-127.

Reimers, J., Wheeler, S. & Dusenbury, R. (1993), "THE EFFECT OF RESPONSE-MODE ON AUDITORS CONTROL RISK ASSESSMENTS." *AUDITING-A JOURNAL OF PRACTICE & THEORY,* Vol. 12, No.2: pp. 62-78.

Rest, J. R. (1986), "*Moral development: Advances in research and theory,"* Praeger Publishers.

Reynolds, S. J. (2006), "Moral awareness and ethical predispositions: investigating the role of individual differences in the recognition of moral issues." *Journal of Applied Psychology,* Vol. 91, No.1: pp. 233.

Rezaee, Z. (2005), "Causes, consequences, and deterence of financial statement fraud." *Critical Perspectives on Accounting,* Vol. 16, No.3: pp. 277-298.

Rietveld, T. & van Hout, R. (2015), "The t test and beyond: Recommendations for testing the central tendencies of two independent samples in research on speech, language and hearing pathology." *Journal of communication disorders,* Vol. 58, No.158-168.

Ringle, C. M., Sarstedt, M. & Straub, D. (2012), "A critical look at the use of PLS-SEM in MIS Quarterly." *MIS Quarterly (MISQ),* Vol. 36, No.1: pp.

Ríos-Figueroa, C. B. & Cardona, R. J. (2013), "Does experience affect auditors' professional judgment? evidence from Puerto Rico." *Evidence from Puerto Rico*, No.13-32.

Rittle-Johnson, B. & Star, J. R. (2007), "Does comparing solution methods facilitate conceptual and procedural knowledge? An experimental study on learning to solve equations." *Journal of Educational Psychology,* Vol. 99, No.3: pp. 561.

Robertson, J. C. (2010), "The effects of ingratiation and client incentive on auditor judgment." *Behavioral Research in Accounting,* Vol. 22, No.2: pp. 69-86.

Robinson, J. P., Shaver, P. R. & Wrightsman, L. S. (1991), "Criteria for scale selection and evaluation." *Measures of personality and social psychological attitudes,* Vol. 1, No.3: pp. 1-16.

Rodgers, W. (1992), "The effects of accounting information on individuals' perceptual processes." *Journal of Accounting, Auditing & Finance,* Vol. 7, No.1: pp. 67-95.

Rodgers, W. (1999), "The influences of conflicting information on novices and loan officers' actions." *Journal of Economic Psychology,* Vol. 20, No.2: pp. 123-145.

Rodgers, W. (2003), "Measurement and reporting of knowledge-based assets." *Journal of Intellectual Capital,* Vol. 4, No.2: pp. 181-190.

Rodgers, W. (2006), "*Process thinking: Six pathways to successful decision making,"* iUniverse.

Rodgers, W. (2007), "Problems and resolutions to future knowledge-based assets reporting." *Journal of Intellectual Capital,* Vol. 8, No.2: pp. 205-215.

Rodgers, W. (2009a), ""Ethical beginnings: preferences, rules and principles"." *New York: iUniverse*.

Rodgers, W. (2009b), "*Ethical Beginnings: Preferences, rules, and principles influencing decision making,"* iUniverse.

Rodgers, W. (2010), "Three primary trust pathways underlying ethical considerations." *Journal of business ethics,* Vol. 91, No.1: pp. 83-93.

Rodgers, W. (2012), "*Biometric and auditing issues addressed in a throughput model,"* IAP.

Rodgers, W., Choy, H. L. & Guiral, A. (2008), "Do Investors Value a Firm's Commitment to Social Activities? The Moderating Role of Intangibles and the Impact of the Sarbanes-Oxley

Act." *The Moderating Role of Intangibles and the Impact of the Sarbanes-Oxley Act (December 4, 2008)*.

Rodgers, W., Choy, H. L. & Guiral, A. (2013), "Do investors value a firm's commitment to social activities?" *Journal of business ethics,* Vol. 114, No.4: pp. 607-623.

Rodgers, W. & Epstein, M. (1997), "*Throughput modeling: Financial information used by decision makers,"* Jai Press Greenwich, CT.

Rodgers, W. & Gago, S. (2001), "Cultural and ethical effects on managerial decisions: Examined in a Throughput Model." *Journal of Business Ethics,* Vol. 31, No.4: pp. 355-367.

Rodgers, W. & Gago, S. (2003), "A model capturing ethics and executive compensation." *Journal of Business Ethics,* Vol. 48, No.2: pp. 189-202.

Rodgers, W. & Gago, S. (2006), "Biblical scriptures underlying six ethical models influencing organizational practices." *Journal of business ethics,* Vol. 64, No.2: pp. 125-136.

Rodgers, W. & Guiral, A. (2011), "Potential model misspecification bias: Formative indicators enhancing theory for accounting researchers." *The International Journal of Accounting,* Vol. 46, No.1: pp. 25-50.

Rodgers, W., Guiral, A. & Gonzalo, J. A. (2009), "Different pathways that suggest whether auditors' going concern opinions are ethically based." *Journal of business ethics,* Vol. 86, No.3: pp. 347-361.

Rodgers, W. & Housel, T. J. (1987), "The effects of information and cognitive processes on decision making." *Accounting and Business Research,* Vol. 18, No.69: pp. 67-74.

Rodgers, W. & Housel, T. J. (2004), "The effects of environmental risk information on auditors' decisions about prospective financial statements." *European Accounting Review,* Vol. 13, No.3: pp. 523-540.

Rodgers, W. & Johnson, L. W. (1988), "Integrating Credit Models Using Accounting Information With Loan Officers' Decision Processes." *Accounting & Finance,* Vol. 28, No.2: pp. 1-22.

Rodgers, W., Negash, S. & Suk, K. (2005), "The moderating effect of on-line experience on the antecedents and consequences of on-line satisfaction." *Psychology & Marketing,* Vol. 22, No.4: pp. 313-331.

Rodgers, W., Söderbom, A. & Guiral, A. (2015), "Corporate Social Responsibility Enhanced Control Systems Reducing the Likelihood of Fraud." *Journal of Business Ethics,* Vol. 131, No.4: pp. 871-882.

Rohrmann, B. (1986), "Evaluating the usefulness of decision aids: A methodological perspective." *New directions in research on decision making*, No.363-381.

Romanus, R. N., Maher, J. J. & Fleming, D. M. (2008), "Auditor industry specialization, auditor changes, and accounting restatements." *Accounting Horizons,* Vol. 22, No.4: pp. 389-413.

Rorty, R. (1991), "*Objectivity, relativism, and truth: philosophical papers,"* Cambridge University Press.

Roscoe, J. T. (1975), "*Fundamental research statistics for the behavioral sciences [by] John T. Roscoe,"* Holt, Rinehart and Winston, New York, NY.

Rose, J. M. (2007), "Attention to evidence of aggressive financial reporting and intentional misstatement judgments: Effects of experience and trust." *Behavioral Research in Accounting,* Vol. 19, No.1: pp. 215-229.

Rose, J. M., McKay, B. A., Norman, C. S. & Rose, A. M. (2012), "Designing decision aids to promote the development of expertise." *Journal of information systems,* Vol. 26, No.1: pp. 7-34.

Rose, J. M. & Wolfe, C. J. (2000), "The effects of system design alternatives on the acquisition of tax knowledge from a computerized tax decision aid." *Accounting, Organizations and Society,* Vol. 25, No.3: pp. 285-306.

Rosenthal, R. (1991), "*Meta-analytic procedures for social research,"* Sage.

Rosenthal, R. & Rosnow, R. L. (1991), "*Essentials of behavioral research: Methods and data analysis,"* McGraw-Hill Humanities Social.

Ross, S. M. & Morrison, G. R. (1996), "Experimental research methods." *Handbook of research for educational communications and technology: A project of the association for educational communications and technology*, No.1148-1170.

Rudnick, A. (2001), "A meta-ethical critique of care ethics." *Theoretical medicine and bioethics,* Vol. 22, No.6: pp. 505-517.

Sabău, E. M. (2013), "Fraud risk management–human rationalization assessment." *Business Excellence and Management,* Vol. 3, No.1: pp. 41-56.

Salancik, G. R. & Pfeffer, J. (1978), "A social information processing approach to job attitudes and task design." *Administrative science quarterly*, No.224-253.

Scott, G., Leritz, L. E. & Mumford, M. D. (2004), "The effectiveness of creativity training: A quantitative review." *Creativity Research Journal,* Vol. 16, No.4: pp. 361-388.

Sekaran, U. (2000), Research Methods for Business: A Skill-building Approach. USA: John Willey & Sons. Inc.

Sekaran, U. (2003a), "Research method for business: A skill Approach." *New Jersey: John Willey and Sons, Inc*.

Sekaran, U. (2003b), "Research methods for business: a skill building approach." *Journal of Education for Business,* Vol. 68, No.5: pp. 316-317.

Sekaran, U. & Bougie, R. (2010), Research Method for Business, A Skill Building Approach. John Wiley & Sons Inc. Singapore.

Shaphiro, S. & Wilk, M. (1965), "An analysis of variance test for normality." *Biometrika,* Vol. 52, No.3: pp. 591-611.

Shaub, M. K. (1995), "An analysis of the association of traditional demographic variables with the moral reasoning of auditing students and auditors." *Journal of Accounting Education,* Vol. 12, No.1: pp. 1-26.

Shaub, M. K. (1996), "Trust and Suspicion; The Effects of Situational and Dispositional Factors on Auditors' Trust of Clients." *Behavioral Research in Accounting,* Vol. 8, No.154-174.

Shaub, M. K. & Lawrence, J. E. (1996), "Ethics, experience and professional skepticism: A situational analysis." *Behavioral Research in Accounting,* Vol. 8, No.124-157.

Shaub, M. K. & Lawrence, J. E. (1999), "Differences in auditors’ professional skepticism across career levels in the firm." *Advances in Accounting Behavioral Research,* Vol. 2, No.1: pp. 61-83.

Shaub, M. K. & Lawrence, J. E. (2002), "A taxonomy of auditors’ professional skepticism." *Research on Accounting Ethics,* Vol. 8, No.167-194.

Shelton, S. W. (1999), "The effect of experience on the use of irrelevant evidence in auditor judgment." *The Accounting Review,* Vol. 74, No.2: pp. 217-224.

Shelton, S. W., Whittington, O. R. & Landsittel, D. (2001), "Auditing firms' fraud risk assessment practices." *Accounting Horizons,* Vol. 15, No.1: pp. 19-33.

Shrieves, R. E. & Gao, P. (2002), "Earnings management and executive compensation: a case of overdose of option and underdose of salary?," *EFA 2002 Berlin Meetings Presented Paper*, at

Sidgwick, H. (1981), "*The methods of ethics,"* Hackett Publishing.

Sikka, P., Puxty, A., Willmott, H. & Cooper, C. (1998), "The impossibility of eliminating the expectations gap: Some theory and evidence." *Critical Perspectives on Accounting,* Vol. 9, No.3: pp. 299-330.

