

**THE UNIVERSITY OF HULL**

**The Ethical Pathway of the Chief Audit Executive Reporting  
Relationships and the Influence of the Boundary Span of  
Knowledge and Geography**

Being a Thesis submitted for the degree of  
Doctor of Philosophy in the University of Hull

**By**

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## **Abstract**

Internal auditing is an essential part of an organisation's internal control, governance, and risk management. The nature and value of internal audit quality are measured by objectivity, competence and application of a systematic and disciplined approach. However, a close relationship with the appropriate authority, such as those charged with governance, supports the independence and objectivity of the internal auditors and complies with organisation independence standards. Nonetheless, previous literature has indicated that the chief audit executive's primary responsibilities may be compromised due to 'who they report to' (e.g., the board of directors, audit committee, chief executive officer, chief financial officer or other executives).

Internal audit reporting relationships have attracted a great deal of attention. Several attempts have been made by academic researchers and professional practitioners to investigate internal audit reporting relationship with mixed results. The vast majority of them support reporting on the execution and results of internal audit activities to the organisation's high authority. In contrast, other studies argued the difficulties of chief audit executives reporting deficiencies in full as well as reporting directly to a higher authority. However, no previous study has examined the ethical pathway of the chief audit executive's reporting relationships.

The primary purpose of this research is to examine the ethical pathways of the chief audit executives' reporting relationships with the appropriate authority and the interactions between their perceptions and decision choices. Further, it explores the interactions between the chief audit executive's assessment regarding internal audit technical expertise and the activities of internal audit in terms of governance review and information technology risk and cybersecurity with the extent of using information

technology tools and techniques. In addition, investigates the influence of the boundary span on the ethical pathway of the chief audit executive's reporting decision. The types of boundary span on which this study focuses are the boundary span of knowledge and geographical region.

The Ethical Process Thinking Model was applied to examine the relationships among the investigated factors, which provides a better understanding of dealing with governance review and information technology risk and cybersecurity issues and effective reporting relationships. A world-wide survey administered by the Institute of Internal Auditors Research Foundation is used to test the proposed hypotheses. The results indicate that chief audit executives follow different decision-making pathways depending on the internal audit activities and characteristics. In addition, the boundary span of chief audit executives' knowledge and geographical regions are proven to be associated with significant difference in chief audit executives' ethical pathway. Finally, the nature and extent of internal audit activities are associated with the chief audit executives' reporting relationships.

**Keywords:** *Boundary Span; Cybersecurity; Ethical Process Thinking; Governance Review; Information Technology; Institute of Internal Auditors; Internal Audit Reporting Relationship; Systematic literature review; Objectivity; Organisation independence.*

**Data Availability:** *The Institute of Internal Auditors Research Foundation controls access to the Common Body of Knowledge (CBOK) survey data.*

## Dedications

I would like to take this valuable opportunity to thank many individuals, without whose assistance, this research would not have been completed:

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Finally, I dedicate my work to my first teacher and great example, my father (Mesfer AL Fayi) who passed away 12 years ago, and to my dearly departed brother (Somman), aunt (Refah), sister (Fawziah), and nephews (Hamad and Fawaz) whom I sadly lost during my PhD studies. May Allah rest their souls in heaven (Amin).

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Finally, I express my thanks to the Institute of Internal Auditors Research Foundation (IIARF) for access to the Common Body of Knowledge (CBOK) 2015 Practitioner Survey data on conditions of confidentiality and a non-disclosure agreement.

## **Author's Declaration**

I, Salem Mesfer A AL Fayi, declare that the work, research analyses and conclusions reported in my PHD Thesis 'The Ethical Pathway of the chief audit executive Reporting Relationships and the influence of the Boundary Span of Knowledge and Geography' are entirely my efforts, except where otherwise acknowledged. I also declare that I have followed the academic rules and ethical conduct in presenting all information in this document.

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## List of Abbreviations

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<b>AC</b>	Audit Committee of the Board of Directors
<b>CAE</b>	Chief Audit Executives
<b>CBOK</b>	Global Common Body of Knowledge
<b>CEO</b>	Chief Executive Officer
<b>CFO</b>	Chief Financial Officer
<b>COCO</b>	Committee of Sponsoring Organisation
<b>DEC</b>	Reporting Decision
<b>EFA</b>	Exploratory Factor Analysis
<b>GOV</b>	Governance Review Activities
<b>IAF</b>	Internal Audit Function
<b>IIA</b>	Institute of Internal Auditors
<b>IIARF</b>	Institute of Internal Auditors Research Foundation
<b>IPPF</b>	International Professional Practices Framework
<b>ITS</b>	Information Technology Risk and Cybersecurity Activities
<b>ITU</b>	Using Information Technology Tools and Techniques
<b>SPPI</b>	International Standards for the Professional Practices
<b>PCA</b>	Principal Component Analysis
<b>PCAOB</b>	Public Company Accounting Oversight Board
<b>SOX</b>	Sarbanes-Oxley Act of 2002

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# Chapter 1 Introduction

## 1.1 Background and Motivation

Internal auditing is an essential part of an organisation's internal control, governance, and risk management (Anderson et al., 2012). The nature and value of internal audit quality are measured by objectivity, competence and application of a systematic and disciplined approach (ISA, 2013). Objectivity and competence may be viewed as a continuum, but a high level of competence cannot compensate for lack of objectivity and the opposite is also true. However, a close relationship with the appropriate authority, such as those charged with governance<sup>1</sup> (e.g., the audit committee of the board (AC)), supports the independence and objectivity of the internal auditors (Abbott et al., 2016; Lin et al., 2011). The major challenge faced by chief audit executives (CAEs)<sup>2</sup> is to independently ensure that there is no material misstatement in the financial information as well as no misappropriation of assets (Kagermann et al., 2008). Typically, CAEs are responsible for guaranteeing the aforementioned are carried out in a successful manner to obtain the most effective reaction from organisation managers to achieve corporate objectives (Ernst & Young, 2012). This can be achieved by reporting the result of their work to a level within the organisation that allows the internal audit activity to fulfil its responsibilities (IIA, 2016a).

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<sup>1</sup> In the UK and Ireland those charged with corporate governance, "rather than management, are usually responsible for determining the role of internal audit" (International Standard on Auditing (UK and Ireland) 610, (2004).

<sup>2</sup> CAEs are accountable for overall conformance with the Standards. The CAEs is "a person in a senior position responsible for effectively managing the internal audit activity in accordance with the internal audit charter and the Definition of Internal Auditing, the Code of Ethics, and the Standards. The specific job title of the chief audit executive may vary across organisations" (IIA, 2016a; 21).



Nonetheless, previous literature has indicated that the CAE's primary responsibilities may be compromised due to 'who they report to' (e.g. board of directors, senior management, chief financial officer (CFO) or other executives) (IIA, 2013a). Further, the auditing literature has documented that some difficulties may result from pressure resulted from an individual or committee that receives the CAE's report (Schneider, 2009; Norman et al., 2010).

According to the Institute of Internal Auditors (IIA) International Standards for the Professional Practice of Internal Auditing, the CAE should report to the board functionally (e.g. on the approving charter, planning, execution and results of audit activities), and report to the organisation's chief executive officer (CEO) administratively (e.g. on budgeting, evaluations and administration matters) (IIA, 2016a). Such reporting relationships represent the standard of organisational independence, which has been explained in the IIA practice advisories No. 1110-1 to promote dual-reporting lines. Thus, the CAE should serve two masters (the board & CEO) to facilitate organisation independence (IIA, 2016b). Thus, the AC and executive management's support is crucial to the success of the internal audit function (IAF) (Fraser & Lindsay, 2004; Schneider, 2009). In this study, independence between the board and the CEO assumes that the former has no strong control over the AC reporting to the board.<sup>3</sup>

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<sup>3</sup> According to the IIA Practice Advisory in 2002, CAEs should report functionally to the AC of the board, while the new Practice Advisory (2013) requires reporting to the board of directors. This update has occurred because not all organisations have an AC in place. In addition, the AC and board of directors are both high governance authorities.

The IIA was established in 1941 to organise and improve the profession of internal audit by issuing standards, code of ethics and other professional practice guidance (IIA, 2016a). According to the IIA website (IIA, 2017a), internal audit is:

*“An independent, objective assurance and consulting activity designed to add value and improve an organisation's operations. It helps an organisation accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes”.*

The definition of the IAF clarifies the importance of independent and objectivity rules. In addition, it confirms that the IAF should improve the effectiveness of corporate governance. Therefore, internal audit reporting relationships are considered as an important factor of corporate structure (Bame-Alderred et al., 2013), and the reliability of the IAF is influenced by clients' regulatory environment factors (e.g., governance characteristics). In addition, internal audit, along with the external auditors, management and the AC of the board are the four cornerstones of corporate governance (Gramling et al., 2004; Norman et al., 2010; IIA, 2010). Cooperation between them improves the reliability of financial reports and corporate governance (Mihret, 2011). Furthermore, increased reliance on the IAF by others makes it imperative to seek to better understand (Desai et al., 2010), with this in mind, the role of internal auditors, as 'pillars' of corporate governance (Gramling et al., 2004).

However, there are pros and cons associated with each reporting line (Fraser & Lindsay, 2004), which should be weighed and analysed before the determination of a particular reporting mechanism, taking into account the ethical considerations that might be influenced by the changing environment, time pressure and the available information (Rodgers & Gago, 2001). The ethical consideration is an opportunity to improve the

organisation as presented in the IIA Audit Executive Centre report, which was released in 2013 (IIA, 2013a).

In addition, the Code of Ethics of internal audit was issued by the IIA and it is considered as the foundation of governance and a dominant part of the International Professional Practices Framework (IPPF) (IIA, 2016c). It includes two essential components:

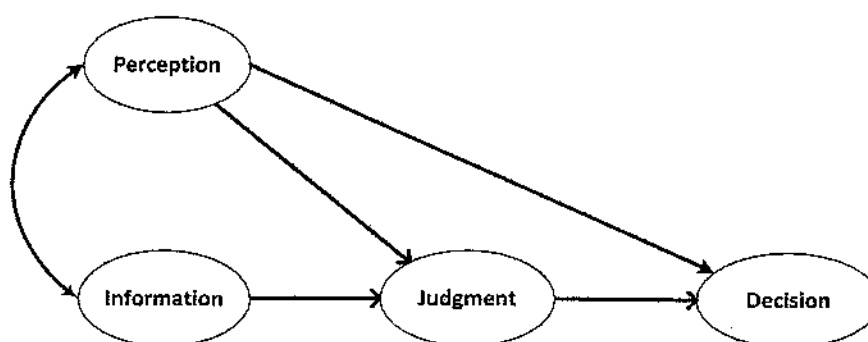
- Principles (integrity, objectivity, confidentiality and competency)
- Rules of conduct that describe behaviour norms expected from internal auditors.

However, to date, no study has examined the ethical position of internal audit reporting relationships. In addition, no study has investigated the boundary span between actors, such the relationship between the CAEs and board, AC or other management executives, which may influence the CAE's decisions as to whom he/she should report. According to McNulty and Stewart (2015; 516), a 'boundary' is a separation, or a range of activities, that highlights the limitations of an area, which may comprise "*knowledge, tasks, hierarchical, social, relational and, of course, temporal/spatial boundaries*". Thus, the boundary span involves the strength or weakness of information flow between two entities, which may be divided by knowledge, geography, organisational areas, culture, etc. That is, the boundary span of knowledge and geography entails inequality, conflict, domination, subordination, and manipulation influences. Knowledge also can be viewed as a combination of contextual information, values, framed experience, expert insight and grounded intuition (Mohrman et al., 2001), which distinguish between high and low knowledge.

An article by Everett and Tremblay (2014) examines ethics in the field of internal audit and they underscored the need for studying the relative independence of internal audit. They stated that "*One needs to question the internal auditor's relative independence and*

*the degree to which the practice of auditing is being compromised by organisational actors who may not share the auditor's particular moral-philosophical outlook'* (Everett & Tremblay, 2014; 183). Therefore, this research will examine the ethical pathways of the CAE reporting relationships with the organisation different authorities. In addition, it will harness the strengths and weaknesses of the primary ethical pathways as depicted in the Ethical Process Thinking Model (Rodgers, 2009). The importance of this model is that it suggests how perception, information and judgment interact before making a decision. It can provide meaningful insight into the impediments or causes of decisions. In addition, it centres upon the Throughput Model (Rodgers, 1997), and hypothesises that three major concepts of perception (P), information (I) and judgment (J) are applied in a certain order, before the decision choice (D) (see Figure 1.1). It conceptualises decisions as the outcome of the interaction among perception (governance review and information technology security), information (technical competency), and judgment (analysis stage). *"These stages are always present in a decision-making context, but their predominance or ordering influences decision outcome"* (Foss & Rodgers 2011; 7).

**Figure 1-1: Ethical Process Thinking Model**



SOURCE: ETHICAL BEGINNINGS (RODGERS, 2009; 19)

Based on Figure 1.1, this model outlines six dominant ethical pathways influencing a decision choice. Three of these are primary ethical pathways (preferences, rules, and

principles); building on these three pathways leads to three secondary pathways (relativism, virtue ethics, and ethics of care)<sup>4</sup>. However, not all of the four major concepts are necessary for each of the six pathways. For that reason, this study focuses on the primary ethical pathways (preferences-based [ethical egoism], rule-based [deontology] and principle-based [utilitarianism]) in order to examine the basic ethical positions of the CAEs' reporting lines. These three primary ethical pathways tend to be the most discussed and applied ethical positions in accounting and auditing (Rodgers et al., 2009). These pathways represent ethical positions relating to (1) an individual's utility, (2) rules pertaining to an organisation/society, and (3) satisfying a group emphasis towards a goal. Rodgers (2009; 26), for instance, observed that '*individuals with a strong sense of ethical process thinking are more likely to act ethically than are those who are operating with a weak or non-existent preference, rules and principles ethical system*'.

<b>Primary Ethical Pathways</b>	(1) Preference-based (Ethical egoism)	$P \rightarrow D$
	(2) Rule-based (Deontology)	$P \rightarrow J \rightarrow D$
	(3) Principles-based (Utilitarianism)	$I \rightarrow J \rightarrow D$
<b>Secondary Ethical Pathways</b>	(4) Relativism-based	$I \rightarrow P \rightarrow D$
	(5) Virtue ethics-based	$P \rightarrow I \rightarrow J \rightarrow D$
	(6) Ethics of care-based (stakeholders)	$I \rightarrow P \rightarrow J \rightarrow D$

Source: Rodgers (2009; 17)

<sup>4</sup> The secondary ethical pathways include relativism, virtue ethics and ethics of care. Relativism pathway assumes that culture, environments and people around decision makers allow individuals to change their ethical beliefs ( $I \rightarrow P \rightarrow D$ ). Virtue ethics pathway focuses on what makes a good person rather than good action ( $P \rightarrow I \rightarrow J \rightarrow D$ ). Ethics of care pathway similar to stakeholder theory, which seeks to not harming any stakeholders ( $I \rightarrow P \rightarrow J \rightarrow D$ ). For further discussion regarding the ethical pathways. Please, see Rodgers et al. 2009).

The Ethical Process Thinking Model is useful in conceptualising a number of important issues in accounting and management (Foss & Rodgers 2011; Rodgers & Housel 1987; Rodgers et al., 2017), ethics/corporate social responsibility issues (Rodgers et al., 2014), as well as ethical dilemmas in auditing (Guiral et al., 2015; Rodgers et al., 2009). This model can clarify critical pathways in ethical decision-making that are influenced by different sources of information and environmental conditions (Rodgers, 1997; 2009).

The importance of governance review and information technology (IT) security activities has grown with increased use of technology (e.g., smart devices, social media, and cybersecurity). Executives are increasingly concerned about governance and technology risks, which make organisations, turn to the IAF asking for help to manage such risks. Consequently, the IAF should take further steps to review ethics-related audits, strategy and performance, and executive compensation, as well as to ensure IT risks, cybersecurity, access to mobile devices and employees' use of social media.

This study examines the interrelationships between information (technical expertise), the CAEs' perception related to internal audit activities (governance review and IT risk and cybersecurity), mediated by judgment (the extent of using IT tools and techniques) before making a reporting decision. This examination is based upon the three primary ethical positions (psychological egoism, deontology, and utilitarianism), which are discussed later in the research. This study offers a clear explanation of the basic components that support the three primary ethical pathways (see Rodgers et al., 2009). The researcher argues that each of these major ethical positions can lead to or influence the interpretation of an ethical dilemma that deals with material misstatement or misappropriation of assets. For example, Jones (1991) argued that ethical positions are deemed to be the driver of the decisions making process or action taking by individuals and organisations.

The focus of this study is on the internal audit reporting relationships stemming from three important aspects. **First**, we still know very little about CAEs' challenges in serving two masters; for example, Gramling et al. (2004) and Cohen et al. (2004) indicated that there is a paucity of research with respect to the relationships between the IAF and the other two masters (AC and CAE) (Gramling et al., 2004; Cohen et al., 2004). Fairly inconsistent findings across some recent studies have suggested the issue should be investigated (e.g., Christopher et al., 2009; Stewart & Subramaniam, 2010; Zaman & Sarens, 2013). **Second**, internal audit reporting relationships have an effect on internal auditors' objectivity and independence (IIA, 2016a), and the importance of independence and objectivity of internal auditors continue to increase with the development of the business environment (IIA, 2011). **Finally**, there is an opportunity for improving organisational ethics through examining the ethical pathways of the CAEs reporting relationships with the appropriate authority (IIA, 2013a).

## 1.2 Research Motivation

This study examines the ethical pathway of CAEs' reporting relationships with the appropriate governance authority and the influence of the boundary span of knowledge and geography. The motivation for the study is fourfold. **First**, the regulatory and best practices guidance typically fails to explicitly delineate high authorities' (audit committee and board) duties regarding the IAF. **Second**, no study has examined the ethical pathway of the CAEs' reporting relationship with different organisation authorities. **Third**, this study advances the literature by investigating the influence of the boundary span of knowledge and geography on CAEs' reporting decision pathway. **Finally**, this study adds to prior research by examining the nature of IAF activities or their influence on the CAE's perception, judgment and decision choice. Using a unique survey of CAEs' responses

collected and maintained by the Institute of Internal Auditors Research Foundation (IIARF) for benchmarking purposes, proposed hypotheses were tested. This study uses the years of professional experience (high and low knowledge groups) and the geographical region where the CAE is based or primarily works (i.e., Europe, North America, Middle East, Africa, Asia and Pacific, and South and Central America and the Caribbean) as a boundary span to measure their influence on the ethical pathway of reporting relationships.

### **1.3 Research Problem**

A body of literature exists on the subject of internal audit reporting relationships, including scholarly journals and professional reports. However, they reported mixed results. First, some studies claimed that reporting to the AC of the board functionally and the CEO administratively can provide more credibility (e.g., Holt, 2012), prevent fraud (e.g., James, 2003; 2004) and is considered to be the preferred approach (IIA, 2016a). In contrast, Norman et al. (2010) argued that dual-reporting lines might not be a wise solution for internal audit independence and objectivity, as they found that internal auditors reduce their risk assessment when they report to the AC. In the same context, others have argued that there are some difficulties with CAEs reporting all deficiencies directly to ACs (e.g., Fraser & Lindsay 2004; Hoos et al., 2015).

No study has discussed the ethical considerations which might deter the CAE from reporting deficiencies in full, including the person who decides their salary, evaluations and bonus. Finally, such mixed results may indicate that internal audit reporting relationships follow different ethical pathways and the CAE's reporting decision can be influenced by time pressure, environment change and his/ her perception (Rodgers & Gago, 2001). For example, Hoos et al. (2015) found that internal auditors make



significantly different judgments if task complexity is high, depending on communicated superior preferences. This is an example of the ethical considerations which can be analysed.

## **1.4 Research Objectives**

Based on the aforementioned research motivations and problems, this study seeks to achieve the following objectives:

1. Review the relevant literature of internal audit reporting relationships to identify the advantages and disadvantages for each reporting line (reporting to the board of directors, AC, CEO and CFO); as well as, to discuss the factors that may influence the CAE's reporting decision.
2. Examine the Ethical Process Thinking Model to determine the ethical pathway of the CAEs' reporting relationships with the appropriate authority.
3. Investigate the direct and indirect influence of the IAF competency, the CAEs' perception and judgment on the reporting decision.
4. Investigate the significant difference of the extent of governance review and IT risk and cybersecurity activities between high and low knowledge groups.
5. Examine the influence of the boundary span of knowledge on the CAEs' reporting relationships.
6. Investigate the significant difference of the extent of governance review and IT risk and cybersecurity activities in six geographical regions.
7. Examine the influence of the boundary span of geographical regions on the CAEs' reporting relationships.

## **1.5 Research Questions**

Based on the previous discussion, the author can formulate the problem of this study in the following questions:

1. To what extent have the internal audit reporting relationships hitherto been investigated?
2. To what extent is the implementation of the Ethical Process Thinking Model useful to study the CAE's reporting relationships?
3. Does the CAE's perception regarding the extent of the IAF activities have direct and indirect influence on the CAE's reporting decision?
4. Do technical expertise along with judgment components affect the CAE's reporting decision?
5. Does the extent of governance review and IT risk and cybersecurity activities vary between high and low knowledge groups?
6. Does the boundary span of knowledge influence the CAE's reporting decision?
7. Does the extent of governance review and IT risk and cybersecurity activities vary in the six different regions?
8. Does the boundary span of geographical regions influence the CAE's reporting decision?

## **1.6 Research Method**

In order to make an academic and professional contribution, this study conducts a systematic literature review supported by additional narrative methods to review the literature on internal audit reporting relationships. These two methods advance the literature by documenting the degree to which internal audit reporting relationships have hitherto been investigated, as well as to identify factors that may influence the CAE's

reporting decision (see Chapter 2: the literature review). Then, this study examines the ethical pathways of the CAE reporting relationships focusing on three primary pathways of the Ethical Process Thinking Model. This model provides help to identify the direct and indirect influence on the reporting decision of the CAEs' perception and available information, which is largely driven by the mediation of their judgment (see Chapter 3: the theoretical framework and hypotheses development). A full discussion of the research methodology is presented in Chapter 4. A worldwide survey administered by the Institute of Internal Auditors Research Foundation is used (see Chapter 5: Descriptive Analysis), and Partial Least Squares Structural Equation Modelling (PLS-SEM) is applied to tests the proposed hypotheses (see Chapter 6: Evaluation of PLS-SEM Results).

## **1.7 Overview of Study Findings**

A close and effective relationship between the IAF and high authority can be beneficial not only to the organisation, but also to society as a whole. In contrast, reporting relationships with lower authority are considered inappropriate and should be restricted. Nonetheless, a close relationship between the CAE and CEO should be clearly defined to create good corporate governance and avoid negative consequences. However, the nature of IAF activities, independence threats, authority characteristics, control environment and ethical considerations can provide more insight into the CAE's relationship with different authorities.

Consistent with institutional theory, organisations differ across institutional frameworks, as a result of the dynamic interaction between the organisations and the formal and informal institutional environment. For instance, within a situation where formal institutions (e.g., laws, regulations and rules) are underdeveloped, informal institutions (e.g., norms, cultures, ethics) are given stronger control to facilitate transactions. The

researcher believes that reporting relationships are not only driven by firm capabilities and industry conditions, but also, are influenced by the formal and informal constraints of a particular institutional framework. For example, each organisation has its legal system and its conditions, which have an effect on the available information and individuals' perceptions. Accordingly, individuals' different perception and judgment, as well as information signals can lead to different decisions. This may explain the connection between the institutional theory and the Ethical Process Thinking Model, as the dynamic interaction between formal and informal institutional environment can lead to different ethical decisions (pathways).

This research examines the ethical pathway of CAEs' reporting relationships with the appropriate governance authority and the influence of the boundary span of knowledge and geography. The author uses the years of professional experience and the region where the CAE is based or primarily works as a boundary span to measure their influence on the ethical decision of reporting relationships. The results show that different ethical pathways are followed by the CAEs. In particular, CAEs with expert knowledge typically may prove more capable of solving an ethical problem that requires a great deal of experience ( $P \rightarrow D$ ), but do not necessarily follow the rules or principles when solving such an ethical dilemma. However, following the regulations mean that the CAEs should report to the board or AC; in this case, the decision is non-consequential, and the rule should be implemented regardless of the substance of the transaction. This leads to more consistent decisions, when the same rules are implemented. The decision is induced by a judgment based on a perception of a circumstance ( $P \rightarrow J \rightarrow D$ ). Nonetheless, there may be times when the rules do not support the substance of the accounting transaction. In addition, professional standards, firm policies and procedures, and decision support systems are different from one organisation to another. These environmental

characteristics have the capacity to influence judgment performance and decision motivations (I→J→D).

Finally, statistical examinations prove that there are significant differences between CAEs' Knowledge and geographical regions groups. Such significant differences explain the boundary span of knowledge and geography between CAEs' activities (e.g., governance review and IT risk and cybersecurity), which influence the CAEs' ethical pathways (i.e., reporting decision). The findings, in turn, support earlier evidence on the influence of environmental characteristics. For instance, Al-Akra et al. (2016) focus on the literature of independence and objectivity in the Middle East and North Africa and find that independence and objectivity are lacking in this region. They affirm the need to consider cultural and social influences when formulating rules and regulations (Al-Akra et al., 2016). In addition, Alzeban and Gwiliam (2014) in their study consider that perceptions and beliefs, culture and societal relationships can influence behaviour and decisions. Finally, social consensus and the magnitude of consequences affect the decision path of auditors (Arnold et al., 2013).

## **1.8 Research Contribution**

This study adds to prior research by reviewing the literature of internal audit reporting relationships and covers a wide range of publications during the last three decades to identify the advantages and disadvantages for each reporting line, as well as the factors that may influence the CAEs reporting decisions. This study has advanced debate on internal audit reporting by shifting the focus from the importance of internal audit reporting relationships to the issue of the reporting decision. Two theoretical frameworks including 12 hypotheses were developed in order to explain the linkages between the investigated constructs. The Ethical Process Thinking Model was implemented in

connection with the previous literature of internal audit reporting relationships to examine the ethical pathways of the CAEs reporting relationships with the appropriate authority. It was possible to demonstrate the strengths and weaknesses of the three primary ethical pathways.

From a methodological perspective, a unique survey of CAEs' responses developed and administered by IIARF was obtained, containing new cross-sectional data collected in 2015. It was possible to identify 2235 CAEs with different levels of experience from six regions. This large sample provided the opportunity for the researcher to examine the proposed hypotheses and compare between CAEs without restraint. A further methodological contribution is the provision of valid and reliable measurements for the two theoretical models' components (i.e., governance review, IT risk and cyber security, technical expertise, the use of IT tool and techniques and reporting relationships decision). Both theoretical models have been tested through a rigorous statistical methodology, including exploratory factor analysis, and smart PLS-SEM quality criteria for the measurement model.

Finally, this study used a variety of non-parametric techniques in order to achieve the research objectives. For example, the Mann-Whitney U Test was used to examine the significant difference between high and low knowledge related to the CAEs' perception about internal audit activities. In addition, the Kruskal-Wallis Test was used to examine the significant difference in CAEs' perception regarding the extent of the internal audit activities among the six different geographical groups. Smart PLS bootstrapping for multi-group analysis was applied for comparison between groups. However, the theoretical framework and the empirical results provide a foundation for future research, where more constructs can be investigated to complement the results of this study.

## 1.9 Practical Implications

The results of this study may prove interesting to several parties. This study proposed that the distinctive nature of CAEs' knowledge, more specifically, certain conditions inherent in each of the primary ethical pathways, will widen or close the boundary span. Therefore, this research advances the literature by providing a clearer picture for practitioners, researchers and regulators to facilitate independence and objectivity requirements. These results also speak to the need for regulators to consider the boundary span of geography and cultural difference. Initially, should policy makers consider expanding or restricting specific reporting structural roles, they should consider the effect on the CAEs' ethical decision-making pathways. In addition, organisations' appropriate governance authorities oversee the work of internal auditors; our results suggest that these authorities should consider the nature of IAF activities that address the objective of their organisation and eliminate any expected bias or conflict of interest that may influence CAEs' actions (i.e., decision-making).

The findings of this study complement our understanding of how reporting relationships work, which is useful to inform external auditors' reliance decisions by using the work of internal auditors, or using them for direct assistance. Finally, studies reveal that IT tools and techniques support decision makers faced with difficult decisions. Consequently, organisations should pay attention to the increased reliance on IT for operations and assurance tasks, which can help the CAEs to make decisions more quickly and effectively.

## 1.10 Structure of Thesis

This thesis is divided into seven chapters. A brief description of each chapter is given as follows:

*Chapter 1* introduces the research study. Specifically, it discusses briefly the research background, motivation and problem, followed by the research objectives, questions and expected research methodology. In the end, it provides an overview of the research findings and highlights its contribution to knowledge.

*Chapter 2* Based on the research questions (Question 1), this chapter advances the literature by conducting a systematic literature review supported by narrative review to achieve two main purposes. The first is to summarise relevant studies in order to determine the degree to which internal audit lines have hitherto been investigated and identify the advantages and disadvantages of reporting to four different authorities (the board of directors, the AC, CEO and CFO). The second is to identify the factors that may influence the CAE's reporting decision in order to highlight gaps in the field and directions for further research. A full discussion of those two objectives is included in this chapter.

*Chapter 3* represents the conceptual framework, which begins with the theoretical background, followed by the Ethical Process Thinking Model and the primary ethical pathways (e.g., preference-based, rule-based and principle-based). This is followed by discussion of the study constructs related to information, perception, judgment and decision. The development of hypotheses is explained. The chapter ends with discussion of the derived theoretical frameworks (i.e., Model A & Model B).

*Chapter 4* explains the research methodology, which enabled the researcher to achieve the research objectives and answer the questions under consideration. This chapter discusses the methodological strategies and the research approach, followed by the



research choice and strategy. It also discusses variables and measurements, data collection procedures, and the ethical considerations.

*Chapter 5* presents descriptive analysis, classified into preliminary analysis, demographic analysis and exploratory factor analysis (EFA). The preliminary analysis starts with screening and preparing the data, followed by assessing and treating missing values and outliers. Then, it summarises the process of sample selection and the evaluation of normality assumption. The demographic analysis describes respondents' characteristics and organisations' characteristics. Finally, the evaluation of EFA is illustrated at the end of this chapter, followed by a discussion of the data analysis tools and criteria.

*Chapter 6* evaluates the PLS-SEM results. It presents the details of the empirical assessment of the research models proposed in Chapter 3. It begins with the evaluation of the measurement model, followed by the evaluation of the structural model. The proposed hypotheses are examined statistically. Finally, all statistical outcomes are presented and evaluated.

*Chapter 7* presents the research discussion and conclusion. The theoretical and empirical findings are discussed and organised by following the research questions and hypotheses. The theoretical and methodological contributions are included, as well as the practical implications. Finally, this chapter ends by discussing the research limitations, future research and concluding remarks.

## Chapter 2 Literature Review

### 2.1 Introduction

This chapter advances the literature by conducting a systematic literature review supported by additional narrative methods to achieve the first objectives of this study. The review has two main purposes. The first is to summarise studies showing the degree to which internal audit lines have hitherto been investigated in order to determine the advantages and disadvantages of reporting to four different authorities (the board of directors, AC, CEO and CFO). The second is to identify the factors that may influence CAE reporting decisions in order to generate new ideas and directions for further research avenues. To accomplish these goals, the author collected both empirical and theoretical articles that investigate internal audit reporting relationships, either directly or implicitly. Previous literature review researches contained many variations on this simple paradigm. Most importantly, some researchers were interested in reviewing the literature related to the role of the IAF in corporate governance (Gramling et al., 2004), independence and objectivity of the IAF (Stewart & Subramanian, 2010), and external auditors' reliance on the work of the IAF (Bame-Alder et al., 2013). However, no study has reviewed the literature of internal audit reporting relationships, which are a crucial concern to all of internal audit's customers, including internal and external stakeholders, professional groups and regulators, because, internal audit reporting relationships have an effect on the internal auditors' objectivity and independence (Goodwin & Yeo, 2001; IIA, 2011). In addition, researchers still know very little about CAEs' challenges in serving two masters (Gramling et al., 2004). Finally, increased reliance on the IAF by others makes it imperative to seek to better understand this function (Desai et al., 2010).

However, organisations are transmitted by various types of vehicles, such as reporting to the board, AC, CEO and CFO, which indicate reporting relationships. Further, they operate at different levels of jurisdiction (e.g., Sarbanes- Oxley, the Committee of Sponsoring Organisations (COSO), highly recommended international standards) via relationships between the board and CEO. This may explain why internal audit reporting relationships are so complex in reality.

The researcher believes it is essential to discuss first the development of the internal audit profession, the need for internal audit and the international standards for professional practice. Consequently, the remainder of this chapter is structured as follows. The next section describes the development of the IAF in section 2.2. Section 2.3 discusses the importance of internal audit. Then, section 2.4 describes briefly the IIA and the international standards for professional practice. After that, the approaches adopted in collecting internal audit reporting relationships literature are discussed in section 2.5. Section 2.6 outlines the systematic and narrative search process. The remaining sections discuss the findings of internal audit reporting relationships literature in more details.

## **2.2 The Development of the Internal Audit Profession**

Internal audit became popular in the 1940s in America and subsequently transformed from counting and balancing cash to an independent function (Moeller, 2004). The demand for both external and internal auditing results from the need for independent verification. However, the internal audit profession has been redefined over the years to keep pace with rapid environmental changes and the needs of entities (Munteanu & Zaharia, 2014). At the beginning, it was a process of double-checking of financial and accounting transactions with the objective of isolating errors and irregularities. Nowadays, it is completely different from that in the early 1900s. It is developing with

time to be a mechanism for promoting efficiency and effectiveness of accounting and managerial procedures. Table 2.1 summarises the historical development of the IAF from 1950 to 2003 as discussed by Pickett (2004).

The IIA's *Statement of Responsibilities*, issued in 1947 to establish professional standards and professional responsibilities and clarified the scope of IAF activities. This statement had been considerably broadened by 1957, to include numerous services to management, such as verifying accounting data reliability, the extent of compliance with established policies and plans, and the quality of performance (Ramamoorti, 2003). Around the 1960s, more attention was placed on getting the procedure right. For the first time, in the 1970s, internal auditors moved further to find problems and suggest corrections, rather than only spot errors. By the late 1980s, internal auditors conducted the evaluation of internal control and risk management tasks. This was followed by the need for providing independent judgment and reporting the results to the organisation's high authority (Pickett, 2004).

By 1993, the scope of internal auditing had changed to reflect the continuing and rapid evolution of the internal auditing profession. According to the revised *Statement of Responsibilities of Internal Auditing*, the scope of the IAF should evaluate organisation's system of internal control effectiveness and the quality of performance. Internal audit became more firmly established and responded quickly to new legislation and regulations, for example, the report of the COSO of the Tradway Commission (1992) (COSO, 2017), as well as the Sarbanes-Oxley Act of 2002 and ongoing calls for better organisational control and governance (United States Congress, 2002).

**Table 2-1: History of IAF Development**

1	<b>Check accounting records</b> to identify errors that were uncovered during each accounting period.	1950
2	<b>Assess compliance</b> with basic office procedures and financial regulations.	1960
3	<b>Examine procedures</b> to find problems, then suggest corrections; it is more than spotting errors.	1970
4	<b>Evaluate controls</b> to ensure objectives that can be met. It is more than following rigid procedures.	1980
5	<b>Report on internal control system</b> by providing an independent view about control environment and report to the AC and board.	1990
6	<b>Assess risk management.</b> As a result of organisations' scandals and mismanagement, internal auditors were being asked to assess the adequacy of risk management strategies and suggest how structures, mechanisms, and practices could be improved.	2000
7	<b>Facilitate risk management</b> through cooperation between the auditors and the operations managers and work teams. It reflects the popularity of enterprise risk management and the consulting role.	2001
8	<b>Report risk and assure control</b> of all audit work to a high-level authority through reporting functionally to the board and administratively to management.	2002
9	<b>Add value</b> to the organisation based on getting the most impact from the budget allocated to the audit plan.	2003

Source: Pickett (2004; 11)

At the beginning of the 21<sup>st</sup> century, the report of the COSO of the Treadway Commission was revised and reissued in May 2013 (COSO, 2017). In addition, IAF activities have been developed and classified into assurance and consultant activities. These changes reflect the growth of business activities in size, scope, and complexity. In addition, decision makers need some means of evaluating not only the efficiency of work performed but also the honesty of employees. Furthermore, internal auditors should understand the role and responsibilities of different types of audit and should consider the importance of personal attributes (Ramamoorti, 2003). Now, more than ever, the IAF is

recognised as a key pillar in an organisation's overall governance structure (Gramling et al. 2004). Internal auditors' responsibilities have been translated directly into an expectation to deliver deeper assurance beyond the areas of strategy, risk and sustainable analytics (IIA, 2016a). Internal auditors should report functionally to the highest authority in the organisation (Boyle et al., 2015; Chambers & Odar, 2015; IIA, 2016b).