Singer, P. (2003), "Voluntary euthanasia: a utilitarian perspective." *Bioethics,* Vol. 17, No.5-6: pp. 526-541.

Sitorus, T. & Scott, D. (2009), "Integrated fraud risk factors and robust methodology: a review and comment." *International Journal of Auditing,* Vol. 13, No.3: pp. 281-297.

Skalak, S. L., Golden, T. W., Clayton, M. M. & Pill, J. S. (2011), "*A guide to forensic accounting investigation,"* John Wiley & Sons.

Skousen, C. J., Smith, K. R. & Wright, C. J. (2008), "Detecting and predicting financial statement fraud: The effectiveness of the fraud triangle and SAS No. 99." *Available at SSRN 1295494*.

Skousen, C. J. & Wright, C. J. (2006), "Contemporaneous risk factors and the prediction of financial statement fraud." *Available at SSRN 938736*.

Sloan, R. (1996), "Do stock prices fully reflect information in accruals and cash flows about future earnings?(Digest summary)." *Accounting review,* Vol. 71, No.3: pp. 289-315.

Slote, M. (1998), "The justice of caring." *Social Philosophy and Policy,* Vol. 15, No.01: pp. 171-195.

Smedley, G. & Sutton, S. G. (2007), "The effect of alternative procedural explanation types on procedural knowledge acquisition during knowledge-based systems use." *Journal of Information Systems,* Vol. 21, No.1: pp. 27-51.

Smith, M., Haji Omar, N., Iskandar Zulkarnain Sayd Idris, S., Baharuddin, I. & Vinten, G. (2005), "Auditors' perception of fraud risk indicators: Malaysian evidence." *Managerial Auditing Journal,* Vol. 20, No.1: pp. 73-85.

Smith, R. (2001), "Defining, measuring, and reporting fraud risk within your organisation," *IIR Conferences, Applying Risk Management to Implement a Proactive Fraud Prevention Strategy in Financial Services.* , at Parkroyal Darling Harbour.

Solomon, R. C. (1992), "Corporate roles, personal virtues: An Aristotelean approach to business ethics." *Business Ethics Quarterly,* Vol. 2, No.03: pp. 317-339.

Soltani, B. (2007), "*Auditing: An international approach,"* Pearson Education.

Spathis, C. T. (2002), "Detecting false financial statements using published data: some evidence from Greece." *Managerial Auditing Journal,* Vol. 17, No.4: pp. 179-191.

Spector, P. E. (2006), "Method variance in organizational research truth or urban legend?" *Organizational research methods,* Vol. 9, No.2: pp. 221-232.

Spector, P. E. & Brannick, M. T. (2010), "Common method issues: an introduction to the feature topic in organizational research methods." *Organizational Research Methods*.

Star, J. R. (2002), "Re-" Conceptualizing" Procedural Knowledge in Mathematics."

Steffy, B. D. & Grimes, A. J. (1986), "A critical theory of organization science." *Academy of Management Review,* Vol. 11, No.2: pp. 322-336.

Steutel, J. & Carr, D. (1999), "Virtue ethics and the virtue approach to moral education." *Virtue ethics and moral education*, No.3-18.

Ştirbu, D., Moraru, M., Farcane, N., Blidisel, R. & Popa, A. (2009), "Fraud and error. Auditors' responsibility levels." *Annales Universitatis Apulensis Series Oeconomica,* Vol. 11, No.1: pp. 54-64.

Stock, J. R. & Lambert, D. M. (2001), "*Strategic logistics management,"* McGraw-Hill/Irwin Boston, MA.

Stough, C. L. (1969), "*Greek skepticism; a study in epistemology,"* Univ of California Press.

Summers, S. L. & Sweeney, J. T. (1998), "Fraudulently misstated financial statements and insider trading: An empirical analysis." *Accounting Review*, No.131-146.

Sutton, S. G. & Byington, J. R. (1993), "An analysis of ethical and epistemological issues in the development and implementation of audit expert systems." *Advances in Public Interest Accounting,* Vol. 5, No.231-243.

Sweeney, J. T. & Roberts, R. W. (1997), "Cognitive moral development and auditor independence." *Accounting, Organizations and Society,* Vol. 22, No.3: pp. 337-352.

Switzer, F. S. & Sniezek, J. A. (1991), "Judgment processes in motivation: Anchoring and adjustment effects on judgment and behavior." *Organizational Behavior and Human Decision Processes,* Vol. 49, No.2: pp. 208-229.

Sykes, A. O. (1993), An introduction to regression analysis. Coase-Sandor Institute for Law & Economics Working Paper No. 20, 1993, University of Chicago Law School.

Tabachnick, B. & Fidell, L. (2007), "Using Multivariate Statistics., 5th edn.(Allyn and Bacon: Boston, MA.)."

Tan, H.-T. (1995), "Effects of expectations, prior involvement, and review awareness on memory for audit evidence and judgment." *Journal of Accounting Research*, No.113-135.

Taylor, M. H. (2000), "The Effects of Industry Specialization on Auditors' Inherent Risk Assessments and Confidence Judgements*." *Contemporary Accounting Research,* Vol. 17, No.4: pp. 693-712.

Ten Berge, T. & Van Hezewijk, R. (1999), "Procedural and declarative knowledge an evolutionary perspective." *Theory & Psychology,* Vol. 9, No.5: pp. 605-624.

Thagard, P. (2006), "How to collaborate: Procedural knowledge in the cooperative development of science." *The Southern journal of philosophy,* Vol. 44, No.S1: pp. 177-196.

Thorndike, E. L. (1920), "A constant error in psychological ratings." *Journal of applied psychology,* Vol. 4, No.1: pp. 25-29.

Thorne, L. (1998), "The role of virtue in auditors’ ethical decision making: an integration of cognitive developmental and virtue-ethics perspectives." *Research on Accounting Ethics,* Vol. 4, No.291-308.

Ticehurst, G. & Veal, A. (2000a), "„Questionnaire surveys‟." *Business Research Methods: A Managerial Approach*, No.135-158.

Ticehurst, G. W. & Veal, A. J. (2000b), "*Business research methods: A managerial approach,"* Addison Wesley Longman.

Toba, Y. (2011), "Toward a Conceptual Framework of Professional Skepticism in Auditing." Vol. 47, No.83-116.

Toba, Y. (2012), "Toward a conceptual framework of professional skepticism in auditing." No.

Trompeter, G. M., Carpenter, T. D., Desai, N., Jones, K. L. & Riley Jr, R. A. (2012), "A synthesis of fraud-related research." *Auditing: A Journal of Practice & Theory,* Vol. 32, No.sp1: pp. 287-321.

Trotman, K. T., Simnett, R. & Khalifa, A. (2009), "Impact of the Type of Audit Team Discussions on Auditors' Generation of Material Frauds*." *Contemporary Accounting Research,* Vol. 26, No.4: pp. 1115-1142.

Trotman, K. T. & Wright, W. F. (2012), "Triangulation of audit evidence in fraud risk assessments." *Accounting, Organizations and Society,* Vol. 37, No.1: pp. 41-53.

Tubbs, R. M. (1992), "The effect of experience on the auditor's organization and amount of knowledge." *Accounting Review*, No.783-801.

Turkson, E. R. & Riley, M. (2008), "The problem of eliciting management knowledge: A case of research into hospitality management knowledge." *International Journal of Hospitality Management,* Vol. 27, No.4: pp. 584-593.

Tversky, A. & Kahneman, D. (1974), "Judgment under uncertainty: Heuristics and biases." *science,* Vol. 185, No.4157: pp. 1124-1131.

Vaisu, L., Warren, M. & Mackay, D. (2003), "Defining fraud: issues for organizations from an information systems perspective." *PACIS 2003 Proceedings*, No.66.

Van Staveren, I. (2007), "Beyond utilitarianism and deontology: ethics in economics." *Review of Political Economy,* Vol. 19, No.1: pp. 21-35.

Vanasco, R. R. (1998), "Fraud auditing." *Managerial Auditing Journal,* Vol. 13, No.1: pp. 4-71.

Vinten, G., Alleyne, P. & Howard, M. (2005a), "An exploratory study of auditors' responsibility for fraud detection in Barbados." *Managerial Auditing Journal,* Vol. 20, No.3: pp. 284-303.

Vinten, G., Payne, E. A. & Ramsay, R. J. (2005b), "Fraud risk assessments and auditors' professional skepticism." *Managerial Auditing Journal,* Vol. 20, No.3: pp. 321-330.

Viswanathan, M., Sudman, S. & Johnson, M. (2004), "Maximum versus meaningful discrimination in scale response:: Implications for validity of measurement of consumer perceptions about products." *Journal of Business Research,* Vol. 57, No.2: pp. 108-124.

Wainer, H. & Braun, H. I. (2013), "*Test validity,"* Routledge.

Waller, W. & Zimbelman, M. (2000), An empirical assessment of external validity in audit research on the dilution effect. Working Paper, Brigham Young University.

Waller, W. S. (1993), "Auditors' assessments of inherent and control risk in field settings." *Accounting Review*, No.783-803.

Waller, W. S. & Zimbelman, M. F. (2003), "A cognitive footprint in archival data: Generalizing the dilution effect from laboratory to field settings." *Organizational Behavior and Human Decision Processes,* Vol. 91, No.2: pp. 254-268.

Webber, S., Sinason, D., Apostolou, B. & Hassell, J. (2006), "An investigation of auditor assessment of fraud risk." *Journal of Forensic Accounting,* Vol. 7, No.2: pp. 411-438.

Wells, J. T. (2004), "New approaches to fraud deterrence." *JOURNAL OF ACCOUNTANCY-NEW YORK-,* Vol. 197, No.2: pp. 72-76.

Wersig, G. & Neveling, U. (1975), "The phenomena of interest to information science." *The information scientist,* Vol. 9, No.4: pp. 127-140.

Wheeler, P. R. & Arunachalam, V. (2008), "The effects of decision aid design on the information search strategies and confirmation bias of tax professionals." *Behavioral Research in Accounting,* Vol. 20, No.1: pp. 131-145.

Wilks, T. J. & Zimbelman, M. F. (2004a), "Decomposition of Fraud-Risk Assessments and Auditors' Sensitivity to Fraud Cues*." *Contemporary Accounting Research,* Vol. 21, No.3: pp. 719-745.

Wilks, T. J. & Zimbelman, M. F. (2004b), "Using game theory and strategic reasoning concepts to prevent and detect fraud." *Accounting Horizons,* Vol. 18, No.3: pp. 173-184.

Wilson, M. & Sapsford, R. (1996), "Asking questions." *Data collection and analysis,* Vol. 74.

Windsor, C. A. & Ashkanasy, N. M. (1995), "The effect of client management bargaining power, moral reasoning development, and belief in a just world on auditor independence." *Accounting, Organizations and Society,* Vol. 20, No.7: pp. 701-720.

Winkielman, P., Knutson, B., Paulus, M. & Trujillo, J. L. (2007), "Affective influence on judgments and decisions: Moving towards core mechanisms." Review of General Psychology, Vol. 11, No.2: pp. 179.

Winograd, T. (1975), "Frame representations and the declarative/procedural controversy." Representation and understanding: Studies in cognitive science, No.185-210.

Wipo, W. I. P. O. (2011), Interface Between Exhaustion Of Intellectual Property Rights And Competition Law. Cdip/4/4 Rev./Study/Inf/2 June 1, 2011.

Wold, H. (1985), "Partial least squares." Encyclopedia of statistical sciences.

Wolfe, David T., and Dana R. Hermanson (2004). "The fraud diamond: Considering the four elements of fraud." The CPA Journal No. 74 pp12: 38.

Wong, K. K.-K. (2013), "Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS." Marketing Bulletin, Vol. 24, No.1: pp. 1-32.

Wood, L. I. (2012a), "The impact of decision aid use on the dilution effect when assessing fraud." Journal of Finance & Accountancy, Vol. 9, No.2: pp. 24-42.

Wood, L. I. (2012b), "The impact of decision aid use on the dilution effect when assessing fraud." Journal of Finance & Accountancy, Vol. 9.

Wright, A. M. & Bedard, J. C. (2000), "Decision processes in audit evidential planning: A multistage investigation." Auditing: A Journal of Practice & Theory, Vol. 19, No.1: pp. 123-143.

Wu, C.-F. (2003), "A Study of the Adjustment of Ethical Recogntion and Ethical Decision-Making of Managers-to-be Across the Taiwan Strait Before and After Receiving a Business Ethics Education." Journal of Business Ethics, Vol. 45, No.4: pp. 291-307.

Ye, K., Cheng, Y. & Gao, J. (2014), "How individual auditor characteristics impact the likelihood of audit failure: Evidence from China." Advances in Accounting, Vol. 30, No.2: pp. 394-401.

Zailinawati, A., Schattner, P. & Mazza, D. (2006), "Doing a pilot study: why is it essential?" *Malaysian Family Physician,* Vol. 1, No.2 & 3: pp. 4.

Zikmund, W. G. (2003), "Sample designs and sampling procedures." *Business research methods,* Vol. 7, No.368-400.

Zimbelman, M. (2001), "An overview of research on auditor's detection of financial statement fraud." *The Auditor's Report,* Vol. 24, No.2: pp. 19-21.

Zimbelman, M. F. (1997), "The effects of SAS No. 82 on auditors' attention to fraud risk factors and audit planning decisions." *Journal of Accounting Research,* Vol. 35, No.2491454: pp. 75-97.

Appendices

Appendix I: Ethical Approval Letter from University of Hull

UNIVERSITY OF Hull

Mrs Badriya Al Shammakhi
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HULL
Yorkshire
HU6 7TX

Hull University Business School
Research and Enterprise Office
T +44(0)1482 463536
E h.carpenter@hull.ac.uk

Ref: HUBSREC 2014/18

8 October 2014

Dear Badriya

Re: An experimental examination of the effect of through put model focused decision on auditors fraud risk assessment in entrepreneurship

Thank you for your research ethics application.

I am pleased to inform you that on behalf of the Business School Research Ethics Committee at the University of Hull, Professor Wayne Rogers has approved your application on 26 September 2014.

I wish you every success with your research.

Yours sincerely,

Hilary Carpenter
Secretary,
Research Ethics Committee

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Accredited by Association of MBAs

Appendix II: Cover Letter of the Instrument Questionnaire

Hull University Business School

Cottingham Rd,

Hull, North Humberside

HU6 7RX

Cover Letter

Dear Participant:

Enclosed is my questionnaire which is pertaining to entrepreneurship fraud. In recent years, entrepreneurs' type fraud has increased resulting in bankruptcy. Hence, many researchers suggest that fraud is the main cause of entrepreneurs' failure. Entrepreneurship is an engine of economic growth and job creation; therefore, failure of these firms may contribute to a deteriorating economy. My dissertation is focused on how auditors contemplate and perform fraud risk assessments, which may assist improving audit procedures.

There is no direct benefit to you from participating in this study. However, if you take part in this study, your responses will enhance our understanding of auditors' professional judgments. Also, you will help us determine whether a decision making modeling process can assist auditors in providing better fraud risk assessments. Moreover, this study does not involve sensitive ethical or political issues.

Participating in this study will take approximately 30 minutes. Please *carefully* read the providedinformation regarding two audit engagements. Further, review and assess the fraud risk for the two hypothetical clients. You will be asked to answer questions relevant to these hypothetical clients, and provide demographic information. *There are no right answers.* Additionally, please do not discuss the study with your colleagues as it may influence or affect their responses.

Your participation is completely voluntary. Your responses will be confidential, and you will not be asked to provide any identifying information. The result of this study will be reported only as aggregated data, and your material will remain confidential.

If you have any questions about this study, you can contact me, Badriya Al Shammakhi at B.N.Al-Shammakhi@2012.hull.ac.uk at the department of Accounting at Hull University Business School.

Thank you again for participation.

Sincerely,

Badriya Al Shammakhi

Ph.D. Candidate in Accounting

Appendix III: Task (1) Professional Skepticism Scale (Hurtt 2010)

<u>Skepticism Scale:</u>

Please read the following statements carefully and circle the score on a 6 point scale ranging from 1 (strongly disagree) to 6 (strongly agree). (Please circle only one answer for each statement).

Statement	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. I often accept other peoples' explanations without further thought. (r)	1	2	3	4	5	6
2. I feel good about myself.	1	2	3	4	5	6
3. I wait to decide on issues until I can get more information.	1	2	3	4	5	6
4. The prospect of learning excites me.	1	2	3	4	5	6
5. I am interested in what causes people to behave the way that they do.	1	2	3	4	5	6
6. I am confident of my abilities.	1	2	3	4	5	6
7. I often reject statements unless I have proof that they are true.	1	2	3	4	5	6
8. Discovering new information is fun.	1	2	3	4	5	6
9. I take my time when making decisions.	1	2	3	4	5	6
10. I tend to immediately accept what other people tell me. (r)	1	2	3	4	5	6
1. Other peoples' behavior doesn't interest me. (r)	1	2	3	4	5	6
12. I am self-assured.	1	2	3	4	5	6
13. My friends tell me that I usually question things that I see or hear.	1	2	3	4	5	6
14. I like to understand the reason for other peoples' behavior.	1	2	3	4	5	6
15. I think that learning is exciting.	1	2	3	4	5	6

16. I usually accept things I see read or hear at face value. (r)	1	2	3	4	5	6
17. I don’t feel sure of myself. (r)	1	2	3	4	5	6
18. I usually notice inconsistencies in explanations.	1	2	3	4	5	6
19. Most often I agree with what the others in my group think. (r)	1	2	3	4	5	6
20. I dislike having to make decisions quickly.	1	2	3	4	5	6
21. I have confidence in myself.	1	2	3	4	5	6
22. I don’t like to decide until I’ve looked at all of the readily available information.	1	2	3	4	5	6
23. I like searching for knowledge.	1	2	3	4	5	6
24. I frequently question things that I see or hear.	1	2	3	4	5	6
25. It is easy for other people to convince me. (r)	1	2	3	4	5	6
26. I seldom consider why people behave in a certain way. (r)	1	2	3	4	5	6
27. I like to ensure that I’ve considered most available information before making a decision.	1	2	3	4	5	6
28. I enjoy trying to determine if what I read or hear is true.	1	2	3	4	5	6
29. I relish learning.	1	2	3	4	5	6
30. The actions people take and the reasons for those actions are fascinating.	1	2	3	4	5	6

Appendix IV: Experiment Instruments

High Fraud Risk Cases (Case A and Case B)

CASE A

Background Information

AAA Lumber, Inc. is located in a metropolitan area of approximately 200,000 people. Building materials, lawn and garden products, and home improvement supplies constitute 91% of AAA Lumbar's sales to retail customers, as well as to contractors and other building professionals. Retail customers are required to pay in cash or by a major credit card at the time of their purchase. However, the vast majority of contractors and building professionals has established credit accounts and are billed on a monthly basis. AAA Lumber's main competitors in the area are The Home Depot, Inc. and Eagle Hardware & Garden.

Your firm has been the auditors for AAA Lumber since 1982. The current "in-charge" auditor in the AAA Lumber's Auditor is Karen. **You are assigned to assist Karen on the FY 2012 AAA Lumber audit. Your assignment as a fraud specialist is to determine whether fraud exists in AAA regardless of its size or magnitude.**

Key Personnel: AAA Lumber, Inc.'s top management team consists of the following key executives. Based on your firm's prior interaction with these key executives, you have some basic knowledge of their background.

John Mosher – Controller: John started his career as an auditor with Becker & Pippen LLP. John was assigned to the audit of AAA Lumber each of the six years he worked for Becker & Pippen. He has been the Controller for AAA Lumber since 1995. The controller's daughter was recently diagnosed with a rare disease. The disease is curable, but requires extensive treatment and hospital stays, much of which is not covered by insurance. The controller's spouse has finally graduated and now is working, but student loan payments are coming due.

Terry James – Accounting Manager: Terry has a B.A. in accounting and has been with AAA Lumber for four years. Prior to working for AAA Lumber, Terry was the night auditor for a small hotel. Terry has extensive and detailed knowledge of the AAA Lumber's accounting systems as well as their weaknesses. Terry has struggled in the past with a gambling addiction and has run up considerable debts. He has been required to work overtime nearly every weekend for the last six months, and because he is a salaried employee his pay does not reflect this extra work. Terry was passed over for a raise during his annual review but was promised an increase in salary in another six months.

Managerial Compensation: AAA Lumber, Inc. compensates its key personnel primarily through a fixed salary schedule. In a recent board meeting, AAA's board of directors approved the motion to award all key personnel a cash bonus at the end of each year, starting in FY2012. Each key personnel will receive a cash bonus based on a predetermined percentage of the company's reported net income.

AAA Lumber's Accounting Environment

Based on your firm's prior year audits, AAA Lumber Inc. appeared to have some minor weaknesses in its accounting systems. However, these weaknesses did not appear to allow material errors into the company's financial reporting process. AAA management reassured your firm that AAA will take appropriate actions to upgrade its accounting systems.

Bad Debts Expense

Bad Debts Expense as a percentage of credit sales was approximately 3.2 percent for FY2012, whereas in the prior two years Bad Debts Expense as a percentage of credit sales was 5.0 percent for both FY2011 and FY2010. Credit sales for FY2012 were about £2,600,000. Review and testing of the aged trial balance of Accounts Receivable indicated that the amount and percentage of accounts receivable in each aging category were comparable to prior years. The percentages used to estimate the uncollectible accounts were almost reduced by half in practically every aging category to prior year.

When Karen questioned Terry James, the Accounting Manager, about the decreased percentages, he stated that John Mosher, the Controller, had instructed him to use the lower percentages for FY2012. Karen subsequently discussed the matter with John, who informed Karen that he was expecting customers to pay more quickly in FY2013, owing to a better than expected growth of the housing market in the area in which AAA Lumber does business. The current reported net income may have been overstated by £29,016 due to the Bad Debts Expense account. However, this is below the materiality level of £52,020.