The recent financial crisis has highlighted the awareness, attitude and behaviour of employees toward internal and external risk. In addition, the recession pressure and environmental changes pose new and different risks. These have led to the need for new internal audit activities to face risks related to management projects, operations and cybersecurity (Murray & Shaikh, 2015). An example of these new risks is the changing role of technology. For many years, only technology firms based their growth on IT. In the era of technology, all industries use information and digital technologies. The rapid use of devices and networks produces a huge amount of data collected by organisations, which poses new types of risks. The internal audit team is responsible for addressing functional and operational risk related to cybersecurity risk, compliance and data privacy risks.

### **2.3 The Importance of the Internal Audit Function (IAF)**

IAF provides a number of important services to organisations' managements. These include testing internal control, managing risk, preventing and detecting fraud, and monitoring compliance with policy and regulations. In 2006, the New York Stock Exchange proposed a requirement to maintain an IAF for registrants. The same happened in the NASDAQ Stock Market LLC (NASDAQ) in 2013. The increased importance of internal audit has been reflected in ASX Corporate Governance Principles and

Recommendations (ASX Corporate Governance Council, 2014; 3) that required listed organisations, if they do not have IAF, to explain why not.

*“Under the Principles and Recommendations, if the board of a listed entity considers that a Council recommendation is not appropriate to its particular circumstances, it is entitled not to adopt it. If it does so, however, it must explain why it has not adopted the recommendation – the ‘if not, why not’ approach”.*

Additionally, financial institutions in Australian are mandated by the Australia Prudential Regulation Authority (APRA, 2017; 19) to maintain an IAF.

*“An APRA-regulated institution must have an independent and adequately resourced internal audit function for the institution. If an APRA-regulated institution does not believe it is necessary to have a dedicated internal audit function, it must apply to APRA to seek an exemption from this requirement, setting out reasons why it believes it should be exempt. APRA may approve alternative arrangements for an institution where APRA is satisfied that they will achieve the same objectives.”*

Furthermore, many governments also require the IAF to be established in a public sector context, for example, in the Australian public sector (IIA-Australia, 2014). The Council of Ministers in Saudi Arabia has issued resolution No. 129 (2007), which includes a consolidated list of IAF units in government agencies and public institutions. One of the most important decisions of the Council of Ministers, No. 235 (2004), was to establish an internal audit unit in each governmental department under the control of the General Auditing Bureau. In 2011, the National Commission was established with a responsibility to protect public funds and fight against corruption and eliminate it. In the same year, the Council of Ministers ratified the Organisation of the Saudi Society for Internal Auditors (SSIA), which follows Global IIA with the aim of developing the internal audit profession in the Kingdom of Saudi Arabia (IIA-Saudi, 2011). Such decisions should improve the situation of the IAF.

On the other hand, the IIA-UK was established in London in 1948. By 1959 three UK chapters had been formed: North Western England, Birmingham and Yorkshire, and Scotland. Subsequently, all chapters of the UK districts became one chapter (Vinten, 1991). In 1981 there were only two candidates as members of the IIA-UK, and they became seven members in the following year. In 1985 the IAF established itself as an important function within both large and small organisations; about 2000 companies, local authorities, government departments and public sector organisations were surveyed by the IIA-UK (Vinten, 1991). Nowadays, it includes about 8,000 members in the Chartered Institute of Internal Auditors across the UK and Ireland. The Chartered Institute of Internal Auditors is part of the Global IIA, which has more than 185,000 members in 190 countries (IIA, 2017b).

The rationale for these requirements is that the IAF is an essential part of the assurance environment and internal control system in any organisation, whether that organisation is private or public. It is important to identify that it helps the organisation to achieve its objectives. Therefore, it is an important source of independent and objective assurance (IIA, 2016b). It is a critical part of the modern business environment, which should identify that it is a creative system that complies with high-quality standards and helps the organisation to achieve its objectives (Karagiorgos et al., 2006).

In summary, the IAF is a key component in the assurance structure of an organisation presenting the third line of defence (IIA Australia, 2014). It serves as an early warning system, identifying deficiencies and suggesting remediation. It is a cornerstone of good corporate governance in organisations, containing financial and non-financial audit and can play an important role to improve organisation management and accountability (Gramling et al., 2004). Internal auditors should communicate risk and control



information to the AC, board of directors, external auditors, senior management and other appropriate areas of the organisation. It should be independent and objective to meet the governance- related expectations of the AC and management (PwC advisory, 2005).

## **2.4 The International Professional Practices Framework**

The IPPF is the conceptual framework that organises authoritative guidance publicised by the IIA. The IIA was established in 1941 to provide standards and other professional practice guidance. It is an international professional association with global headquarters in Florida, USA. Today, it includes more than 185,000 members around the world, working in internal auditing, risk management, governance, internal control, IT audit, education and security (IIA, 2017b). In 1978, the IIA first formally approved the standards for the professional practice of internal auditing (standards) (Ramamoorti, 2003). These standards have been developed and improved with time to meet the expectations and requirements. Figure 2.1 shows the components of the Framework for Internal Audit Effectiveness, which was organised in the new IPPF into mandatory and recommended guidance (IIA, 2017c). Mandatory guidance comprises core principles for the professional practice of internal auditing, internal audit definition, Code of Ethics, and International Standards. Recommended guidance contains Implementation Guidance and Supplemental Guidance. However, both the mandatory guidance and recommended guidance support the mission of internal audit by illustrating how practitioners should leverage the entire framework. The mission of internal audit represents the primary purpose of internal audit, to enhance and protect organisational value by providing risk-based and objective assurance, advice, and insight (IIA, 2017c).

**Figure 2-1: The Framework for Internal Audit Effectiveness**



Source: the IIA (2017c)

## **2.4.1 Mandatory Guidance**

### *2.4.1.1 The Definition of Internal Auditing*

The IIA (2017a) defined internal audit as:

*“An independent, objective assurance and consulting activity designed to add value and improve an organisation's operations. It helps an organisation accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes”.*

This definition shows the fundamental purpose, nature, and scope of internal auditing.

### *2.4.1.2 Core Principles for the Professional Practice of Internal Auditing*

The core principles articulate criteria for internal audit effectiveness, which may differ from one organisation to another. However, failure to achieve any one of them would

present ineffectiveness of internal audit activity in achieving internal audit's mission. The core principles of IAF include integrity, competence and due professional care. IAF should be independent and aligned with the organisation's strategies, objectives and risks. In addition, IAF should be appropriately positioned and adequately resourced. In addition, it should demonstrate quality, maintain continuous improvement, communicate effectively and provide risk-based assurance. Finally, the last two core principles are focusing on the future and promoting organisational improvement (IIA, 2017c).

#### *2.4.1.3 Code of Ethics*

The Code of Ethics illustrates the minimum requirements of behavioural expectations and the principles governing individuals' and organisations' behaviour. It promotes an ethical culture with no specific activities. Returning to the definition of the internal audit, the Code of Ethics focuses on the trust placed on governance, risk management and control assurance (IIA, 2017c). The Code of Ethics includes two essential components:

- Principles (integrity, objectivity, confidentiality and competency)
- Rules of conduct that describe behaviour norms expected of CAEs.

#### *2.4.1.4 International Standards for the Professional Practice of Internal Auditing (Standards)*

The standards are a set of principles-based, mandatory requirements consisting of statements of core requirements and their interpretations. The purpose of the standards is to guide adherence to the IPPF, provide a framework for performing and promoting value-added services, provide a basis for performance evaluation, and foster improved organisation processes and operations (IIA, 2016a). The standards contain two main categories applicable to assurance and consulting services: **attribute standards**, which

address the characteristics of organisations and parties performing internal audit activities and **performance standards**, which describe the nature of those activities.

Attribute standards comprise four major standards:

- 1000 – Purpose, Authority, and Responsibility
- 1100 – Independence and Objectivity
- 1200 – Proficiency and Due Professional Care
- 1300 – Quality Assurance and Improvement Program

Performance standards contain six major standards:

- 2000 – Managing the Internal Audit Activity
- 2100 – Nature of Work
- 2200 – Engagement Planning
- 2300 – Performing the Engagement
- 2400 – Communicating Results
- 2500 – Monitoring Progress
- 2600 – Communicating the Acceptance of Risks

According to the standards, internal audit should communicate risk and control information to the AC, board of directors, external auditors, senior management and other appropriate areas of the organisation. It should be independent and objective to meet the governance- related expectations of the AC and management (PwC advisory, 2005).

Independence is *“the freedom from conditions that threaten the ability of the internal audit activity to carry out internal audit responsibilities in an unbiased manner”*.

Objectivity is *“an unbiased mental attitude that allows internal auditors to perform engagements in such a manner that they believe in their work product and that no quality compromises are made”* (IIA, 2016b; 1). Attribute standard 1110- organisational

independence states that “*the chief audit executive must report to a level within the organisation that allows the internal audit activity to fulfill its responsibilities*” (IIA, 2016b; 4). Organisational independence is effectively achieved when the CAE reports functionally to the board.

Before the WorldCom and Enron scandals, some auditors were reporting to senior management. As a result of public and legislative pressures, the Sarbanes-Oxley Act was passed, which required CAEs to report to the board of directors instead of senior management (Mills, 2013). However, serving two masters can lead to many problems in terms of loyalties, independence, and efficiency. Without making the CAE a true senior executive, removing any ambiguity about reporting line and placing the CAE in a visible position in the organisation’s hierarchy, IAF will not succeed (Delotte, 2010).

## **2.4.2 Recommended Guidance**

Recommended guidance contains implementation and supplemental guidance.

### *2.4.2.1 Implementation Guidance*

The implementation guidance is more comprehensive than supplemental guidance. Its purpose is to assist internal auditors in applying the standards. It includes the internal auditing approach, methodologies and considerations, such as organisational independence and direct interaction with the board.

### *2.4.2.2 Supplemental Guidance*

Supplemental guidance provides detailed guidance for conducting internal audit activities. It includes topical areas, processes and procedures, tools and techniques and sector-specific issues. For example, the guidance on internal audit and the second line of defence promulgated standards related to independence and objectivity.

## 2.5 Key Concepts and Approaches to Assess the Literature

Defining the term “organisation independence” is the starting point. The IIA has issued international standards for the professional practices of internal auditing (SPPD). Attribute standard 1110- organisational independence states that “*the chief audit executive must report to a level within the organisation that allows the internal audit activity to fulfill its responsibilities*” (IIA, 2016a; 4). The IIA Practice Advisory (1110-1) clarifies that organisational independence is part of the independence and objectivity standard and it reflects that the CAE should report functionally to the board and administratively to the CEO (IIA, 2016b). In addition, performance standard 2060- reporting to senior management and the board, shows that “*the chief audit executive must report periodically to senior manager and the board on the internal audit activity’s purpose, authority, responsibility, and performance relative to its plan*” (IIA, 2016a; 11). Furthermore, the Code of Ethics defines the objectivity of internal auditors by requiring them to make a balanced assessment and not be unduly influenced by their or others’ interests or judgments (IIA, 2016b). Therefore, it can be considered that internal audit reporting relationships are determinants of the independence and objectivity of the IAF. In addition, internal audit reporting relationships can be defined as reporting lines or reporting levels. For this reason, this study considers all the relevant key words related to internal reporting relationships.

A literature review process is an important part of any research. Practitioners since the Second World War have focused more on research rigour with the development of social science. As a result, researchers should provide evidence to support their studies (Tranfield et al., 2003). Generally, there are two main methodologies for a literature review: a narrative literature review approach and a systematic literature review approach.

A narrative literature review is a traditional method that describes a specific topic or theme from a theoretical and contextual point of view. In this method, there is no list of databases or methodological approach. It is useful with a qualitative research method. In contrast, systematic literature review is a new method in business research compared to the narrative review approach. It is a well-planned approach using a systematic and explicit methodology. It critically evaluates the results of a search (Denyer & Tranfield, 2006). According to Denyer and Tranfield (2009; 671), a systematic review is “*a specific methodology that locates existing studies, selects and evaluates contributions, analysis and synthesises data, and reports the evidence in such a way that allow reasonably clear conclusions to be reached about what is and is not known*”.

Literature review techniques over the last fifteen years or so have been improved and raised the profile of systematic review as a consistent research methodology (Denyer & Tranfield, 2009). A systematic review is common in medical fields and popular in quantitative research (Denyer & Tranfield, 2006), as clinical practitioners do not have the time to read over two million articles every year published in 20,000 biomedical journals. At the same time, it is crucial for them to update their knowledge continuously to make the right decisions every day. As a result, a reliable system of knowledge management is needed to provide a trustworthy overview of current knowledge (Cipriani & Geddes, 2003). Cook et al. (1997) confirm that the difference between systematic review and narrative review is the former’s adoption of a systematic process with the aim of reducing bias. In the era of technology, this is possible through exhaustive literature databases.

Both approaches are useful, but there are many disparities between them in characteristics and goals. A narrative literature review addresses a broader question, whereas a systematic literature review is more specific. In addition, the selection and sources of

literature in a narrative review are not specific, in contrast to a systematic literature review, which is comprehensive and involves a uniform approach (Rother, 2007). A traditional literature review is considered as the most common technique in social science (Denyer & Tranfield, 2009). Usually, the researcher summarises and interprets previous contributions in a subjective and narrative fashion. Recently, however, traditional literature reviews have been criticised for the way included studies are selected. Such a review may not include all relevant articles, which may cause a study's limitation (Denyer & Tranfield, 2006).

However, researchers should not privilege one method over the other, but they may think about the approach that can most effectively achieve their study objectives. In this study both types are used; the systematic literature review, to make the search process replicable, and the narrative search method, to capture all relevant papers.

## **2.6 Methodology of Collecting the Literature**

As an alternative to a subjective, qualitative literature review, a systematic literature review was carried out before conducting the narrative review.

### **2.6.1 Search Process**

At the end of December 2016, published studies were identified through searches of three reliable data-bases (Web of Knowledge-based Web of Science, Direct Science and ProQuest Business Collection). Generally, the focus on internal audit research aligned with the scandals of the late 1990s and the passage of Sarbanes-Oxley, as very little was done before this point. Thus, the searches were undertaken for the period between 1990 and 2016. These 26 years cover a wide range of publications related to internal audit reporting relationships. To achieve the objective of this study the initial search criterion

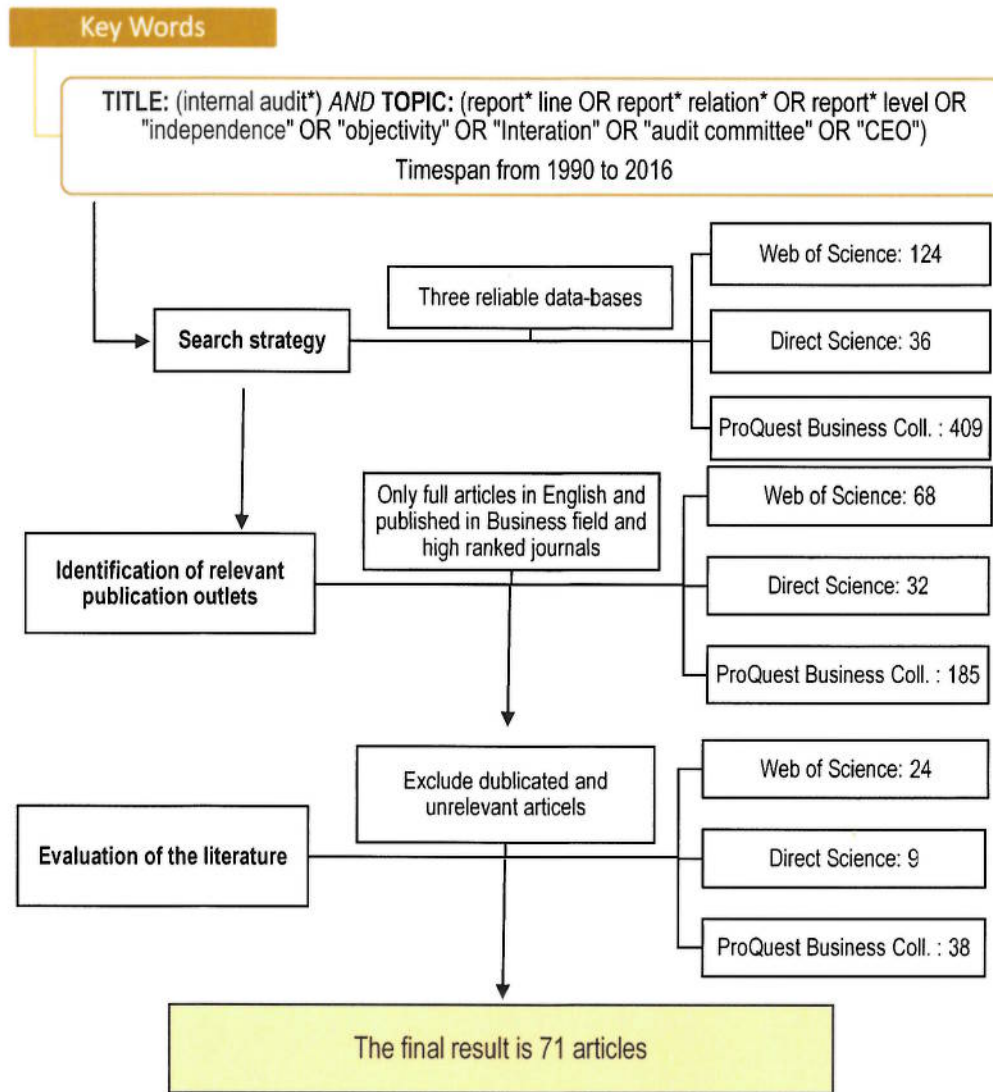


used was based on the relevant words. Figure 2.2 shows that the initial search revealed 569 documents.

This initial search was then refined to include only full articles in English. Also, the Chartered Association of Business Schools' Academic Journal Guide (ABS, 2015) criteria were used to assess the quality of journals that published included articles. Only articles published in high ranked journals (level 2 and higher) were included. These articles are related to business, management, economics, accounting and finance fields. The total result was 285 articles. The bibliographic software EndNote was used to hold the data sets for final selection. Figure 2.2 describes the process of the initial inclusion and exclusion process.

By using EndNote features, it was discovered that there were seven duplicated articles, which were excluded. Based on reviewing the abstracts and if necessary the full publication, of all 278 articles, the decision was made to exclude irrelevant papers. The study exclusion process resulted in 207 of the identified articles being excluded from the present study, as they did not report information related to internal audit reporting relationships or factors influencing the CAE's reporting decision. A complete list of the excluded articles is available from the author on request. Thus, the final result of the systematic literature review was 71 articles.

**Figure 2-2: Flow Diagram of the Inclusion and Exclusion Process**



Source: Developed by the Author

### 2.6.2 Narrative Search Data-Set

In order to identify and include early online/accepted papers, as well as papers related to investigated subject with different key words in the title (no “internal audit\*” in the title), a variety of strategies were applied. For example, the search was expanded to cover some leading journals websites (e.g., The American Accounting Association (AAAJ), Emerald, Springer and Wiley Online Library). Furthermore, hand searching, reference list checking, and internet searching were used to capture all relevant papers.

Hand searching is scanning manually the contents of documents to identify relevant research. The reference list strategy involved checking the titles of reference lists of the most relevant articles. Internet searching was conducted by using Google and Google Scholar search engines (Gough et al., 2012). These searches revealed additional 15 papers related to internal audit reporting relationships. Thus, the total number of included papers is 86 papers. The following sections will discuss those papers in detail.

## **2.7 Findings Overview**

Researchers agreed that internal audit reporting relationships are important dimensions to measure the quality of internal audit (Arel et al., 2012; Johl et al., 2013; Kaplan & Schultz 2007; Mihret & Yismaw 2007; Zaman & Sarens 2013), internal audit effectiveness (Lenz & Hahn, 2015; Lenz et al., 2014), internal audit objectivity (Desai et al., 2010; Krishnamoorthy 2002; Lin et al., 2011; Pizzini et al., 2015; Prawitt et al., 2009 ), and independence (Abbott et al., 2016; Alzeban & Gwiliam 2014; Allegrini et al., 2006; Desai et al., 2010). In addition, audit reporting significantly influences the risk assessment and control activities aspects of the internal control system (Fadzil et al., 2005).

Several studies have investigated the literature of internal audit for different purposes. First, Gramling et al. (2004) examined the role of the IAF in corporate governance, and found that IAF characteristics or characteristics of other parties can influence the effectiveness of IAF relationships. In addition, another three studies resulted from the IIA-commissioned Global Common Body of Knowledge (CBOK) in 2006. They sought to better understand about internal audit practice in the Americas, Europe and Asian Pacific respectively. These three studies concluded that internal audit activities have changed with the development of business transactions, the regulatory environment and the significant advances in information technology (Hass et al., 2006; Allegrini et al.,

2006; Cooper et al., 2006). In 2010, Steward and Subramanian studied internal audit independence and objectivity to identify research opportunities and concluded that internal audit independence and objectivity are a rich area of investigation, which needs to be searched in the future (Stewart & Subramanian, 2010). Bame-Alderred et al. (2013) focused on the literature of external auditors' reliance on the work of the IAF. Further, Lenz and Hahn (2015) reviewed empirical studies related to the effectiveness of IAF. The most recent study was conducted to review internal auditing in the Middle East and North Africa, and they found that independence and objectivity are lacking in this region. Additionally, there is a need to consider cultural and social influences when formulating rules and regulations (Al-Akra et al., 2016). However, to the best of the author's knowledge, no prior study has reviewed the literature concerning internal audit reporting relationships. Table 2.2 shows more details<sup>5</sup>.

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<sup>5</sup> The tables are organised in chronological order first, then alphabetical order if there is more than one article published in the same year.

**Table 2-2: Summary of the Literature Review Papers**

<i>Author &amp; year</i>	<i>Title</i>	<i>Journal</i>	<i>Type of study</i>	<i>Research Issue(s)</i>	<i>Finding(s)</i>
<i>Gramling et al. (2004)</i>	The role of the IAF in corporate governance	Journal of Accounting Literature	Literature Review	Study the role of IAF in corporate governance	Internal audit characteristic is one of many factors that might affect the IAF relationship with AC and management, which need more investigation.
<i>Allegrini et al. (2006)</i>	The European literature review on internal auditing	Managerial Auditing Journal	Literature Review	Documents the shift of IAF in global business practices in Europe	Internal audit activities have changed with the development of business transactions, the regulatory environment and the significant advances in information technology.
<i>Cooper et al. (2006)</i>	The Asia Pacific literature review on internal audit	Managerial Auditing Journal	Literature Review	Documents the shift of IAF in global business practices in Asia Pacific region	There is a lack of strong professional leadership and internal audit prominence in Asia Pacific. In addition, independence of internal audit is still confused.
<i>Hass et al. (2006)</i>	The Americas literature review on internal auditing	Managerial Auditing Journal	Literature Review	Documents the shift of IAF in global business practices in Americas	There is need to expand internal auditors' set of skills and knowledge to perform audit activities and match the development of environment regulatory and business complexity.

<i>Stewart and Subramaniam (2010)</i>	Internal audit independence and objectivity: emerging research opportunities	Managerial Auditing Journal	Literature Review	Reviews the literature of internal audit independence and objectivity and suggests future research	Reporting to the CFO can compromise internal audit independence and objectivity. Internal audit independence and objectivity are a rich area of investigation, which needs to be studied in the future.
<i>Bame-Aldred et al. (2013)</i>	A summary of research on external auditing reliance on the internal audit function	Auditing: A Journal of Practice & Theory	Literature review	Review the extant literature on the external auditors' reliance on IAF	The environment of external audit reliance decisions is very complex. There are difficulties for IAF reporting the excessive risks directly to the board.
<i>Lenz and Hahn (2015)</i>	A synthesis of empirical internal audit effectiveness literature pointing to new research opportunities	Managerial Auditing Journal	Literature Review	Reviews the literature of internal audit effectiveness in the last ten years	The main factors that influence internal audit effectiveness are synthesised, such as internal audit relationships, resource and process. Further research is required to investigate the confused relationships between internal audit and the two masters.
<i>Al-Akra et al. (2016)</i>	Internal auditing in the Middle East and North Africa: A literature review	Journal of International Accounting, Auditing and Taxation	Literature Review	Reviews the literature of independence and objectivity, assurance and consulting, and the IA role in consulting activities	Independence and objectivity are lacking in this regions. There is a need to consider cultural and social influences when formulating rules and regulations.

Source: Developed by the Author

## 2.8 Dual-Reporting Relationships

According to the Sarbanes-Oxley Act (SOX-Act) of 2002 senior management are responsible to assess the design and the adequacy of internal controls over financial reporting and report the result within their annual report. In addition, the AC is responsible for overseeing the integrity of financial statements, risk management and internal control. However, management and AC often turn to the IAF to support compliance with these requirements (PwC advisory, 2005). The CAE should serve two masters (the board and CEO) to facilitate organisation independence (IIA, 2016c). In this regard, it can be considered that the internal audit report is only of value when managers pay considerable attention to the deficiencies and problems identified by the IAF. Distinct disadvantage may result from low quality relationships between actors (Kacmar et al., 2007). Thus, the AC and executive management's support is crucial to the success of the IAF (Fraser & Lindsay 2004; Schneider 2009). Two studies have found that IAF is fraught with problems in Australian and Zimbabwean contexts as a result of the lack of support from the AC of the board and CEO (Christopher et al., 2009; Matavire & Dzama 2013). Additionally, Moeller (2004) has cited some issues regarding IAF before and after SOX-Act. He claimed that reporting relationships differ from one corporation to another (Moeller, 2004), which reflects the importance of the institutional theory.

During the past three decades, several attempts have been made by academic researchers and professional practitioners to investigate internal audit reporting relationships, with mixed results. Some studies support dual reporting lines by reporting to high authority functionally and the CEO administratively (Holt, 2012; IIA, 2016c; James, 2003; Munro & Stewart, 2011). In contrast, other studies have argued that there are difficulties in CAEs reporting deficiencies in full, directly to ACs (Bame-Aldred et al., 2013; Schneider,

2009). However, the reality of the internal audit reporting relationships is much more complex than dual reporting requirements. For example, there is career risk for CAEs reporting the deficiencies of their manager's operation, which represents the major issue of CAEs' reporting mission (Fraser & Lindsay, 2004). In addition, there is personal threat from the AC, in addition to the threats of management, which make internal auditors reduce their assessments of risk when they report to the AC. For these reasons, Norman believed that dual reporting to the AC and CEO is not a wise solution for independence (organisation independence) and objectivity (individual independence) (Norman et al., 2010). Lastly, Hoos et al. (2015) found that internal auditors make significantly different judgments if task complexity is high, depending on communicated superior preferences, which represent the ethical considerations and social relationships that may influence the decisions of CAEs.

The development of internal audit reporting relationships shows an increase in the percentage of reporting to the AC and CAE compared to other executives, but some exceptions still exist. Serving two masters (AC & CEO) is challenging in practice (Lenz & Sarens, 2012), and can lead to many problems in terms of loyalties, independence, and efficiency. Without making the CAE a true senior executive, removing any ambiguity about reporting line and placing the CAE in a visible position in the organisation's hierarchy, the IAF will not succeed (Deloitte, 2010).

## **2.9 Internal Audit Reporting Relationships**

The results obtained from the analysis of the literature suggest that each reporting line has advantages and disadvantages, as summarised in Table 2.3. More details are discussed in the following sections.



**Table 2-3: Advantages and Disadvantages for Each Reporting Relationship**

<i>Authority</i>	<i>Advantages</i>	<i>Disadvantages</i>
<b>The Board</b>	<ul style="list-style-type: none"> <li>Enhances the third line of defence (Chambers &amp; Odar, 2015).</li> </ul>	<ul style="list-style-type: none"> <li>Can have unintended consequences (Rose et al., 2013).</li> </ul>
<b>AC of the board</b>	<ul style="list-style-type: none"> <li>More likely to deter financial statement fraud (James, 2003).</li> <li>Effective internal audit (Arena &amp; Azzone, 2009)</li> <li>Higher quality of IAF in discovering management earnings (Prawitt et al., 2009).</li> <li>Control orientation (Abbott et al., 2010).</li> <li>Enhances IAF objectivity (Lin et al., 2011; Abbott et al., 2012).</li> <li>Ensures relevant and timely information (Leung et al., 2011).</li> <li>Impacts reliance decision positively (Munro &amp; Stewart, 2011).</li> <li>Better corporate governance roles (Sarens et al., 2012).</li> <li>Higher disclosure credibility (Holt, 2012).</li> <li>Higher quality in discovering &amp; reporting the areas of accounting manipulation (Arel et al., 2012).</li> <li>Compliance orientation (Everett &amp; Tremblay 2014).</li> <li>Provides comfort for AC (Sarens et al., 2009).</li> <li>Provides higher assessment for fraud risk and control risk (Boyle et al., 2015).</li> <li>Enhances IAF independence (Abbott et al., 2016).</li> </ul>	<ul style="list-style-type: none"> <li>Leads to conflict of interest or independence and objectivity threats (Norman et al., 2010; Reynolds, 2000).</li> <li>Leads to conservative judgment (Boyle et al., 2015).</li> </ul>

	<ul style="list-style-type: none"> <li>• Spurs the moral courage to report manager fraud (Khelil et al., 2016)</li> <li>• Can identify business opportunities conditional to positive intentions, strong internal control and long run perspective (Rittenberg &amp; Covaleski, 2001).</li> <li>• Leads to more objective information (Norman et al., 2010).</li> <li>• Consultant orientation (Everett &amp; Tremblay 2014).</li> <li>• Establishes direction and support (Boyle et al., 2015).</li> </ul>
<p style="text-align: center;"><b>CFO</b></p>	<ul style="list-style-type: none"> <li>• Threatens IAF independence (Christopher et al., 2009; Al-Twajiry et al., 2003)</li> <li>• Compromises internal audit independence and objectivity (Stewart &amp; Subramaniam 2010).</li> <li>• Lower status for internal auditors (Goodwin, 2004).</li> <li>• Lower disclosure credibility (Holt 2012).</li> <li>• May damage the third line of defence (Chambers &amp; Odar, 2015).</li> </ul>

Source: Developed by the Author

### **2.9.1 Reporting to AC / Board (High Authority)**

Leung et al. (2011) examined the accountability structures and the relationships between internal audit and management support. They conclude that CAEs' reporting lines are diverse and inconsistent. A clear reporting role with the AC of the board can provide relevant, timely and complete information. A close relationship between the CAE and CEO can lead to career risk or management pressure on the CAE. Such relationships should be clearly defined to create good corporate governance and avoid negative consequences (Leung et al., 2011).

However, it appears there is widespread agreement that reporting to high authorities, such as the AC or board, has many advantages. These advantages include providing a better quality of reporting of accounting misstatement (Arel et al., 2012); higher quality of discovering management earnings (Prawitt et al., 2009); better objectivity (Lin et al., 2011; Abbott et al., 2012); and independence (Abbot et al., 2016). In addition, it complies with IIA requirements (Everett & Tremblay, 2014). A study by Sarens et al. (2009) states that a close relationship between the IAF and AC provides comfort to the AC. In a review of the literature studying the external audit reliance decision, they used reporting to the highest authority as the major factor influencing objectivity in a positive way, which impacts the reliance decision (Munro & Stewart, 2011). However, Ege (2015) found no relationship between IAF objectivity and management misconduct, and he attributed that to the possibility of a high level of objectivity in the sample or the lack of variation in the measures. Thus, he suggested that future researches should use better measures and re-examine such relationships (Ege, 2015).

In 2003 James examined whether internal audit-reporting structure and sourcing arrangement affect users' perceptions of their protection from financial statement fraud.

He conducted a survey of seven different banks in the U.S.A, including 63 lender officers. He concluded that reporting functionally and administratively to the AC is more likely to prevent financial statement fraud than reporting to management (James, 2003).

It can be concluded that reporting to the highest authority is preferable and beneficial to fill the board's assurance vacuum and enhances the third line of defence (Chambers & Odar, 2015). This is especially in a situation where the CAE is placed in a visible position in the organisation's hierarchy, there is no ambiguity or threat, and support is received from different authorities.

### **2.9.2 Reporting to CEO (Middle Authority)**

A number of researchers assume that reporting to high authority may lead to unintended consequences or conflict of interest between authorities (Reynolds, 2000), especially with the use of the IAF as a training ground for future senior managers (Rose et al., 2013). For instance, Norman et al. (2010) investigated the effects of internal audit reporting relationships on fraud risk assessments made by internal auditors when the level of fraud risk varies. They included 142 highly experienced internal auditors in their survey. They found that internal auditors usually reduce risk assessment when they report directly to the AC as a result of their fear of AC over-reactions. They argued that the requirement of internal audit reporting to the AC is not a wise solution to independence and objectivity threats, while reporting to the CEO might provide more objective information.

In addition, Boyle et al. (2015) examined the effects of internal audit reporting relationship and reporting type on the assessment of fraud risk and control risk. They found that reporting to the AC and providing an assurance report led to higher assessment of fraud risk and control risk. However, they argued in the same study that when the IAF is accountable to stakeholders or the AC, it is more likely to make conservative

judgments, in contrast to reporting to the CEO, which establishes direction and support for the IAF. Finally, Rittenberg and Covaleski (2001) studied the current trend towards outsourcing internal audit services and expressed that reporting to senior management with positive intentions, strong internal control and a long run perspective can identify business opportunities. Despite the positive consequences of a close relationship between the CAE and the CEO, there is an argument that it may pose a threat to IAF independence and should be avoided (Christopher et al., 2009; Al-Twaijry et al., 2003, Roussy & Rodrigue, 2016).

### **2.9.3 Reporting to CFO (Low Authority)**

According to the three lines of defence model, the first two lines are related to senior management, while the third line is the final assurance line and should maintain the connection between IAF and the highest authority (e.g. governing body/ board / AC). Thus, reporting to a lower authority, such as the CFO may damage the third line of defence (Chambers & Odar, 2015). A study by Goodwin (2004) explored the status of internal audit in Australia and New Zealand and concluded that, overall, IAF in the private sector have lower status than in the public sector, where more than a third of CAEs report to the CFO. In addition, Holt (2012) examined the effect of internal audit role and reporting relationships on the perceptions of disclosure credibility. Results suggest that participants perceived lower disclosure when the CAE reports to the CFO, compared to reporting to the AC functionally and to the CEO administratively.

Furthermore, the majority of recent professional experience indicates that there are problems with reporting to the CFO (Johnson, 2006; Marks, 2010; Tabuena, 2013; Tysiac, 2013). Johnson (2006) asked the question, “*should internal audit report to the CFO?*” and she indicated that “... *the answer to that question is no*”. In addition, Norman

Marks, who had been a CAE since 1990, stated in his article in 2010, “*i am no longer sure that is optimal*”. Tabuena (2013) and Tysiac (2013) assume that reporting to the CFO is fraught with risks and challenges for the CAE. In 2015, the president and CEO of the IIA, Richard Chambers, wrote an article under the title, “*internal audit should never belong to the CFO*”. He claimed that internal audit should not report administratively to executives with functional responsibilities as they can impair internal audit’s ability to follow up risks (Chambers, 2015).

## **2.10 Factors Influencing Internal Audit Reporting Decision**

A key aspect of identifying the factors that may influence the CAE’s reporting decision is to provide a natural guide to future research, which takes these variables into account, will need to be undertaken. Based on the literature they are classified into five main factors: the activities of IAF, the influence of independence and objectivity threats, the authority characteristics, the organisation environment, and ethical considerations.

### **2.10.1 The Nature of IAF Activities**

Internal auditors are concerned about compliance by reporting to the AC, while managers are concerned about profitability and bonuses. As a result of the aforementioned, it can be expected that internal audit with more compliance and assurance activities will serve a higher authority, while internal audit with more operational and consultant activities will serve management. The question here is whether auditors serve shareholders, the general public or management. If all three are considered to be served, then the conflict of interest should be considered and stated responsively among these groups (Everett & Tremblay, 2014). Roussy and Brivot (2016) characterised the notion of IAF quality. They argued that external auditors’ and the IIA’s frames are focusing on professional quality

controls to ensure independence and loyalty of IAF to the public rather than the organisation. In contrast, internal auditors' and AC members' frames are focusing on administrative controls to protect public secrets. Consequently, *“output controls are equally unsatisfactory for professional work, because they can signal quality defaults only ex post, when an important problem has emerged. Input quality controls, through the selection of the brightest and best, are viewed as more efficient and easier to implement”* (Roussy & Brivot, 2016; 731).

Cooper et al. (1994) studied 491 internal audit managers and found conflict of interest between the internal auditors and CEOs. They found that CEOs place more emphasis on the financial area, whereas internal auditors focus on the operational area. This suggests that the AC and management may have conflicts concerning the focus of the IAF's activities. The IAF's relationship with the AC is associated with the IAF role in corporate governance. This means the IAF role in corporate governance can influence the reporting decision (Sarens et al., 2012).

In 2003, the IIA Research Foundation investigated the conflicts of internal audit reporting relationships before the implementation of the SOX-Act of 2002 (United States Congress, 2002). They demonstrated that the IAFs activities generally differ in importance as perceived by the AC and management (IIARF, 2003). This view has been supported by Abbott et al. (2010) who investigated the relationship between AC oversight variables (reporting lines, termination rights, and budgetary control) and the nature of IAF activities. They found a strong positive association between AC oversight and the IAF budget allocated toward internal control activities. In addition, Hoos et al. (2015) argued that when internal auditors favour management's over the AC's position, they prioritise the cost reduction of internal control rather than effectiveness. However, lack of authority

over the IAF budget restricts its control of resource acquisition and utilisation. Furthermore, a case study of a large public sector in Ethiopian higher education institutions found that internal audit activities are limited to regular activities. The authors concluded that the effectiveness of IAF would improve with expanding the scope of IAF activities with appropriate risk analysis (Mihret & Yismaw, 2007).

Furthermore, de Zwaan et al. (2011) examined internal auditors' willingness to report a breakdown in risk procedures. They did not find a significant relationship between internal audit willingness to report and a strong relationship with the AC. However, they found high involvement in enterprise risk management affects internal auditors' perception to report to the AC (de Zwaan et al., 2011). Finally, a study by Roussy (2013) examined how the roles performed by internal auditors impede their governance role in the public sector. She divided internal audit roles into a protector role and helper role. Further, she claimed that internal audit is not a governance actor (not independent of management) as expected by the regulatory bodies in the public sector. She found that interviewed internal auditors considered that they should prioritise the top managers sometimes at the expense of the AC, as their primary role was to serve the top manager and the organisation. Finally, it has been suggested that future studies should examine the interactions between both IAF and AC in different situations, such as planning of the internal audit activities (Roussy & Rodrigue, 2016).

### **2.10.2 Independence and Objectivity Threats**

The IAF is distinguished from many other internal assurance providers by virtue of a requirement to comply with professional standards and a code of ethics that demand independence and objectivity. Consequently, the importance of independence and objectivity of internal auditors continues to increase with the development of the business



environment [e.g. the need for greater transparency, more disclosures, and corporate governance] (IIA, 2016b). It has been found that internal auditors' independence and competence are associated negatively with internal control deficiencies (Mazza & Azzali, 2015). Currently, internal auditors should be independent and objective to meet the governance-related expectations of the AC and management (PwC, 2005). Any impairment of internal auditors' independence and objectivity can influence their judgment and decisions, not only toward to their relationship with the appropriate authority, but also in the quality of their work.

A survey conducted by Christopher et al. (2009) included a sample of 34 Australian companies to analyse the independence of the IAF throughout the relationship with AC and management. The researchers suggested that there are threats from not reporting functionally to the AC. It seems ACs do not have the ability to evaluate the CAE and do not have a qualified accounting member. In addition, they identified a combination of indirect threats that stem from management, such as approving the internal audit budget, involvement in the IAF plan and using the internal audit as a stepping stone to move to other positions. They assumed that independence threats from management and AC are related to non-compliance with best practices and the lack of support, which can influence relationship with the appropriate authority (Christopher et al., 2009).

Rose et al. (2013) believe that the objectivity of internal auditors can be impaired when the IAF is used as a training ground. The argument underpinning the assumption is that internal auditors might accept management's wishes, which may influence their reporting decision (Rose et al., 2013). Hence, internal auditors with interest in moving to higher positions do not deal with financial reporting issues, and the board does not typically concern itself with hiring all management positions, which may impair internal auditors'

status (Koonce, 2013). Furthermore, it has been found that lower financial reporting quality is associated with using IAF as training ground, but this negative effect can be reduced with the existence of an effective AC (Christ et al., 2015).

In a more recent study Roussy and Rodrigue (2016) interviewed CAEs and experienced auditors from various Quebec public and para-public organisations and found that the effectiveness of internal auditors as a third line of defence and as a governance function are influenced by teaming up with managers; also, the ACs may not always have the information they need to achieve oversight duties (Roussy & Rodrigue, 2016). That is, CAEs are more likely to consider themselves as members of the management team, which shortens the required distance between them and management to achieve monitoring objectives (Roussy & Brivot, 2016). Those CAEs are aware of their accountability relationship central to the highest authority, but they are appointed by top management, which may impede the CAEs in performing their duties and making ethical decisions. Lisic et al. (2016) confirm that AC effectiveness is negatively associated with CEO power, especially when the CEO is the chairman of the board, has higher compensation, or has held executive positions in the company before.

On the other hand, an independence threat results from the weak power exercised by the AC compared to the top managers (Roussy, 2015), or the conflict of interest between the two masters (Norman et al., 2010). For example, in a country with a structure like Saudi Arabia, internal auditors believe they are not free to report fraud, wrongdoing or mistakes as a result of management pressure. Inadequate resources, lack of qualified staff and independence restrictions are the main reasons behind independence threats (Al-Twaijry et al., 2003). Alzeban and Gwiliam (2014) argued that internal audit effectiveness is linked to hiring qualified staff, providing sufficient resources, and having an independent

IAF (Alzeban & Gwiliam, 2014). A low level of independence from management influences the work value and reliance on the work of the IAF (Al-Twajjry et al., 2004). That is, the recommendation to report to high authority may create tension with management as the traditional role of the IAF is as the 'eyes and ears' of management. The nature and impact of such tension on the activities and contribution of the IAF should be examined (Paape et al., 2003). In summary, from the discussion above it can be expected that management pressure, lack of support from high authority and insufficient resources can affect internal auditors' reporting decisions.

### **2.10.3 Authority Characteristics**

The SOX- Act called for the formulation of the Public Company Accounting Oversight Board (PCAOB). As a result of that, the PCAOB issued Auditing Standard No. 5, which allows external audit to rely on the internal audit work when they think it would be useful to do so (PCAOB, 2007). Schneider (2010) stated that according to the Statement Auditing Standard (SAS) No. 65, external auditors should evaluate the competence, objectivity and work of the IAF in order to make a reliance decision (Schneider, 2010). In addition, a positive association has been found between IAF operating efficiency and attending board meetings (Cho et al., 2015). Unfortunately, the standards do not clearly state whether the internal auditor should report for all purposes to the board or the AC, and do not stipulate that administrative reporting should be to the CEO, not to the CFO (Chambers, 2014a).

However, according to the literature on external audit reliance decisions, the CAE should report to the highest authority to ensure the objectivity of internal auditors (Munro & Stewart, 2011). Thus, the IAF should not be accountable to management below the level of the board, as that weakens their assurance. Therefore, CAE's primary or only reporting

line should be to the non-executive members of the board (Chambers & Odar, 2015). Two studies have examined the influence of AC characteristics on the IAF. Both of them confirmed the importance of the presence of independent members and accounting expertise in the AC (Alzeban & Sawan, 2015; Sarens et al., 2013; Zaman & Sarens, 2013). In addition, AC chairs who are independent, new, understand business risk, are aware of the importance of governance and know internal auditing tasks are more likely to interact with IAFs informally, as they need more information (Sarens et al., 2013). Another two studies conducted by Scarbrough et al. (1998) and Raghunandan et al. (2001) examined the relationship between AC composition and its interaction with the IAF. They concluded that AC characteristics influence their oversight on the IAF. For example, ACs with independent members had more frequent meetings with internal auditors and were more likely to review the result of internal auditing (Scarbrough et al., 1998). Also, ACs with independent members and with at least one member who has finance or accounting qualifications are more likely to meet internal auditor privately, provide longer meeting, review the results of internal auditing and review management's collaboration with internal auditing (Raghunandan et al., 2001, Goodwin, 2003). There are associations between AC effectiveness (meeting and authority) and both extent and quality of integrated reporting practice in South African companies. Finally, the AC can overcome technical challenges to provide internal assurance through close relationships with the IAF (Ahmed Haji & Anifowose, 2016)

The importance of the ACs' leadership role is highlighted by their private meetings and informal communications with IAF (Zain a&nd Subramaniam, 2007; Zaman & Sarens, 2013). It has been found that there is a positive relationship between IAF allocated budget and the number of meetings with AC (Barua et al., 2010). In addition, there are positive associations between IAF conformance with international standards and AC

independence, auditing experts and number of meetings (Alzeban, 2015). However, there is an argument that to ensure the effectiveness of the IAF, internal auditors should be appointed, supervised and compensated by the highest authority rather than management (Al-Khabash & Al-Thuneibat, 2009). Also, internal audit objectivity includes direct access to the AC and responsibility for appointment, removal and compensation of the CAE (Schneider, 2010). In general, AC characteristics influence the IAF. For example, Anderson et al. (2012) found that AC size, frequency of meetings with the CAE and budget approval influence internal audit size. In addition, it can be argued that the AC's power to approve the annual plan and potential engagements may influence the CAE's decision (Roussy, 2015). However, it should be taken into consideration that different institutional pressures can lead to different roles and responsibilities for ACs (Hegazy & Stafford, 2016).

#### **2.10.4 Cultural and Control Environment**

The standards for internal auditors, unlike external auditors, are not mandatory and internal audit roles are not always clearly determined in law or regulations. Every organisation has special needs depending on its size, type and activities. They must identify their needs for internal auditing and define them in their charter of internal audit. Generally, organisation characteristics, such as size and geographical dispersion of operations' are important to consider (Sarens et al., 2009). Additionally, the charter of internal audit should be attuned with that of the AC and must include the functional and administrative reporting relationship between the CAE and others in general and the relationship between the CAE and external auditors in particular. Such relationships are critical to the success of the IAF. The guideline is important for the regulator, board and

senior management to identify the responsibilities of each authority and reflect what is the optimal reporting structure (Chambers, 2014b).

The internal audit reporting bias is highly sensitive and conditional on the level of IAF competence. Corporate cultures and control environments can inhibit internal auditor reporting bias, which should be tested empirically (Al-Twaijry et al., 2003; Krishnamoorthy, 2001). There is a widespread agreement about the influence of environmental characteristics. For instance, Al-Akra et al. (2016) focus on the literature of independence and objectivity in the Middle East and North Africa and find that independence and objectivity are lacking in this region. They affirm the need to consider cultural and social influences when formulating rules and regulations (Al-Akra et al., 2016). Also, Alzeban and Gwiliam (2014) in their study consider that perceptions and beliefs, culture and societal relationships can influence behaviour and decisions. Finally, social consensus and magnitude of consequences affect the decision path of auditors (Arnold et al., 2013).

Van Peurseem (2005) investigated how an effective internal auditor can overcome management pressure. He concluded that the presence of a formal reporting structure, a strong charter and an active governing board or AC could overcome the tension of working with management. There is empirical evidence that such factors can influence reporting decisions (Van Peurseem, 2005). Cooper (1993) views competence, corporate culture and positive thinking as fundamental factors to establish a fruitful relationship between IAF and the AC, as is a clear reporting structure through a charter published and distributed to management.

## 2.10.5 Ethical Considerations

Internal auditors' personal ethical philosophies may differ from those of management in certain situations. This could lead to a breakdown in the reporting system (Ziegenfuss et al., 1994). In addition, internal auditors may not always act ethically. However, O'Leary and Stewart (2007), in their experimental study, explored five ethical decisions and found that internal auditors with more experience adopted a more ethical stance in some cases (O'Leary & Stewart, 2007).

Internal auditors may face a conflict between loyalty to professional standards and their employer. Internal audit reporting to the AC can induce conflict with management (Reynolds, 2000). In the presence of such difficulties, different ethical pathways can be implemented by CAEs. For example, an internal auditor with enough knowledge about the rules and regulations of the organisation is more likely to follow those rules; otherwise, he will follow his personal interest or others' interest. This may explain disagreement regarding which reporting line is optimal. Arnold et al. (2013) compared three sectors of the auditing profession (internal auditing, external auditors from large firms and external auditors from smaller firms) to examine the mediation effect of social consensus and magnitude of consequences of the decision path. They found that the decision paths are influenced by the expected consequences of the decision (Arnold et al., 2013).

The case of WorldCom is an example of different ethical pathways of internal auditors. When WorldCom's internal auditor, Cynthia Cooper, discovered the treatment of line costs as capital expenditures, she discussed the misclassification with the CFO, and later, the controller. After several months, she reported the matter to the head of the AC (Lyke

& Jickling, 2002). The strong signal of the information guided the internal auditor to do what she thought was right and would satisfy all parties.

Everett and Tremblay (2014, 183) examine ethics in the field of internal audit and underscores the need for studying the relative independence of internal audit: *“One needs to question the internal auditor’s relative independence and the degree to which the practice of auditing is being compromised by organisational actors who may not share the auditor’s particular moral-philosophical outlook”*. A commentary article by Burrell Nickell and Roberts (2014) stated that internal auditors’ position within business organisations makes them accountable to the AC and management, which may undermine internal auditors’ cultural and moral authority.

In addition, a Code of Ethics for internal audit was issued by the IIA and is considered as the foundation of governance and a dominant part of the IPPF (IIA, 2016b). It includes two essential components: first, principles (integrity, objectivity, confidentiality and competency); second, rules of conduct that describe behaviour norms expected of CAEs. Siegel et al. (1995) examined the role and importance of the Code of Ethics in providing ethical guidance to Certified Internal Auditors. They concluded that there are ethical pressures or conflicts of interest between groups. For example, a close relationship with management complicates the code in terms of legal and moral responsibilities when there is a conflict of interest. Consequently, there is substantial need for strong rules of conduct (Siegel et al., 1995). The Code of Ethics maintains both moral character and professional competence (Reynolds, 2000). The Code of Ethics can help in solving ethical dilemmas. It can positively influence the ethical perceptions of members more than personal ethical philosophies or organisational environment (Ziegenfuss & Singhapakdi, 1994). A new article by Khelil et al. (2016) investigates the effect of AC interaction with IAF on the



CAE's moral courage. They found significant associations between private access to AC and number of meetings, and moral courage of the CAEs. In contrast, AC contribution to appointment and dismissal of the CAE was not associated with moral courage (Khelil et al., 2016).

Appendix 1 shows a brief summary of the internal audit reporting literature discussed above.

## **2.11 Literature Review Discussion**

There have been several calls to investigate IAF reporting relationships issue (e.g., Gramling et al., 2004; Christopher et al., 2009; Stewart & Subramaniam, 2010; Zaman & Sarens, 2013). For example, Gramling et al. (2004) recognised the need for research to promote effective IAF relationships. However, they claimed that IAF characteristics or characteristics of other parties could influence such relationships.

This study has identified the pros and cons of each reporting line. In general, a close and effective relationship between internal audit and the AC can be beneficial not only to the organisation, but also to society as a whole (Sarens et al., 2012). Nonetheless, a close relationship between the CAE and CEO should be clearly defined to create good corporate governance and avoid negative consequences (Leung et al., 2011). Dual reporting lines are defined by professional standards, but not always achievable as a result of conflicting priorities between the two masters (Hoos et al., 2015). Finally, the main conclusion derived from the body of research articles as a whole is that reporting to the CFO is inappropriate and should be restricted (Stewart & Subramaniam, 2010).

A number of the findings are consistent with institutional theory. Institutions can be defined according to economist Douglass North (1990; 3) as "*the humanly devised constraints that structure human interaction,*" and he divides institutions into formal and

informal camps. In addition, Sociologist W. Richard Scott (1995; 33) defined institutions as “*regulative, normative, and cognitive structures and activities that provide stability and meaning to social behaviour*”. While terms and labels differ on the surface, they share common ground. For example, Scott’s (1995) idea of regulative structures equates to North’s (1990) formal institutions (e.g., laws, regulations and rules), while Scott’s normative and cognitive structure equates to informal institutions (e.g., norms, cultures, ethics).

However, institutional theory can enhance our understanding of how different institutions may develop different reporting strategies. Looking at the institutions related to the IAF Paape et al. (2003) claimed that not all companies in Europe have an AC, such as listed companies in Austria and Portugal. In addition, the existence of AC does not necessarily guarantee IAF effectiveness. A case study of five large companies in Belgium found that internal auditors more likely to meet both the expectation of senior management and AC (Sarens & De Beelde, 2006). However, institutional theory specifies that board structure can be different from one organisation to another (Hegazy & Stafford, 2016). For example, institutions differ when the CEO is the chair of the board, or a member of AC or board. In addition, if the board is composed of family members, institutional theory indicates that different governing features may exist. Moreover, AC effectiveness can be reduced by board structure (e.g., one-tier board vs two-tier board), or the power of the CEO (Lisic et al., 2016). In many countries, listed companies are required to have an AC comprising independent directors to oversee the work of internal and external auditors. In some countries (e.g., Belgium) ACs adopt a one-tier board structure, whereas other countries (e.g., Germany) follow a two-tier board structure (Sarens et al., 2009). Research has produced conflicting results related to which is better, the one or two- tier corporate governance system (Paape et al., 2003).

The lack of empirical evidence about the effect of corporate governance on the strength of the IAF in general (Desai et al., 2010) and reporting relationships in particular, requires more investigation (Lenz & Hahn, 2015). This study suggests a starting point through the five main factors that may influence the CAE's reporting decision. First, Abbott et al. (2010) suggest that future research should fully explore the relationship between the IAF and AC, in order to understand the determinants of the mix of IAF activities. Also, the AC and board of directors in the public sector have unique characteristics in regard to their roles, responsibilities and processes and these should be investigated (Roussy, 2015). However, the nature of IAF activities, independence threats, authority characteristic, control environment and ethical considerations can provide more insight into the CAE's relationship with different authorities.

Second, some researchers, such as Arel et al. (2012); Boyle et al. (2015); and Norman et al. (2010) have studied only highly experienced samples, and did not consider less experienced samples, which may present different findings (i.e., the boundary span of knowledge). CAEs with expert knowledge typically may prove more beneficial in solving an ethical problem that requires a great deal of experience, but do not necessarily follow rules or principles when solving such an ethical dilemma. Following the regulations reinforces the idea of making consistent decisions, which may occur more regularly when the same rules are implemented without bias. Nonetheless, there may be times when the rules do not support the substance of the accounting transaction. Further, research should explore the role played by different variables, which may enhance dual-reporting lines, such as CAEs' experience, ethical perceptions and attitudes. Furthermore, studying the IAF in different regions with a large sample is likely to provide ample opportunities for future research, which can provide new insights. For instance, comparative studies

between groups and between countries could provide complete understanding of the ethical decision-making process internationally (Arnold et al., 2013).

Finally, within a situation when formal institutions (e.g., laws, regulations and rules) are underdeveloped, informal institutions (e.g., norms, cultures, and ethics) are given stronger control to facilitate the transaction (Peng et al., 2009). For example, AC roles and responsibilities in English local authorities are still developing compared to other public and private sectors (Hegazy & Stafford, 2016). The researcher believes that formal and informal institutions complement each other. Economists have mostly focused on formal laws and regulations, while sociologists have paid more attention to informal cultures, norms and values (Peng et al., 2009). As a result of the dynamic interaction between organisations and the formal and informal institutional environment, organisations differ across institutional frameworks (Lin et al., 2009).

## **2.12 Summary of the Chapter**

This chapter started by describing the development of IAF and highlighting its importance. A summary of the IPPF was obtained to present the mandatory and recommended guidance. The approach to collecting the literature of internal audit reporting relationships was discussed. The discussion of the literature shows that dual reporting lines are defined by professional standards, but not always achievable as a result of conflicting priorities between the two masters. In addition, there are advantages and disadvantages for each reporting line. However, reporting to the CFO is inappropriate and should be restricted. Based on prior literature, five factors have been presented and discussed. They are different from one organisation to another, and they may influence the CAE's reporting decision. For these reasons, this study seeks to investigate the different ethical pathways of the CAE's reporting relationships, as well as the influence

of the boundary span of knowledge and geography on the CAE's perception related to internal audit activities. The theoretical frameworks guiding this endeavour, and the hypotheses to be tested, are introduced in the next chapter.

# **Chapter 3 Theoretical Framework and Hypothesis Development**

## **3.1 Introduction**

This chapter is intended to develop the research theoretical models and the hypotheses. In order to do so, a systematic literature review of internal audit reporting relationships supported by some additional narrative methods was undertaken in the previous chapter. Some considerable differences and limitations were observed between studies. In addition, some factors were found to have an influence on the CAE's reporting relationships. However, it was found that no study has examined the ethical pathways of the CAE's reporting relationships and the influence of the boundary span of knowledge and geographical regions on the CAE's reporting relationships with organisation authorities. Based on these findings, it was rational to begin this chapter with a brief summary of the ethical decision-making literature, which will be included in section 3.2. Then, the Ethical Process Thinking Model and the three primary ethical pathways are discussed in section 3.3. In addition, the theoretical background for the conceptual model is devised in section 3.4, followed by section 3.5, which presents the study constructs. Section 3.6 highlights the development of study hypotheses related to the interaction between CAEs' available information, perception and judgment, which clarify the ethical pathways of internal audit reporting decisions, as well as the influence of the boundary span of knowledge and geographical regions. Finally, section 3.7 suggests the study's two theoretical frameworks, followed by the summary of the chapter in section 3.8.

## **3.2 Ethical Decision-making**

Three studies have reviewed ethical decision-making empirical research over a span of 38 years. First, Ford and Richardson (1994) reviewed the empirical literature of the ethical

decision-making models from 1978 to 1992, to assess which variables influence decision-making. They claimed that individuals' decision behaviours are influenced by two broad categories of variables. The first category includes variables associated with the individual decision maker. Individual factors represent the total of the life experiences (e.g., personality, attitudes, values, education, religion, employment, etc.) and circumstances of birth (e.g., nationality, sex, age, etc.). The second category comprises variables associated with individuals' environment, which forms and define the situation in which individuals make decisions. Based on their results, people perceive themselves to be more ethical than their peers. For that reason, they suggested, future research should focus on examining the interaction effects between respondents' perceptions and other factors rather than investigating respondents' beliefs as compared to their perception of peer beliefs (Ford & Richardson, 1994). Additionally, O'Fallon and Butterfield (2005) summarised and critiqued the empirical ethical decision-making literature from 1996 to 2003. They were examining the direct effects of individual factors and organisational factors on ethical decision-making. They suggested the need to study the interaction effects on such factors, especially in modern business practice. In 2013, a third study was conducted by Craft to review the empirical ethical decision-making literature from 2004 to 2011. This study was extended to be applied to individual variables, organisational variables and the concept of moral intensity (Craft, 2013). Common themes called for by researchers included the effects of availability on business practitioner's perceptions (Hayibor & Wasieleski 2009), as well as examining the possible relationship between moral intensity and cognitive capacities for moral reasoning. Watson et al. (2009; 22) asked, "*Is the evaluation of the broader moral issue conducted with deontological rules, while the impact of reward and punishment evaluated with utilitarian rules?*". Therefore, this research refers to the Ethical Process Thinking Model to study the interaction between

the CAEs' perception and their environments, mediated by their judgments before making a decision choice.

### **3.3 Ethical Process Thinking Model**

As a result of the aforementioned discussion, there was significant need to investigate the influence of CAEs' perception on their decision-making choices and the interaction between environment situation, perception and judgment factors before making a decision. For this reason, the Ethical Process Thinking Model was selected to build the conceptual framework for this study. The Ethical Process Thinking Model is centred upon the Throughput Model (Rodgers, 1997).

The Ethical Process Thinking Model can clarify critical pathways in ethical decision-making that are influenced by different sources of information and environmental conditions. In addition, this model hypothesises that three major concepts of perception (P), information (I) and judgment (J) are applied in a certain order, before the decision choice (D) (see Figure 1.1 in chapter 1). These stages are always present in a decision-making context, yet their predominance or ordering influences decision outcome (parallel process rather than serial process) (Foss & Rodgers, 2011). The Ethical Process Thinking Model contains six pathways, three of which are primary ethical pathways (preferences, rules, and principles); building on these three pathways leads to three secondary pathways (relativism, virtue ethics, and ethics of care). Each of the primary pathways differs according to how much weight one puts on his or her perception or available information (Rodgers, 2009). In this model, perception and information are interdependent because *“information can influence how the decision maker frames a problem (perception) or how he/she select the evidence (information) to be used in later decision-making stages (judgment and choice)”* (Rodgers et al. 2009; 350). The reader should bear in mind that



this study is based on the three primary ethical pathways. The most interesting aspect of these three pathways is that they are essential in offering a better understanding of the CAE's reporting relationships, which will be applied in more detail later in this research. Generally, this model provides a broad conceptual framework for examining interrelated processes that influence ethical decisions. The first process (**perception**) concerns the heuristics of framing effects (Kahneman, 2003). It is a higher mental activity level that includes analysing of financial and non-financial information. CAEs' sense is the lower level of perception, which describes how CAEs understand or process information. Such perception is an automatic reaction to information. Individuals respond differently according to their experience, qualification, morale, environment...etc. In this model, **information** interrelates with perception and judgment. For instance, decision makers' evaluations of particular prospects are influenced by previous experience and memorised information. Typically, before CAEs decide to whom they should report, they encode the information and develop a knowledge representation for the problem. Furthermore, the strategies of **judgment** that affect CAE choice are under their deliberate control. Kahneman and Tversky (1979) have suggested that both automatic, perception-like heuristics and more deliberate information processing strategies (judgment) are important determinants of decision choices. In addition, Rodgers (1999) argued that **decision choice** may be influenced by individuals' cognitive mechanisms, which include biases, errors, and context-dependent heuristics, which they are largely unaware.

The next subsections highlight the three primary ethical pathways depicted in the Ethical Process Thinking Model.

### **3.3.1 The Preference-Based Ethical Pathway (Psychological Egoism) P → D**

This pathway is based on every individual acting according to his interest, in other words, maximising one's self-interest (Rodgers & Gago, 2001). Individuals focus on what they need, want and desire. They give more weight to results that are positive rather than negative for themselves. Thus, they care more about their own interest than those of others when the two conflict (Rodgers, 2009). The decision is taken based on perception, ignoring previous judgment or information. In this regard, internal audit standards require an independent and objective evaluation to continue in existence in every decision (IIA, 2016a). Here it is important to distinguish between self-interest and selfish behaviour. It is healthy for everyone to pursue their self-interest, but selfish behaviour brings benefits only for a few and loss to many (UK essays, 2015). For example, the world has witnessed numerous scandals, since some accountants and auditors have adopted various means of accounting techniques to mislead the users of the financial statement that led to gains for a handful of people and losses to the investor community at large (United States Congress, 2002). In addition, Lampe et al. (1992) studied self-interested behaviour and found it adversely affected auditors' ethical decision-making (Lampe et al., 1992).

On the other hand, Moeller (2004) claimed that CAEs might split their time between assisting the AC, management and external auditors, which creates time constraint problems. It can be concluded that unavailable information, personal interest and time pressure can encourage CAEs to follow the preference-based ethical pathway. Therefore, the decision to whom to report is taken by ignoring previous judgment or information signals. Building on this pathway, CAEs, influenced by their "perception" can have an opportunity to solve ethical problems, as long as they have adequate experience and personal ethics.

### **3.3.2 The Rule-Based Ethical Pathway (Deontology) P → J → D**

In this pathway, the decision is motivated by laws, procedures, guidelines and individuals' rights. The decision is non-consequential, judgment-oriented and conditioned by one's perception of the rules and laws. Information is not required, because the decision is driven by regulations (Rodgers, 2009). For instance, Guiral et al. (2010) examined the impact of perceived consequences on auditors' decision-making. They concluded that auditors' perceptions regarding the consequences of issuing a qualified audit opinion are an essential determinant of audit reporting decisions. Another example is that Lampe et al. (1992) provided a measurement of self-interested behaviour that influences auditors' ethical decision-making; nonetheless, they found that rule-based platforms are the most significant influence on auditors' ethical decision-making. Furthermore, internal auditors' "code of ethics" has been found to have a strong moral effect in helping to resolve professional ethical dilemmas (Reynolds, 2000). In this research paradigm, internal auditors typically follow the standard of organisation independence by reporting to the AC functionally and CEO administratively (IIA, 2016b), as well as abide by the Code of Ethics (IIA, 2016c). To this extent, following a rule-based perspective, internal auditors may develop analytical procedures to determine their decision. Thus, any decision should consist of a rule-based theme of analytical evolution of the evidence, both negative and positive, regardless of the substance of the decision.

### **3.3.3 The Principle-Based Ethical Pathway (Utilitarianism) I → J → D**

This pathway deals with group influences, which is an expansion of individual influences of ethical egoism. However, both pathways are similar in that they examine the outcome of a particular action (UK essays, 2015). Further, utilitarianism is a consequential

decision-making process that maximises the utility for all. Accordingly, this pathway highlights that properly weighted information can play a strong role in determining the reporting propensity of internal auditors. Building on this foundation, individuals that agree with group standards typically order and weight the available information before rendering a decision. In this regard, the principle-based pathway attempts to facilitate the greatest good for the organisation affected by the decision (Rodgers & Gago, 2001).

### 3.4 Theoretical Background

The lack of empirical evidence about the effect of corporate governance on the strength of the IAF in general (Desai et al., 2010) and reporting relationships in particular, requires more investigation (Lenz & Hahn, 2015). According to Abbott et al. (2010), it has been suggested that future research should fully explore the relationship between the IAF and AC, in order to understand the determinants of the mix of IAF activities.

Also, some researchers, such as Norman et al. (2010); Arel et al. (2012); and Boyle et al. (2015) have studied only highly experienced samples, and did not consider less experienced samples, which may produce different findings (e.g., related to the boundary span of knowledge). In this research, a ‘boundary’ is a separation or a range of activities, that highlights the limitations of an area, which may comprise “*knowledge, tasks, physical, geographical, social, cognitive, relational, cultural, and occupational*” (Carlile, 2002; Ferlie et al., 2005; Hsiao et al., 2012; Levina & Vaast, 2008; Orlikowski, 2002)<sup>6</sup>. Generally, the influence of years of experience on the decision-making is one of some demographic factors that are seldom reported and poorly understood (Ford & Richardson,

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<sup>6</sup> More detail available at McNulty and Stewart (2015; 516).

1994). Furthermore, studying the IAF in different regions with a large sample is more likely to provide ample opportunities to provide new insights. For instance, comparative studies between groups and between countries could provide a better understanding of the ethical decision-making process internationally (Arnold. et al., 2013). Thus, the types of boundary span on which this study focuses are the boundary span of knowledge and geographical region.

Current IIA International Standards for the Professional Practice of Internal Auditing identify that the main reporting relationship should be to the board of directors (the highest authority in the organisation) (IIA, 2016b). The International Standards on Auditing (ISA- 610) support reporting to the organisation's high authority and state that reporting to management would be considered a significant threat to the IAF's objectivity (ISA, 2013). In 2003, James examined whether internal audit reporting structure and sourcing arrangement affect users' perceptions of their protection from financial statement fraud. He conducted a survey of seven different banks in the USA, including 63 lender officers. He concluded that reporting functionally and administratively to the AC is more likely to prevent financial statement fraud than reporting to management (James, 2003). Additionally, an experimental study conducted by Holt (2012) examined the effect of internal audit role and reporting relationships on investors' judgments and decisions. He found that participants perceived higher disclosure credibility when the CAE reported strategically to the AC versus reporting to a lower authority (e.g., CFO) (Holt, 2012).

Despite the advantages of a close relationship between internal audit and the high authorities, Norman et al. (2010) disagreed with this view. They investigated the effects of internal audit reporting relationships on fraud risk assessments made by internal

auditors when the level of fraud risk varied. They found that internal auditors usually reduced risk assessment when they reported directly to the AC. They concluded that reporting to the AC is not a wise solution for IAF objectivity and independence (Norman et al., 2010). In addition, a few other studies claimed some difficulties that may face CAEs when reporting to high authorities. For instance, Boyle et al. (2015) examined the effects of internal audit reporting relationship and reporting type on the assessment of fraud risk and control risk. They found that reporting directly to the AC and providing an assurance report lead to higher assessment of fraud risk and control risk. However, they argued in the same study that when the IAF is accountable to stakeholders or the AC, it is more likely to make a conservative judgment, compared to reporting to the CEO, which establishes direction and support for the IAF (Boyle et al., 2015). Furthermore, Reynolds (2000; 122) argued that *'if the internal auditors report to the audit committee, as recommended, management may perceive them as adversarial'*. It appears that conflict of interest between authorities and unintended consequences is expected when the CAE reports to high authority (Reynolds, 2000).

The author believes that the aforementioned disagreements are attributable partly to the failure to consider ethical pathways and the boundary span between actors, which might deter CAEs from reporting deficiencies in full, including the person who appoints them and decides their salaries, evaluations and bonuses. Therefore, the CAE's reporting relationship with the appropriate authority may follow different ethical pathways, as the CAE's reporting decision can be influenced by time pressure, environment change and his/her perception (Rodgers & Gago, 2001). For example, Hoos et al. (2015) found that internal auditors arrived at significantly different judgments if task complexity was high, depending on communicated superior preferences (Hoos et al., 2015).

## 3.5 Study Constructs

While the cornerstones of the Ethical Process Thinking Model approach are perception (framing the problem), information (financial and non-financial), judgment (analysis of perception and information), and decision choice, the model can highlight and explain how the extent of IAF activities can influence individuals' actions. From a broad perspective, this study examined whether CAEs' assessment regarding IAF competency (e.g., technical expertise), and the activities of internal audit related to some issues (i.e., governance review and IT risk and cybersecurity), mediated by their judgment (e.g., the extent of use of IT tools and techniques) influences the CAE's reporting relationship decision. Hence, the primary purpose of this chapter is to build the theoretical framework and develop the research hypotheses to achieve the research objectives, namely, to determine the ethical pathways of the CAE's reporting relationships, and to examine the influence of the boundary span on the ethical position of the CAE's reporting decision. The following subsections contain the researcher's determinants of particular reporting mechanisms, as depicted by the Ethical Process Thinking Model.

### 3.5.1 Information

**Information**<sup>7</sup> in this study refers to non-financial information pertaining to the reality of how the entity (IAF) functions. To assess the quality of the IAF environment, this study refers to the IIA's Global Internal Audit Competency Framework, which identifies ten core competencies. The framework divides those competencies into four categories that

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<sup>7</sup> Information can be divided into political, economic, management, financial and social elements (see Rodgers, 2006: 12).

build on each other beginning with foundational skills, and then technical expertise, personal skills, and internal audit delivery (see Figure 3.1). In general, IAF competency is an important factor to measure the quality of IAF (ISA, 2013). For that reason this study suggests three measures, which are grouped as a technical expertise that can predict the reality of how the entity of IAF function. They include the competency of the application of governance, risk and control (EXP1), the competency of the application of IPPF (EXP2), and the competency of IAF resources through maintaining expertise of the business environment, industry practices and specific organisational factors (EXP3) (IIA, 2013b). Thus, technical expertise is considered to be the first variable that forms the information construct. The outcome of the information processing is the CAE's assessment of IAF competence. Making an assessment involves retrieving information, cognitive processing, and activating perception and judgment.



**Figure 3-1: The IIA’s Global Internal Audit Competency Framework**

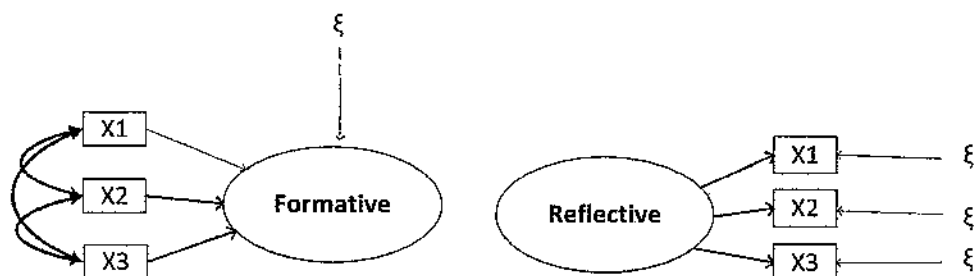


Source: The Institute of Internal Auditors (2013; 3).

There are two types of measurement model: formative and reflective. Following Jarvis et al. (2003), four major criteria should be evaluated to decide whether measurements are reflective or formative: (1) the logical direction of causality from a latent construct to its indicators; (2) interchangeability of indicators; (3) covariation among indicators; and (4) homological set of constructs indicators (see figure 3.2). Dowling (2009), in an article in *The Accounting Review*, used both formative and reflective constructs. To this end, she employed PLS instead of a Covariance-Based-SEM (CB-SEM). Furthermore, Rodgers and Guiral (2011; 25) argue that “*the exclusive use of reflective factors constrains theory development and may lead to imprecise measurement*”. In this study framework, the

technical expertise measures are formative<sup>8</sup> as they refer to a theoretical basis. The arrowheads are directed from the measures to the theoretical variable, as the three measures are causing the technical expertise construct.

**Figure 3-2: Reflective and Formative Measurement Model**



### 3.5.2 Perception

**Perception** concerns the heuristics of framing effects (Kahneman, 2003). It refers to framing the decision-making process. Individuals' perceptions "*simply implement positions that are likely to gain the favour of those to whom they are accountable*" (Rodgers, 2006; 11). In this study, perception refers to the outlining of the CAEs' knowledge (how they view the nature of internal audit activities). It is a higher mental activity level that includes analysing available information. CAEs' sense is the lower level of perception, which describes how CAEs understand or process information.

CAEs consistently review plans for protection and safeguarding of assets regarding governance review and IT risk and cybersecurity. This study advances literature as it shows that CAEs do not only look at security features in their judgment. CAEs'

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<sup>8</sup> A formative construct is "*a theoretical variable, which has actually been created or 'formed' from one or more observables*" (Rodgers & Guiral, 2011; 3).

perceptions influence their reporting decisions directly and indirectly. The impact of this study is related to governance review issues and IT risk and cybersecurity issues. This effect can be examined by investigating the direct and indirect effect of these two different activities. Firstly, the extent of governance review activities related to the issue of ethics (GOV1), strategy and performance (GOV2), compensation assessments (GOV3) and environmental sustainability audit (GOV4). Secondly, the extent of IT risk and cybersecurity activities related to the issue of IT risk (ITS1), cybersecurity (ITS2), physical security of data centre (ITS3), access to mobile (ITS4) and social media (ITS5); also, the security of internal internet (ITS6) and external websites (ITS7). CAEs are in a better position to combining all of these elements in their minds and report any issue to the appropriate authority. CAEs' perception can be translated into meaningful information that enables the board to exercise oversight responsibility and monitor the issues related to governance and IT security. This study suggests the value of gaining a better understanding of the role that the CAE plays in terms of governance review and IT security factors, to see how certain perceptions, experience and training influence their judgment analysis.