Product Warranties Expense

AAA Lumber's Warranty Expense account for FY2012 was approximately £85,000, representing a 25 percent decrease from FY2011. Based on Karen's review, the audit had not disclosed any significant changes in AAA Lumber's product mix. Thus, Karen discussed the increase with Terry. Terry stated that the charge to Warranty Expense was "just an estimate provided by John." When Karen asked John about the decrease in Warranty Expenses, John stated that the decrease was due to the better than expected economic growth in the area. He explained that builders were less particular in a stronger economic climate and they were less inclined to return wood and supplies that might be slightly flawed.

Karen then discussed product warranties with Adam Lester, the manager of the cabinets department, since that department seemed to experience the largest number of returns. Adam stated while he did not keep records of returns per se, he would fill out the appropriate paperwork and forward them to the accounting department. Adam said he didn't think that the returns during FY2012 were much different from those of FY2011. Karen subsequently asked Terry from the accounting department to provide her with a complete list of returns for FY2012. Karen sampled 30 transactions throughout FY2012. All of the sampled transactions were supported by proper documentation. The current reported net income may have been overstated by £21,481 owing to the Product Warranties Expense account. However, this is below the materiality level of £52,020.

The combined effect of both the Bad Debts Expense and the Product Warranties Expense accounts may have overstated the AAA Lumber Inc.'s net income by £50,497 (£29,016 + £21,481). However, the combined effect of these two accounts was still below the materiality level of £52,020.

Additional Analysis:

Ratio	2012	2011	2010
Current ratio	1.95	1.4	1.2
Net margin ratio	7%	5.3%	5%
Debt/equity ratio	30%	38%	43%

Task1:

Information related to task 1:

Fraud triangle factors are:

Incentive or motivation to commit fraud results from a perceived pressure to commit fraud or a perceived benefit from committing fraud.

Opportunities to commit fraud result from internal control deficiencies or working conditions allowing fraud to occur.

Attitudes or rationalizations allow a person to justify why he or she should commit fraud.

Section A:

Based on the given Information and building on fraud triangle factors, please give your impression of this client using the following fraud risk factors.

Fraud risk factors (SAS 99)	For each applicable factor, rate EACH dimension below on a scale from 1(Extremely Low) to 10 (Extremely High):
1. Domination of management by a single person or small group without compensation controls. **(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10
2. Personal financial obligations by AAA Lumber's key personnel. **(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
3. Adverse relationship between company and employees • Changes in compensation • Promotions, compensation or other rewards inconsistent with expectations.**(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
4. Inadequate monitoring controls, including automated controls and controls over interim financial reporting (where external reporting is required). **(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10
5. Ineffective communications, implementation, support or enforcement of ethical climate. **(Attitude)**	Low High 1 2 3 4 5 6 7 8 9 10

Section B:

Based on your analysis of this company's information and building on fraud risk factors, evaluate the fraud risk in this company in terms of:

Fraud risk factors	For each applicable factor, rate EACH dimension below on a scale from 1(low) to 10 (high):
1. Recurring management attempts to justify marginal or inappropriate accounting based on materiality **(Attitude)**; • Overstated net income by £29,016 due to Bad debt Expense account. • Overstated net income by £21,481due to Warranties expense. • Combined effect is (£29,016 + £21,481) = £50,497 which is less than the materiality level of £52,020.	Low High 1 2 3 4 5 6 7 8 9 10
2. Rapid growth or unusual profitability especially compared to that of the prior years. See ratios analysis table. **(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
3. Complex or unstable organizational structure • Difficulty in determining organization or individuals with control of company • Overly complex structure. **(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10
4. Aggressive or unrealistic forecasts by management in maintaining AAA Lumber's earnings trend. Warranties expense in 2012 is £85,000, 25% decrease from the previous year. **(Attitude)**	Low High 1 2 3 4 5 6 7 8 9 10

<u>Section C</u>:

1. **Before providing an overall decision regarding fraud risk assessment for this client, please respond to the following questions**.

A. What is the risk of financial statement fraud attributable to the **incentives** faced by AAA Lumber's management?	Low High 1 2 3 4 5 6 7 8 9 10
B .What is the risk of financial statement fraud attributable to the **opportunities** available to AAA Lumber?	Low High 1 2 3 4 5 6 7 8 9 10
C. What is the risk of financial statement fraud attributable to AAA Lumber management's **attitude** or character?	Low High 1 2 3 4 5 6 7 8 9 10

2. **Consider the overall risk of material financial statement fraud and answer the following question.**

Based on all the information you have reviewed in this case, what is the **overall risk** of material financial statement fraud for AAA Lumber?	Low High 1 2 3 4 5 6 7 8 9 10

CASE B

Background Information

BBBs, Inc. is located in a metropolitan area of approximately 250,000 people. Building materials, lawn and garden products, and home improvement supplies constitute 86% of BBBs' sales to retail customers, as well as to contractors and other building professionals. Retail customers are required to pay in cash or by a major credit card at the time of their purchase. However, the vast majority of contractors and building professionals has established credit accounts and are billed on a monthly basis. BBBs's main competitors in the area are The Home Depot, Inc. and Eagle Hardware & Garden.

Your firm has been the auditors for BBBs since 1985. The current "in-charge" auditor in the BBBs' Auditor is Rohan. **You are assigned to assist Rohan on the FY 2012 BBBs audit. Your assignment as a fraud specialist is to determine whether fraud exists in BBBs regardless of its size or magnitude.**

Key Personnel: BBBs, Inc.'s top management team consists of the following key executives. Based on your firm's prior interaction with these key executives, you have some basic knowledge of their background.

David Blue – Controller: David started his career as an auditor with LLM. David was assigned to the audit of BBBs each of the three years he worked for LLM. He has been the Controller for BBBs since 1997. David usually arrives at work with his Porsche sport car. He and his wife have recently taken out a loan to purchase a new home in an expensive neighborhood.

Mark Rich – Accounting Manager: Mark has a B.A. in accounting and has been with BBBs for three years. Mark has extensive and detailed knowledge of the BBBs's accounting systems as well as their weaknesses. Mark has been advocating less formality in controls. Mark suggested that this would allow the accounting department to operate more efficiently and effectively, with fewer constraints.

Managerial Compensation: BBBs, Inc. compensates its key personnel primarily through a fixed salary schedule. In a recent board meeting, BBBs's board of directors approved the motion to award all key personnel a cash bonus at the end of each year, starting in FY2012. Each key personnel will receive a cash bonus based on a predetermined percentage of the company's reported net income.

BBBs's Accounting Environment

Based on your firm's prior year audits, BBBs Inc. appeared to have some minor weaknesses in its accounting systems. However, these weaknesses did not appear to allow material errors into the company's financial reporting process. BBBs's management reassured your firm that BBBs will take appropriate actions to upgrade its accounting systems.

Bad Debts Expense

Bad Debts Expense as a percentage of credit sales was approximately 3.5 percent for FY2012, whereas in the prior two years Bad Debts Expense as a percentage of credit sales was 5.0 percent for both FY2011 and FY2010. Credit sales for FY2012 were about £2,600,000. Review and testing of the aged trial balance of Accounts Receivable indicated that the amount and percentage of accounts receivable in each aging category were comparable to prior years. The percentages used to estimate the uncollectible accounts were almost reduced by half in practically every aging category to prior year.

When Rohan questioned Mark Rich, the Accounting Manager, about the decreased percentages, he stated that David, the Controller, had instructed him to use the lower percentages for FY2012. Rohan subsequently discussed the matter with David, who informed Rohan that he was expecting customers to pay more quickly in FY2013, owing to a better than expected growth of the housing market in the area in which BBBs does business. The current reported net income may have been overstated by £24,180 due to the Bad Debts Expense account. However, this is below the materiality level of £52,020.

Product Warranties Expense

BBBs's Warranty Expense account for FY2012 was approximately £83,000, representing a 25 percent decrease from FY2011. Based on Rohan's review, the audit had not disclosed any significant changes in BBBs's product mix. Thus Rohan discussed the increase with Mark. Mark stated that the charge to Warranty Expense was "just an estimate provided by David2". When Rohan asked David about the decrease in Warranty Expenses, David stated that the decrease was due to the better than expected economic growth in the area. He explained that builders were less particular in a stronger economic climate and they were less inclined to return wood and supplies that might be slightly flawed.

Rohan then discussed product warranties with John Hogan, the manager of the cabinets department, since that department seemed to experience the largest number of returns. John stated while he did not keep records of returns per se, he would fill out the appropriate paperwork and forward them to the accounting department. John said he didn't think that the returns during FY2012 were much different from those of FY2011. Rohan subsequently asked Mark from the accounting department to provide her with a complete list of returns for FY2012. Rohan sampled 35 transactions throughout FY2012. All of the sampled transactions were supported by proper documentation. The current reported net income may have been overstated by £22,720 owing to the Product Warranties Expense account. However, this is below the materiality level of £52,020.

The combined effect of both the Bad Debts Expense and the Product Warranties Expense accounts may have overstated the BBBs Inc.'s net income by £46,900 (£24,180 + £22,720). However, the combined effect of these two accounts was still below the materiality level of £52,020.

Additional Analysis:

Ratio	2012	2011	2010
Current ratio	1.85	1.4	1.2
Net margin ratio	6.5%	5.3%	5%
Debt/equity ratio	28%	38%	43%

Task1:

Information related to task 1:

Fraud triangle factors are:

Incentive or motivation to commit fraud results from a perceived pressure to commit fraud or a perceived benefit from committing fraud.

Opportunities to commit fraud result from internal control deficiencies or working conditions allowing fraud to occur.

Attitudes or rationalizations allow a person to justify why he or she should commit fraud.

<u>Section A</u>:

Based on the given Information and building on fraud triangle factors, please give your impression of this client using the following fraud risk factors.

Fraud risk factors (SAS 99)	For each applicable factor, rate <u>EACH</u> dimension below on a scale from 1(Extremely Low) to 10 (Extremely High):
1. Domination of management by a single person or small group without compensation controls. **(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10
2. Personal financial obligations by BBBs's key personnel. **(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
3. Adverse relationship between company and employees: • Changes in compensation • Promotions, compensation or other rewards inconsistent with expectations.**(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
4. Inadequate monitoring controls, including automated controls and controls over interim financial reporting (where external reporting is required). **(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10
5. Ineffective communications, implementation, support or enforcement of ethical climate. **(Attitude)**	Low High 1 2 3 4 5 6 7 8 9 10

<u>Section B</u>:

Based on your analysis of this company's information and building on fraud risk factors, evaluate the fraud risk in this company in terms of:

Fraud risk factors	For each applicable factor, rate <u>EACH</u> dimension below on a scale from 1(low) to 10 (high):
1. Recurring management attempts to justify marginal or inappropriate accounting based on materiality **(Attitude)**; • Overstated net income by £24,180 due to Bad debt Expense account. • Overstated net income by £22,720 due to Warranties expense. • Combined effect is (£24,180 + £22,720) = £46,900 which is less than the materiality level of £52,020.	Low High 1 2 3 4 5 6 7 8 9 10
2. Rapid growth or unusual profitability especially compared to that of the prior years. See ratios analysis table. **(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
3. Complex or unstable organizational structure: • Difficulty in determining organization or individuals with control of company • Overly complex structure.**(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10
4. Aggressive or unrealistic forecasts by management in maintaining BBBs's earnings trend. Warranties expense in 2012 is £83,000, 25% decrease from the previous year.	Low High 1 2 3 4 5 6 7 8 9 10

(Attitude)	

Section C:

3. **Before providing an overall decision regarding fraud risk assessment for this client, please respond to the following questions**.