### **3.5.3 Judgment**

**Judgment** is the process of analysing incoming information and the influence from the perception stage. It results in part from the influence on individuals of their experience, qualification, morale, and organisation environment. Judgment includes the process CAEs implement to analyse the current situation of internal audit (technical expertise), as well as the influences from the perception stage (the extent of internal audit activities). This enables the auditor to weight and compares the decision choice and the criteria across the alternatives (Rodgers et al., 2009).

Judgment in this study refers to the extent of using IT tools and techniques. Studies reveal that IT tools and techniques support decision makers who faced with difficult decisions, to decide better, faster and more effectively (Bohanec, 2009). Typically, the strategies of judgment that affect CAE choice are under their deliberate control. For example, during the decision on the CAE's reporting direction, early warning signals about the issue of governance, cybersecurity or ethics- related risk are connected to the extent of using IT tools to assess risk (ITU1), plan and schedule internal audit (ITU2), assess internal quality (ITU3), monitor and track remediation and follow-up (ITU4), and manage the data collected by IAF (ITU5). CAEs employ investigatory and analytical tools to diagnose the cause of problems. Individuals' perceptions about the extent of IAF activities related to governance review and IT risk and cybersecurity differ. Not all of them have the ability to make a decision without analysing the situation. They refer to the judgment stage before making a decision.

### **3.5.4 Decision**

**Decision choice** is the selection of the best option or course of action to ensure individuals' fulfilment of intended plans (Rodgers, 2009). The decision in this study includes different levels of governance authorities to represent the CAEs' reporting relationship choices<sup>9</sup>, from the lowest level in the organisation hierarchal structure (e.g., senior management) to the highest authority in the organisation (e.g., the board of directors). Kahneman and Tversky (1979) have suggested that decision choices are determined by both automatic, perception-like heuristics and more deliberate information

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<sup>9</sup> According to IIA International Standards the CAE should report to the board functionally (e.g. on the approving charter, planning, execution and results of audit activities). Also, approving decisions regarding the appointment and remuneration of the CAE (IIA. 2016a).

processing strategies (i.e., judgment). Consequently, it can be concluded that CAEs' perceptions and judgment affect their decision choice. However, someone may argue that reporting relationships should be pre-determined by the organisational structure, which may not affect the CAE's reporting decisions. This is true when the CAEs are expected to follow only one ethical pathway (e.g., the rule-based ethical pathway) by following organisation rules and regulations. In reality, conflict of interests, time and career pressure, and boundary span can lead to different decisions. Moreover, organisation rules and regulations do not always support the substance of the transaction, especially in an unstable environment.

In general, CAEs' reports are influenced by whom they are directed to. That is, the CAEs' reporting decisions are more likely to be motivated by the position of the appropriate authority. Schneider (2009) points out in his article that internal auditors might be reluctant to report directly to the AC of the board regarding controversial issues involving senior management. In addition, Fraser and Lindsay (2004) claim that there is a career risk for CAEs of reporting the full deficiencies of the operation of their manager or the person who decides their salary, evaluations and bonus, and this is the major problem of the CAEs' reporting mission. For these reasons, CAEs' reporting decisions can be captured by the following elements: first, the CAE's main reporting line (DEC1), followed by who makes the final decision for appointing the CAE (DEC2), and finally, who is ultimately responsible for evaluating the CAE's performance (DEC3).

### **3.6 Hypothesis Development**

The overall relation between the CAE and the appropriate authority may depend on the characteristics of CAEs and their environments, for example, CAEs' knowledge, activities and control environment. In addition, the nature of IAF activities can influence

CAEs' reporting relationships with the appropriate authority, CAEs' perception about the extent of IAF activities presents their position on making a decision. However, ACs rely heavily on both internal and external audit to ensure overall audit quality (Abbott et al., 2007). Because of their position, CAEs should play a stronger role in preparing documents for the AC and board, as they have deep understanding of organisation issues, such as governance and IT risk and cybersecurity issues.

Lin et al. (2011) suggested that IAF quality encompasses specific attributes of the organisation, the parties performing IAF activities, and the nature and scope of activities performed. To understand the interrelationship between IAF competency and the extent of IAF activities, the author uses the assessment of technical expertise competency as information describing how the IAF works, also, the extent of governance review and IT risk and cybersecurity activities describing the CAE's perception. The three primary ethical pathways were used as the bases to derive study hypotheses in order to explore the interrelationships among investigated factors.

I ↔ P Technical expertise and perception are mutually interdependent.

One of the main measures of internal audit quality is IAF objectivity (ISA, 2013). The internal audit reporting relationships is a key determinant of objectivity (Lin et al., 2011). It has been found that reporting to high authority is negatively associated with earnings management (Prawitt et al., 2009). In addition, internal audit quality and competence deter the likelihood of management misconduct. However, Ege (2015) found no relationship between IAF objectivity and management misconduct, and he ascribed that to the possibility of a high level of objectivity in the sample or the lack of variation in the measures. Thus, he suggested that future research should use better measures and re-examine such relationships.

In 2003, the IIA Research Foundation investigated the conflicts of internal audit reporting relationships before the implementation of the Sarbanes-Oxley Act (SOX-Act) of 2002 (United States Congress, 2002). They demonstrated that the IAFs' activities generally differ in importance as perceived by the AC and management (IIARF, 2003). This view has been supported by Abbott et al. (2010) who investigated the relationship between AC oversight variables (reporting lines, termination rights, and budgetary control) and the nature of IAF activities. They proposed the connection between the AC's oversight and an internal controls-oriented focus. They found a strong positive association between AC oversight and the IAF budget allocated toward internal control activities (Abbott et al., 2010).

With the development of IAF activities from traditional activities, such as auditing the accounting and managerial procedures to more effective activities related to governance, management risk and control, IAF activities should add value and improve an organisation's operations. According to the internal audit control standards No. 2130 *"IAF Activity must evaluate the adequacy and effectiveness of controls in responding to risks within the organisation's governance, operations, and information systems"* (IIA, 2016a; 14). The importance of IAF as a mechanism for corporate governance has increased. DeZoort and Salterio (2001) showed that good communication between internal auditors and AC could improve corporate governance quality. In addition, the IAF is one of the four cornerstones of corporate governance. The head of the IAF should communicate with the AC about their progress (Gramling et al., 2004).

Organisation governance is the framework of regulations that control relationships among various parties, such as management, auditors, and board of directors, in determining the direction and performance of organisations (Monks & Minow, 2001). The governance

structure in each country develops in response to its unique country-specific characteristics (e.g., legal, socio-economic, political and financial systems) (East West Management Institute, 2005). Therefore, country-specific factors and conditions can lead to different governance structures. For example, governance in some European countries, such as Netherlands, France, and Germany, separates the board into the supervisory boards and the management board (two-tiered structures) (Hermanson & Rittenberg, 2003). In contrast, North American region companies have a unitary board structure. In addition, different governance models are followed by different countries. For example, the Anglo-US model is followed by the UK, USA, Australia, Canada, and New Zealand (East West Management Institute, 2005), whereas, the Continental (German) model is followed by European countries (Ross, 2015).

Furthermore, several regulations have been issued in order to improve governance in some parts of the world. For instance, the Treadway report and COSO governance-related publications, were designed to reduce the likelihood of financial statements fraud in North America. Other oversight groups, such as CoCo in Canada, Cadbury in the United Kingdom, or the initial King Report in South Africa, have adopted control frameworks based on fundamental control objectives (East West Management Institute, 2005). the SOX-Act (2002) was issued in order to respond to the financial crisis in the USA. However, referring to the aforementioned arguments, different governance systems around the world can lead to different internal audit activities related to governance review. This is guided by the varied country-specific factors and conditions.

In today's challenging environment, IAFs can play a critical role in helping their organisations to effectively manage some of their leading risks. Several factors have increased the attention paid to governance and cybersecurity issues as a result of rapid development in technology, changes in regulatory environments and changes in the threat



landscape. Both high and low authorities have expectation that IAF activities can provide assurance around all important risk related to governance and IT risk and cybersecurity. For these reasons, this study extends the literature by examining the influence of governance review and IT risk and cybersecurity activities on the CAEs reporting decision.

P → D

*H1.* There is a relationship between CAEs' perceptions regarding the activities of governance review and their relationship with the appropriate authority.

*H2.* There is a relationship between CAEs' perceptions regarding the activities of IT risk and cybersecurity, and their relationship with the appropriate authority.

Individuals' perceptions about the extent of IAF activities related to governance review and IT risk and cybersecurity differ. Not all of them have the ability to make a decision without analysing the situation. They refer to the judgment stage before making a decision. However, in the era of technology, the importance of using IT tools and techniques has grown with the increased reliance on IT for business operations and assurance (Stoel et al., 2012). '*Living in an information and communication technological environment requires ethical decision-making approaches that can assist us to arrive to better decisions*' (Rodgers, 2009; 2). In the US, the SOX-Act (2002) requires the use of information systems to produce financial statements. This is a vital part of documenting and testing compliance with management's IT control objectives, as well as an integral part of IT governance. Adopting IT tools and techniques enhances control environment, reduces time pressure, and eliminates errors. Due to the significant role of internal audit and IT, the author considers how CAEs' perception (e.g., the extent of internal activities) influences judgment (e.g., the extent of using IT tools and techniques) that influences the

decision-making pathway (e.g., CAEs' reporting relationship with the appropriate authority).

**P → J**

**H3.** There is a relationship between CAEs' perceptions regarding the activities of governance review and the extent of using IT tools and techniques.

**H4.** There is a relationship between CAEs' perception regarding the activities of IT risk and cybersecurity, and the extent of using IT tools and techniques.

The selection of quality internal auditors is important to enable organisations to maintain external and internal legitimacy and integrity of their systems, operations, and business processes. Objectivity and competence may be viewed as a continuum, but a high level of competence cannot compensate for lack of objectivity, and the opposite is also true. Competency shows the general level of capability of the IAF; in other words, whether experienced leadership, staff and resources are available. According to the IIA's Global Internal Audit Competency Framework (IIA, 2013b), these three elements are related to each other and represent the technical expertise. General levels of technical expertise may comprise technical skills and knowledge (Havelka & Merhout, 2013). Technical expertise measures the competency of governance, risk and control appropriate to the organisation, the competency of applying the IPPF and the competency of maintaining expertise in the business environment, industry practices and specific organisation factors (IIA, 2013). Competent IAF is expected to use IT tools and techniques more, in order to activate and speed analysis process before making a decision.

**I → J**

**H5.** There is a relationship between the CAEs' assessment of technical expertise and the extent of using IT tools and techniques.

As discussed previously, not all CAEs have the same knowledge and ability to make a decision without considering analysis stage, which needs time and effort. It is rational to expect that some CAEs are concerned about the consequences of their decisions. For that reason, they weight the current situation of their IAF and the influence of performed activities before making a reporting decision. However, the IAF looks at technology as a way to improve the analysis process and productivity. Technology can help automate activities, such as risk assessment, planning and scheduling, and monitor and track audit remediation and follow up. The extent of using IT tools and techniques is an essential part of the IAF to succeed in its evolving mandate. IT tools and techniques can help the CAEs to decide better and faster. Studies reveal that IT tools and techniques support decision makers faced with difficult decisions (Bohanec, 2009). This enables the auditor to weight and compares decision choices and criteria across alternatives (Rodgers et al., 2009).

**J → D**

**H6.** There is a relationship between the extent of using IT tools and techniques and CAEs' relationship with the appropriate authority.

Typically, the author examines the influence of the boundary span of knowledge and geographical regions on CAEs' ethical decision pathways. First, extensive attention has been paid to memory and knowledge issues in accounting (Libby & Luft, 1993). Libby and Luft (1993) defined knowledge as '*an internal mental state, which cannot be directly observed*' (Libby & Luft, 1993; 430). In accounting firms, experienced accountants rely heavily on the job-related knowledge that they bring to their tasks. Knowledge difference can best be established by comparing individuals with different level of experience.

Recognition of the importance of experience effects on task assignment and auditing judgment justifies considering knowledge guidelines in this study to examine the ethical pathway of CAE reporting relationships. In many studies, job-relevant experience is measured by the number of years is used as a proxy for expertise. Individuals with many years of experience are considered as “experts,” in contrast to others with little experience who are labelled “novices”. This is rational, but no one can function as an “expert” without the necessary competence. However, despite the uncertainty of using experience as a predictor for the degree of expertise, at worst, it reflects seniority as a result of the positive association between experience and performance (Shanteau et al., 2002). Furthermore, Carlile (2002) found that “*differences in knowledge are not always adequately specified as differences in degree or interpretation, but that knowledge is localized, embedded, and invested in practice*” (Carlile, 2002; 453). It can be concluded that knowledge differences between auditors might lead to different decision processes (Bedard, 1989).

Early psychological literature studied the influence of basic cognitive abilities and deficiencies on decision makers’ performance. This literature suggested that decision makers’ cognitive abilities are a key input into decisions and not all people have the ability to apply them to a sufficient degree to assure error-free judgment. Decision makers with high experience rely on their larger knowledge memory and on the way in which they organise their knowledge, which helps them to bear on the problem (Libby & Luft, 1993). According to Craft (2013), it has been found that years of experience impact the ethical decision-making process. For instance, work experience leads to more morally conservative decisions (McCullough & Faught 2005); associated with increased ethical judgment (Valentine & Rittenburg, 2007); and more experienced students were found to be more ethically oriented (Eweje & Brunton 2010; Valentine & Rittenburg, 2007). In

the auditing profession, the level of experience can explain the quality of auditor judgments (Pflugrath et al., 2007).

The CAE's domain and process knowledge can effect audit practices and procedures, and assurance quality. For instance, if CAEs have a good understanding of the work issues (governance review and IT risk and cybersecurity) they would be more likely to identify control weaknesses or areas for improvement, as well as need less time to perform a specific task (Havelka & Merhout, 2013). Bonner and Lewis (1990) argued that more experienced auditors have greater ability to perform the analytical tasks than less experienced. However, they recognised the need to control related experience differences, which may have resulted from the overall superiority, not the effect of specific task knowledge. This is the reason why both the general experience of CAEs in internal audit and their experience as CAEs were included in this study, to distinguish between high and low knowledge. The high knowledge group include CAEs with six years or more experience as CAE and eleven years and more as internal auditor. The low knowledge group include the CAEs with five years or less experience as CAE and ten years and less experience as internal auditor.

**H7.** There is significant difference between the CAEs' perceptions about the extent of activities related to governance review issues according to their knowledge groups.

**H8:** There is significant difference between the CAEs' perception about the extent of activities related to IT risk and cybersecurity issues according to their knowledge groups.

**H9.** The boundary span of knowledge influences the ethical pathway of the CAE's relationship with the appropriate authority.

On the other hand, IAF activities are performed in diverse cultural and legal environments, where internal auditors are influenced by their respective cultures and legal

regimes (Abdolmohammadi & Sarens, 2011). In addition, CAEs' attitudes and actions are different. These varying attitudes and actions are the result of varied traditions and cultural outlooks (Alzeban, 2015). Furthermore, firm policies, professional standards and decision support systems are different from one organisation to another. These environmental characteristics have the ability to influence judgment and decision motivations. Environmental factors change the task requirements and the class of interaction. For example, economic differences associated with technology services (Levina & Vaast, 2008), which reduces the time and effort required to correct numerical calculations. This is an example of the influence of the environment on task requirements. However, in some cases, the environmental factor may not change the task requirements, but change the effort that decision makers are willing to employ to fulfil those requirements (Libby & Luft, 1993). Researchers recognise that auditors in different countries face different reporting requirements and litigation settings (Messier et al., 2011). For that reason, the CBOK survey combines affiliates and chapters into groups depending on their cultural classification. In 2006, for the first time, respondents were obtained from different geographical regions. Therefore, several criteria were used to classify respondents according to the region where they were based or primarily worked. First, the survey team referred to Hofstede (1980, 1983) who proposed a number of dimensions to classify 50 countries. Then, House et al. (2004) expanded Hofstede's work and classified 62 societies into various cultural clusters. Since the CBOK survey has affiliates in over 160 countries, additional information from the Central Intelligence Agency World Fact Book (2006), languages(s) spoken in the affiliate's geographical area, geographical location, and discussions with the IIA staff and leadership, were considered

(IIARF, 2007). Accordingly, respondents in the CBOK 2015 data were classified into six main regions (see Table 3.1).

**Table 3-1: The Chief Audit Executives' Global (Geographical) Regions**

<i>Geography: region where the CAE's based or primarily works</i>	<i>Sample</i>
Africa	175
Asia and Pacific	462
Europe	690
Middle East	122
North America (the United States and Canada)	489
South and Central America and the Caribbean	297
<b>Total</b>	<b>2235</b>

Source: Developed by the Author

*H10*: There is significant difference between the CAEs' perceptions about the extent of activities related to governance review issues according to their regional groups.

*H11*: There is significant difference between the CAEs' perceptions about the extent of activities related to IT risk and cybersecurity issues according to their regional groups.

*H12*. The boundary span of geographical regions influences the ethical pathway of the CAE's relationship with the appropriate authority.

To sum up, the reader should take into consideration that this study investigates 12 hypotheses. The first six hypotheses are related to the interrelationships between the Ethical Process Thinking Model four components (i.e., information, perception, judgment and decision). The second six hypotheses are related to the investigation of the significant difference among internal audit activities according to different groups, in addition to the influence of the boundary span of knowledge and geographical regions on the ethical pathways of the CAE's reporting decisions. Table 3.2 shows how the research hypotheses are connected to the research questions.

**Table 3-2: Parallelism between Research Hypotheses and Questions**

<i>Research Hypotheses</i>		<i>Research question</i>
Six hypotheses investigate the interrelationships between information, perception, judgment and decision in order to identify the ethical pathways of the CAEs reporting relationships	H1	Research Questions 3 & 4
	H2	
	H3	
	H4	
	H5	
	H6	
Six hypotheses investigate the significant difference between knowledge and geographical regions groups, and the influence of the boundary span on the CAEs reporting decisions	H7	Research Questions 5
	H8	
	H9	Research Question 6
	H10	Research Question 7
	H11	
	H12	Research Question 8

Source: Developed by the Author

### **3.7 Theoretical Framework**

According to the aforementioned specification of the perception construct, this study should examine two different activities related to governance review and IT risk and cybersecurity issues. Consequently, two study frameworks have been developed to examine the two variables separately and clarify any significant difference between the two models' statistical results.

Figure 3.3 shows the study framework model A and Figure 3.4 shows the study framework model B. Both models are built to examine the ethical pathways of the CAEs' reporting relationships. While both models contain the same information, judgment and decision constructs, however, the perception construct distinguishes between them. Specifically, model A represents CAEs' perception related to the extent of internal audit governance review activities (e.g., ethics, strategy and performance, compensation assessments, and environmental sustainability). In contrast, model B represents CAEs' perception related to internal audit IT risk and cybersecurity activities (e.g., IT risk,

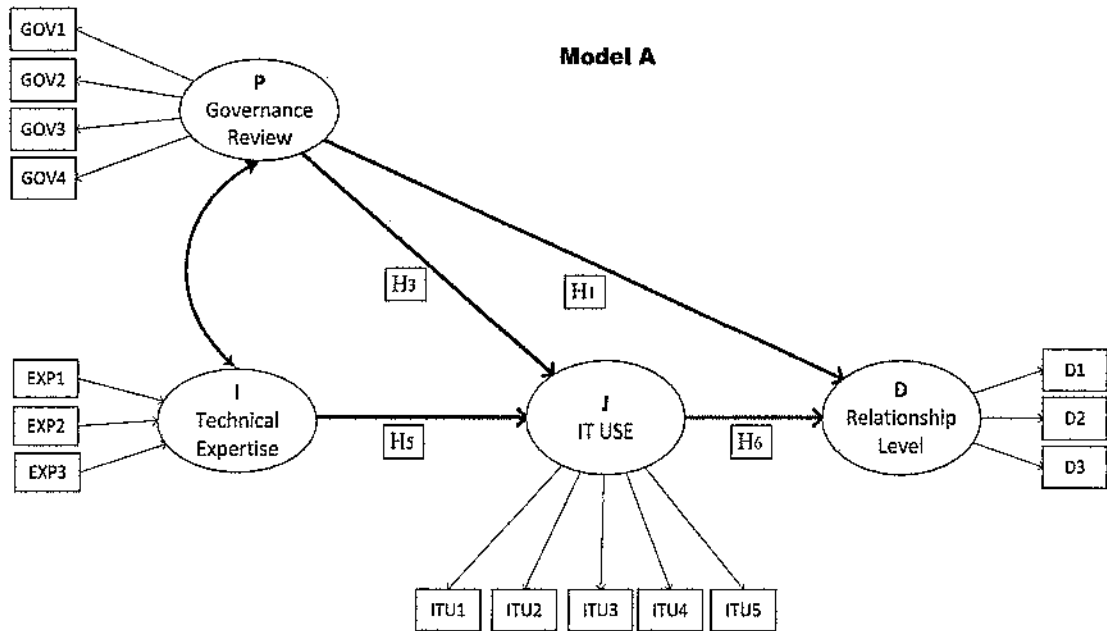


cybersecurity, physical security of data centre, access to mobile and social media, and the security of internal internet and external websites). More details about constructs and measures are presented in the next chapter (Chapter 4).

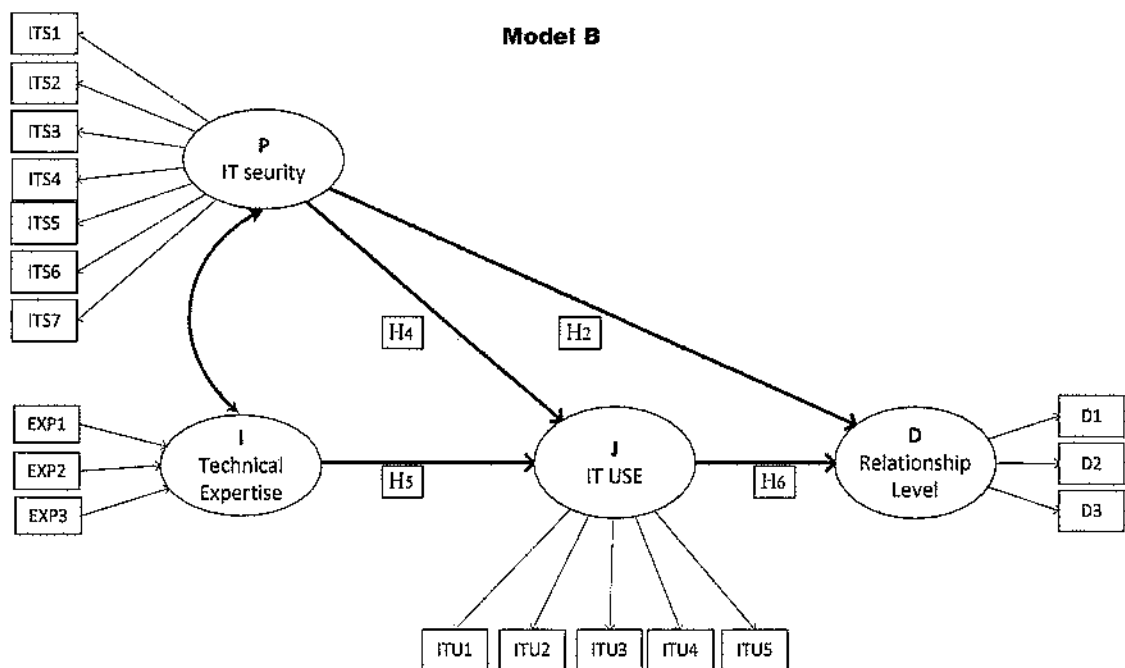
The study frameworks (Figure 3.3 & Figure 3.4) illustrate the process by which an individual's decision choice is made. Building on these models this study can highlight the relationship between the CAE and the appropriate authority within a corporate governance context. Researchers to date have tended to focus on the direct relationship between IAF activity and authority oversights. As summarised in the two study frameworks, this study enhances the literature by illustrating that CAEs' different ethical positions of reporting relationship may be greatly influenced by the competence of the IAF (technical expertise) and the CAEs' perception in regard to IAF activities related to governance review (Model A) and IT risk and cybersecurity (Model B), with the extent of using IT tools and techniques. The researcher proposes that there is significant difference among CAEs' perceptions regarding the extent of IAF activities. In addition, the boundary span of knowledge and geographical regions of CAEs can influence their ethical reporting pathways.

In summary, this research tests 12 hypotheses that represent the research questions and objectives. Four of them are connected to model A (H1, H3, H7 and H10), while another four are connected to model B (H2, H4, H8 and H11). The remaining four hypotheses are connected to both models (H5, H6, H9 and H12). Table 3.3 indicates the hypotheses' position in related to the research models.

**Figure 3-3: The Theoretical Framework (Governance Review)**



**Figure 3-4: The Theoretical Framework (IT risk and Cybersecurity)**



**Table 3-3: Hypotheses' Connection to Study Models**

<i>Hypotheses</i>	<i>Model A</i>	<i>Model B</i>
H1	√	-
H2	-	√
H3	√	-
H4	-	√
H5	√	√
H6	√	√
H7	√	-
H8	-	√
H9	√	√
H10	√	-
H11	-	√
H12	√	√

Source: Developed by the Author

### **3.8 Summary of the Chapter**

This chapter has discussed the ethical decision-making literature and the Ethical Process Thinking Model. In addition, the theoretical background of this research was discussed. The three primary ethical pathways were presented, in order to identify the ethical pathways of the CAEs' reporting decision. Two theoretical models and 12 hypotheses were developed. The perception construct distinguishes between the two models. Specifically, model A represents CAEs' perception related to the extent of internal audit governance review activities, whereas model B represents CAEs' perception related to internal audit IT risk and cybersecurity activities. Finally, it can be noticed that every hypothesis was supported by a specific justification including the boundary span of knowledge and geographical regions hypotheses. The details of the research methodology are introduced in the following chapter.

# Chapter 4 Research Methodology

## 4.1 Introduction

The aim of any research methodology is to answer the research questions and achieve the objectives of the research study. According to Collis and Hussey (2009; 55), research methodology refers to “*the overall approach to the research process, from the theoretical underpinning to the collection and analysis of the data*”. Therefore, this chapter explains the research philosophy, approach, methodology choice, strategy, data collection techniques and analysis procedures, which enable the researcher to achieve the research objectives and answer the questions under consideration. The organisation of this chapter is structured by referring to the research process ‘onion’ proposed by Saunders et al. (2016) shown in Appendix 2.

The research design is the general plan that describes how the researcher will answer his/her research question(s). It is used as a guide for collecting and analysing the data (Saunders et al., 2016). The types of research design are determined by the purpose of the study and they can be divided into three types: the *exploratory study* is conducted when no information is available regarding a particular problems and how similar problems have been solved in the past (Sekaran & Bougie, 2013). This type may commence with a broad focus, and then become narrower as the research progresses (Saunders et al., 2016). The *descriptive study* aims to describe the characteristics of the variables of the phenomenon of interest from an individual, organisational or industry perspective (Sekaran & Bougie, 2013). It gives the researcher a clear picture of the phenomenon (Saunders et al., 2016). The *explanatory study* establishes causal relationships between variables. Statistical tests could be used in this type of study (e.g., regression and correlation) (Saunders et al., 2016). It uses hypothesis testing to explain the nature of

certain relationships or establish the differences among groups (Sekaran & Bougie, 2013; Saunders et al., 2016). This research is considered to be as an explanatory study, as it examines and establishes causal relationships between the CAEs' perception, information and judgment before making a decision. In addition, it explores the significant difference between groups and how such difference can influence the ethical pathway of the CAEs' reporting decision.

## **4.2 Research Philosophical Assumptions**

According to Saunders et al. (2016; 5) research is "*a process that people undertake in a systematic way in order to find out things, thereby increasing their knowledge*". The process followed is guided by the research philosophy. Philosophy is "*the study of the fundamental nature of knowledge, reality, and existence, especially when considered as an academic discipline*" (Pearsall & Hanks, 2001; 1395). The term research philosophy refers to "*a system of beliefs and assumptions about the development of knowledge*" (Saunders et al., 2016; 124). Philosophies are often discussed in terms of paradigms. A research paradigm is "*a philosophical framework that guides how scientific research should be conducted*" (Collis & Hussey, 2009; 55). Different philosophical paradigms exist in response to differences in people's ideas about reality (ontology); the nature of human knowledge (epistemology); and whether or how the research's values influence the research process (axiology). In addition, there is no one philosophy better than others in business and management research (Tsoukas & Knudsen, 2003; Saunders et al., 2016). Until the late nineteenth century, systematic methods were used by scientists, including observation and experiment. Scientists applied deductive logic to predict the future and discover explanatory theories. Their view and beliefs about the world and the nature of knowledge were based on positivism, which has its roots in a realist philosophy.

However, researchers began to turn their attention to social phenomena with the development of industrialisation and capitalism. The suitability of the traditional scientific method into social science was challenged by a number of theorists, which led to a debate that lasted many decades (Smith, 1983). As a result of this controversy, an alternative paradigm to positivism called interpretivism emerged, which is based on the principles of idealism (Collis & Hussey, 2009).

Saunders et al. (2016) suggested five research philosophies (positivism, critical realism, interpretivism, postmodernism and pragmatism) most commonly adopted by business and management researchers. These five major philosophies reflect the researchers' beliefs and assumptions, as well as how they view the world. The research philosophy adopted depends upon the research questions that the researchers seek to answer. Researchers should consider the potential fit between their beliefs and the major philosophies. In turn, strategy and methodology are influenced by the research philosophy (assumptions).

According to the aforementioned discussion, there are three major assumptions involved in thinking about research philosophy: ontology, epistemology and axiology (Collis & Hussey, 2009). Saunders et al. (2016) show the debate in terms of choice between the positivist paradigm (quantitative approach) and interpretivist paradigm (qualitative approach). Before investigating individual research philosophies in section 4.3, the three types of research assumptions (ontology, epistemology, axiology) are discussed below in order to distinguish between research philosophies. The following subsections discuss these assumptions in detail, demonstrate the researcher's awareness and understanding and conclude by describing the approach undertaken in this research.

### **4.2.1 Ontology**

Ontology describes the researcher's view about the nature of reality (Flowers, 2009). It shapes the way in which the researchers see the world of business and management and how they study a particular research object. In business and management research, objects may comprise organisations, managements, individuals' working lives and organisational events (Saunders et al., 2016). Ontology includes two aspects: objectivism and subjectivism. Objectivism is the position that social entities exist in reality external to and independent of social actors. This view assumes that management is similar in all organisations. In contrast, subjectivism argues that the perceptions and consequent actions of social actors create social phenomena. This means it is necessary to study and understand the multiple "realities" or experiences underlining what is happening (Collis & Hussey, 2009).

### **4.2.2 Epistemology**

Epistemology refers to what constitutes acceptable knowledge in a field of study (Collis & Hussey, 2009); or what humans consider as be valid and legitimate knowledge, as well as how such knowledge is transferred to others (Burrell & Morgan, 1979). The multidisciplinary context of business and management contains different types of knowledge, which can lead to the adoption of different epistemologies. Positivist researchers, who believe that reality is represented by objects that are considered real. This paradigm assumes that human feelings and attitudes can be measured. However, interpretivists view the objects studied as affected by the feelings and attitudes of the researcher. They argue that human feelings and attitudes cannot be seen, measured or modified. Hence, researchers' epistemological assumptions will govern what they

consider to be legitimate method of obtaining knowledge for their research (Saunders et al., 2016).

### **4.2.3 Axiology**

Axiology concerns the role of values and ethics within the research process. It includes the question of how researchers deal with their own and participant's values (Saunders et al., 2016). Heron (1996) argues that all human actions are guided by their values. In addition, any research philosophy choice is a reflection of the researcher's values. However, positivists believe that they are independent from the research under investigation, in contrast to interpretivists, who believe that they are not independent from what is being researched and that their values can affect their perceptions and the interpretations drawn from them (Saunders et al., 2016). Appendix 3 summarises the assumptions of the two main philosophies.

## **4.3 Major Research Philosophies**

After discussing the three types of research assumptions (ontology, epistemology, axiology), the following subsection will discuss the five main research philosophies in business and management: positivism, critical realism, interpretivism, postmodernism and pragmatism.

### **4.3.1 Positivism**

As described above, in positivism the researcher's own beliefs have no value to influence the research (objectivism). This view is associated with observation and experiments to collect numeric data. It produces pure and generalizable data and emphasises facts uninfluenced by human interpretation or bias, as it focuses on strictly scientific empiricist method (Saunders et al., 2016). Extreme positivists see organisations and other social



entities as real in the same way that physical objects and natural phenomena are real. They focus on discovering observable and measurable facts and regularities and consider that only phenomena that can be observed and measured would generate credible and meaningful data (Crotty, 1998). They aim to use existing theory or gather facts to develop hypotheses. These hypotheses are tested and confirmed or retested leading to the further development of theory. They examine a causal relationship to create law-like generalisations (Saunders et al., 2016). Hence positivism may be seen as deductive or theory testing. Positivist researchers claim that they are external from the process of data collection as they determine the list of possible responses when they design a questionnaire, and their values do not influence the answers given by the respondents. Positivist research is most commonly aligned with quantitative methods of data collection and analysis. Researchers are more likely to use a highly structured methodology in order to facilitate replication (Gill & Johnson, 2010).

#### **4.3.2 Critical Realism**

Critical realism takes aspects from both the positivist and interpretivist positions. It suggests that researchers' knowledge of reality is a result of social conditioning. It focuses on explaining what researchers see and experience, in term of underlying structures of reality that shape the observable events. Critical realists see reality as external and independent, but not directly accessible through the researcher's observation and knowledge. Researchers try to be as objective as possible, to minimise bias and errors. This is a branch of epistemology which is similar to positivism, in that it assumes a scientific approach to the development of knowledge (Saunders et al., 2016). Hatch and Cunliffe (2006) describe the realist researcher as enquiring into the mechanisms and structures that cause institutional forms and practices, how these emerge over time, how

they might empower and constrain social actors, and how such forms may be critiqued and changed. According to critical realist philosophy, there are two steps to understand the world: first, the sensations and events the researcher experiences, second, mental processing (retroduction) (Saunders et al., 2016). Critical realism may be seen as inductive or theory building.

### **4.3.3 Interpretivism,**

Interpretivism is an alternative to positivism that requires the social scientist to grasp the subjective meaning of social action (Bryman & Bell, 2015). Like critical realism, it developed as a critique of positivism. It emphasises that humans are different and this difference can create meaning (subjectivist perspective). Interpretivism argues that human beings and their social actions cannot be studied in the same way as physical phenomena or natural sciences (Bryman & Bell, 2015). Rather, different meanings can be generated when different people of different backgrounds at different times under different circumstances, are studied. The purpose of interpretivist research is to build or develop theories and generate new interpretations of social worlds and contexts (typically inductive) (Saunders, et al., 2016). This view emphasises the importance of language, culture and history (Crotty, 1998).

From the perspective of business and management researchers, organisations can be seen as made up of different groups of people, at different times and in different circumstances. Therefore, interpretivist researchers try to take into account organisations' complexity to understand the differences between conducting research among people and about objects. In other words, interpretivists share a view that the challenge is to enter the social world of the research participants and understand that world from their point of view (Saunders et al., 2016). Different ways to do this in practice are followed by interpretivists. For

example, phenomenologists interpret the result depending on respondents' lived experience. While hermeneuticists focus on respondents' cultural artefacts such as images, stories and texts. Symbolic interactionists analyse and observe social interaction such as conversations, meetings and teamwork.

#### **4.3.4 Postmodernism**

Postmodernism rejects the modern objectivist and realist ontology of things. It emphasises the role of language and power relations (Saunders et al., 2016). Postmodernists believe that any sense of order is provisional and can only be brought through respondents' language with its categories and classifications (Chia, 2003). At the same time, they recognise that language is always partial and inadequate. This means the dominant ways of thinking are not necessarily the 'best' in absolute terms, but what is viewed as the best at a particular point in time by particular groups of people. Postmodernist researchers undertake a process of deconstructing as they search for what has been left out or excluded. In this research philosophy, researchers are open to any forms of data: texts, images, conversations, voices and numbers, to identify the power relations between the researcher and research subjects, which shape the knowledge created as part of the research process (Saunders et al., 2016). Postmodernism, calls on researchers to be radically reflexive about their own thinking and writing (Cunliffe, 2003).

#### **4.3.5 Pragmatism**

Pragmatism depends on the research questions and asserts that concepts are only relevant where they support action. It strives to reconcile both objectivism and subjectivism, facts and values, accurate and rigorous knowledge and different contextualised experiences (Saunders et al., 2016). It considers theories, concepts, ideas, hypotheses and research

findings in terms of the roles they play as instruments and in practical consequences in specific contexts. Pragmatist researchers start with a problem in order to find a practical solution that informs future practice. Their values drive the reflexive process of inquiry. This stance is concerned more about practical outcomes than abstract distinctions. In summary, pragmatists state that there are many different ways of interpreting the world and undertaking research (multiple realities). They may use one or multiple methods to find reliable and relevant data that advances the research (Kelemen & Rumens, 2008).

#### **4.4 Selected Research Philosophy**

The main purpose of this study is to identify the ethical position of the CAE's reporting relationships with the appropriate authority by examining interrelationships among technical expertise, CAEs' perception and judgment before making a reporting decision. The Ethical Process Thinking Model has been used to describe the aforementioned interrelationships. With this in mind, the researcher is independent, and the researcher's own beliefs have no value to influence the research. Therefore, this study adopts a positivist position, which aims to test a causal relationship through the study hypotheses. These hypotheses are tested to predict the relationship between independent and dependent variables. Figure 3.3 and Figure 3.4 in the previous chapter summarise the key aspects of this study.

#### **4.5 Research Approach**

Research design depends on the extent of the theory available at the beginning of the research. It is important to classify research approaches as deductive, inductive and abductive. The deductive approach is concerned with testing theory (the conclusion is true when all the premises are true); whereas the inductive approach is used for developing theory (there is a gap between the conclusion and the premises observed).

Abductive approaches are used to generate a new theory or modify existing theory by testing additional data (surprising facts) (Saunders et al., 2016). Appendix 4 shows the differences between the main approaches. The current study will adopt a deductive approach. Saunders et al., (2016) noted the deductive approach gives the chance to test hypotheses or formulate theory.

## **4.6 Research Methodological Choice**

Methodological choices are quantitative, qualitative and mixed method. Qualitative and quantitative research differ in their types of data: numeric data (numbers) and non-numeric data (images, words and video) respectively. Qualitative data is non-numerical, consisting of any findings that do not emerge from statistical procedures or other methods of quantification. Quantitative data mainly deals with the amount of a thing that can exist, how quickly certain tasks are done, etc. When data is collected, the value is represented in the form of numbers (Bryman & Bell, 2015). For example, when researchers collect data by using interview and categorise the result, it seems they use and generate non-numeric data (qualitative). In contrast, when researchers use a questionnaire to collect the data and statistical software to analyses them, it seems they use and generate numeric data (quantitative). However, this is an insufficient basis to decide which methodological choice is better for the research. Researchers should refer to their research philosophy, approach and characteristics to select the most appropriate choice (Saunders et al., 2016). Quantitative research can be used within the pragmatist or realist philosophies, but it is generally associated with positivism, especially with highly structured data collection techniques. It is principally connected with experimental and survey strategies (Saunders et al., 2016). This study relies upon quantitative (numeric) data, based on the CBOK (2015) survey. Therefore, this study follows a deductive rather than inductive approach,

and is concerned with theory testing rather than theory building. However, there will be limited opportunity to generalise the results due to the limitations discussed in the last chapter.

## **4.7 Research Strategy**

The strategy is a plan of how to achieve particular objectives. In a research context, it is the methodological link between research philosophy and the method of collecting and analysing data (Denzin & Lincoln, 2008). Therefore, there are many strategies to collect the data. Some of them refer to quantitative research, such as experiment and survey, while some others refer to qualitative research, such as ethnography, action research, grounded theory and narrative inquiry. However, a few other strategies are considered to be both quantitative or qualitative, for example, archival and documentary research, as well as case studies (Saunders et al., 2016). The current study depends on archival data collected by an independent organisation (IIARF) by using a questionnaire survey to examine the relationships between variables, which can be measured numerically and analysed by using statistical tools.

## **4.8 Data Collection Methods**

Adoption of an appropriate research methodology and method of data collection is key to any successful research endeavour. Data fall into two main categories, primary data and secondary data. Primary data is that data gathered from a research population by the researcher him/herself, for instance by talking to people, asking them to complete questionnaires, or observing them. Data obtained from books, journal articles, official publications from companies and government, for example, comprise secondary data, since they have been produced by someone other than the researcher.

In order to achieve the goals of this study, secondary data are used, including secondary research published in peer-reviewed journals related to internal audit reporting relationships and the CBOK 2015 survey.

#### **4.8.1 Secondary Data**

Secondary data are useful for answering the research questions and understanding the research problem. Ghauri and Grønhaug (2010) argue that information collected by other organisations can include positive and negative information. In addition, the scope of the information can vary. The researcher should question the reliability of such information and make a judgment on whether the data are suitable for the research or not. In this study, the researcher looked for secondary sources relevant to the research problem before collecting his own data, on the assumption that secondary data can help researchers to formulate the research problem and find a solution. In addition, they can indicate the particulars of a certain research method. Finally, they can provide benchmarking measures and other comparison findings (Ghauri & Grønhaug, 2010).

Secondary data are used most frequently within business and management research projects. They are classified into three main subgroups: document based, survey-based and those compiled from multiple sources (Saunders et al., 2016). The CBOK 2015 is a survey conducted by an independent organisation (IIARF).

From the literature review on internal audit reporting relationships, it can be argued that each country has different social characteristics. Therefore, studying different populations provides an enormous amount of information about potential societies (Ghauri & Grønhaug, 2010). One of the main advantages of using CBOK 2015 data in this study is that it facilitates cross-country comparison as it covers six different regions.

#### *4.8.1.1 The advantages and disadvantages of secondary data*

It is important for a researcher to be aware of the benefits and drawbacks of using secondary data. Generally, secondary data have many advantages that encourage researchers to think about secondary data first. For instance, secondary data can save time and money, as the verification process is more rapid. This is important for researchers with limited time and budgets, such as postgraduate students. In addition, it can be segmented and sampled towards the targeted group. In the current research, the targeted group is CAEs. In addition, usually secondary data with a large sample and large data sets can be grouped easily. In this research, the CBOK 2015 data draw on a large sample, which provides a unique opportunity for the researcher to group the sample easily according to their demographic or environmental characteristics (e.g., experience, gender, regions, industry, sector, etc...), as well as facilitate cross-country research. It can be argued that the reliability and validity of some secondary data are questionable. However, the CBOK 2015 data were collected by a reliable international organisation (IIARF) and prepared and compiled by experts using rigorous methods. Some additional advantages are that secondary data provides historical and longitudinal data, and can be combined with some primary data to answer specific questions. However, historical and longitudinal data, as well as combination with other primary data, are not the case in the current study.

The above mentioned advantages lead many scholars to recommend that all researcher starts with secondary data sources before collecting their data. For example, Churchill and Dawn (2005; 168) advised, “*Do not bypass secondary data. Begin with secondary data, and only when the secondary data are exhausted or show diminishing returns, process to primary data*”. The argument here is that sometimes there is no need to collect



one's own data, as secondary data can provide enough insight and answer the research questions.

On the other hand, secondary data has its disadvantages, which should be taken into account. First, secondary data are collected for specific purposes and include their measurements and definition, which may not fit the research problem. Second, the accuracy of some secondary data is questionable, which means there is a possibility of error occurrence in collecting, analysing and presenting the data (Churchill & Dawn, 2005; Ghauri & Grønhaug, 2010). In order to overcome these disadvantages and ensure the accuracy of secondary data, specific criteria can be considered, such as the source of the data, the purpose of publication and the general evidence regarding data quality. In this case, the data have been checked, cleaned and segmented to ensure the accuracy, quality and usefulness to meet the research problem (see chapter 5 section 5.2).

Secondary data can be obtained from either the source that originated the data (primary source) or from a source that, in turn, obtained the data from the original source (secondary source) (Churchill & Dawn, 2005). This research obtained secondary data from the source that originated the data, the IARF. Churchill and Dawn (2005; 170) suggested that researchers should *'always use the primary source of secondary data'*. There are two reasons for this. First, the method of data collection and analysis are described by the primary source, which helps the researcher to look at the general quality of the evidence. Second, secondary sources do not include the caveats and qualifications that may be included as disclaimers by the primary source. For instance, errors in transcription may occur in copying the data from a primary source (Churchill & Dawn, 2005).

The purpose of publication can be a vital criterion to judge the accuracy of the data. For example, if there is benefit from publishing secondary data (e.g., business function), high quality and long-term sustainability should be considered. In this research, the IIA was established in 1979 for the purpose of providing and expanding research and education related to the internal audit. Thus, for over 37 years, the IIA has been the global leader in promoting research and knowledge resources to enhance the development and effectiveness of the internal audit profession. Thus, it can be concluded that the IIA in providing data, depends on the long-term satisfaction of its users, which increases the researcher's confidence in the accuracy of the data.

Finally, methodology details, including definitions, data-collection forms, methods of sampling, and so forth should be provided by the data source, in order that the general evidence of quality can be assessed. Such details are provided and discussed in the following sections.

#### **4.8.2 The CBOK 2015 Practitioner Survey**

The IIA is the global leader in internal audit and its mission is to sponsor and promote internal audit profession research. The overall purpose is to develop the most comprehensive database ever, to capture a current view and continue study the evolution of the global practice of internal audit. During the past four decades, the CBOK databases have been contributed significantly in research on the internal audit profession, through assessing the current situation, exploring vital issues, emerging trends, and suggesting topics for future research. The IIA sponsored the first four CBOK studies, which were conducted only in English. The first study was conducted in the USA in 1972 and included only 75 respondents. The CBOK survey was developed with time to cover 21

countries in the fourth CBOK study in 1999. Table 4.1 shows the development of the first four CBOK studies.

**Table 4-1: The Development of the First Four CBOK Studies**

<i>CBOK Number</i>	<i>Year</i>	<i>Number of Countries</i>	<i>Number of Respondents</i>
I.	1972	1	75
II.	1985	2	340
III.	1991	2	1163
IV.	1999	21	136

Source: IARF (2007; 4)

There was little information about the state of skills, tools and technologies used in existing internal auditing literature. The CBOK 2006 database and researches were the starting point for understanding the current state of internal audit practice (IARF, 2007). The CBOK 2006 was the first study to invite the IIA's entire worldwide membership to participate. It used different languages to survey 9,366 respondents from 91 countries. The CBOK 2010 survey was the second world-wide comprehensive database on the state of internal auditing knowledge. It represents the development of the profession of IAF as it surveyed 13,582 internal auditors from 107 countries (Allegrini et al., 2011).

Finally, the CBOK 2015 Practitioner Survey was the last comprehensive database of its kind. It was conducted in March 2015 and offered in 23 languages, with participation from 166 countries/territories. It includes 14,518 practitioners representing different internal auditors' levels from more than 150 chapters and 106 institutes; thus, it provides opportunities for comparative studies of various levels, countries or regions. However, for the purpose of this research, only CAEs or equivalent responses from six regions were

included for statistical analysis (IIARF, 2015). Table 4.2 shows the development of the last three CBOK studies.

**Table 4-2: The Development of the Last Three Worldwide CBOK Studies**

<b><i>CBOK Number</i></b>	<b><i>Year</i></b>	<b><i>Number of Countries</i></b>	<b><i>Number of Respondents</i></b>
V	2006	91	9.366
VI	2010	107	13.582
VII	2015	166	14.518

Source: Allegrini et al. (2011; xii); and Author

#### ***4.8.2.1 The CBOK 2015 Questionnaire***

The survey was developed and validated by the IIARF for the benefit of internal auditors, the internal audit profession and the general public, drawing on the earlier CBOK 2006 questionnaire in developing the 2006 version. An extensive literature review was conducted by different teams, on general areas of responsibility. Then, a pilot study was prepared to poll members about the types of questions that should be included in the final survey. Based on the pilot study result, the final questions were refined and finalised. The questions were reviewed by a group of over 100 internal auditors to ensure completeness and validity. Based on their comments, the final questionnaire was developed in English, which may take about 40 minutes to complete. The questionnaire was translated into 16 additional languages for the convenience of the IIA membership (IIARF, 2007).

Some of the CBOK 2015 questions were carried over from the CBOK 2006 project and some other questions were created by the IIARF researchers who would later be using the data and writing the IIARF reports. The included questions reflect the needs, interests, standards and activities of internal auditors. The questionnaire consists of several components and topics, starting with the respondent's background and their organisation,

followed by internal audit department and staffing. Another section provides information about the audit process, main risks and internal audit department maturity. This is followed by questions on organisation governance, reporting relationships, internal audit competence and internal audit standards. Other questions cover the extent of internal audit activities and the associated risk related to governance, IT security and the use of technology (IIARF, 2015). The complete list of survey questions can be accessed through IIARF (2015).

The CBOK 2015 data was obtained for the following reasons:

- It helped the researcher to clarify the research problem.
- The researcher could obtain comparative benchmarks, as it covers a large sample of CAEs with different levels of experience from different geographical regions.
- It is considered to be new cross-sectional data, as the survey was conducted in 2015.
- It was developed and conducted by an independent reliable organisation, which provided access to the researcher under a confidentiality agreement.
- It saved time and money.

## **4.9 Time Horizon**

Research can be undertaken at a particular point in time (cross-sectional studies) or over a given period (longitudinal studies). Cross-sectional studies employ the survey strategy involving a particular phenomenon at a particular time (Saunders et al., 2016). The current study investigates the current ethical pathway of CAEs in order to evaluate the current situation. However, this study does not aim to study the development of the CAEs' reporting relationships (ethical pathway), which is the main strength of longitudinal research studies.

## **4.10 Variables and Measurements**

Figure 3.3 and Figure 3.4 in the previous chapter summarise the key aspects of this study. The survey questions in Exhibit 1 measure the current situation of the IAF in terms of its technical expertise, which forms the information construct. The questions in Exhibit 2 measure the CAEs' perception regarding the extent of IAF activities related to governance review and IT risk and cybersecurity. The CAEs' judgment was measured by five questions in Exhibit 3 that show the extent of using IT tools and techniques to process internal audit activities. Finally, to measure CAEs' reporting relationship with the appropriate authority, three questions have been included as presented in Exhibit 4.

### **4.10.1 Information Construct**

Information in this study refers to non-financial information pertaining to the reality of how the entity (IAF) functions. The competency framework was employed to assess the quality of the IAF environment. Being one of the corporate governance mechanisms, the IAF responsibility has increased with more complex transactions in order to provide more timely and precise information. Thus, technical expertise was considered to be the first variable that forms the information construct. The outcome of information processing is the CAE's assessment of IAF competence. Exhibit 1 shows details of the technical expertise competency formative measure as depicted in the CBOK 2015 survey.

#### *4.10.1.1 Exhibit 1: Questions Related to the CAE's Information*

According to the IIA Global Internal Audit Competency Framework, technical expertise is defined as "the principal points of focus of an internal auditor's expertise are the IPPF, governance risk and control, and business acumen. The "IPPF" is the primary source of professional standards for internal audit that the IIA provides to all internal auditors around the world. Additionally, internal auditors require technical expertise in

“Governance, Risk and Control” to inform their work and help organisations accomplish their objectives. “Business Acumen” in the form of understanding the client organisation, its culture, the way it works, the sector it operates in and the local and global factors that act upon it is another essential prerequisite that enables internal auditors to provide effective assurance and advisory services and so add value to the organisation.”(IIA, 2013; 3).

Q. Estimate your proficiency for each competency using the following scale: (1 = **Novice** — Can perform routine tasks with direct supervision; 2 = **Trained** — Can perform routine tasks with limited supervision; 3 = **Competent** — Can perform routine tasks independently; 4 = **Advanced** — Can perform advanced tasks independently; 5 = **Expert** — Can perform complex advanced tasks independently).

#### **Exhibit 4.1: Questions Related to the CAE’s Information**

<b>Statement</b>	<b>Proficiency level</b>
<b><i>Information: Technical Expertise Competency</i></b>	
EXP1: Applies appropriate understanding for organisation governance, risk and control.	1 2 3 4 5
EXP2: Applies the International Professional Practices Framework (IPPF)	1 2 3 4 5
EXP3: Maintains expertise of the business environment, industry practices and specific organisational factors.	1 2 3 4 5

#### **4.10.2 Perception Construct**

Perception refers to the outlining of CAEs’ knowledge (how they view the nature of internal audit activities). CAEs’ sense is the lower level of perception, which describes how CAEs understand or process information. CAEs are continually reviewing the plans for protection and safeguarding of assets in terms of governance review and IT risk and cybersecurity. The impact of this study is related to governance review issues and IT risk

and cybersecurity issues. Exhibit 2 presents the survey details about perception constructs related to governance review and IT risk and cybersecurity activities.

#### 4.10.2.1 Exhibit 2: Questions Related to the CAE's perception

According to performance standards, 2210- governance is defined as “the internal audit activity that assesses and makes appropriate recommendations to improve the organisation’s governance process. For example, promoting appropriate ethics, making strategic and operational decisions, and ensuring effective performance management and accountability” (IIA, 2016b; 12).

According to the International Organisation for Standardization (ISO) and the International Electro Technical Commission (IEC) ISO27002: 2005) - IT security is “*the preservation of the confidentiality, integrity and availability of information*” (ISO/IEC 27002, 2005; 1).

Q. What is the extent of activity of your internal audit department related to governance reviews? What is the extent of activity of your internal audit department related to IT risk and cybersecurity? (1 = None; 2 = Minimal; 3= Moderate; 4 = Extensive).

#### Exhibit 4.2: Questions Related to the CAE's Perception

Statement	The extent of activity
<b>Perception1: Activities related to Governance Review</b>	
GOV1: Review ethics-related audits	1 2 3 4
GOV2: Reviews addressing linkage of strategy and performance	1 2 3 4
GOV3: Executive compensation assessments	1 2 3 4
GOV4: Environmental sustainability audits	1 2 3 4
<b>Perception2: Activities related (IT) security</b>	
ITS1: Audits of general IT risks	1 2 3 4
ITS2: Audits of the cybersecurity of your organisation's electronically held information	1 2 3 4
ITS3: Audits of the physical security of your Organisation's data centres	1 2 3 4



ITS4: Audits of the management, use, and access of mobile devices	1 2 3 4
ITS5: The Organisation's procedures for how employees use social media	1 2 3 4
ITS6: Audits of the security of your Organisation's internal intranet	1 2 3 4
ITS7: Audits of the security of your Organisation's external website	1 2 3 4

### 4.10.3 Judgment Construct

Judgment results in part from the influence on individuals of their experience, qualification, morale, and organisation environment. It includes the process CAEs implement to analyse the current situation of internal audit (technical expertise), as well as the influence from the perception stage (the extent of internal audit activities). This enables the auditor to weight and compares the decision choice and criteria across the alternatives. For example, noisy information or uncertain environment affects the monitoring costs (Demsetz & Lehn, 1985; Coles et al., 2008). Judgment in this study refers to the extent of using IT tools and techniques since studies reveal that IT tools and techniques support decision makers who faced with difficult decision, to decide better, faster and more effectively (Bohanec, 2009). Exhibit 3 includes items related to the extent of using IT tools and techniques to process the activity of internal audit department.

#### 4.10.3.1 Exhibit 3: Questions Related to the CAE's Judgment

IT tools and techniques refer to the technology-based audit techniques or any automated audit tool that help IAF to perform their assigned work. According to attribute standard 1220- due professional care "internal auditor must consider the use of technology-based audit and other data analysis techniques (IIA, 2016b; 7).

Q. What is the extent of activity of your internal audit department related to the use of the following information technology (IT) tools and techniques? (1 = None; 2 = Minimal; 3= Moderate; 4 = Extensive).

## Exhibit 4.2: Questions Related to the CAE's Judgment

Statement	The extent of activity
ITU1: A software or a tool for internal audit risk assessment	1 2 3 4
ITU2: An automated tool for internal audit planning and scheduling	1 2 3 4
ITU3: Internal quality assessments using an automated tool	1 2 3 4
ITU4: An automated tool to monitor and track audit remediation and follow up	1 2 3 4
ITU5: An automated tool to manage the information collected by internal audit	1 2 3 4

### 4.10.4 Decision Construct

**Decision choice** is the selection of the best option or course of action to ensure individuals' fulfilment of intended plans (Rodgers, 2009). The decision in this study includes different levels of governance authorities to represent the CAEs' reporting relationship. It can be considered that the CAEs' perceptions and judgment may affect their decision choice. In reality, conflicts of interest, time and career pressure, and boundary span can lead to different decisions. Exhibit 4 illustrates the three elements that can capture the CAE's reporting decision.

#### 4.10.4.1 Exhibit 4: Questions Related to the CAE's Decision

According to attribute standard 1110- organisational independence states that "the chief audit executive must report to a level within the organisation that allows the internal audit activity to fulfil its responsibilities" (IIA, 2016b; 4). Consequently, reporting relationships (Decision) refers to oversight of the responsibilities of the IAF. For example, "approving the internal audit budget and resource plan, receiving communications from the chief audit executive on the internal audit activity's performance relative to its plan and other matters and approving decisions regarding the appointment and removal of the chief audit executive" (IIA, 2016; 4).

Q. Reporting relationship with the appropriate authority (1 = Lowest authority (other); 2 = Low Authority (CFO, Vice president of finance); 3 = Middle authority (CEO, president, head of Government agency); 4 = High authority (AC, or equivalent); 5 = Highest Authority (Board of directors)).

**Exhibit 4.2: Questions Related to the CAE’s Decision**

Statement	Authority level
DEC1: What is the primary functional reporting line for the CAE?	1 2 3 4 5
DEC2: Who makes the final decision for appointing the CAE?	1 2 3 4 5
DEC3: Who is ultimately responsible for evaluating the performance of the CAE?	1 2 3 4 5

**4.11 Research Sample**

The study hypotheses were tested by using a unique sample from the global CBOK database. Initially, it was possible to identify 2,235 CAEs’ valuable responses from six regions. The author uses the responses to the CBOK survey questions relating to tested variables reported in the study framework. However, the assumption that an internal audit department has only one CAE has been made; thus, the dataset of CAEs represents 2,235 organisations. The process of selection the sample is reported in the descriptive analysis chapter (section 5.2.4).

**4.12 Ethical Considerations**

Ethical standards and values are critical factors for the success of any research project and equally important whether the researcher is using primary or secondary data (Saunders et al., 2016). Researchers’ ethical responsibility starts with problem formulation and continues through finding data sources, analysis and coming up with conclusions. They must ensure that the research does not cause embarrassment or harm

to the people who provide data (Ghauri & Grønhaug, 2010). Broom (2006; 152) illustrates several main points for doing ethical social research:

*“(1) research should be designed, reviewed and undertaken to ensure integrity and quality; (2) research staff and subjects must be informed fully about the purpose, methods and intended possible uses of the research, what their participation in the research entails and what risks, if any, are involved; (3) the confidentiality of information supplied by research subjects and the anonymity of respondents must be respected; (4) research participants must participate in a voluntary way, free from any coercion; (5) harm to research participants must be avoided; and (6) the independence of research must be clear, and any conflicts of interest or partiality must be explicit”.*

On the other hand, awareness of ethical principles can help the researcher to achieve the commitment to ethical excellence. Some universities and organisations develop ethical guidelines for researchers to ensure ethical scrutiny and approval. The researcher in this study complied with the University of Hull’s and the IIA’s regulations. First, a data access request form was submitted to the IARF, containing some information about the research proposal and the researcher. Second, after the approval from the CBOK committee members, the confidentiality agreement regarding the use of the CBOK 2015 Global Practitioner Survey for a regional report and/or academic research was signed and approved (See Appendix 5 for the confidentiality agreement details). Finally, the University of Hull ethics policy requires that researchers apply for ethical approval before conducting any fieldwork. Consequently, a formal request was submitted to the Research Ethics Committee including all the necessary information. The request was approved, and confirmation obtained (See Appendix 6 for the approval letter).

Concerning the compliance with the general ethical standards, it can be stated that no funding is connected with this study. In addition, this study does not contain any studies with human participants performed by the author.

### **4.13 Summary of the Chapter**

This chapter introduces the research methodology and relies on the research process 'onion' proposed by Saunders et al. (2016). The research methodology outlines philosophical assumptions, philosophies Paradigms, research approach, and research strategy. Data collection method was discussed including the advantages and disadvantages of using secondary data, followed by the justification of using the CBOK 2015 Practitioner survey. It was possible to use five major constructs presenting the two theoretical models. Different variables and measurements were presented in Exhibit 1, 2, 3 and 4. This chapter ends by discussing the research sample and the ethical considerations. The next chapter provides more details about the research data and the preferred statistical options.

# Chapter 5 Descriptive Analysis

## 5.1 Introduction

The previous chapter discussed research methodologies and justified the selected methodology. In this chapter, the researcher addresses some requirements for preparing and presenting the data. In order to assess the proposed theoretical models, it is necessary to look at some issues related to the data, which required to be resolved before analysis. The remainder of the chapter is divided into four major sections. Section 5.2 presents the preliminary analysis related to data screening and preparation, with essential statistical techniques for dealing with missing values, outliers and the normality assumption. Section 5.3 reports the descriptive statistics of the demographic data (e.g., respondents' and organisations' characteristics). EFA and the reliability of the research models<sup>10</sup> are discussed in section 5.4 in order to confirm the items' relations with underlying constructs. The remaining sections introduce the statistical techniques and procedures that can be used to achieve the research objectives, including SEM and PLS-SEM. Finally, a summary of the chapter is presented at the end of this chapter.

## 5.2 Preliminary Analysis

After obtaining the data, they need to be coded, edited and presented in a suitable form for analysis purposes, which make data capable of being analysed and interpreted into meaningful outcomes (Sekaran & Bougie, 2013). Preliminary analysis was carried out to ensure the necessary preparation. This evaluation of some issues related to the accuracy of data input, missing values, outliers and normality assumptions (Hair et al., 2010). The following subsections will discuss these issues in more details.

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<sup>10</sup> IBM SPSS Statistics 24 was used for preliminary analysis, descriptive statistics and EFA.

### **5.2.1 Data Screening and Preparation**

Before starting the analyses, it is essential to prepare the data and consider any errors. Mistakes can easily occur when collecting data, which can generate unreliable outcomes and distort the analyses. In addition, some analysis is very sensitive to values above or below the other scores (outliers). However, examining the data before the application of any statistical techniques can help the researcher to discover the data and understand the relationship between variables, as well as ensure that all requirements for analysis have been met (Hair et al., 2010). Therefore, it is essential to spend some time screening and preparing the data, rather than trying to repair mistakes after analysis (Hair et al., 2010; Pallant, 2013).

Data cleaning and screening involved (1) checking variables scores to identify any errors for scores not within the range of possible scores and correct or delete them (Pallant, 2013); and (2) identifying inconsistent responses and missing values (Malhotra, 2012).

Univariate descriptive statistics techniques were followed to bring the variables into compliance with analysis requirements. It might be possible to proofread the data file with a small sample, yet this may not be possible with a large data set. In this case, descriptive statistical techniques are beneficial for examining and screening the data file (Tabachnick & Fidell, 2014).

Table 5.1 illustrates that the decision variables (DEC1, DEC2, and DEC3) have different score ranges and there is a need to transform them to ensure that all variables are within the same range. These three variables ranged from high to lower level scored from 1 to 10 and one of them from 1 to 8. They were transformed to a 5-point Likert scale ranging from the lowest authorities to the highest authorities, depending upon the organisation hierarchal levels. (See Table 5.2; more details are provided in the Appendix 7, 8 and 9).

**Table 5-1: Descriptive Statistics before Transformation**

<i>Construct</i>		<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Deviation</i>
<b>Information</b>	<b>EXP1</b>	2633	1.00	5.00	3.801	.867
	<b>EXP2</b>	2580	1.00	5.00	3.485	1.025
	<b>EXP3</b>	2631	1.00	5.00	3.928	.829
<b>Perception 1</b>	<b>GOV1</b>	2544	1.00	4.00	2.34	.967
	<b>GOV2</b>	2554	1.00	4.00	2.45	.990
	<b>GOV3</b>	2414	1.00	4.00	1.77	.925
	<b>GOV4</b>	2374	1.00	4.00	1.68	.877
<b>Perception 2</b>	<b>ITS1</b>	2535	1.00	4.00	2.962	.873
	<b>ITS2</b>	2506	1.00	4.00	2.526	.982
	<b>ITS3</b>	2514	1.00	4.00	2.736	.937
	<b>ITS4</b>	2500	1.00	4.00	2.336	.961
	<b>ITS5</b>	2474	1.00	4.00	2.072	.942
	<b>ITS6</b>	2486	1.00	4.00	2.363	1.002
	<b>ITS7</b>	2486	1.00	4.00	2.291	1.026
<b>Judgment</b>	<b>ITU1</b>	2479	1.00	4.00	2.188	1.075
	<b>ITU2</b>	2483	1.00	4.00	2.130	1.098
	<b>ITU3</b>	2438	1.00	4.00	1.776	.942
	<b>ITU4</b>	2493	1.00	4.00	2.320	1.151
	<b>ITU5</b>	2478	1.00	4.00	2.169	1.101
<b>Decision</b>	<b>DEC1</b>	2634	1.00	10.00	2.26	1.893
	<b>DEC2</b>	2409	1.00	8.00	2.99	1.872
	<b>DEC3</b>	2408	1.00	10.00	3.87	2.342
<b>Valid N (listwise)</b>		<b>1732</b>				

**Table 5-2: Decision Measures Transformation**

		<i>DEC1</i>	<i>DEC2</i>	<i>DEC3</i>
<b>Before transformation</b>	Minimum	1	1	1
	Maximum	10	8	10
<b>After Transformation</b>	Minimum	1	1	1
	Maximum	5	5	5



## 5.2.2 Missing Values and Treatment

Missing values are a result of non-completion of one or more questions. For example, some respondents fail to answer some questions. Missing data is one of the most common problems in questionnaire-based research (Tabachnick & Fidell, 2014). In order to select the appropriate course of action to treat a missing data problem, it is essential to understand the nature of missing values and the process that generates such a problem (Hair et al. 2010). Types of missing values are divided into two groups: ignorable and non-ignorable missing values (Hair et al., 2010). Ignorable missing values are expected to be part of the research design and under control of the researcher. They occur at random over the total set of values (e.g., observed and missed) and no remedies are needed. Non-ignorable missing values refer to entry errors or failure to complete the entire questionnaire, or when respondents refuse to answer some questions within a survey instrument.

In the CBOK 2015 survey, there was a chance that ignorable and non-ignorable missing data could occur. The occurrence of ignorable missing data is due to the design of the CBOK survey as a comprehensive questionnaire that involves different questions for different actors. For example, it contains many questions designed for students, internal auditors, academics, directors, CAEs, retired, etc., meaning that in order for the respondent to see a particular question, he or she had to give a certain answer to a preceding question. Thus, ignorable missing data are expected to occur with such design. On the other hand, non-ignorable missing values are related directly to the respondent, for instance, when the respondent does not answer one or more questions due to insufficient knowledge to answer these questions or is not happy to answer them. Such missing values should be anticipated and minimised in the research design.

With regard to non-ignorable missing values, it was found that a number of CAEs did not complete all questions. Particularly, the CBOK 2015 survey follows an online survey approach, which reduces the missing values problem, because respondents are prevented from going to the next question if they do not answer the current question. This forced-answer approach can stop some respondents from continuing to answer the survey (Hair et al., 2017). Consequently, the whole survey was examined to identify respondents who did not complete the survey and did not answer included questions. It was possible to identify 3344 CAE from the total sample (the targeted group). The Excel program was used to identify the percentage of missing data for each case. From Table 5.3 it can be seen that 1723 CAEs had answered 100% of the included questions. In contrast, 655 CAEs did not answer any question. Furthermore, 167 CAEs failed to answer at least two thirds of the required questions. The decision was made to exclude 822 CAEs (655 + 126 = 822 = 24.6% of the total respondents) as they were considered to represent non-ignorable missing data. Consequently, the initial sample is 2522 CAEs (75.4% of the total respondents).

**Table 5-3: The Percentage of Completed Answers throughout Cases**

<b>%</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
<b>.00</b>	655	19.6	19.6	19.6
<b>4.55</b>	1	.0	.0	19.6
<b>9.09</b>	1	.0	.0	19.6
<b>13.64</b>	9	.3	.3	19.9
<b>18.18</b>	8	.2	.2	20.2
<b>22.73</b>	7	.2	.2	20.4
<b>27.27</b>	6	.2	.2	20.5
<b>31.82</b>	23	.7	.7	21.2
<b>36.36</b>	8	.2	.2	21.5
<b>40.91</b>	12	.4	.4	21.8
<b>45.45</b>	37	1.1	1.1	22.9
<b>50.00</b>	7	.2	.2	23.1
<b>54.55</b>	14	.4	.4	23.6
<b>59.09</b>	17	.5	.5	24.1

<b>63.64</b>	17	.5	.5	<b>24.6</b>
<b>68.18</b>	31	.9	.9	25.5
<b>72.73</b>	32	1.0	1.0	26.5
<b>77.27</b>	54	1.6	1.6	28.1
<b>81.82</b>	56	1.7	1.7	29.8
<b>86.36</b>	79	2.4	2.4	32.1
<b>90.91</b>	293	8.8	8.8	40.9
<b>95.45</b>	245	7.3	7.3	48.2
<b>100.00</b>	1732	51.8	51.8	100.0
<b>Total</b>	3344	100.0	100.0	

Researchers should be aware of the pattern of missing data, which is more important than the amount of missing values (Tabachnick & Fidell, 2014). Missing data are characterised as missing completely at random (MCAR), missing at random (MAR), and missing not at random (MNAR). IBM SPSS Missing Values Analysis (MVA) is designed to highlight the pattern of missing values and replace them with the data set. Table 5.4 shows some basic univariate statistics. For example, it can be noticed that no variable has missing values higher than 10% and only four variables have more than 5% missing data (GOV3, GOV4, DEC2, and DEC3). Generally, missing data under 10% can be ignored except when they occur in a specific non-random way (Hair et al., 2010).

**Table 5-4: Initial Univariate Statistics**

	<i>N</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>Missing</i>		<i>No. of Extremes<sup>a</sup></i>	
				<i>Count</i>	<i>%</i>	<i>Low</i>	<i>High</i>
<b>EXP1</b>	2511	3.81	.856	11	.4	103	0
<b>EXP2</b>	2470	3.49	1.016	52	2.1	107	0
<b>EXP3</b>	2514	3.93	.820	8	.3	98	0
<b>GOV1</b>	2432	2.33	.963	90	3.6	0	0
<b>GOV2</b>	2437	2.45	.988	85	3.4	0	0
<b>GOV3</b>	2313	1.77	.926	209	<b>8.3</b>	0	129
<b>GOV4</b>	2276	1.68	.876	246	<b>9.8</b>	0	95
<b>ITS1</b>	2504	2.96	.874	18	.7	176	0
<b>ITS2</b>	2484	2.52	.982	38	1.5	0	0
<b>ITS3</b>	2486	2.73	.937	36	1.4	0	0

<b>ITS4</b>	2477	2.33	.962	45	1.8	0	0
<b>ITS5</b>	2454	2.07	.943	68	2.7	0	191
<b>ITS6</b>	2462	2.36	1.003	60	2.4	0	0
<b>ITS7</b>	2463	2.29	1.027	59	2.3	0	0
<b>ITU1</b>	2439	2.19	1.073	83	3.3	0	0
<b>ITU2</b>	2439	2.13	1.096	83	3.3	0	0
<b>ITU3</b>	2400	1.77	.940	122	4.8	0	142
<b>ITU4</b>	2449	2.32	1.150	73	2.9	0	0
<b>ITU5</b>	2437	2.17	1.099	85	3.4	0	0
<b>DEC1</b>	2490	3.78	.928	32	1.3	103	0
<b>DEC2</b>	2285	3.90	1.108	237	<b>9.4</b>	110	0
<b>DEC3</b>	2291	3.44	1.232	231	<b>9.2</b>	0	0

a. Number of cases outside the range (Mean - 2\*SD, Mean + 2\*SD).

However, according to Hair et al. (2010) rule of thumb 2-2, it has been suggested that “cases with missing data for dependent variables typically are deleted, to avoid any artificial increase in relationships between dependent variable(s) and independent variables” (Hair et al., 2010; 48). Therefore, missing data related to dependent variables (DEC1, DEC2 and DEC3) represent 266 CAEs in total, which have been eliminated (see Table 5.5). Accordingly, the remaining sample is 2256 CAEs.

**Table 5-5: Dependent Variables Missing Values**

<i>Dependent variables</i>	<i>Missing Values</i>	<i>Deleted Cases</i>	<i>Valid Cases</i>	
			<b>N</b>	<b>Percent</b>
<b>DEC1</b>	34 cases	32 cases	2256	100.0%
<b>DEC2</b>	237 cases	223 cases	2256	100.0%
<b>DEC3</b>	231 cases	11 cases	2256	100.0%
<b>Total</b>	-	<b>266 cases</b>	-	-

To test the pattern of missing data, Little’s MCAR test was performed, which resulted from Expectation Maximisation (EM) statistics. It was found that the CBOK 2015 data are not MCAR as the null hypothesis of MCAR is rejected (Sig. = .013), (see Table 5.6). Thus, it can be considered that the missing values in the current data set are MAR or MNAR. Remedies may be available for missing data that occur in a random pattern (Hair et al., 2010), but non-randomly missing values are a serious problem, because they are related to the variable itself and cannot be ignored, and also they affect the generalisability of results (Tabachnick & Fidell, 2014). Tabachnick and Fidell (2014; 105) claimed that *“if there is evidence of non-randomness in the pattern of missing data, methods that preserve all cases for further analysis are preferred”*.