A. What is the risk of financial statement fraud attributable to the **incentives** faced by BBBs's management?	Low High 1 2 3 4 5 6 7 8 9 10
B .What is the risk of financial statement fraud attributable to the **opportunities** available to BBBs?	Low High 1 2 3 4 5 6 7 8 9 10
C. What is the risk of financial statement fraud attributable to BBBs management's **attitude** or character?	Low High 1 2 3 4 5 6 7 8 9 10

4. **Consider the overall risk of material financial statement fraud and answer the following question.**

Based on all the information you have reviewed in this case, what is **the overall risk** of material financial statement fraud for BBBs?	Low High 1 2 3 4 5 6 7 8 9 10

Low Fraud Risk Cases (Case Z and Case Y)

CASE Z

ZZZs Company is located in the heart of Manhattan's bustling garment district. Building Materials constitute approximately 67 percent of sales. **For the past four years, you have been working as an auditor for an accounting firm. You will be taking over as the current in-charge on the ZZZs engagement. You must perform an evaluation of ZZZs's control environment and assess fraud risk.**

Most of the ZZZs management team has been with the company since your firm began auditing the company five years ago. Your firm maintains a good working relationship with ZZZs and has found both management and the employees to be generally cooperative. Furthermore, several reliable sources of information indicate that the character of the management team is of high quality. Most people in the business community characterize ZZZs as being very supportive of social values and maintaining high ideals. This characterization stems largely from the principles of the management team.

The five top officers of ZZZs have been at the firm for 10-15 years. **Jon**, the son of the company's founder, became the CEO after graduating from business school. Steve, the CFO, had been hired personally by the company's founder after graduating with an accounting degree and had risen quickly through the ranks of ZZZs. The internal audit department reports to the audit committee and demonstrates reasonable competence in performing its tasks.

Managerial Compensation

ZZZs compensate its management team primarily through a fixed salary schedule. In a recent board meeting, ZZZs's board of directors approved the motion to award all the managements team a cash bonus at the end of each year, starting in FY2012. All key personnel will each receive a cash bonus based on their salary level and their years of service. The maximum cash bonus is 3% of the key personnel's salary.

ZZZs's Accounting Environment

Based on your firm's prior year audits, ZZZs. appeared to have no issue with its accounting systems. No material deficiencies related to the company's transactions were noted in prior audits. ZZZs seemed to have a good control over its financial reporting process. ZZZs's management assured your firm that ZZZs will continue to maintain the quality of its accounting systems.

Bad Debts Expense

ZZZs's Bad Debts Expense as a percentage of credit sales was approximately 4.8 percent for FY2012, whereas in the prior two years Bad Debts Expense as a percentage of credit sales was 5.0 percent for both FY2011 and FY2010. Credit sales for FY2012 were about £1,900,000. Review and testing of the aged trial balance of Accounts Receivable indicated that the amount and percentage of accounts receivable in each aging category were comparable to prior years. The percentages used to estimate the uncollectible accounts for FY2012 were slightly lower in practically every aging category to prior year. This decrease is due to the expected growth of the housing market in the area in which ZZZs does the business. The current reported net income may have been overstated by £1,444 owing to the Bad Debts Expense account. However, this is below the materiality level of £45,020.

Product Warranties Expense

ZZZs's Warranty Expense account for FY2012 was approximately £102,846, representing a 6 percent increase from FY2011. The audit had not disclosed any significant changes in ZZZs product mix. The management explained that the increase was due to the better than expected economic growth in the area. They explained that builders were more particular in a stronger economic climate and they tended to return wood and supplies that might be slightly flawed.

The manager of the cabinets department stated that he did remember handling more returns during FY2012 than in FY2011.A sample of 30 transactions throughout FY2012 was handled. All of the sampled transactions were supported by proper documentation. The current reported net income may have been overstated by £434 owing to the Product Warranties Expense account. However, this is below the materiality level of £45,020. The combined effect of both the Bad Debts Expense and the Product Warranties Expense accounts may have overstated the ZZZs Lumber Inc.'s net income by £1,878 (£1,444 + £434). However, the combined effect of these two accounts was still below the materiality level of £45,020.

Additional Information:

Ratio	2012	2011	2010
Current ratio	1.6	1.4	1.2
Net margin ratio	5.7	5.3%	5%
Debt/equity ratio	36%	38%	43%

Task1:

Information related to task 1:

Fraud triangle factors are:

Incentive or motivation to commit fraud results from a perceived pressure to commit fraud or a perceived benefit from committing fraud.

Opportunities to commit fraud result from internal control deficiencies or working conditions allowing fraud to occur.

Attitudes or rationalizations allow a person to justify why he or she should commit fraud.

<u>Section A</u>:

Based on the given Information and building on fraud triangle factors, please give your impression of this client using the following fraud risk factors.

Fraud risk factors (SAS 99)	For each applicable factor, rate <u>EACH</u> dimension below on a scale from 1(Extremely Low) to 10 (Extremely High):
1. Domination of management by a single person or small group without compensation controls. **(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10
2. Personal financial obligations by ZZZs' s key personnel. **(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
3. Adverse relationship between company and employees • Changes in compensation • Promotions, compensation or other rewards inconsistent with expectations.**(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
4. Inadequate monitoring controls, including automated controls and controls over interim financial reporting (where external reporting is required). **(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10

5. Ineffective communications, implementation, support or enforcement of ethical climate. **(Attitude)**	Low High 1 2 3 4 5 6 7 8 9 10

Section B:

Based on your analysis of this company's information and building on fraud risk factors, evaluate the fraud risk in this company in terms of:

Fraud risk factors	For each applicable factor, rate EACH dimension below on a scale from 1(low) to 10 (high):
1. Recurring management attempts to justify marginal or inappropriate accounting based on materiality **(Attitude)**; • Overstated net income by £ 1,444due to Bad debt Expense account. • Overstated net income by £434due to Warranties expense. • Combined effect is (£1,444 + £434) = £1,878 which is less than the materiality level of £45,020.	Low High 1 2 3 4 5 6 7 8 9 10
2. Rapid growth or unusual profitability especially compared to that of the prior years. See ratios analysis table. **(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
3. Complex or unstable organizational structure	Low High 1 2 3 4 5 6 7 8 9 10

• Difficulty in determining organization or individuals with control of company • Overly complex structure. **(Opportunity)**	
4. Aggressive or unrealistic forecasts by management in maintaining ZZZs's earnings trend. Warranties expense in 2012 is £102,846, 6% increase from the previous year. **(Attitude)**	Low High 1 2 3 4 5 6 7 8 9 10

Section C:

5. **Before providing an overall decision regarding fraud risk assessment for this client, please respond to the following questions**.

A. What is the risk of financial statement fraud attributable to the **incentives** faced by ZZZs's management?	Low High 1 2 3 4 5 6 7 8 9 10
B .What is the risk of financial statement fraud attributable to the **opportunities** available to ZZZs	Low High 1 2 3 4 5 6 7 8 9 10
C. What is the risk of financial statement fraud attributable to ZZZs management's **attitude** or character?	Low High 1 2 3 4 5 6 7 8 9 10

6. **Consider the overall risk of material financial statement fraud and answer the following question.**

Based on all the information you have reviewed in this case, what is the **overall risk** of material financial statement fraud for ZZZs?	Low High 1 2 3 4 5 6 7 8 9 10

CASE Y

YYYs Company is located in the heart of Manhattan's bustling garment district. Building Materials constitute approximately 67 percent of sales. **For the past four years, you have been working as an auditor for an accounting firm. You will be taking over as the current in-charge on the YYYs engagement. You must perform an evaluation of YYY's control environment and assess fraud risk.**

Most of the YYYs management team has been with the company since your firm began auditing the company five years ago. Your firm maintains a good working relationship with YYYs and has found both management and the employees to be generally cooperative. Furthermore, several reliable sources of information indicate that the character of the management team is of high quality. Most people in the business community characterize YYYs as being very supportive of social values and maintaining high ideals. This characterization stems largely from the principles of the management team.

The five top officers of YYYs have been at the firm for 10-15 years. **Chris**, the son of the company's founder, became the CEO after graduating from business school. Paul, the CFO, had been hired personally by the company's founder after graduating with an accounting degree and had risen quickly through the ranks of YYYs. The internal audit department reports to the audit committee and demonstrates reasonable competence in performing its tasks.

Managerial Compensation

YYYs compensate its management team primarily through a fixed salary schedule. In a recent board meeting, YYYs's board of directors approved the motion to award all the managements team a cash bonus at the end of each year, starting in FY2012. All key personnel will each receive a cash bonus based on their salary level and their years of service. The maximum cash bonus is 1% of the key personnel's salary.

YYYs's Accounting Environment

Based on your firm's prior year audits, YYYs appeared to have no issue with its accounting systems. No material deficiencies related to the company's transactions were noted in prior audits. YYYs seemed to have a good control over its financial reporting process. YYYs's management assured your firm that YYYs will continue to maintain the quality of its accounting systems.

Bad Debts Expense

YYYs's Bad Debts Expense as a percentage of credit sales was approximately 4.9 percent for FY2012, whereas in the prior two years Bad Debts Expense as a percentage of credit sales was 5.0 percent for both FY2011 and FY2010. Credit sales for FY2012 were about £1,900,000. Review and testing of the aged trial balance of Accounts Receivable indicated that the amount and percentage of accounts receivable in each aging category were comparable to prior years. The percentages used to estimate the uncollectible accounts for FY2012 were slightly lower in practically every aging category to prior year. This decrease is owing to the expected growth of the housing market in the area in which YYYs does the business. The current reported net income may have been overstated by £722 due to the Bad Debts Expense account. However, this is below the materiality level of £45,020.

Product Warranties Expense

YYYs's Warranty Expense account for FY2012 was approximately £105,000, representing a 6 percent increase from FY2011. The audit had not disclosed any significant changes in YYYs product mix. The management explained that the increase was owing to the better than expected economic growth in the area. They explained that builders were more particular in a stronger economic climate and they tended to return wood and supplies that might be slightly flawed.

The manager of the cabinets department stated that he did remember handling more returns during FY2012 than in FY2011.A sample of 30 transactions throughout FY2012 was handled. All of the sampled transactions were supported by proper documentation. The current reported net income may have been overstated by £902 owing to the Product Warranties Expense account. However, this is below the materiality level of £45,020.