Initially, the data set were examined to identify whether missing data were random or occurred in a non-random patterns. There was no evidence to indicate a non-randomness problem. However, the decision was made to perform the analysis with and without missing values, which can help to identify any marked difference. Therefore, all the responses were kept for further analysis.

**Table 5-6: Expectation Maximisation (EM) Means<sup>a</sup>**

EXP1	EXP2	EXP3	GOV1	GOV2	GOV3	GOV4	ITS1	ITS2	ITS3	ITS4	ITS5	ITS6	ITS7	ITU1	ITU2	ITU3	ITU4	ITU5	DEC1	DEC2	DEC3
3.8	3.4	3.9	2.3	2.4	1.7	1.6	2.9	2.5	2.7	2.3	2.0	2.3	2.2	2.1	2.1	1.7	2.3	2.1	3.7	3.9	3.4

a. Little’s MCAR test: Chi-Square = 2653.252, DF = 2494, Sig. = .013

The decision of exclusion may lead to substantial loss of subjects (Tabachnick & Fidell, 2014). This might be the case with high percentages of missing data (above 10%), but Hair et al (2010) claimed that any imputation methods could be applied when missing data are very low (under 10%) (Hair et al., 2010), and suggested that pairwise deletion of missing values can handle missing values when they amount to less than 10%, and the

sample size is 250 or more (Hair et al., 2010). In this study, the dependent variables did not have any missing values, and only two independent variables (GOV3 and GOV4) had missing values, 8.3% and 9.9% respectively. The other variables had missing values lower than 5%. (See Table 5.7).

**Table 5-7: Univariate Statistics after Excluding Missing Values**

	<i>N</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>Missing</i>		<i>No. of Extremes<sup>a</sup></i>	
				<i>Count</i>	<i>%</i>	<i>Low</i>	<i>High</i>
EXP1	2248	3.819	.844	8	.4	85	0
EXP2	2213	3.488	1.008	43	1.9	90	0
EXP3	2250	3.938	.807	6	.3	79	0
GOV1	2180	2.32	.964	76	3.4	0	0
GOV2	2186	2.44	.991	70	3.1	0	0
GOV3	2068	1.74	.916	188	8.3	0	110
GOV4	2033	1.66	.866	223	9.9	0	81
ITS1	2240	2.95	.875	16	.7	156	0
ITS2	2222	2.51	.981	34	1.5	0	0
ITS3	2224	2.72	.937	32	1.4	0	0
ITS4	2214	2.32	.958	42	1.9	0	0
ITS5	2192	2.04	.933	64	2.8	0	156
ITS6	2202	2.33	1.002	54	2.4	0	0
ITS7	2204	2.25	1.023	52	2.3	0	0
ITU1	2181	2.15	1.074	75	3.3	0	0
ITU2	2180	2.10	1.099	76	3.4	0	0
ITU3	2142	1.73	.922	114	5.1	0	114
ITU4	2189	2.31	1.158	67	3.0	0	0
ITU5	2178	2.15	1.101	78	3.5	0	0
DEC1	2256	3.78	.922	0	.0	90	0
DEC2	2256	3.91	1.099	0	.0	103	0
DEC3	2256	3.46	1.223	0	.0	214	0

a. Number of cases outside the range (Mean - 2\*SD, Mean + 2\*SD).

### 5.2.3 Test of Outliers

An outlier is “an extreme response to one or more questions” (Hair et al., 2017; 59). Outlier observation is identified as different from other observations (Hair et al. 2010). It refers to unusually high or low values. These can be due to incorrect data entry, failure to specify codes for missing values, entering wrong observations and including observations

with extreme values higher or lower than the normal distribution (Tabachnick & Fidell, 2014).

There are beneficial outliers and problematic outliers. Beneficial outliers are extreme values that describe population characteristics that would not be discovered in the normal course of analysis. In contrast, problematic outliers are extreme values and not representative of the population. Consequently, researchers should identify and treat outliers to avoid any possibility of negative impacts on the result by biasing the mean or affecting the normality requirement (Field, 2013; Hair et al., 2017).

The univariate method was applied to identify outliers by examining the distribution of each case with an outlandish value on one variable (Tabachnick & Fidell). There are several tools for spotting outliers in the dataset (e.g., z-scores, histograms, box-plots, probability plots). Univariate outliers are cases with very large standardised scores (z-scores) (Tabachnick & Fidell, 2014). The general rule of thumb is to flag scores 3 or 4 z units from the mean (Hair et al., 2010). However, the current research used the commonly used cutoff of  $\pm 3.29$  ( $p < 0.001$ , two-tailed test) (Tabachnick & Fidell, 2014). It was found that only two variables (EXP1 (-3.34) & EXP3 (3.63)) had univariate outliers (outside the range of the measurement scale) (see Table 5.8).

**Table 5-8: Z scores for Individual Variable**

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>
<b>Zscore: EXP1</b>	2248	<b>-3.34003</b>	1.39852
<b>Zscore: EXP2</b>	2213	-2.46792	1.49903
<b>Zscore: EXP3</b>	2250	<b>-3.63728</b>	1.31326
<b>Zscore: GOV1</b>	2180	-1.37418	1.73879
<b>Zscore: GOV2</b>	2186	-1.45457	1.57178
<b>Zscore: GOV3</b>	2068	-.81114	2.46509
<b>Zscore: GOV4</b>	2033	-.75881	2.70525
<b>Zscore: ITS1</b>	2240	-2.23495	1.19323
<b>Zscore: ITS2</b>	2222	-1.54267	1.51424
<b>Zscore: ITS3</b>	2224	-1.84149	1.35727

<b>Zscore: ITS4</b>	2214	-1.38025	1.74863
<b>Zscore: ITS5</b>	2192	-1.11617	2.09605
<b>Zscore: ITS6</b>	2202	-1.32997	1.66144
<b>Zscore: ITS7</b>	2204	-1.23120	1.70132
<b>Zscore: ITU1</b>	2181	-1.07700	1.71492
<b>Zscore: ITU2</b>	2180	-1.00292	1.72663
<b>Zscore: ITU3</b>	2142	-.79992	2.45342
<b>Zscore: ITU4</b>	2189	-1.13322	1.45525
<b>Zscore: ITU5</b>	2178	-1.04679	1.67603
<b>Zscore: DEC1</b>	2256	-3.02144	1.31881
<b>Zscore: DEC2</b>	2256	-2.64419	.99596
<b>Zscore: DEC3</b>	2256	-2.00737	1.26298
<b>Valid N (listwise)</b>	1732		

Table 5.9 & Table 5.10 show that 15 cases exceeded the cutoff of - 3.29 for each variable, but 9 of them are outliers in both variables. Thus, a total of 21 cases were considered to be outliers. Hair et al. (2014) suggest eliminating outliers if they are only a few. In this study, there were only a few outliers compared to the whole data set. Consequently, the decision was made to drop the 21 cases from the data sample. Thus, the final sample is 2235 CAEs.

**Table 5-9: Z score for EXP1**

<b>Zscore</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
<b>-3.34003</b>	15	.7	.7	.7
<b>-3.10310</b>	3	.1	.1	.8
<b>-2.86617</b>	4	.2	.2	1.0
<b>-2.62925</b>	12	.5	.5	1.5
<b>-2.45155</b>	1	.0	.0	1.6
<b>-2.39232</b>	9	.4	.4	2.0
<b>-2.15539</b>	41	1.8	1.8	3.8
<b>-1.91846</b>	26	1.2	1.2	4.9
<b>Valid -1.85923</b>	3	.1	.1	5.1
<b>-1.68154</b>	32	1.4	1.4	6.5
<b>-1.56307</b>	2	.1	.1	6.6
<b>-1.44461</b>	31	1.4	1.4	8.0
<b>-1.26691</b>	2	.1	.1	8.1
<b>-1.20768</b>	58	2.6	2.6	10.6
<b>-.97075</b>	283	12.5	12.6	23.2
<b>-.73383</b>	111	4.9	4.9	28.2
<b>-.67460</b>	5	.2	.2	28.4



<b>-.57588</b>	5	.2	.2	28.6
<b>-.49690</b>	113	5.0	5.0	33.6
<b>-.37844</b>	18	.8	.8	34.4
<b>-.25997</b>	128	5.7	5.7	40.1
<b>-.18100</b>	6	.3	.3	40.4
<b>-.08228</b>	10	.4	.4	40.8
<b>-.02305</b>	148	6.6	6.6	47.4
<b>.21388</b>	362	16.0	16.1	63.5
<b>.45081</b>	122	5.4	5.4	69.0
<b>.51004</b>	8	.4	.4	69.3
<b>.60876</b>	4	.2	.2	69.5
<b>.68774</b>	139	6.2	6.2	75.7
<b>.80620</b>	8	.4	.4	76.0
<b>.92466</b>	122	5.4	5.4	81.5
<b>1.00364</b>	2	.1	.1	81.5
<b>1.10236</b>	7	.3	.3	81.9
<b>1.16159</b>	108	4.8	4.8	86.7
<b>1.39852</b>	300	13.3	13.3	100.0
<b>Total</b>	2248	99.6	100.0	
<b>Missing System</b>	8	.4		
<b>Total</b>	2256	100.0		

**Table 5-10: Z score for EXP3**

<b>Zscore</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
<b>-3.63728</b>	13	.6	.6	.6
<b>-3.38975</b>	2	.1	.1	.7
<b>-3.14223</b>	2	.1	.1	.8
<b>-2.89470</b>	5	.2	.2	1.0
<b>-2.81219</b>	1	.0	.0	1.0
<b>-2.64717</b>	6	.3	.3	1.3
<b>-2.39965</b>	32	1.4	1.4	2.7
<b>-2.15212</b>	18	.8	.8	3.5
<b>-1.90459</b>	20	.9	.9	4.4
<b>-1.78083</b>	1	.0	.0	4.4
<b>-1.65706</b>	36	1.6	1.6	6.0
<b>-1.47142</b>	2	.1	.1	6.1
<b>-1.40954</b>	47	2.1	2.1	8.2
<b>-1.16201</b>	247	10.9	11.0	19.2
<b>-.91448</b>	80	3.5	3.6	22.8
<b>-.85260</b>	3	.1	.1	22.9
<b>-.74947</b>	1	.0	.0	22.9
<b>-.66696</b>	104	4.6	4.6	27.6
<b>-.54319</b>	3	.1	.1	27.7
<b>-.41943</b>	128	5.7	5.7	33.4

	<b>-.33692</b>	2	.1	.1	33.5
	<b>-.23378</b>	3	.1	.1	33.6
	<b>-.17190</b>	135	6.0	6.0	39.6
	<b>.07562</b>	414	18.4	18.4	58.0
	<b>.32315</b>	170	7.5	7.6	65.6
	<b>.38503</b>	4	.2	.2	65.7
	<b>.48817</b>	2	.1	.1	65.8
	<b>.57068</b>	150	6.6	6.7	72.5
	<b>.69444</b>	7	.3	.3	72.8
	<b>.81821</b>	132	5.9	5.9	78.7
	<b>.90071</b>	1	.0	.0	78.7
	<b>1.00385</b>	3	.1	.1	78.8
	<b>1.06573</b>	104	4.6	4.6	83.5
	<b>1.31326</b>	372	16.5	16.5	100.0
	<b>Total</b>	2250	99.7	100.0	
<b>Missing</b>	<b>System</b>	6	.3		
<b>Total</b>		2256	100.0		

Box plots are an alternative graphical method for finding univariate outliers. They are simpler and literally box in observations that are around the median. Box plots locate any case with considerable distance from others and consider them as extreme (Tabachnick & Fidell, 2014). Box plots indicated some cases as outliers (see Appendix 10, 11, 12, 13 and 14), yet when they were deleted, different cases appeared as outliers. Hair et al. (2017) argued that “*if there is no clear explanation for the exceptional values, outliers should be retained*” (Hair et al., 2017; 60). Because of this argument, the decision was made to retain them in order not to lose valuable samples.

## 5.2.4 Sample Selection Procedures

Table 5.11 summarises the procedures that the researcher applied to obtain the final data sample. All justifications have been discussed in the previous sections.

**Table 5-11: Sample Selection Procedures**

	<i>Number of Observation</i>
➤ Full sample of the CBOK 2015 practitioner survey	14518 Cases
➤ Only CAEs respondents	3344 CAEs
➤ Excluding non-ignorable Missing Data (822 Cases)	2522 CAEs
➤ Excluding missing data related to dependent variables (266 Cases)	2256 CAEs
➤ Excluding outliers (21Cases)	2235 CAEs
<b>The Final obtained Sample</b>	<b>2235 CAEs</b>

## 5.2.5 Test of Normality

Multivariate normality is the assumption that deals with distribution-related problems. The multivariate normality assumption is met when “*each variable and all linear combinations of the variables are normally distributed*” (Tabachnick & Fidell, 2014; 112). The normal distribution is an important assumption in order to run parametric techniques. For nonparametric procedures, there are no distributional assumptions.

Normality of variables is assessed by skewness and kurtosis components (Pallant, 2013). Skewness occurs when the variable mean is not located in the centre of the distribution. That means skewness is a measure of variable distribution symmetry. It can be positive or negative. For example, when the variable distribution is skewed to the right, it is negative skewness, but if the variable distribution is skewed to the left at the low values, it is positive skewness. In addition, kurtosis refers to the variable distribution peakedness. It can be positive or negative. For instance, negative kurtosis indicates that the distribution

is relatively flat with long left and right tails (too flat), whereas positive kurtosis indicates that the variable distribution is pileup with thin tails (too peaked). A variable with normal distribution can record zero value for both skewness and kurtosis. However, values higher than zero indicate positive skewness or kurtosis. In contrast, values lower than zero indicate negative skewness or kurtosis. Finally, the problems of skewness which can ‘make substantive difference in the analysis’, and non-normal kurtosis or ‘underestimate of the variance of a variable’ can be reduced with a reasonably large sample (Tabachnick & Fidell, 2014).

Table 5.12 illustrates variable skewness and kurtosis standard errors scores, which can be considered to be close to zero. However, with a large sample data set the standard errors for both skewness and kurtosis decrease, which generates acceptable results from formal inference tests. When there are only minor aberrations from normality, the null hypothesis is likely to be rejected. In other words, with a large sample, the significance levels of skewness and kurtosis are not as important as their visual appearance and the actual size of the distribution (Tabachnick & Fidell, 2014). Hence, it is preferable to look at the data distributions through histograms, P-P or Q-Q plots.

**Table 5-12: Descriptive Statistics**

	<i>Mean</i>	<i>Std. Devi</i>	<i>Vari.</i>	<i>Skewness</i>		<i>Kurtosis</i>	
				<i>Statis.</i>	<i>Std. Error</i>	<i>Statistic</i>	<i>Std. Error</i>
<b>EXP1</b>	3.844	.808	.654	-.389	.052	-.389	.104
<b>EXP2</b>	3.509	.989	.980	-.391	.052	-.299	.105
<b>EXP3</b>	3.961	.772	.597	-.478	.052	-.329	.104
<b>GOV1</b>	2.33	.964	.930	.144	.053	-.965	.105
<b>GOV2</b>	2.45	.990	.979	-.015	.053	-1.046	.105
<b>GOV3</b>	1.74	.917	.840	.949	.054	-.215	.108
<b>GOV4</b>	1.66	.868	.753	1.092	.055	.156	.109
<b>ITS1</b>	2.964	.869	.757	-.545	.052	-.364	.104
<b>ITS2</b>	2.520	.979	.960	-.120	.052	-.996	.104
<b>ITS3</b>	2.735	.933	.872	-.356	.052	-.716	.104
<b>ITS4</b>	2.327	.959	.920	.113	.052	-.973	.104

<b>ITS5</b>	2.046	.934	.874	.437	.053	-.823	.105
<b>ITS6</b>	2.338	1.00	1.005	.103	.052	-1.094	.105
<b>ITS7</b>	2.263	1.02	1.050	.203	.052	-1.136	.105
<b>ITU1</b>	2.162	1.074	1.156	.325	.053	-1.237	.105
<b>ITU2</b>	2.106	1.100	1.210	.462	.053	-1.177	.105
<b>ITU3</b>	1.738	.9217	.850	.949	.053	-.252	.106
<b>ITU4</b>	2.317	1.158	1.343	.186	.053	-1.436	.105
<b>ITU5</b>	2.156	1.101	1.214	.361	.053	-1.265	.105
<b>DEC1</b>	3.78	.919	.845	-1.089	.052	1.558	.104
<b>DEC2</b>	3.91	1.099	1.209	-.827	.052	.112	.104
<b>DEC3</b>	3.46	1.222	1.492	-.435	.052	-.628	.104

In order to assess the normality assumption in the current study, both formal inference tests and distribution shapes were used. First, Kolmogorov-Smirnov and Shapiro-Wilk tests were performed for all variables (see Table 5.13). A significant result (sig. values lower than 0.05) indicates a violation of the normality assumption. Table 5.13 shows that all variables recorded significant Kolmogorov-Smirnov and Shapiro-Wilk results (i.e., sig. =0.000). Data with non-significant Kolmogorov-Smirnov and Shapiro-Wilk results are considered to be normally distributed. However, the obtained data display non-normal distribution, where the variables that depart from normality predominantly show positive and negative skewness and kurtosis. Significant results are more commonly expected with a large data set, even if the scores are only slightly different from a normal distribution (Field, 2013; Pallant, 2013).

Given the aforementioned discussion, the assumption of normality was tested by looking at the distribution shapes for variables. This can be done through histograms, P-P or Q-Q plots, and the values of skew and kurtosis. A histogram is an important graphical device for assessing normality. It presents the actual shape of the distribution for each variable. Deviations from normality shift the points away from the diagonal. For example, the EXP variables histogram shows positive skewness and negative kurtosis. In contrast, the ITU variables, present negative skewness and positive kurtosis (see Appendix 15 for the

results of the histograms). Finally, non-normal data can be transformed to accommodate non-normal distributions. However, non-normality contributes to other assumption violations. The transformation may cause bias in the data, so the decision was made to use PLS-SEM without any transformation of the data, as PLS-SEM is a non-parametric technique that can deal with non-normal data (Efron & Tibshirani, 1986). Consequently, PLS-SEM was well-suited to this study.

**Table 5-13: Tests of Normality**

	<i>Kolmogorov-Smirnov<sup>a</sup></i>			<i>Shapiro-Wilk</i>		
	<i>Statis.</i>	<i>df</i>	<i>Sig.</i>	<i>Statis.</i>	<i>df</i>	<i>Sig.</i>
<b>EXP1</b>	.108	1719	.000	.956	1719	.000
<b>EXP2</b>	.125	1719	.000	.956	1719	.000
<b>EXP3</b>	.128	1719	.000	.945	1719	.000
<b>GOV1</b>	.203	1719	.000	.875	1719	.000
<b>GOV2</b>	.211	1719	.000	.875	1719	.000
<b>GOV3</b>	.320	1719	.000	.762	1719	.000
<b>GOV4</b>	.345	1719	.000	.736	1719	.000
<b>ITS1</b>	.252	1719	.000	.844	1719	.000
<b>ITS2</b>	.229	1719	.000	.876	1719	.000
<b>ITS3</b>	.257	1719	.000	.866	1719	.000
<b>ITS4</b>	.201	1719	.000	.876	1719	.000
<b>ITS5</b>	.209	1719	.000	.850	1719	.000
<b>ITS6</b>	.211	1719	.000	.872	1719	.000
<b>ITS7</b>	.196	1719	.000	.866	1719	.000
<b>ITU1</b>	.232	1719	.000	.839	1719	.000
<b>ITU2</b>	.243	1719	.000	.828	1719	.000
<b>ITU3</b>	.316	1719	.000	.768	1719	.000
<b>ITU4</b>	.218	1719	.000	.834	1719	.000
<b>ITU5</b>	.239	1719	.000	.832	1719	.000
<b>DEC1</b>	.325	1719	.000	.805	1719	.000
<b>DEC2</b>	.213	1719	.000	.840	1719	.000
<b>DEC3</b>	.177	1719	.000	.891	1719	.000

a. Lilliefors Significance Correction

## 5.3 Demographic Data Analysis

The following subsections show the demographic information about the study sample, to enable understanding of respondents' characteristics. They describe the CAEs' background and organisations' characteristics.

### 5.3.1 Respondents' characteristics

Table 5.14 represents the frequencies and percentages of respondents' demographic details. It can be noticed that almost two thirds of the obtained sample (CAEs) were male, while female respondents constituted one third. Also, 22.5% of all respondents were younger than 40 years old, while respondents aged between 40 and 59 represented the majority at about 62%; the remaining percentage were aged 60 years or older. Based on education level, it can be seen that more than 90% of the respondents had obtained Bachelor or Master degrees, and 54% of them had more than ten years of experience in the internal audit field, as well as about 47% had more than five years of experience as CAE. Finally, only 55 CAEs did not state any training hours, while more than 80% of the respondents had spent 21 hours or more in training.

**Table 5-14: Profile A of The Main Study Respondents**

	<i>Profile Category</i>	<i>Frequency (Valid N)</i>	<i>Percentage (%)</i>
<b>Gender</b>	Female	695	31.1
	Male	1527	68.3
	Total	2222	99.4
	Missing Values	13	.6
	Total	2235	100.0
<b>Age</b>	29 years or younger	34	1.5
	30 to 39 years	448	20.0
	40 to 49 years	709	31.7
	50 to 59 years	672	30.1
	60 years or older	144	6.4
	Total	2007	89.8
	Missing Values	228	10.2
	Total	2235	100.0

<b>Education</b>	Secondary/high school education	29	1.3
	Undergraduate diploma or associate degree (less than four years)	77	3.4
	Bachelor's degree/diploma	877	39.2
	Master's degree/graduate degree/diploma	1171	52.4
	Doctorate degree (PhD or higher)	66	3.0
	None of the above	15	.7
	<b>Total</b>	<b>2235</b>	<b>100.0</b>
<b>Experience In IAF</b>	0	35	1.6
	1 to 5	435	19.5
	6 to 10	555	24.8
	11 to 15	447	20.0
	16 to 20	314	14.0
	21 to 30	336	15.0
	31 to 55	109	4.9
	<b>Total</b>	<b>2231</b>	<b>99.8</b>
	Missing Values	4	.2
<b>Total</b>	<b>2235</b>	<b>100.0</b>	
<b>Experience as CAE</b>	No experience	62	2.8
	1- 5 Years	1139	53.8
	6 -10 Years	598	80.5
	11-15 Years	258	92.1
	16-20 Years	118	97.4
	21 Years and more	59	100.0
	<b>Total</b>	<b>2234</b>	
	Missing Values	1	
<b>Total</b>	<b>2235</b>		
<b>Training Hours</b>	0 (no hours)	55	2.5
	1 to 10	104	4.7
	11 to 20	282	12.6
	21 to 40	983	44.0
	41 to 60	506	22.6
	61 to 80	156	7.0
	81 to 100	82	3.7
	101 and over	67	3
	<b>Total</b>	<b>2235</b>	<b>100.0</b>

Source: Developed by the Author

According to the regions in which respondents were based or primarily worked, it can be noticed that they were located in six different geographical regions (see Table 5.15). CAEs from Europe were the highest percentage at approximately 31% of the whole sample, whereas the United States and Canada came second with about 22% of the sample, while Asia and Pacific accounted for 20%. The lowest percentages were 5.5%



and 7.8% for the Middle East and Africa respectively. In addition, the majority of the sample (92.5%) were recorded as members of the IIA, and approximately 56% of them had been members for five years or more. The author believes that the impact of different legal systems in different countries varies. For example, some countries do not follow the International Professional Practices Framework, which leads to different standards or requirements being followed by those countries. Thus, including different countries (regions) in the sample can generate different findings.

Two thirds of the respondents had technical specialisations. For example, more than 30% had technical specialisations in accounting or risk management, while 20 % specialised in risk management and IT. Thus, one third did not have any technical specialisations. However, 24% of the CAEs had internal audit certification. Finally, almost 99 % of CAEs still worked within the organisation where they were employed and only 1% of the respondents were retired.

Appendix 16 shows more details about the 23 different languages that were used in the CBOK survey, and Appendix 17 includes more than 110 IIA institutes with which the respondents primarily identified.

**Table 5-15: Profile B of The Main Study Respondents**

	<i>Profile Category</i>	<i>Frequency (Valid N)</i>	<i>Percentage (%)</i>
<b>Region</b>	Africa	175	7.8
	Asia and Pacific	462	20.7
	Europe	690	30.9
	Middle East	122	5.5
	North America (USA and Canada)	489	21.9
	South and Central America and the Caribbean	297	13.3
	Total	2235	100.0
	<b>IIA Membership</b>	Yes, I am a member	2067
No, I am not a member		168	7.5
Total		2235	100.0

<b>Years as IIA Member</b>	2 years or less	348	15.6
	3 to 5 years	465	20.8
	6 to 10 years	604	27.0
	11 to 20 years	482	21.6
	21 years or more	168	7.5
	Total	2067	92.5
	Missing Values	168	7.5
	Total	2235	100.0
<b>Current Profession</b>	I work as an internal auditor within the Organisation where I am employed.	2215	99.1
	I am retired.	20	.9
	Total	2235	100.0
<b>IA Certificate</b>	Yes	537	24.0
	No	1698	76.0
	Total	2235	100.0
<b>Technical specialisation</b>	I do not have a technical specialization for my internal audit work.	678	30.3
	Accounting	369	16.5
	Financial reporting	106	4.7
	Fraud	107	4.8
	Information technology (IT)	131	5.9
	Ethics	14	.6
	Compliance	108	4.8
	Legal	29	1.3
	Risk management	322	14.4
	Operations	78	3.5
	Management	117	5.2
	Engineering	16	.7
	Construction	8	.4
	Environmental auditing	9	.4
	Performance auditing	56	2.5
Other	87	3.9	
	Total	2235	100.0

Source: Developed by the Author

### 5.3.2 Organisations' characteristics

Table 5.16 describes the respondents' organisations through five main characteristics. The first is their organisation types, which were classified into six types. These include privately held and publicly traded (17.7% and 25.1% respectively), followed by the financial sector, public sector and not-for-profit organisations (22.8%, 25.7% and 6%

respectively). Finally, 61 organisations (2.7%) did not fall into one of the five mentioned types.

The second characteristic is the size of each organisation, based on employees' number. It can be seen that more than 34% of the organisations contained fewer than 500 employees, while the remainder were larger. The third and fourth characteristics are related to the internal audit department. It seems that 15% of the organisations had newly established their IAF during the last five years. Approximately 60% of the organisations employed four or more internal auditors in their internal audit department. Finally, included organisations represented 20 different industries, with more than 28% from the finance and insurance industry.

**Table 5-16: Organisations' Characteristics**

	<i>Profile Category</i>	<i>Frequency (Valid N)</i>	<i>Percentage (%)</i>
<b>Organisation Type</b>	1. Privately held (excluding financial sector)	396	17.7
	2. Publicly traded (excluding financial sector)	561	25.1
	3. Financial sector (privately held and publicly traded)	509	22.8
	4. Public sector (including government agencies and government-owned operations)]	575	25.7
	5. Not-for-profit Organisation	133	6.0
	6. Other types of Organisations	61	2.7
	Total	2235	100.0
<b>Employees in Organisation</b>	Less than 500	768	34.4
	500 to 1,500	526	23.5
	1,501 to 10,000	656	29.4
	10,001 to 100,000	256	11.5
	100,001 to 2,250,000	29	1.3
	Total	2235	100.0
<b>Age of internal audit department</b>	less than 5 years	337	15.1
	5 to 14 years	870	38.9
	15 to 24 years	447	20.0
	25 to 34 years	194	8.7
	35 years or more	200	8.9
	Total	2048	91.6
	Missing observations	187	8.4
Total	2235	100.0	

<b>Employees in Internal Audit</b>	1 to 3	890	39.8
	4 to 9	721	32.3
	10 to 24	364	16.3
	25 to 49	98	4.4
	50 to 299	76	3.4
	300 to 999	9	.4
	1,000 or more	37	1.7
	Total	2195	98.2
	Missing observations	40	1.8
Total		2235	100.0
<b>Industry</b>	Agriculture, Forestry, Fishing and Hunting	37	1.7
	Mining, Quarrying, and Oil and Gas Extraction	75	3.4
	Utilities	113	5.1
	Construction	68	3.0
	Manufacturing	329	14.7
	Wholesale Trade	47	2.1
	Retail Trade	69	3.1
	Transportation and Warehousing	97	4.3
	Information	54	2.4
	Finance and Insurance	639	28.6
	Real Estate and Rental and Leasing	46	2.1
	Professional, Scientific, and Technical Services	66	3.0
	Management of Companies and Enterprises	17	.8
	Administrative and Support and Waste Management and Remediation Services	7	.3
	Educational Services	87	3.9
	Health Care and Social Assistance	111	5.0
	Arts, Entertainment, and Recreation	21	.9
	Accommodation and Food Services	14	.6
	Other Services (except Public Administration)	148	6.6
	Public Administration	190	8.5
Total		2235	100.0

Source: Developed by the Author

## 5.4 Exploratory Factor Analysis (EFA)

In this study, EFA was performed to summarise data by grouping variables together that are correlated. It is a useful tool to consolidate variables and generate hypothesis about underlying processes (Tabachnick & Fidell, 2014). EFA is known in SPSS as a 'data reduction' technique. There are different methods for variables extraction, for instance, principal component analysis (PCA), generalised least squares, maximum likelihood and alpha factors. The PCA provides information about the maximum variance in the data set,

where the first component extracted accounts for the highest variance, and the last component accounted for the least variance. In addition, it helps to group the large set of variables into a smaller number (Hair et al., 2010; Tabachnick & Fidell, 2014). Therefore, PCA was selected to generate the initial solutions for the EFA.

It is recommended to consider particular procedures in order to achieve appropriate factor analysis results. These procedures are the following:

- Sampling adequacy is measured by calculating the Kaiser-Meyer-Olkin (KMO) test (value above 0.6). This value indicates that there is statistical significance between measurements items (Tabachnick & Fidell, 2014).
- Calculate Bartlett's test of Sphericity (it should be significant), which indicates that the data is suitable for EFA and represents correlation value higher than 0.4 among the measurement items (variables) (Hair et al., 2010).
- The eigenvalues of a factor helping to identify the amount of the total variance explained by a factor (Pallant, 2013). An eigenvalue greater than one satisfies the latent root criterion.
- Communality represents the total variance of an original variable shared with other variables (Hair et al., 2010). In a case of a variable that has no variance, the communality value should be one. In contrast, communality for a variable that shares nothing with other variables, the communality value should be zero (Field, 2013). Items that exhibits communality lower than 0.5 (50%) are considered to be weak items (Hair et al., 2010). In some cases, depending on the sample size, cut-off value of 0.3 is also accepted (Pallant, 2013). In this study cut-off value of 0.4 was selected.
- It has been argued that the orthogonal varimax rotational method is the most commonly used variance maximising procedure, as it provides higher generalizability

and replicability power compared to another method, such as oblique rotational method<sup>11</sup>. For these reasons, the orthogonal varimax rotational method was selected to extract the theoretical constructs (Tabachnick & Fidell, 2014; Pallant, 2013).

Table 5.17 shows that KMO values are above 0.6, which verifies the data set's suitability for factor analysis; and the significant Bartlett's test of Sphericity values ( $p = 0.000$ ) indicates that sufficient correlations exist among the variables to proceed. In addition, the Total Variance Explained results show that four components explained a total of 66.73 % of the variance for Model A and 68.95 % for Model B. The initial eigenvalues were above 1 for model A (4.52, 1.98, 1.91, and 1.58); and for Model B (6.51, 2.11, 1.95, and 1.82). Rotated Component Matrix presents the items' loadings on the four factors with 15 items for Model A and 18 items for Model B. It can be seen that three or more items loaded above 0.4 in each component (see Appendix 18 and 19). Finally, reliability analysis showed high Cronbach's Alpha values (e.g., 0.816 for Model A and 0.881 for Model B).

**Table 5-17: EFA and Reliability Results**

	<i>Model A</i>	<i>Model B</i>
<b>KMO value</b>	.826	.885
<b>Bartlett's Test of Sphericity</b>	0.000	0.000
<b>Communalities</b>	all > 0.5	All > 0.5
<b>Total Variance Explained</b>	66.73	68.95
<b>Scree Plot</b>	4 constructs > Eigenvalue 1	4 constructs > Eigenvalue 1
<b>Reliability through Cronbach's Alpha</b>	0.816	0.881

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<sup>11</sup> For further explanation, please, refer to *SPSS Survival Manual: A step by step guide to data analysis using IBM SPSS* (Pallant, 2013; 199-200).

Table 5.18 shows the final descriptive statistics for the constructs and their measurements included in the research models. It can be seen that each construct is measured by at least three indicators. Also, the minimum score for each indicator was 1 and the highest was 5. By looking at the variables' mean, it can be noticed that some variables recorded high score compared to others. For example, the higher mean values of information variables (EXP1, EXP2 and EXP3) implies advanced technical expertise. In contrast, the mean values for GOV3 and GOV4 show the minimal extent of their activities. Furthermore, the mean of the decision variables showed that high percentages of our sample have relationships with high authority; 71.9% of the CAEs reported functionally to a high authority (e.g., AC or the board). Finally, the average experience of the CAEs was 13 years in internal audit and around 6.6 years as CAE.

Table 5.19 demonstrates the Spearman correlations matrix for model A and Table 5.20 shows the Spearman correlations matrix for model B. They illustrate the strength and direction of the correlations between measures and the significance level. However, both of them show no negative correlation between investigated measurements. On the other hand, it can be noticed that some variables are highly correlated, such as EXP1 & EXP3  $\rightarrow$  0.736; and ITU1&ITU4  $\rightarrow$ 0.726 in Table 5.19, as well as ITS6 & ITS7  $\rightarrow$  .0801 in Table 5.20. In this case, it is suggested that any multicollinearity problem or any cross loading between variables should be identified. However, statistical examinations through Variance Inflation Factor analysis show that there is no multicollinearity problem (see section 6.2.2.2), in addition, there is no cross-loading between variables (see Appendix 22).