The combined effect of both the Bad Debts Expense and the Product Warranties Expense accounts may have overstated the YYYs Lumber Inc.'s net income by £1,624 (£722 + £902). However, the combined effect of these two accounts was still below the materiality level of £45,020.

Additional Information:

Ratio	2012	2011	2010
Current ratio	1.5	1.4	1.2
Net margin ratio	5.5%	5.3%	5%
Debt/equity ratio	35%	38%	43%

<u>Task1:</u>

Information related to task 1:

Fraud triangle factors are: **Incentive or motivation** to commit fraud results from a perceived pressure to commit fraud or a perceived benefit from committing fraud. **Opportunities** to commit fraud result from internal control deficiencies or working conditions allowing fraud to occur. **Attitudes or rationalizations** allow a person to justify why he or she should commit fraud.

Section A:

Based on the given Information and building on fraud triangle factors, please give your impression of this client using the following fraud risk factors.

Fraud risk factors (SAS 99)	For each applicable factor, rate EACH dimension below on a scale from 1(Extremely Low) to 10 (Extremely High):
1. Domination of management by a single person or small group without compensation controls. **(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10
2. Personal financial obligations by YYYs' s key personnel. **(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
3. Adverse relationship between company and employees • Changes in compensation • Promotions, compensation or other rewards inconsistent with expectations.**(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10

4. Inadequate monitoring controls, including automated controls and controls over interim financial reporting (where external reporting is required). **(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10
5. Ineffective communications, implementation, support or enforcement of ethical climate. **(Attitude)**	Low High 1 2 3 4 5 6 7 8 9 10

<u>Section B</u>:

Based on your analysis of this company's information and building on fraud risk factors, evaluate the fraud risk in this company in terms of:

Fraud risk factors	For each applicable factor, rate <u>EACH</u> dimension below on a scale from 1(low) to 10 (high):
1. Recurring management attempts to justify marginal or inappropriate accounting based on materiality **(Attitude);** • Overstated net income by £722 due to Bad debt Expense account. • Overstated net income by £902 due to Warranties expense. • Combined effect is (£722 + £902) = £1,624 which is less than the materiality level of £45,020.	Low High 1 2 3 4 5 6 7 8 9 10

2. Rapid growth or unusual profitability especially compared to that of the prior years. See ratios analysis table. **(Incentive)**	Low High 1 2 3 4 5 6 7 8 9 10
3. Complex or unstable organizational structure • Difficulty in determining organization or individuals with control of company • Overly complex structure. **(Opportunity)**	Low High 1 2 3 4 5 6 7 8 9 10
4. Aggressive or unrealistic forecasts by management in maintaining YYYs earnings trend. Warranties expense in 2012 is £105,000, 6% increase from the previous year. **(Attitude)**	Low High 1 2 3 4 5 6 7 8 9 10

Section C:

1. **Before providing an overall decision regarding fraud risk assessment for this client, please respond to the following questions**.

B. What is the risk of financial statement fraud attributable to the **incentives** faced by YYYs's management?	Low High 1 2 3 4 5 6 7 8 9 10
B .What is the risk of financial statement fraud attributable to the **opportunities** available to YYYs?	Low High 1 2 3 4 5 6 7 8 9 10
C. What is the risk of financial statement fraud attributable to YYYs management's **attitude** or character?	Low High 1 2 3 4 5 6 7 8 9 10

2. **Consider the overall risk of material financial statement fraud and answer the following question.**

Based on all the information you have reviewed in this case, what is the **overall risk** of material financial statement fraud for YYYs?	Low High 1 2 3 4 5 6 7 8 9 10

Task (2) Demographic Questions

TASK 2:

DEMOGRAPHICS

<u>Please provide your background information</u>

Years of full-time audit experience ______________ (years)

Please indicate the highest level of education attained:
□Bachelors

□ Masters □Other (please specify) ____________________

Please indicate which of the following most accurately describes your professional position:

□Staff □ senior □ Supervisor □ Manager □Partner (shareholder)

□ Other (please specify) _______________________.

What are your professional certifications? Please check all applied.

□ACCA □ CIA □ CIMA□ CFA □Other (please specify) ___________________ .

Do you have experience in assessing the fraud risk?

□Yes, for ________ months.□ No

How many audit engagements have you experienced where material fraud was discovered? _____

How many years you been working as an auditor? For ________ years.

Gender: □ Male □ Female

Appendix V: Graphical Results of Normality and Outliers Detection

6.2 Missing Data

Missing data occur when respondents fail to answer all the questions in the questionnaire, so no data value is stored for the variable in an observation instrument. In most of the social science studies, questionnaires are used as data collection instruments and missing data is a very common problem in data analysis (Little, 1988). Missing data causes serious problems when the sample size is already small, as it reduces sample size further and accordingly the statistical power (Cordeiro et al., 2010). In order to overcome the problems caused by missing values, Hair et al. (2006) suggested four steps to be followed: (1) identify and examine the type of missing data; (2) examine the extent of the missing data issue; (2) examine the randomness of these missing values; and (4) implement remedial techniques, such as the imputation method.

In this study, researcher did not observe any missing values in the experiment instrument. Therefore, addressing the missing values was not necessary. Nonetheless, missing value analysis (MVA) have been conducted using SPSS v. 20 to demonstrate the absence of missing observations in the data set. See Appendix V table (1) for the missing value analysis (MVA).

1- Table (1): Missing Value Analysis (MVA)

Variables	N	Mean	Std. Deviation	Missing	
				Count	Percent
domination	42	6.44	1.453	0	.0
personal	42	6.05	1.549	0	.0
adversely	42	5.37	1.743	0	.0
ineffective	42	5.32	1.224	0	.0
inadequate	42	5.65	1.484	0	.0
recurring	42	5.05	1.253	0	.0
Rapid growth	42	4.93	1.314	0	.0
complex	42	4.48	1.874	0	.0
aggressive	42	5.67	1.421	0	.0
incentive	42	5.67	1.262	0	.0
opportunity	42	5.63	1.538	0	.0
attitude	42	5.30	1.255	0	.0
overall risk	42	5.45	1.343	0	.0

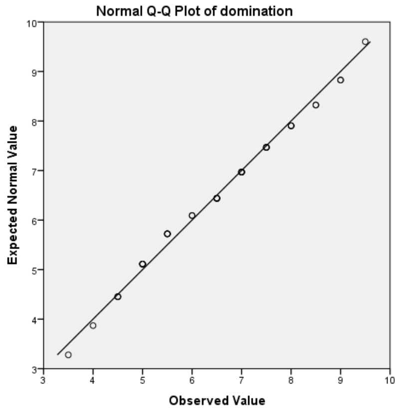
2- Table (2): Univariate outlier

Observation number	Case of outlier	Standardized values, Z-Score <± 2.5	Observation number	Case of outlier	Standardized values, Z-Score <± 2.5
1	No case	0.07	22	No case	0.43
2	No case	-0.45	23	No case	-0.51
3	No case	-0.81	24	No case	-0.41
4	No case	-0.42	25	No case	1.43
5	No case	-0.16	26	No case	-1.04
6	No case	0.96	27	No case	-0.45

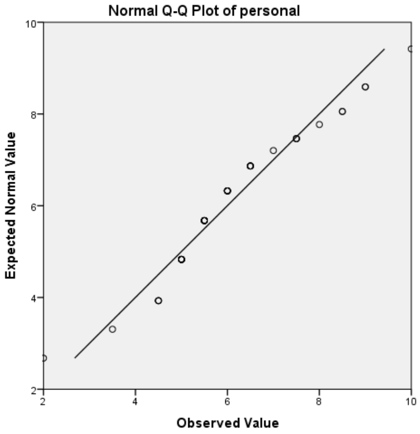
7	No case	0.86	28	No case	0.25
8	No case	0.73	29	No case	-0.21
9	No case	-1.32	30	No case	0.09
10	No case	0.74	31	No case	0.09
11	No case	-0.47	32	No case	1.2
12	No case	-0.56	33	No case	-0.27
13	No case	0.44	34	No case	0.53
14	No case	0.23	35	No case	0.13
15	No case	-0.08	36	No case	1.22
16	No case	-0.37	37	No case	0.11
17	No case	1.14	38	No case	0.64
18	No case	-1.51	39	No case	-0.37
19	No case	0.09	40	No case	-0.04
20	No case	-0.6	41	No case	-0.27
21	No case	-0.49	42	No case	-0.56

3- Q-Q Plot:

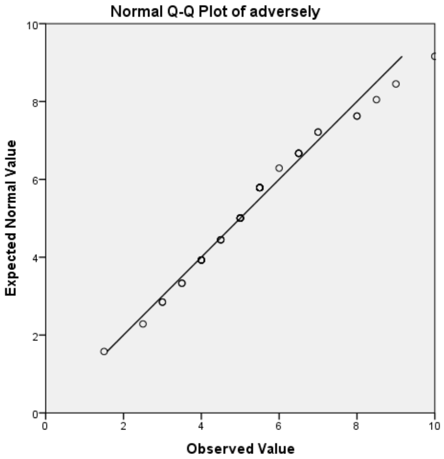
- Domination Normality Q-Q



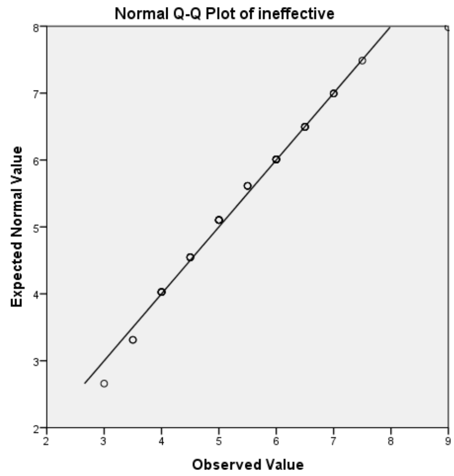
- personal Normality Q-Q



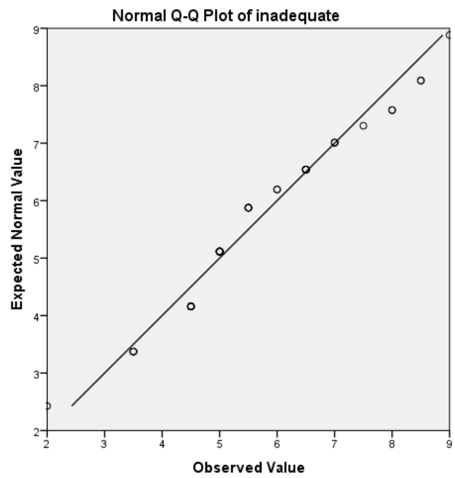
- Adversely Normality Q-Q



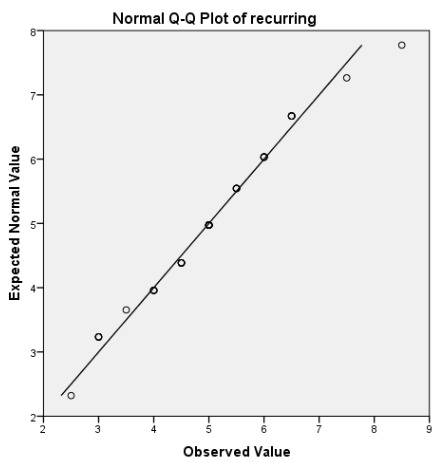
- Ineffective Normality Q-Q



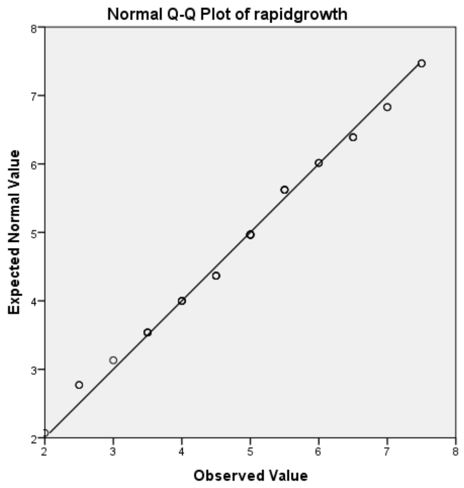
- **Inadequate Normality Q-Q**



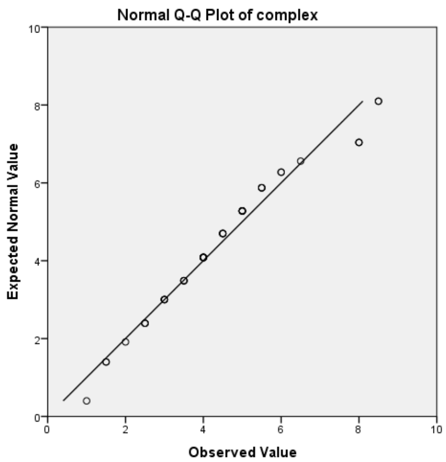
- **Recurring Normality Q-Q**



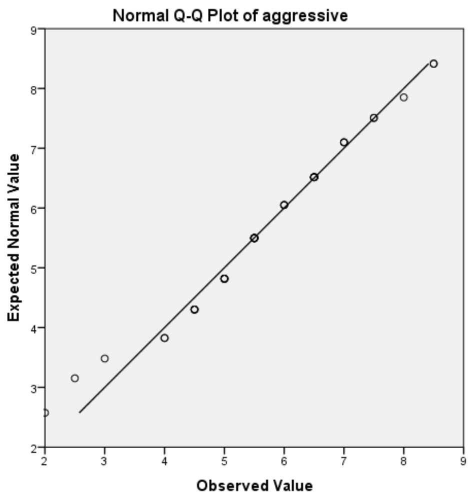
- **Rapid growth Normality Q-Q**



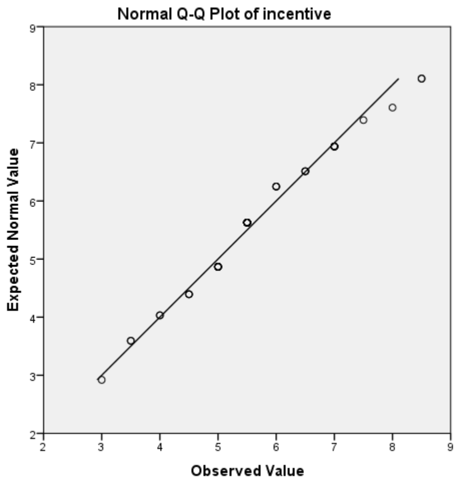
- Complex Normality Q-Q



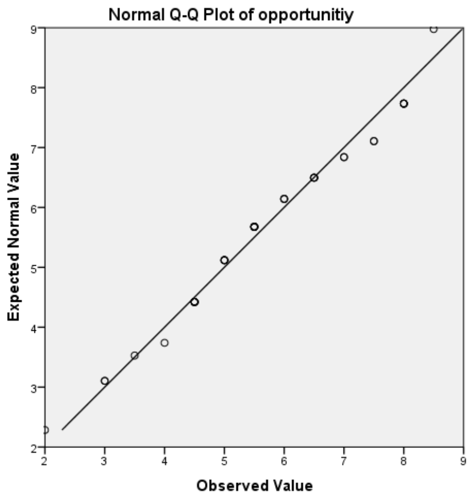
- Aggressive Normality Q-Q



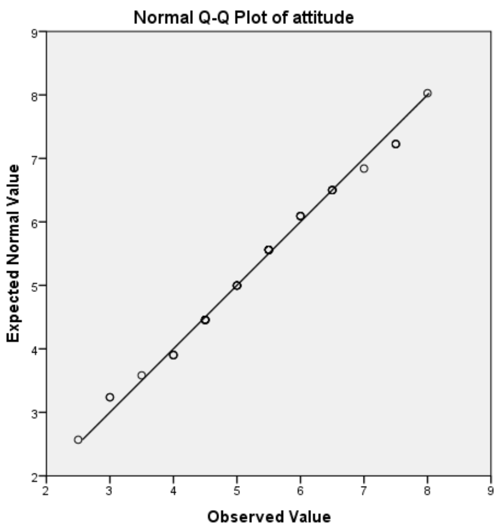
- Incentive Normality Q-Q



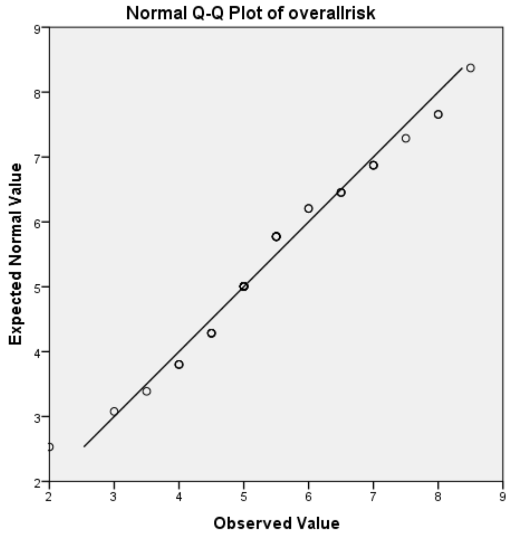
- Opportunity Normality Q-Q



- Attitude Normality Q-Q



- Overall Risk Normality Q-Q



4- Histograms:

Figure (1): Perception indicator (1)

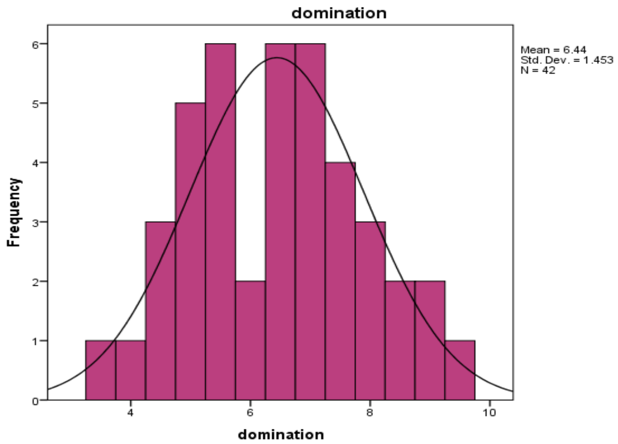


Figure (2): Perception indicator (2)

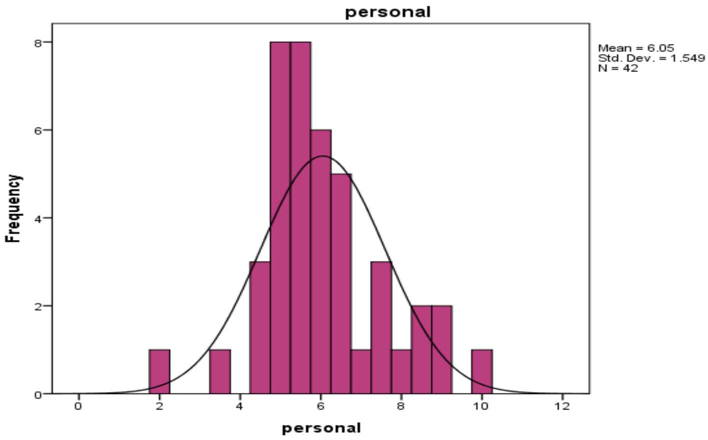


Figure (3): Perception indicator (3)

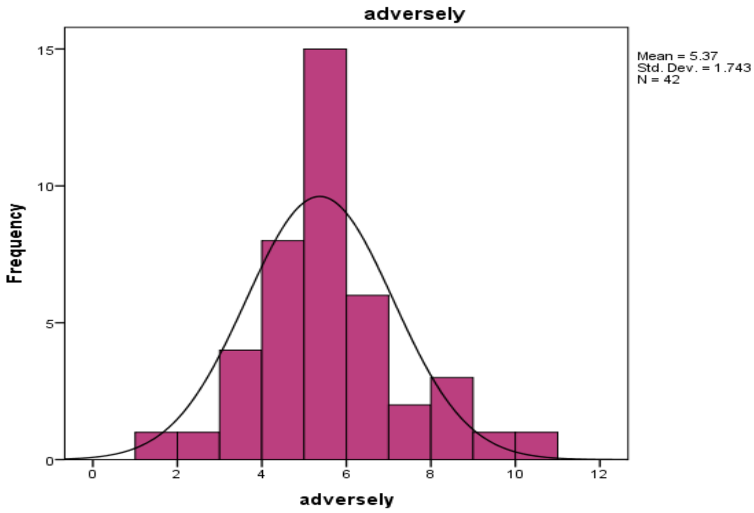


Figure (4): Perception indicator (4)

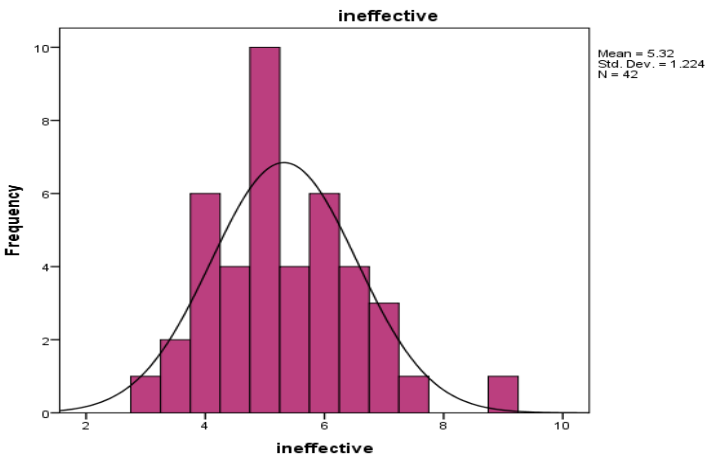


Figure (5): Perception indicatore (5)