**Table 5-18: Final Descriptive Statistics**

<i>Constructs</i>	<i>Measures</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>Median</i>	<i>Std. Dev.</i>	<i>VAR.</i>
<b>Information (I)</b>	EXP1	1.20	5.00	3.84	4.00	.808	.654
	EXP2	1.00	5.00	3.50	3.66	.989	.980
	EXP3	1.40	5.00	3.96	4.00	.772	.597
<b>Perception (Model A)</b>	GOV1	1.00	4.00	2.33	2.00	.964	.930
	GOV2	1.00	4.00	2.45	2.00	.990	.979
	GOV3	1.00	4.00	1.74	1.00	.917	.840
	GOV4	1.00	4.00	1.66	1.00	.868	.753
<b>Perception (Model B)</b>	ITS1	1.00	4.00	2.96	3.00	.869	.757
	ITS2	1.00	4.00	2.52	3.00	.979	.960
	ITS3	1.00	4.00	2.73	3.00	.933	.872
	ITS4	1.00	4.00	2.32	2.00	.959	.920
	ITS5	1.00	4.00	2.04	2.00	.934	.874
	ITS6	1.00	4.00	2.33	2.00	1.002	1.005
	ITS7	1.00	4.00	2.26	2.00	1.024	1.050
<b>Judgment (J)</b>	ITU1	1.00	4.00	2.16	2.00	1.074	1.156
	ITU2	1.00	4.00	2.10	2.00	1.100	1.210
	ITU3	1.00	4.00	1.73	1.00	.921	.850
	ITU4	1.00	4.00	2.31	2.00	1.158	1.343
	ITU5	1.00	4.00	2.15	2.00	1.101	1.214
<b>Decision (D)</b>	DEC1	1.00	5.00	3.78	4.00	.919	.845
	DEC2	1.00	5.00	3.91	4.00	1.099	1.209
	DEC3	1.00	5.00	3.46	3.00	1.222	1.492
<b>Years of exp. in IA</b>		.00	55.0	13.36	12.00	9.168	84.06
<b>Years of exp. as CAE</b>		.00	40.0	6.71	5.00	5.769	33.28



Table 5-19: Spearman Correlations for Model A

	EXP1	EXP2	EXP3	GOV1	GOV2	GOV3	GOV4	ITU1	ITU2	ITU3	ITU4	ITU5	DEC1	DEC2	DEC3
EXP1	1.000														
EXP2	.654**	1.000													
EXP3	.736**	.557**	1.000												
GOV1	.192**	.148**	.134**	1.000											
GOV2	.163**	.161**	.152**	.431**	1.000										
GOV3	.116**	.105**	.119**	.373**	.422**	1.000									
GOV4	.048	.055	.018	.418**	.407**	.410**	1.000								
ITU1	.222**	.210**	.197**	.199**	.230**	.231**	.187**	1.000							
ITU2	.192**	.184**	.187**	.204**	.206**	.251**	.205**	.726**	1.000						
ITU3	.148**	.184**	.112**	.267**	.263**	.309**	.295**	.551**	.604**	1.000					
ITU4	.220**	.253**	.204**	.172**	.172**	.205**	.149**	.557**	.638**	.565**	1.000				
ITU5	.181**	.199**	.157**	.230**	.228**	.249**	.215**	.588**	.679**	.649**	.746**	1.000			
DEC1	.076**	.095**	.076**	.036	.118**	.115**	.093**	.097**	.083**	.073**	.092**	.070**	1.000		
DEC2	.039	.042	.051*	.072**	.110**	.150**	.120**	.109**	.087**	.093**	.063**	.071**	.443**	1.000	
DEC3	.050*	.073**	.066**	.076**	.134**	.168**	.130**	.128**	.124**	.125**	.084**	.082**	.397**	.612**	1.000

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table 5-20: Spearman Correlations for Model B

	EXP1	EXP2	EXP3	ITS1	ITS2	ITS3	ITS4	ITS5	ITS6	ITS7	ITU1	ITU2	ITU3	ITU4	ITU5	DEC1	DEC2	DEC3
EXP1	1.000																	
EXP2	.654**	1.000																
EXP3	.736**	.557**	1.000															
ITS1	.270**	.284**	.265**	1.000														
ITS2	.217**	.238**	.217**	.623**	1.000													
ITS3	.205**	.215**	.202**	.652**	.606**	1.000												
ITS4	.165**	.164**	.159**	.465**	.577**	.572**	1.000											
ITS5	.148**	.146**	.137**	.363**	.507**	.469**	.670**	1.000										
ITS6	.162**	.175**	.152**	.519**	.642**	.605**	.634**	.667**	1.000									
ITS7	.173**	.194**	.179**	.512**	.657**	.587**	.610**	.655**	.801**	1.000								
ITU1	.222**	.210**	.197**	.292**	.316**	.314**	.321**	.319**	.325**	.332**	1.000							
ITU2	.192**	.184**	.167**	.313**	.350**	.335**	.327**	.324**	.334**	.332**	.726**	1.000						
ITU3	.148**	.184**	.112**	.209**	.336**	.293**	.341**	.402**	.388**	.385**	.551**	.604**	1.000					
ITU4	.220**	.253**	.204**	.331**	.352**	.322**	.310**	.278**	.304**	.320**	.557**	.638**	.565**	1.000				
ITU5	.181**	.199**	.157**	.292**	.326**	.319**	.299**	.312**	.334**	.330**	.588**	.679**	.649**	.746**	1.000			
DEC1	.076**	.095**	.076**	.108**	.105**	.128**	.085**	.070**	.127**	.135**	.097**	.083**	.073**	.092**	.070**	1.000		
DEC2	.039	.042	.051	.079**	.112**	.127**	.127**	.140**	.161**	.148**	.109**	.087**	.093**	.063**	.071**	.443**	1.000	
DEC3	.050	.073**	.065**	.095**	.111**	.170**	.132**	.140**	.172**	.161**	.128**	.124**	.125**	.084**	.082**	.397**	.612**	1.000

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## **5.5 Statistical Techniques and Procedures**

The current study obtained a combination of several variables that could not be measured directly (unobservable or latent variables). The measurement scale used ordinal coding from 1 (the lowest code) to 4 or 5 (the highest code). However, ordinal scales such as Likert scales, which are commonly used within a SEM context, can approximate an interval-level measurement, and the corresponding variables can be used in SEM.

According to Hair et al. (2017), considerations in using SEM depend on whether we have composite variables (combinations of several variables) (Hair et al., 2010) or assign a number of measurements to a variable based on a set of rules (Hair et al., 2016). In addition, it depends on the type of measurement scales, which refer to nominal, ordinal, interval and ratio scales and the coding scheme. However, data distribution is the way answers to questions are distributed across the response categories. It is a symmetric curve around the mean value. Normal distributions are desirable with CB-SEM. In contrast, PLS-SEM makes no such assumptions about the data distributions (Hair et al., 2017).

## **5.6 Structural Equation Modeling (SEM)**

### **5.6.1 Introduction**

SEM is “*a family of statistical models that seek to explain the relationships among multiple variables*” (Hair et al., 2010; 634). Also, it is defined as “*a collection of statistical techniques that allow a set of relationships between one or more independent variables, either continuous or discrete, and one or more dependent variables, either continuous or discrete, to be examined*” (Tabachnik & Fidell, 2014; 731). Both independent and dependent variables can be either factors or measured variables. Therefore, it is a statistical model similar to a series of multiple regression equations, as

it examines the structure of interrelations described in a series of equations. These equations involve all of the relationships among the independent and dependent constructs under consideration (Hair et al., 2010).

Constructs are unobservable or latent factors represented by multiple variables representing a factor in factor analysis. Hence, SEM is a combination of both factor analysis and multiple regression analysis. It is also known by many names, such as covariance structure analysis and latent variables, as well as concerning the software package used (e.g., LISREL, AMOS or PLS model) (Hair et al., 2010). Furthermore, causal analysis, causal modelling, path analysis, simultaneous equation modelling, and confirmatory factor analysis (CFA) are different types of SEM (Tabachnick & Fidell, 2014). The number of independent and dependent variables, in addition to the nature of the relationships between them, play a double role in a SEM model, which means, unlike linear regression, the SEM can capture all relationships in one regression rather than two or more regressions. It is among the most useful advanced statistical analysis techniques that have emerged in the social sciences in recent decades (Hair et al., 2017).

However, there are theoretical and practical limitations to SEM. Theoretical issues include that researchers should have prior knowledge of, or hypotheses about, potential relationships among variables, as SEM planning is driven by theory or hypotheses. The practical issues refer to sample size, missing data, outliers, as well as multivariate assumptions, such as normality, linearity, multicollinearity and singularity (Tabachnick & Fidell, 2014).

In summary, SEM combines aspects of factor analysis and regression, enabling the researcher to simultaneously assess the measurement model (relationships among

measures and latent variables); and assess the structural model (the relationships between latent variables) (Hair et al., 2017). Statistical analysis tools have been used by social science researchers to develop, explore and confirm research findings. The first generation statistical methods, such as exploratory method (e.g., cluster analysis, EFA and multidimensional scaling) and confirmatory method (e.g., analysis of variance, logistic regression, multiple regression and confirmatory factor analysis) dominated the research landscape through the 1980s. The second generation methods such as SEM have expanded rapidly since the early 1990s to overcome the weaknesses of first –generation methods (Hair et al., 2017).

### **5.6.2 CB-SEM and PLS-SEM**

There are several approaches to conducting SEM, but the most widely applied method is CB-SEM. It was introduced by Karl Jöreskog in 1973 (Jöreskog & Wold, 1982) and used to confirm or reject theories. In contrast, PLS-SEM is primarily used to develop theories in exploratory research. It focuses on explaining the variance in the dependent variables when examining the model, in other words, which independent variables are better predictors of the dependent variables (more exploratory) (Hair et al., 2017).

The predominance of well-known software tools that perform CB-SEM, such as AMOS and LISREL, led to a lack of awareness of the composite-based PLS-SEM approach as a very useful alternative approach to SEM. PLS-SEM was created first by the econometrician Herman Wold (1966) and further developed in the years after. It has several advantages and should not be viewed as a less stringent alternative to CB-SEM, but rather as a complementary modelling approach to SEM (Chin & Newsted 1998; Hair et al., 2017; Barclay et al., 1995).

### **5.6.3 The Difference between CB-SEM and PLS-SEM**

It is important to highlight and understand the difference between the CB-SEM and PLS-SEM techniques in order to select the correct method. Each is appropriate for a particular research context. These two set of techniques differ based on estimation method, and researchers do not have to favour one technique over the other. Therefore, the purpose of differentiating between CB-SEM and PLS-SEM methods is to describe their relevance within the current study by focusing on the characteristics and objective of each technique. For example, CB-SEM most commonly applies the maximum likelihood (ML) estimation method in order to compare the observed and estimated covariance matrix (Hair et al., 2010). It aims to test theory and is poorly suited to situations that lack fulfilment of particular assumptions related to multivariate normality, large sample sizes and well-specified models to achieve goodness-of-fit. It is accepted as a fit-model in general (Hair et al., 2010; Tabachnick & Fidell, 2014). However, CB-SEM has some disadvantages, and one of them is that the model does not always produce interpretable outcomes, which poses the requirement of modifying the model or reassessing the theory under consideration (Chin & Newsted 1998; Henseler et al., 2009). In contrast, PLS-SEM is a variance-based technique that most commonly applies the ordinary least squares (OLS) (i.e. factor analysis combined with path difference) as estimation method to explain the total variance. It is unlike CB-SEM, which estimates the variance of all the observed variables at the same time, PLS-SEM analyses on construct at a time in order to minimise the residual variance of all the dependent variables. Consequently, it has the ability to deal with non-normally distribution sample and with small sample (Barclay et

al., 1995; Chin, 1998; Gefen et al., 2000). Appendix 20 summarises the differences between CB-SEM and PLS-SEM.

#### **5.6.4 Sample Size Considerations for SEM**

SEM requires a larger sample relative to other multivariate approaches (Hair et al., 2010). SEM is less stable with small sample as it is based on covariance, which like correlations, (Tabachnick & Fidell, 2014). For that reason, the sample size is considered as an important issue in the applications of SEM. It provides a basis for the estimation of sampling error (Hair et al., 2010). However, there is no absolute sample size limit identified by literature, but some considerations should be taken into account. According to Hair et al. (2010) a small sample size (100-150) is accepted with simple model that has communality higher than 0.6. It can be considered that sample size is associated negatively with modest communality and associated positively with complex models that include more constructs. For example, models having more than six constructs and low communality (lower than 0.45) require samples above 500.

On the other hand, PLS-SEM has the ability to deal with small samples as it has higher levels of statistical power (Hair et al., 2017); minimal recommendations range from 30 to 100 cases as its power analysis is based on the portion of the model with the largest number of predictors (Hoyle, 1999). However, in this research, the total sample is sufficient to use SEM (2235 CAEs), which increases the consistency of PLS-SEM estimations.

### **5.6.5 Rationale for Selecting PLS-SEM**

Researchers should apply the SEM technique that best suits their research objective, data characteristics, and model setup (Roldán & Sánchez-Franco, 2012). CB-SEM and PLS-SEM differ from a statistical point of view, are designed to achieve different objectives, and rely on different philosophies of measurement. Neither one of them is appropriate for all situations, and neither technique is superior to the other. However, there are four critical issues relevant to the application of PLS-SEM (Hair et al., 2011; Hair et al., 2012a; Ringle et al., 2012): (1) the data, (2) model properties, (3) the PLS-SEM algorithm, and (4) model evaluation issues. First, the researcher should assess the data characteristics related to sample size, distribution, missing values and scale of measurement. In this study, the obtained data (the CBOK 2015 data) is large enough to increase the consistency of PLS-SEM estimations, as PLS-SEM achieves high levels of statistical power with small sample sizes. In addition, the CBOK data fail to meet the normality assumption, as discussed previously in section 5.2.5 and PLS-SEM is a non-parametric method, which makes no assumption about normal distribution. It provides precise estimates in such non-normal data (Cassel et al., 1999; Reinartz et al. 2009). For example, PLS-SEM has the ability to underestimate structural model relationships (Dijkstra, 1983), when highly skewed data inflate bootstrap standard errors (Hair et al., 2012c). In addition, missing values are below 10% in the obtained data and PLS-SEM is highly robust as long as missing values are below a reasonable level. Furthermore, the scale of study measurements is ordinal, and PLS-SEM works with quasi-metric (ordinal) scaled data. Furthermore, secondary data typically collected without the benefit of a theoretical framework (i.e. not a good match for CB-SEM analysis as it needs a high-quality



developed manifest variables), and Ringle et al. (2012) stated that PLS-SEM could indeed be a “silver bullet” when using secondary data.

Second, model characteristics include the evaluation of the number of items in each construct, relationships between constructs and their indicators, model complexity and model setup. One of the main advantages of PLS-SEM is that it can easily incorporate reflective and formative measurement models, and this is exactly what the author needed to analyse the obtained models. CB-SEM can apply formative measures, but requires construct specification modifications (it must include formative and reflective indicators to meet identification requirements). In addition, additional advantages of PLS-SEM are that it can handle constructs measured with single and multi-item measures and complex models with many structural model relations. In this study, there were no single-items constructs, and the obtained models are not that very complicated.

Third, with large sets of data, the PLS-SEM algorithm converges after a few iterations to the optimum solution (efficient algorithm) and minimises the amount of unexplained variance. Constructs are viewed as proxies of the latent concept under investigation, represented by composite variables. In addition, construct scores are determinate, estimated as linear combinations of their indicators and not affected by data inadequacies. Furthermore, in PLS-SEM structural models relationships are generally underestimated, and measurement model relationships are overestimated when estimating data from common factor models; also, parameter estimates are consistent in general, and PLS-SEM has a higher level of statistical power than CB-SEM. This means that, in a situation when there is in fact a significant relationship between investigated factors; PLS-SEM is more likely to indicate that relationship as significant. However, there is no practical difference

between PLS-SEM and CB-SEM parameter accuracy when the measurement models have four or more indicators and indicator loadings meet the common standards ( $>$  or  $=$  0.7) (e.g., Reinartz et al., 2009; Thiele et al., 2015). Thus, the discussion of PLS-SEM bias is of no practical relevance for the vast majority of applications (Astrachan et al., 2014).

Finally, there are two limitations of the PLS-SEM framework. First, it cannot be applied when structural models contain circular relationships (causal loops) between constructs (latent variables). Thus, no circular relationships are allowed in the current study's structural model. Second, PLS-SEM does not have an established global goodness-of-fit measure, as it is applied for theory testing, not confirming. However, researchers have tried to improve goodness-of-fit measures. For instance, Henseler et al. (2014) started developing the standardised root mean square residual (SRMR) to validate the model. This means SRMR measures the squared discrepancy between the observed correlations and the model-implied correlations. The result of SRMR is discussed in the evaluation of the structural model (Chapter 6.3).

In summary, justifications for adopting PLS-SEM are threefold: first, in general, SEM has been little used in internal audit research. However, PLS-SEM has been widely accepted and used in various business disciplines, such as, accounting (Lee et al., 2011); operations management (Peng and Lai, 2012); strategic management (Hair et al., 2012b); and marketing (Hair et al., 2012c). The second reason for adopting PLS is based on the characteristics of the obtained data and models. For instance, during the screening and data preparation process (section 5.2.5) normal distribution was not tenable. Therefore, it is not logical to apply CB-SEM to examine the structural models due to the potential

threat that the model might fail to converge without achieving the normality requirement (Tabachnick and Fidell, 2014; Hair et al., 2010). In contrast, PLS-SEM has the ability to handle extremely non-normal data (e.g., a high level of skewness). Finally, the information construct (technical expertise) in the two models is formative and PLS-SEM can handle reflective and formative measurement models without additional requirements or constraints (Hair et al., 2017).

The computer software used to analyse data was Smart-PLS version 3.2.6, which was developed by Smart PLS GmbH ([www.smartpls.de/](http://www.smartpls.de/)). Smart-PLS 3 is '*a milestone in latent variable modelling. It combines state of the art methods (e.g., PLS-POS, IPMA, complex bootstrapping routines) with an easy to use and intuitive graphical user interface*' (Hair, 2017<sup>12</sup>)

### **5.6.6 Partial Least Squares (PLS)**

PLS path modelling is a variance-based (component-based) method to estimate composite-based path models (Hair et al., 2017). Path models are diagrams that describe the hypotheses and variable relationships when SEM is applied (Hair et al., 2011; Hair et al., 2016). PLS-SEM has the ability to map paths to many dependent variables in the same research model and analyse all paths in the structural model simultaneously rather than one at a time (Barclay et al., 1995).

A path model contains constructs, indicators and arrows. Constructs are variables that are not directly measured. In the current study models they are presented in the model as

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<sup>12</sup> Available at: <http://www.smartpls.de/>

information, perception, judgment and decision construct. The measures or indicators (called items or manifest variables) are the directly measured proxy variables that contain the raw data. They are presented in the current study models as rectangles. Finally, arrows show the relationships between constructs as well as between constructs and their measures (Hair et al., 2017).

The relationship between constructs refers to the structural model, also called the inner model, in the context of PLS-SEM (e.g., the relationships between information, perception, judgment and decision in this study). The relationships between constructs and their indicators refer to the measurement model, also called the outer model (e.g., the relationships between the technical expertise construct and the three measures; the relationship between the governance review and IT risk and cybersecurity constructs and their measures). Measurement models are classified into exogenous latent variables and endogenous latent variables. Exogenous latent variables are independent constructs or those constructs that explain other constructs in the model. In the current study technical expertise and the CAEs perception construct are mutually interdependent and they are exogenous variables. Endogenous latent variables are dependent variables, these constructs that are being explained in the model. In the current study, judgment and decision are endogenous constructs. Finally, error terms represent the unexplained variance when path models are estimated and are connected to the endogenous constructs that reflectively measured. In contrast to formative constructs, exogenous and single-item constructs do not have error terms (Hair et al., 2017).

## **5.7 Summary of the Chapter**

This chapter described the screening and preparation of the data. Missing values and outliers were tested and treated. Kolmogorov-Smirnov and Shapiro-Wilk tests were performed for all variables; in addition, histograms were produced to test the normality assumption. It was reported that the normality assumption was violated, which justifies the selection of non-parametric statistical techniques. Furthermore, descriptions were provided of respondents' and organisations' characteristics, followed by the conducting of EFA in order to extract variables. Finally, SEM was discussed, including the difference between CB-SEM and PLS-SEM and the rationale for selecting PLS-SEM in this study to analyse the data. The statistical outcome of PLS-SEM will be reported in the next chapter.

# Chapter 6 Evaluation of PLS-SEM Results

## 6.1 Introduction

After preparing the data as described in chapter 5, and indicating the rationale for using PLS-SEM (section 5.6.4), it was time to evaluate the specified measurement and structural models in order to evaluate their validity and reliability. Path models result from the application of SEM when examining variables' relationships. They are like a diagram that displays research hypotheses (Hair et al., 2011). A PLS path model consists of two elements: first, the structural model (inner model), which defines the relationship (paths) between the constructs; second, the measurement model (outer model), which defines the relationships between the constructs and the measures (Hair et al., 2017).

The remainder of this chapter is divided into five major sections. Section 6.2 explains the ground evaluation for PLS-SEM by using Smart PLS 3. The evaluation section addresses the assessment of the reflective and formative measurements models. In order to test the research hypotheses and understand the overall relations among the study measures (research model A depicted in Figure 3.3, and research model B depicted in Figure 3.4) simultaneously (Chin et al., 2003), the structural models with substantive relations between information, perception, judgment and decision were evaluated in section 6.3. Research models involve multiple latent constructs with multiple measures. Also, PLS is a latent SEM approach that imposes minimal restrictions on measurement scales and residuals distributions (Ringle et al., 2012). ). Furthermore, this research aims to explore the interrelationships among investigated factors. Goodhue et al. (2012; p. 981) compared between PLS, multiple regression and LISREL in terms of accuracy and statistical power. They resulted to that *“PLS performed as effectively as the other techniques in detecting*

*actual paths, and not falsely detecting non-existent paths*". A bootstrapping re-sampling procedure is used in order to estimate path coefficients and factor loadings in the proposed research models (Chin, 1998). This includes the tests for the first six hypotheses. The testing and results of the remaining six hypotheses, related to the boundary span of knowledge and geographical regions, are presented in sections 6.4 and 6.5 respectively. Appendix 21 shows the systematic evaluation of PLS-SEM results as depicted by Hair et al. (2017).

## **6.2 Evaluation of the Measurement Models**

PLS-SEM is a non-parametric technique that uses procedures such as bootstrapping and blindfolding. It provides evaluation criteria related to the measurement and structural model results. Model assessment focuses on the measurement models to evaluate the reliability and validity of the construct measures (items) (Hair et al. 2017). In this study, information, perception, judgment and decision constructs (see Table 5.18 in the previous chapter) were captured by multi-item measures in both research models. The logic of using several items to measure a particular concept is that it is more likely to capture all the varied aspects of that concept (Hair et al. 2017).

In these models, the **information stage** consists of one construct measured by three formative indicators related to internal audit department competency (EXP1, EXP2, and EXP3). According to the IIA's global internal audit competency framework (IIA, 2013b), these three indicators cause the measurement of the construct. Consequently, the direction of the arrows, unlike reflective measures, is from the measures to the construct. However, the **perception stage** differs between model A and model B, where two latent constructs

formed the perception stage: Model A captures the extent of internal audit activities related to governance review (GOV1, GOV2, GOV3, and GOV4); Model B captures the extent of internal audit activities related to IT risk and cybersecurity (ITS1, ITS2, ITS3, ITS4, ITS5, ITS6, and ITS7). Five indicators were used to measure the CAE's **judgment** about the extent of using IT tools and techniques to process internal audit activities (ITU1, ITU2, ITU3, ITU4, and ITU5). Finally, the **decision stage** related to the CAEs' reporting relationships was measured by three indicators: reporting line authority (DEC1), appointment authority (DEC2), and evaluation authority (DEC3).

PLS-SEM handles reflective and formative measurement models easily. It has the ability to render a specific association significant as long as there is, in fact, a significant relation in the population. Reflective and formative measures require different evaluation measures because they are based on different concepts. The following subsections will discuss the reflective and formative measurement models in more details. Smart-PLS 3 was used to evaluate the reliability, and validity of the research models' constructs.

## **6.2.1 Reflective Measurement Models**

Evaluation criteria related to reflective measurement models begin with internal consistency, convergent validity and discriminant validity.

### ***6.2.1.1 Internal Consistency***

The first criterion is to assess internal consistency reliability and this can be obtained by looking at both Cronbach's alpha and composite reliability. Cronbach's alpha assumes that all the indicators have equal outer loadings on the construct (equally reliable), and is considered to be a conservative measure as it is sensitive to the number of items in the



scale. Composite reliability is an alternative measure that takes into account the different outer loadings of indicator variables. However, as shown in Table 6.1, both Cronbach's alpha and composite reliability in both models have values above 0.70 (see Fornell & Larcker 1981), the benchmark level suggested by Nunnally (1978). Hence, the measurements' reliability is achieved.

### 6.2.1.2 Convergent validity

The second criterion is convergent validity on the construct level, which is commonly established by the Average Variance Extracted (AVE) measure. It measures the extent of correlations between different measures of the same construct: "*the average variance shared between the construct and its indicators is larger than the variance shared between the construct and other constructs*" (see Rodgers et al., 2013; 614). As a rule of thumb, a construct should explain at least 50% of each indicator's variance (Hair et al., 2017), which means that an indicator's outer loading should be above 0.7 if it squared. In the smart PLS result, AVE values are above 0.50, (ranging between 0.569 and 0.706), meaning each construct explains more than half of the variance of its indicators (see Table 6.2).

**Table 6-1: Quality Criteria**

		<i>R Square</i>	<i>R Square Adjusted</i>	<i>Average Variance Extracted (AVE)</i>	<i>Composite Reliability</i>	<i>Cronbach's Alpha</i>
<b>Model A</b>	<b>EXP</b>	-	-	-	-	-
	<b>GOV</b>	-	-	0.569	0.841	0.730
	<b>ITU</b>	0.169	0.168	0.705	0.923	0.892
	<b>DEC</b>	0.037	0.036	0.642	0.842	0.720

		<i>R Square</i>	<i>R Square Adjusted</i>	<i>Average Variance Extracted (AVE)</i>	<i>Composite Reliability</i>	<i>Cronbach's Alpha</i>
<b>Model B</b>	<b>EXP</b>	-	-	-	-	-
	<b>ITS</b>	-	-	0.661	0.932	0.912
	<b>ITU</b>	0.251	0.250	0.706	0.923	0.892
	<b>DEC</b>	0.036	0.036	0.643	0.842	0.720

### 6.2.1.3 Discriminant Validity

The final quality criterion is assessing discriminant validity through cross loading, the Fornell-Larcker criterion and Heterotrait-Monotrait Ratio (HTMT). The presence of cross loadings that exceed the indicators' outer loadings represents a discriminant validity problem (Hair et al. 2017). Appendix 22 shows that there is no cross loading between variables in both models. Additionally, Chin (1998) and Chin et al. (2003) considered that convergent and discriminant validity are inferred if the square root of each construct's AVE is larger than its correlations with other constructs. Appendix 23 represents the Fornell-Larcker criterion, and there is no violation of discriminant validity (Hair et al. 2017).

The final quality criterion is assessing discriminant validity through the Heterotrait-Monotrait Ratio (HTMT). The confirmatory factor analysis (CFA) procedure in PLS was performed. Appendix 24 shows that the HTMT confidence interval does not include 1 (Hair et al., 2017). This is an examination of correlations of measure loadings on constructs. The result illustrates that in both research models, no indicator loads more highly on another construct. Thus, according to the above discussion of quality criteria, it can be concluded that the constructs are measured with sufficient precision; that is, the reflective measurement models are both reliable and valid.

## **6.2.2 Formative Measurement Models**

Reflective measurement quality criteria cannot be applied to formative measurement models. This is because of the error free assumption related to formative measurement (Diamantopoulos, 2002; Edwards & Bagozzi, 2000), which means the internal consistency reliability concept is inappropriate to evaluate formative measurements. Moreover, assessing convergent and discriminant validity for formative measurements does not have any meaning (Chin, 1998). Therefore, content validity should be established to ensure that all or at least the major facets of the construct are captured by the formative measures. Content validity issues are addressed by the content specification for the domain of the construct that the indicators are intended to measure. Formative measurement models can be evaluated by assessing the measures' convergent validity, indicators' collinearity, and analysing the significance and relevance of formative measures.

### *6.2.2.1 Convergent Validity*

The first assessment is convergent validity, which is defined as the degree of statistical correlation between two or more measures of a construct. It is also known as redundancy analysis (Chin, 1998). Convergent validity needs to be taken into consideration before collecting the data or even during the research design phase. Therefore, the researcher should include formative and reflective measures for the same construct to evaluate measures' convergent validity. Usually, formative constructs (exogenous latent variables) predict reflective ones (endogenous latent variables). Convergent validity is assessed by the strength of the path coefficient between formative and reflective measures for the same construct. Unfortunately, the CBOK 2015 survey does not include such reflective

indicators that enable the researcher to test whether the EXP formative and reflective measures are highly correlated with each other. Consequently, convergent validity cannot be verified.

#### 6.2.2.2 Collinearity Issues

The second assessment is collinearity issues. High correlations between reflective measures are expected, unlike formative measures. However, the variance inflation factor (VIF) is used to assess formative measures' collinearity. VIF is known as the reciprocal of the tolerance. The tolerance value should be higher than 0.20, and a VIF value should be lower than 5 to avoid a potential collinearity problem (Hair et al., 2011). A VIF value level of 5 indicates that *"80% of an indicator's variance is accounted for by the remaining formative indicators associated with the same construct"* (Hair et al., 2017; 144). With a high VIF value of 5 or above, one of the corresponding indicators should be removed. The existence of collinearity problem can boost the standard errors, which decrease the ability to identify whether the estimated weights are significantly different from zero. In addition, may lead to incorrect estimation of weights or reverse their signs (Hair et al., 2017).

However, Appendix 25 proves that there is no collinearity problem in the inner models (i.e., inner VIF values are between 1.034 and 1.297 in both models), while Appendix 26 shows there is no collinearity problem in the outer models (i.e., outer VIF values are between 1.24 and 3.42 in both models). Finally, Appendix 27 confirms that there is no collinearity problem between the three formative measurements for the EXP construct in the two models (i.e., there is no VIF value higher than 5).

### 6.2.2.3 Significance and Relevance of Outer Weights

Since there are no critical levels of collinearity higher than 5, the analysis of outer weights' significance level is the last required assessment for formative measurements. The outer weights are the result of a multiple regression (Hair et al., 2010). The key point is to find out whether formative indicators truly contribute to forming the construct. In Bootstrapping, about 5000 subsamples are randomly drawn, replaced and repeated in order to estimate the model. In order to assess each indicator weight's significance t value is calculated. In addition, the indicator weights are used to derive standard errors for the estimates.

Appendix 28 illustrates that both EXP1 & EXP2 recorded significant p values, which means they contribute to forming the EXP construct, whereas EXP3 is not significant in both models. However, Hair et al. (2017; 147) argued that "*non-significant indicator weights should not automatically be interpreted as indicative of poor measurement model quality*". Researchers should consider the absolute contribution of each formative indicator to its construct. The absolute contribution is given by the formative indicator's outer loading (e.g., above 0.50). Outer loadings stem from single regressions of each indicator on its corresponding construct (in PLS-SEM, bivariate correlation between each indicator and the construct). Appendix 29 shows that the outer loading is higher than 0.50 in both models, which means all the three formative indicators are important and should be retained. Although EXP3's outer weight is not significant, it explains more than 77% of the main construct (EXP construct) in both models.

### 6.3 Evaluation of the Structural Model

After evaluating the measurement model (formative and reflective measurements), the structural model should be evaluated. It should be known that PLS-SEM is different from CB-SEM as it is based on different statistical objective when estimating model parameters, i.e. it is based on maximising the explained variance, while CB-SEM is based on minimising the differences between covariance matrices. As a result of that, goodness-of-fit measures associated with CB-SEM (e.g., chi-square ( $\chi^2$ ) statistic or the various fit indices) cannot be transferred to PLS-SEM (Hair et al., 2017; Shmueli, 2010). There are several measures to evaluate the PLS-SEM-based model fit (e.g., SRMR, RMS and exact fit test), but they are in their early stages of development, and it has been suggested that such statistics should not be routinely used in the context of PLS-SEM (Hair et al., 2017). Therefore, rather than testing the overall goodness-of-fit, some heuristic criteria are assessed to evaluate the structural model in PLS and find out how well the models predict the endogenous constructs (Sarstedt et al., 2014). However, it is possible to present the result of SRMR as Henseler et al. (2014) accepted it as a measure for goodness of fit. Appendix 30 shows the results of SRMR, which shows a value lower than 0.10 or 0.08 (in a more conservative version; see Hu and Bentler, 1999), which is considered a good fit.

Hair et al. (2017) suggested five key criteria can indicate the quality of obtained structural models. They begin with the coefficients of determination ( $R^2$  values) and the significance level of the path coefficients, followed by assessing the effect size  $f^2$ , the predictive relevance  $Q^2$ , and the  $q^2$  effect size. All of these five key criteria will be evaluated in

details in the following subsections. However, it is essential to examine the structural model for collinearity first. The reason is that if the estimation involves significant levels of collinearity among the predictor constructs the path coefficients result might be biased. Structural models in PLS are based on multiple regression, through OLS regression of each endogenous latent variable on its corresponding predecessor constructs. In this study, there is no critical level of collinearity higher than 5, as presented in the evaluation of measurement models (See section 6.2.2.2).

### **6.3.1 Coefficients of Determination ( $R^2$ )**

R-squared ( $R^2$ ) is a measure of the model's predictive accuracy, which explains the variance of endogenous latent constructs.  $R^2$  values are normed between 0 and 100%. Generally, the higher  $R^2$  value is, the better the model fits the data. With multiple regression, the adjusted  $R^2$  can be used to avoid bias toward complex models. However, in this study there is no big difference between  $R^2$  and adjusted  $R^2$  values. Figure 6.1 shows that 16.9% of CAEs' judgment variance for Model A and 25.1% of CAEs' judgment variance for Model B are explained by their perception and information constructs. Furthermore, 3.7% of the CAEs' reporting relationship is explained by their perception and judgment for model A and 3.6% for model B. These values are not high enough to confirm model accuracy.

However, Hair et al. (2017) suggested that  $R^2$  values of 20% are high in some disciplines, such as studies measuring human behaviour. In addition, selecting a model based on the  $R^2$  value is not a good approach, because researchers' concern to obtain higher  $R^2$  values may lead to inherent bias toward selection of models with many exogenous (non-

significant) constructs. Furthermore, Frost (2013) claims that it is possible to have low  $R^2$  values in a good model. Therefore, researchers should not consider  $R^2$  as the only basis to evaluate a structural model that measures human perception and judgments. Consequently, the level and significance of the path coefficients were used to evaluate the research models.

### **6.3.2 Significance of the Path Coefficient**

PLS-SEM relies on a non-parametric bootstrap procedure as it does not assume normality of the data (Davison & Hinkley, 1997; Efron & Tibshirani, 1986). Bootstrapping replaces a subsample from the original sample and repeats the procedures many times. As a rule, 5000 bootstrap samples are recommended. That is, 5000 PLS path models are estimated. In addition, the confidence level (e.g., 95%) is considered satisfactory as it represents the value probability range (the lower and upper values) that implies confidence intervals or the true population parameters. For example, a 95% confidence interval would include the true population parameters. Appendix 31 shows the three accepted significant levels. In PLS-SEM the signs of the latent variable scores are indeterminate, which may change the t value. The no sign change option was selected to run bootstrapping in order to accept the negative impact of sign changes on the results for the empirical t value. However, in practice, there is no big difference between the results of the three options, but the no sign changes option is recommended because it results in the most conservative outcome.

In this research, the structural models predict that the CAE's evaluation begins with a mental integration of the current situation of IAF (i.e., technical expertise competency) and its possible interaction with the CAE's perceptions related to internal audit activities



(e.g., governance review & IT risk and cybersecurity). This integration between information and perception leads to the CAE's judgment stage (i.e., the use of IT). In the final stage, both perception and judgment lead to the CAE's final decision (i.e., the CAEs reporting relationship with the appropriate authority).

The smart-PLS simultaneous analysis allows us to interpret how the CAEs integrated the information about the competency of IAF, which may be driven by their perception of internal audit activities. Table 6.2 shows the result of path coefficients for the total sample (2235 CAEs). Overall, the CAEs follow different decision-making pathways depending on the internal audit competency, activities and the extent of using technology tools. The model results seem to be consistent with the researcher's assumptions (i.e., hypotheses 1 to 6) that the CAE's assessment of the IAF technical competency and governance review ( $r1 = 0.184$ ) and IT risk and cybersecurity activities ( $r2 = 0.272$ ) are correlated (I  $\leftrightarrow$  P).

Significant pathways and correlations are described in Figure 6.1 for model A and Model B. CAEs' perception about the extent of governance review and IT risk and cybersecurity activities have direct impact on their reporting relationships (decision stage) (i.e., **H1**:  $\beta_1 = 0.149$ ,  $p < 0.01$ ; **H2**:  $\beta_2 = 0.157$ ,  $p < 0.01$ ) (**P**  $\rightarrow$  **D**); as well as the CAEs' judgment stage (i.e., **H3**:  $\beta_3 = 0.314$ , **H4**:  $p < 0.01$ ;  $\beta_7 = 0.437$ ,  $p < 0.01$ ). Hence, there is a relationship between the extent of IAF activities and the extent of using IT tools and techniques, which influences the CAE's reporting decision (i.e., **H5**:  $\beta_6 = 0.080$ ,  $p < 0.01$ ; **H6**:  $\beta_8 = 0.056$ ,  $p < 0.05$ ) (**P**  $\rightarrow$  **J**  $\rightarrow$  **D**).

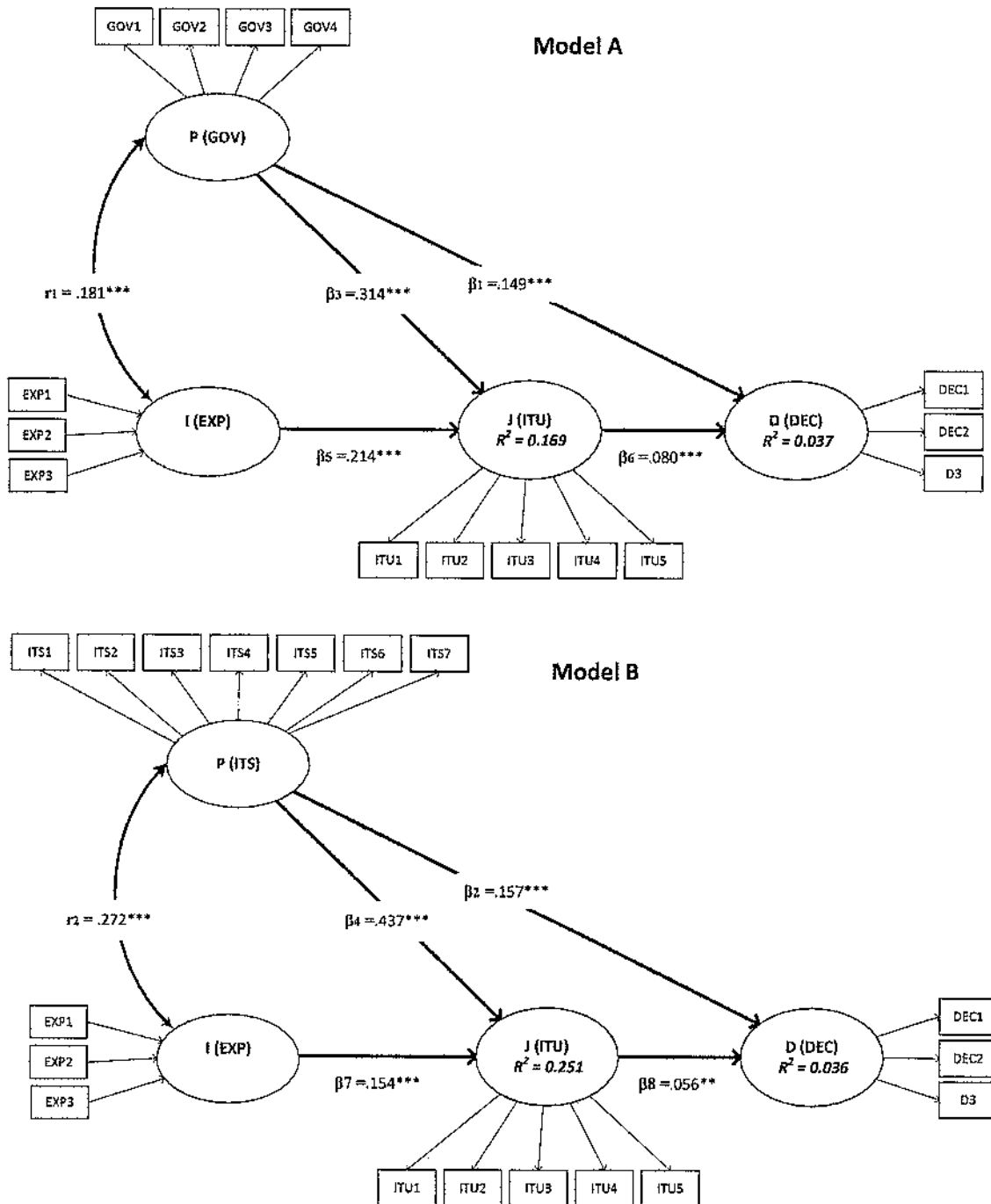
In addition, technical expertise competency has direct impact on the judgment stage (i.e.,  $\beta_5 = 0.214, p < 0.01$ ;  $\beta_7 = 0.154, p < 0.01$ ). That is, there is a relationship between IAF technical competency and the extent of using IT tools and techniques, which influences the CAEs reporting decision (**I → J → D**).