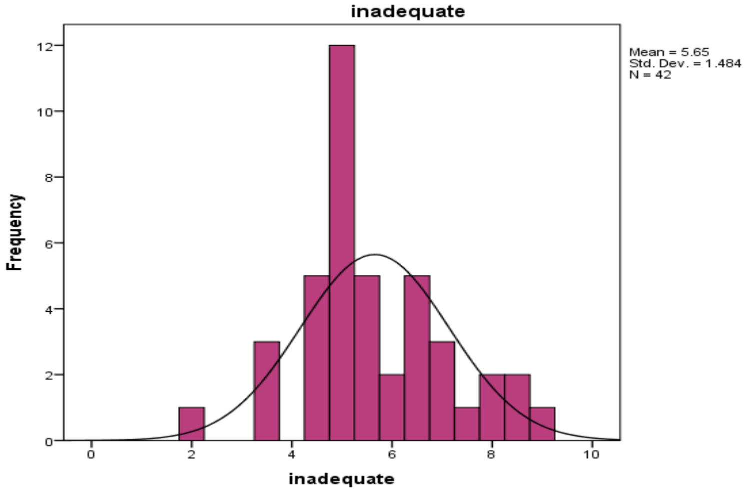


Figure (6): Judgment indicator (1)

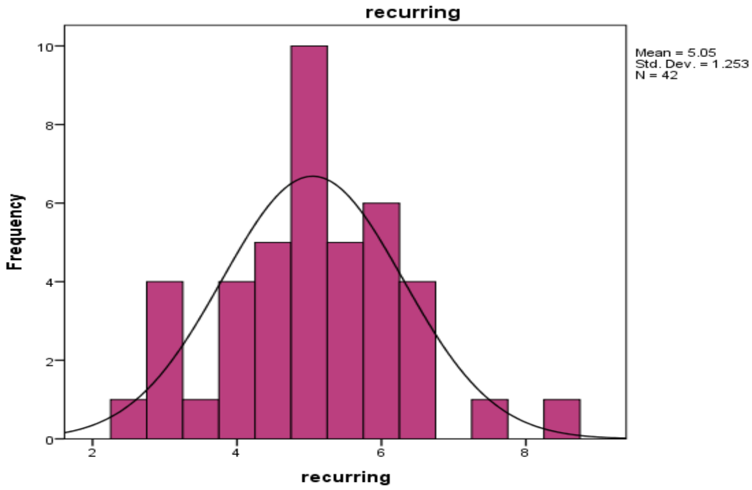


Figure (7): Judgment indicator (2)

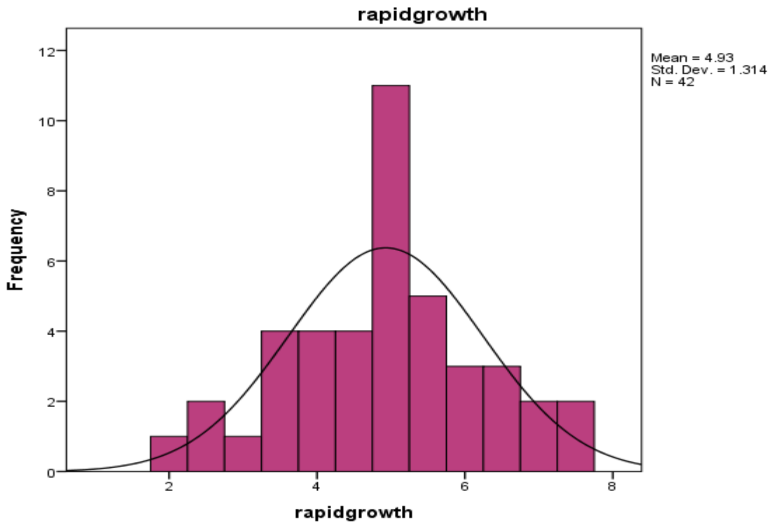


Figure (8): Judgment indicator (3)

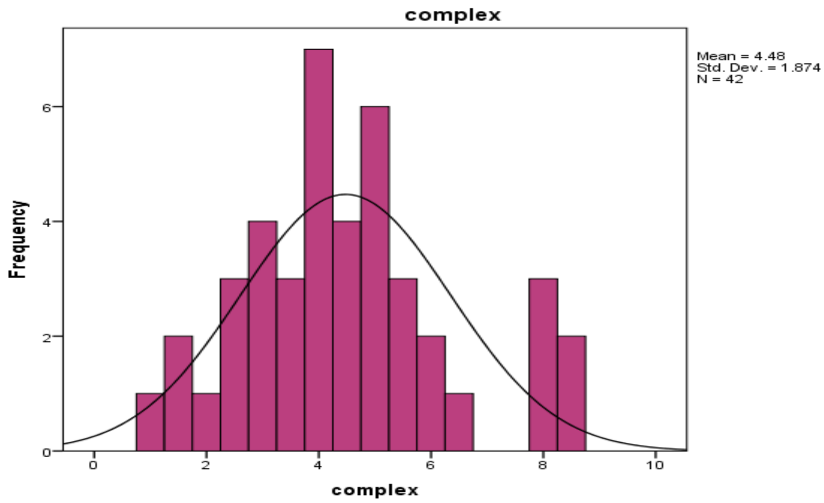


Figure (9): judgment indicator (4)

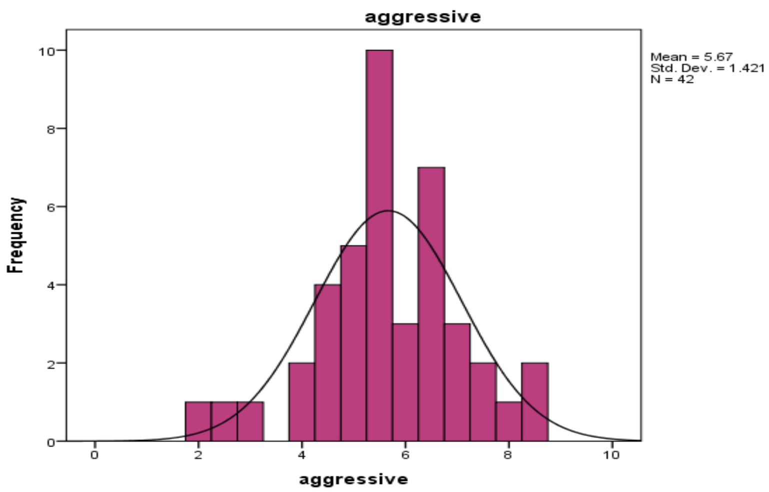


Figure (10): Decision indicator (1)

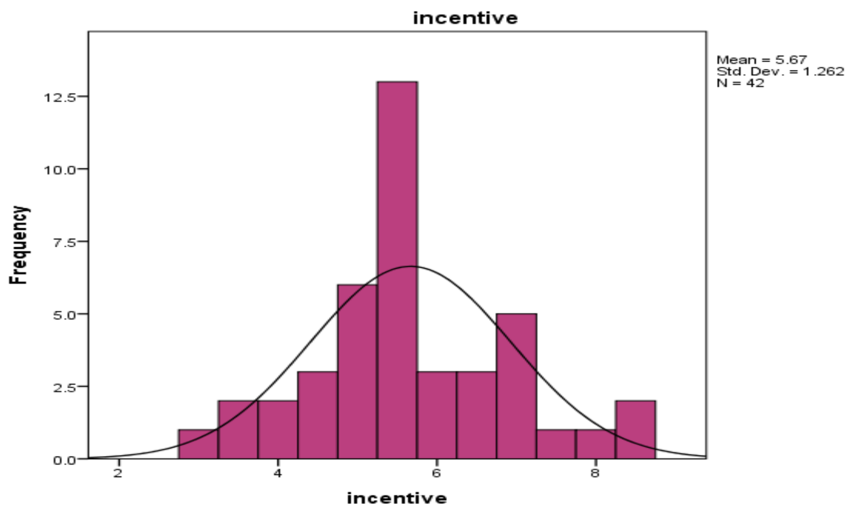


Figure (11): Decision indicator (2)

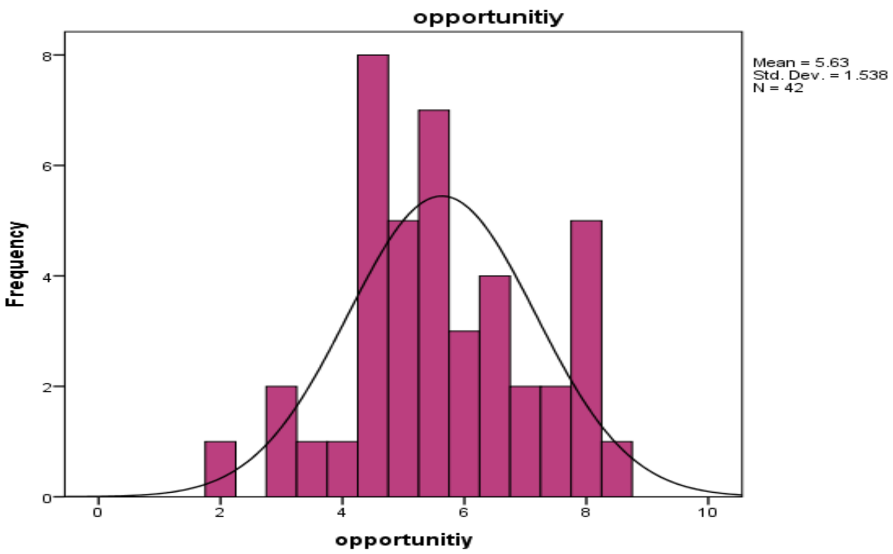


Figure (12): Decision indicator (3)

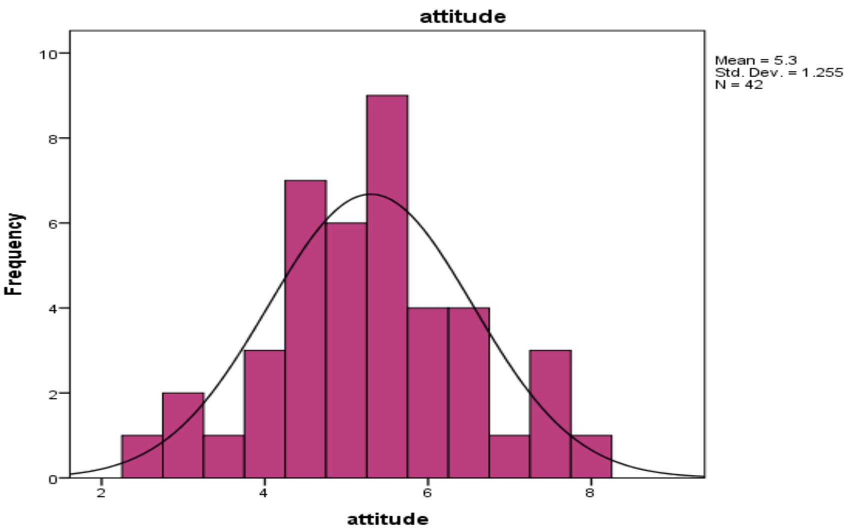


Figure (13): Decision indicator (4)