Finally, Table 6.3 shows the results of indirect effects of information and perception on the decision stage in model A and model B. In addition, Table 6.4 shows the result of the total effect for each pathway. It can be seen that in both models, both indirect and total effect are significant, with p-value  $< 0.01$  &  $0.05$ .

**Table 6-2: Path Coefficients**

		<i>Original Sample</i>	<i>Sample Mean</i>	<i>Standard Deviation</i>	<i>T Statistics</i>	<i>P Values</i>
<b>Model A</b>	<b>GOV → DEC</b>	0.149	0.150	0.022	6.711	0.000
	<b>GOV → ITU</b>	0.314	0.314	0.020	15.386	0.000
	<b>EXP → ITU</b>	0.214	0.216	0.019	11.172	0.000
	<b>ITU → DEC</b>	0.080	0.080	0.023	3.537	0.000
<b>Model B</b>	<b>ITS → DEC</b>	0.157	0.158	0.024	6.437	0.000
	<b>ITS → ITU</b>	0.437	0.436	0.019	22.880	0.000
	<b>EXP → ITU</b>	0.154	0.156	0.018	8.337	0.000
	<b>ITU → DEC</b>	0.056	0.056	0.024	2.303	0.021

**Figure 6-1: Significant Paths and Correlations Coefficients for Model A and Model B**



Effect \*significant at  $p < 0.1$ ; \*\*significant at  $p < 0.05$ ; and \*\*\*significant at  $p < 0.01$ . Bidirectional arrows are comparable to correlation coefficients ( $r$ ); unidirectional arrows are similar to regression coefficients ( $\beta$ ).

**Table 6-3: Indirect Effects**

<i>Indirect effects</i>		<i>Original Sample</i>	<i>Sample Mean</i>	<i>Standard Deviation</i>	<i>T Statistics</i>	<i>P Values</i>
<b>Model A</b>	<b>GOV -&gt; DEC</b>	0.025	0.025	0.007	3.436	0.001
	<b>EXP -&gt; DEC</b>	0.017	0.017	0.005	3.285	0.001
<b>Model B</b>	<b>ITS -&gt; DEC</b>	0.024	0.024	0.011	2.281	0.023
	<b>EXP -&gt; DEC</b>	0.009	0.009	0.004	2.159	0.031

**Table 6-4: Total Effects**

<i>Total effects</i>		<i>Original Sample</i>	<i>Sample Mean</i>	<i>Standard Deviation</i>	<i>T Statistics</i>	<i>P Values</i>
<b>Model A</b>	<b>GOV -&gt; DEC</b>	0.174	0.175	0.020	8.558	0.000
	<b>GOV -&gt; ITU</b>	0.314	0.314	0.020	15.386	0.000
	<b>EXP -&gt; DEC</b>	0.017	0.017	0.005	3.285	0.001
	<b>EXP -&gt; ITU</b>	0.214	0.216	0.019	11.172	0.000
	<b>ITU -&gt; DEC</b>	0.080	0.080	0.023	3.537	0.000
<b>Model B</b>	<b>ITS -&gt; DEC</b>	0.182	0.183	0.021	8.705	0.000
	<b>ITS -&gt; ITU</b>	0.437	0.436	0.019	22.880	0.000
	<b>EXP -&gt; DEC</b>	0.009	0.009	0.004	2.159	0.031
	<b>EXP -&gt; ITU</b>	0.154	0.156	0.018	8.337	0.000
	<b>ITU -&gt; DEC</b>	0.056	0.056	0.024	2.303	0.021

In order to test the influence of the missing values on the path coefficients results for both models, the casewise deletion was selected to remove all cases that included missing values from the analysis (Hair et al., 2017). Bootstrapping results do not appear to have different significant results between casewise and pairwise deletion (see Appendix 32). However, casewise deletion may lead to a systematic deletion for a particular group of respondents or diminish the number of observations. To avoid casewise issues, the pairwise deletion was selected, which includes all observations with complete responses in the calculation of the model parameters.

On the other hand, it is valuable to report the bootstrap confidence interval. Confidence intervals in the PLS-SEM context are based on the standard errors obtained from the bootstrapping procedure (Henseler et al., 2009). The following formula describes the lower and upper range of confidence interval:

*The lower bound is*

outer weight (w1) - 1.96 (confidence level 95%)\* sew1(standard error for outer weight)

*The upper bound is*

outer weight (w1) + (confidence level 95%)1.96 \* (standard error for outer weight) sew1

Outer weight is considered to be significant as long as the confidence interval does not include zero value (Hair et al., 2017). Table 6.5 shows the range of the confidence interval for each pathway. For example, it can be seen that the population value of outer weight for EXP → ITU will be somewhere in between 0.178 and 0.254 in model A. In addition, the population value of outer weight for EXP → ITU will be somewhere in between 0.120 and 0.191 in model B.

**Table 6-5: Confidence Intervals**

		<i>Original Sample</i>	<i>Sample Mean</i>	<i>2.5%</i>	<i>97.5%</i>
<b>Model A</b>	EXP → ITU	0.214	0.216	0.178	0.254
	GOV → DEC	0.149	0.150	0.106	0.193
	GOV → ITU	0.314	0.314	0.273	0.353
	ITU → DEC	0.080	0.080	0.035	0.124
<b>Model B</b>	EXP → ITU	0.154	0.156	0.120	0.191
	ITS → DEC	0.157	0.158	0.112	0.205
	ITS → ITU	0.437	0.436	0.398	0.475
	ITU → DEC	0.056	0.056	0.009	0.104

### 6.3.3 Effect Size $f^2$

To evaluate whether the excluded construct has a substantive impact on the endogenous construct, a specified exogenous construct can be excluded from the model to identify the change in the  $R^2$  value. This measure refers to the  $f^2$  effect size (which allows assessing an exogenous variable). Theoretical bases for calculating  $f^2$  value is the following:

$$f^2 \text{ value} = (R^2 \text{ included} - R^2 \text{ excluded}) / (1 - R^2 \text{ included})$$

Guidelines for assessing  $f^2$  are that a value of 0.02 represents small effects of the exogenous latent variable, while 0.15 and 0.35 represent medium and large effects respectively (Cohen, 1988). It can be predicted that a low  $R^2$  value can generate very low impact on the endogenous construct when a specified exogenous construct is excluded. The  $f$  square statistical results are presented in Table 6.6, which shows that the EXP construct has small effects on the ITU construct in both models. Also, the GOV and ITS constructs have medium impacts on the ITU and small impact on DEC. Finally, the ITU recorded a very low  $f^2$  value on the DEC construct.

**Table 6-6:  $f$  Square**

		<i>ITU</i>	<i>DEC</i>
<b>Model A</b>	<b>EXP</b>	0.054	
	<b>GOV</b>	0.115	0.020
	<b>ITU</b>		0.006
		<i>ITU</i>	<i>DEC</i>
<b>Model B</b>	<b>EXP</b>	0.029	
	<b>ITS</b>	0.236	0.020
	<b>ITU</b>		0.003

### 6.3.4 Blindfolding and Predictive Relevance Q<sup>2</sup>

After examining the magnitude of the R<sup>2</sup> value, researchers should examine Stone-Geisser's Q<sup>2</sup> value (Geisser, 1974; Stone, 1974). This measure is an indicator of the model's predictive relevance for the inner model. Q<sup>2</sup> values for a certain reflective endogenous latent variable larger than zero indicate the path model's predictive relevance for this particular construct, while values of 0 and below indicate a lack of predictive relevance (Hair et al., 2017). Q<sup>2</sup> value can be measured by the blindfolding procedure in Smart PLS for a certain omission distance. The blindfolding procedure is applied to endogenous constructs that have a reflective measurement model or single-item constructs.

In the current research models, using the first approach, judgment scores can be predicted by using the available information for structural model (i.e.,  $ITU = P1^{13} * EXP + P2 * GOV$  or  $ITS$ ). The same can be applied to the decision construct to predict DEC scores. Consequently, predicted scores that result from a PLS-SEM algorithm are different from the scores that result from a blindfolding procedure, because of using the structural model estimates in the blindfolding procedure rather than those of the measurement model (Hair et al., 2017). In the second approach, the predictive scores for ITU and DEC are used to predict systematically omitted data points of their reflective indicators in the measurement model. The systematic pattern depends upon the omission distance. For example, the DEC construct has three omission distances (three indicators), and one of

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<sup>13</sup> P refers to structural model coefficients.

them is eliminated in a single blindfolding round each time. Therefore, three rounds are applied with the DEC construct and five rounds with the ITU construct; hence “*the number of blindfolding rounds always equals the omission distance*” (Hair et al., 2017; 203).

In the blindfolding setting window, an omission distance of 5 to 10 (the omission of between approximately 20% and 10% of the data points per blindfolding round) is suggested for most research (Apel & Wold, 1982; Hair et al., 2012c). The difference between the true values and the predicted values (the prediction errors) and the mean of the remaining data are then used to estimate the  $Q^2$  value (Chin, 1998).  $Q^2$  value can be calculated by the cross-validated redundancy or cross-validated communality approach. The cross-validated redundancy approach is recommended as it builds on the path model estimates of both the structural model and the measurement model. In contrast, the cross-validated communality approach uses only the construct scores estimated for the target endogenous construct to predict the omitted data points. Therefore, blindfolding was conducted with an omission distance of seven. Tables 6.7 and 6.8 show that  $Q^2$  values are higher than 0 for the two exogenous constructs and their indicators (ITU and DEC) in both models. This means the exogenous constructs have predictive relevance for the endogenous construct under consideration.

**Table 6-7: Construct Cross-validated Redundancy**

		<b>SSO</b>	<b>SSE</b>	<b><math>Q^2 (=1-SSE/SSO)</math></b>
<b>Model A</b>	<b>DEC</b>	6,705.000	6,558.401	0.022
	<b>ITU</b>	10,770.000	9,524.416	0.116
<b>Model B</b>	<b>DEC</b>	6,705.000	6,561.089	0.021
	<b>ITU</b>	10,770.000	8,886.798	0.175



**Table 6-8: Indicator Cross-validated Redundancy**

		SSO	SSE	Q <sup>2</sup> (=1-SSE/SSO)
<b>Model A</b>	<b>DEC1</b>	2,235.000	2,204.492	0.014
	<b>DEC2</b>	2,235.000	2,185.834	0.022
	<b>DEC3</b>	2,235.000	2,168.075	0.030
	<b>ITU1</b>	2,161.000	1,914.334	0.114
	<b>ITU2</b>	2,160.000	1,930.724	0.106
	<b>ITU3</b>	2,122.000	1,815.140	0.145
	<b>ITU4</b>	2,169.000	1,957.170	0.098
	<b>ITU5</b>	2,158.000	1,907.049	0.116
<b>Model B</b>	<b>DEC1</b>	2,235.000	2,203.433	0.014
	<b>DEC2</b>	2,235.000	2,183.824	0.023
	<b>DEC3</b>	2,235.000	2,173.833	0.027
	<b>ITU1</b>	2,161.000	1,788.090	0.173
	<b>ITU2</b>	2,160.000	1,779.834	0.176
	<b>ITU3</b>	2,122.000	1,728.890	0.185
	<b>ITU4</b>	2,169.000	1,785.930	0.177
	<b>ITU5</b>	2,158.000	1,804.054	0.164

### 6.3.5 Effect Size $q^2$

Similar to the  $f^2$  effect size approach for assessing  $R^2$  value, the relative impact of predictive relevance  $Q^2$  value can be compared by means of the measure of the  $q^2$  effect sizes as follows:

$$q^2 \text{ effect sizes} = (Q^2 \text{ included} - Q^2 \text{ excluded}) / (1 - Q^2 \text{ included})$$

Smart PLS software does not provide  $q^2$  effect sizes; thus this assessment was calculated manually. Table 6.9 summarises  $q^2$  effect size results for each construct. For example, the  $q^2$  effect size of GOV on DEC is -.01 and on ITU is 0.048 in both models. In addition, the  $q^2$  effect size of EXP on DEC is -0.021 and that on ITU is -.079 in model A and -

0.148 in Model B. However, the model's predictive relevance can be considered low in general.

**Table 6-9: q<sup>2</sup> Effect Sizes**

		<i>GOV</i>	<i>EXP</i>	<i>ITU</i>	<i>DEC</i>
<b>Model A</b>	<b>DEC</b>	-0.01	-0.021	-0.02	-
	<b>ITU</b>	-0.048	-0.079	-	-0.107
		<i>ITS</i>	<i>EXP</i>	<i>ITU</i>	<i>DEC</i>
<b>Model B</b>	<b>DEC</b>	-0.01	-0.021	-0.021	-
	<b>ITU</b>	-0.048	-0.148	-	-0.162

## 6.4 The Boundary Span of Knowledge

Bouwman (1984) examined the difference between experts' and novices' decision-making process in the context of a financial analysis task. He found that experts follow much more varied decision-making processes. Novices employ a passive, sequential strategy, and consider observed facts as the main problem, while experts rely on a structured checklist, which contains both standard and conditional questions, to guide the analysis. Experts employ some tools that are rarely used by novices. For example, they summarise groups of related findings, formulate hypotheses and use a list of typical problems.

In order to investigate the significant differences between the CAEs' perception regarding the extent of governance review and IT risk and cybersecurity activities, in addition, investigating the influence of the boundary span of knowledge on the ethical pathway of the CAEs reporting relationships, the researcher first split the total sample into two groups (high and low knowledge) depending on both their years of experience in internal audit

and their experience as CAEs. This was followed by some statistical techniques that helped to test the proposed hypotheses (H7, H8 and H9).

With normally distributed data, researchers usually use T-tests to compare the mean score between two sets of data. In addition, one-way analysis of variance (ANOVA) is similar to a t-test, but used when researchers aim to compare between two or more groups. However, in the current research, the normality assumption was violated, which imposed the need to use non-parametric alternative statistical techniques. For example, the Mann-Whitney U Test is a non-parametric alternative to *t-test* that can help to test the significant difference between two independent groups (e.g., high and low knowledge). The Mann-Whitney U Test compares the two groups' medians rather than their means, for example, the difference between high and low knowledge groups on the extent of internal audit activities (GOV & ITS). Furthermore, the Kruskal-Wallis Test is a non-parametric equivalent to ANOVA that helps researchers to compare the scores for more than two groups (e.g., six geographical regions) (Pallant, 2013).

#### **6.4.1 Governance Review Activities (GOV)**

The Mann-Whitney U Test was used to examine the significant difference between high and low knowledge related to the CAEs' perception about governance review activities. The z value and Asymp.Sig. (2-tailed) results are presented in Table 6.10. The results show that there are significant differences between the high and low knowledge groups in two variables of the extent of governance review activities (Asymp.Sig = 0.028 for GOV1 and 0.024 for GOV2 variables). However, the GOV3 and GOV4 variables did not record any significant differences between the high and low knowledge groups

(Asymp.Sig = 0.591 and 0.336 respectively). (H7). This may refer to the low extent of internal audit activities related to governance review of executive compensation assessments and environmental sustainability audit in general. The final descriptive statistics (Table 5-18; 144) shows very low mean and median values for both GOV3 and GOV4 variables, which confirm the low extent of these two activities.

**Table 6-10: Mann-Whitney Test for GOV**

	<i>GOV1</i>	<i>GOV2</i>	<i>GOV3</i>	<i>GOV4</i>
<b>Asymp. Sig. (2-tailed)</b>	.028	.024	.591	.339
<b>a. Grouping Variable: High and Low Knowledge</b>				

#### **6.4.2 IT Risk and Cybersecurity (ITS)**

The Mann-Whitney U Test was used to examine the significant difference between high and low knowledge related to the CAEs' perception about the IT risk and cybersecurity activities. The z value and Asymp.Sig. (2-tailed) results are presented in Table 6.11. The results show that there is significant difference in the extent of IT risk and cybersecurity activities between the high and low knowledge groups (Asymp.Sig = 0.010 or lower for all ITS variables) (H8). Therefore, it can be considered that the extent of ITS activities differs between the two groups (high and low knowledge CAEs), which may confirm the significant difference in CAEs' perception about GOV and ITS activities.

**Table 6-11: Mann-Whitney Test for ITS**

	<i>ITS1</i>	<i>ITS2</i>	<i>ITS3</i>	<i>ITS4</i>	<i>ITS5</i>	<i>ITS6</i>	<i>ITS7</i>
<b>Asymp. Sig. (2-tailed)</b>	.000	.000	.000	.002	.010	.000	.000
<b>a. Grouping Variable: High and Low Knowledge</b>							

### 6.4.3 Smart PLS Multi-Group Analysis

The multi-group analysis was used to compare path coefficients between two or more groups of data in the structural model. Comparing several groups of respondents is beneficial from a practical and theoretical perspective. Typically, it helps researchers to explore differences between observable characteristics such as knowledge and regions; also, to understand group-specific effects, which facilitates obtaining further differentiated findings (Hair et al., 2017).

#### 6.4.3.1 Multi-Group Analysis for Governance Review Activities (Model A)

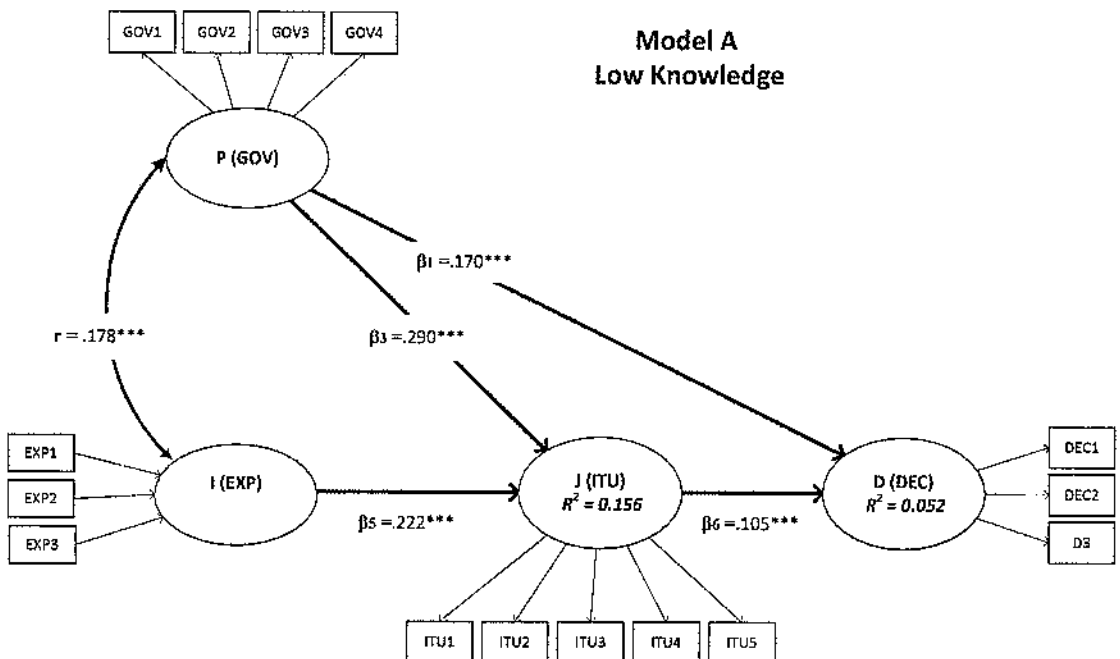
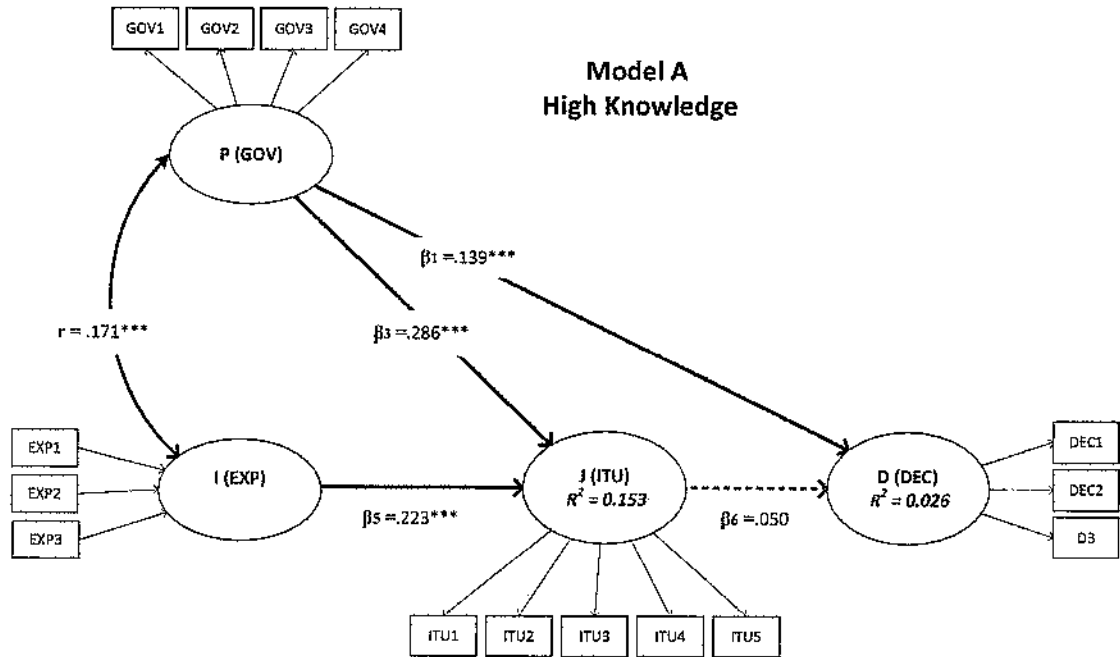
Smart PLS bootstrapping results for multi-group analysis show significant difference between the CAEs' perceptions of high and low knowledge pathways (see Table 6.12). For instance, Figure 6.2 shows that the CAEs with high knowledge follow their perception about the extent of governance review activities (i.e.,  $\beta_1 = 0.133$ ,  $p < 0.01$ ), which influences their relationship with the appropriate governance authority (i.e., the preference-based pathway ( $P \rightarrow D$ )). However, the rule-based pathway and principle-based pathway are not followed by high knowledge CAEs, as indicated by the non-significant relationships between ITU and DEC (i.e.,  $\beta_6 = 0.050$ ,  $p\text{-value} = 0.175 > 0.05$ ). Thus, only one pathway has been proven to be followed by the CAEs with six years or more experience as CAE and 11 years and more as internal auditor. It can be concluded that the CAE's perception has a direct influence on the CAE's reporting decision. In contrast, CAEs with 5 years or less experience as CAE, and 10 years and less experience as internal auditor (low knowledge), may follow different ethical pathways (i.e.,  $p\text{-value} < 0.01$  for all the three primary pathways). CAEs with low knowledge are influenced by the perceived consequences of their judgment. Figure 6.2 describes that the CAEs follow

the rule ( $P \rightarrow J \rightarrow D$ ) and principle-based pathways ( $I \rightarrow J \rightarrow D$ ), where information and perception influence their judgment, which consequently influences their decision, in addition to the preference-based pathway ( $P \rightarrow D$ ). Thus, there is direct and indirect effect on the reporting decision. In summary, the boundary span of knowledge influences the CAE's decision-making pathway, in addition to the nature of governance review activities (H9).

**Table 6-12: Bootstrapping Results for Multi-Group Analysis between High and Low Knowledge for Model A**

		<i>Path Coefficients</i>		<i>t-Values</i>		<i>p-Values</i>	
		High Know.	Low Know.	High Know.	Low Know.	High Know.	Low Know.
<b>Model A</b>	<b>EXP -&gt; ITU</b>	0.223	0.222	6.852	6.783	0.000	0.000
	<b>GOV -&gt; DEC</b>	0.139	0.170	3.835	4.805	0.000	0.000
	<b>GOV -&gt; ITU</b>	0.286	0.290	8.218	8.426	0.000	0.000
	<b>ITU -&gt; DEC</b>	0.050	0.105	1.359	2.776	<b>0.175</b>	0.006

**Figure 6-2: Significant Path and Correlation Coefficients for High and Low Knowledge Model A**



### 6.4.3.2 Multi-Group Analysis for IT Risk and Cybersecurity Activities (Model B)

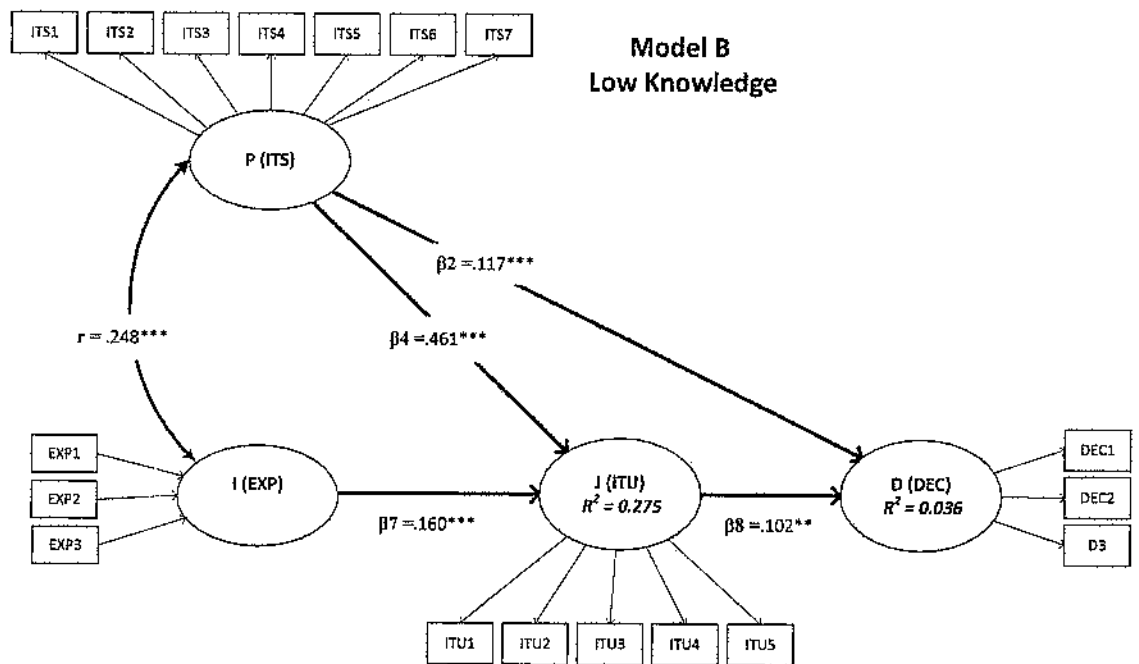
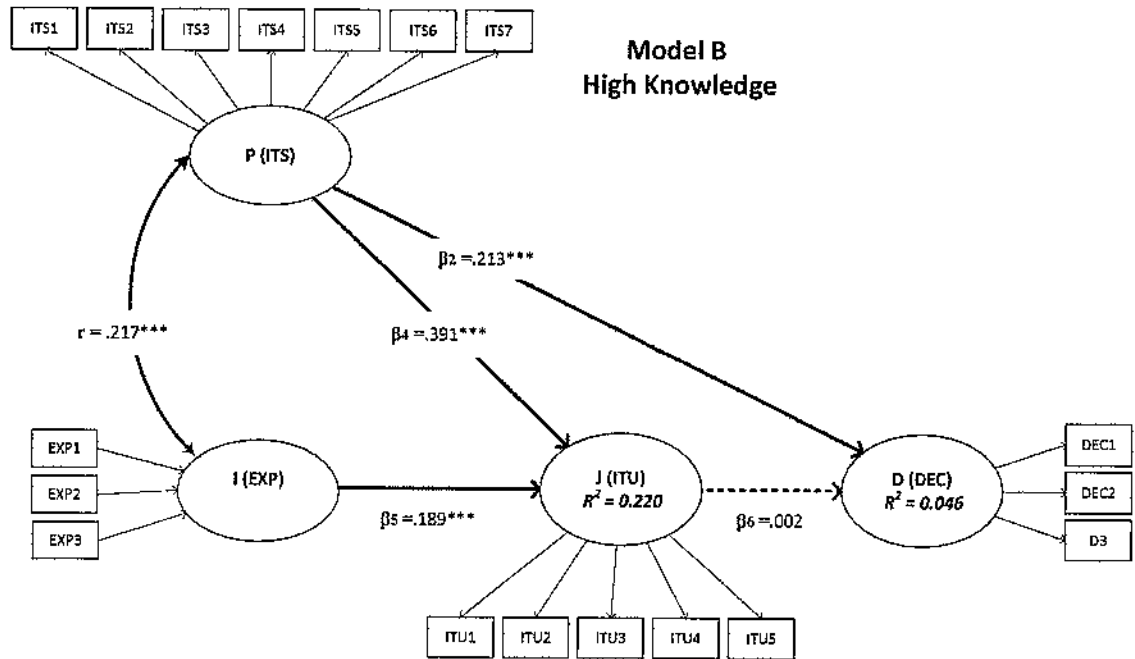
Similar to governance review activities, the IT risk and cybersecurity activities revealed significant difference between the high and low knowledge pathways (see Table 6.13). Figure 6.3 shows that the CAEs with high knowledge follow their perception about the extent of IT risk and cybersecurity activities (i.e.,  $\beta_2 = 0.213$ ,  $p < 0.01$ ), which influences their relationship with the appropriate governance authority (i.e., the preference-based pathway (P → D)). Consequently, the direct relationship between the CAEs' perception and reporting decision is related to the extent of IT risk and cybersecurity activities. In this pathway, the CAEs may prove more capable of solving an ethical problem that requires a great deal of experience, but the rules or principles can be ignored. In contrast, CAEs with low knowledge are influenced by the perceived consequences of their judgment. Therefore, CAEs with low knowledge may follow different ethical pathways, where information and perception influence their judgment, which consequently influences their decision indirectly. In summary, the boundary span of knowledge influences the CAE's decision-making pathway, in addition to the nature of IT risk and cybersecurity activities (H9).

**Table 6-13: Bootstrapping Results for Multi-Group Analysis between High and Low Knowledge for Model B**

		<i>Path Coefficients</i>		<i>t-Values</i>		<i>p-Values</i>	
		High Know.	Low Know.	High Know.	Low Know.	High Know.	Low Know.
<b>Model B</b>	EXP → ITU	0.189	0.160	5.848	5.378	0.000	0.000
	ITS → DEC	0.213	0.117	5.317	2.781	0.000	0.006
	ITS → ITU	0.391	0.461	12.358	15.468	0.000	0.000
	ITU → DEC	0.002	0.102	0.048	2.403	<b>0.962</b>	0.017



**Figure 6-3: Significant Path and Correlation Coefficients for High and Low Knowledge Model B**



## 6.5 The Boundary Span of Geographical Regions

The same procedure was followed to test the influence of geographical region where the CAE is based or primarily works (the boundary span of geographical regions). According to the demographic information in Table 5.15 (section 5.3.1), it can be seen that the obtained sample is from six different regions. Consequently, the Kruskal-Wallis Test was used to examine the significant difference of the governance review and IT risk and cybersecurity activities among the six different geographical groups. The Kruskal-Wallis Test is similar in nature to the Mann-Whitney U Test, but it compares more than just two groups.

### 6.5.1 Governance Review Activities (GOV)

The Kruskal-Wallis Test was used to examine the significant difference in the CAEs' perception regarding the extent of the governance review activities among the six different geographical groups. Table 6.14 shows the Kruskal-Wallis Test results, which revealed a statistically significant difference in governance review variables across the six different regions (i.e., Asymp. Sig. = 0.000 for all GOV variables) (H10).

**Table 6-14: Kruskal-Wallis Test Statistics for GOV**

	<i>GOV1</i>	<i>GOV2</i>	<i>GOV3</i>	<i>GOV4</i>
<b>Chi-Square</b>	32.616	81.267	67.397	117.073
<b>df</b>	5	5	5	5
<b>Asymp. Sig.</b>	.000	.000	.000	.000

a. Kruskal Wallis Test

b. Grouping Variable: In which region are you based or primarily work?

## 6.5.2 IT Risk and Cybersecurity (ITS)

Similarly, the Kruskal-Wallis Test was used to examine the significant difference in CAEs' perception regarding the extent of the IT risk and cybersecurity activities among six different geographical groups. Table 6.15 shows the Kruskal-Wallis Test results, which revealed statistically significant differences in ITS variables across the six different regions (i.e., Asymp. Sig. = 0.000 for all ITS variables) (H11).

**Table 6-15: Kruskal-Wallis Test Statistics for ITS**

	ITS1	ITS2	ITS3	ITS4	ITS5	ITS6	ITS7
<b>Chi-Square</b>	58.567	42.734	34.291	15.632	19.928	36.827	21.285
<b>Df</b>	5	5	5	5	5	5	5
<b>Asymp. Sig.</b>	.000	.000	.000	.008	.001	.000	.001
a. Kruskal Wallis Test							
b. Grouping Variable: In which region are you based or primarily work?							

## 6.5.3 Smart PLS Multi-Group Analysis

In order to test the influence of the boundary span of geographical regions on CAEs' reporting decision, bootstrapping for multi-group analysis was run for both governance review activities (Model A) and IT risk and cybersecurity activities (Model B) (H12).

### 6.5.3.1 Multi-Group Analysis for Governance Review Activities (Model A)

Table 6.16 compares the significance level for each pathway among the six regions. It can be seen that CAEs' perception about the extent of governance review activities has a direct effect on their reporting relationships with the appropriate authority in Africa and the Asia & Pacific regions. However, CAEs from Europe, Asia and Pacific and South & Central America & the Caribbean followed the rule-based (P→J→D), and principle -

based (I→J→D) pathways, which means their decisions are consequential. In other words, they have direct and indirect influence on the CAEs' reporting decision. That is, there is a relationship between the information, perception and judgment variables, which influence the decision (i.e., p-value = 0.000 for the Europe group; p-value = .019 for the Asia and Pacific group; and p-value = 0.009 for South & Central America & the Caribbean group). Finally, CAEs located in the Middle East and North America did not reveal any significant relationships between the governance review activities and the extent of using IT tools and techniques with their reporting relationship decisions. This represents the significant difference between the legal systems of these regions, which means that the perception of the CAEs regarding the extent of governance review activities varies from one region to another. The insignificant result in the Middle East and North America can be explained by the low extent of governance review activities in these regions or by the diversity of the sample. For example, the diversity of the Middle East sample can explain the insignificant result (see section 7.2 Q8 discussion for the Middle East region).

**Table 6-16: Bootstrapping Results for Multi-Group Analysis between Geographical Regions for Model A**

	<i>p-Values</i>					
	Africa	Asia and Pacific	Europe	Middle East	North America	South and Central America and the Caribbean
<b>GOV -&gt; DEC</b>	0.000	0.000	<b>0.298</b>	<b>0.180</b>	<b>0.117</b>	<b>0.606</b>
<b>GOV -&gt; ITU</b>	0.001	0.000	0.000	0.000	0.000	0.000
<b>EXP -&gt; ITU</b>	0.003	0.000	0.000	0.053	0.000	0.000
<b>ITU -&gt; DEC</b>	<b>0.577</b>	0.019	0.000	<b>0.164</b>	<b>0.848</b>	0.009

### 6.5.3.2 Multi-Group Analysis for IT Risk and Cybersecurity Activities (Model B)

Table 6.17 shows the significance level for each pathway among the six different geographical regions, this time with the ITS construct. It can be seen that CAEs' perception about the extent of IT risk and cybersecurity has a direct effect on CAEs' reporting relationships with the appropriate authority in five regions. Only the CAEs located in Middle East did not show any significant relationships between the governance review activities and the extent of using IT tools and techniques with their reporting relationship decisions. However, the CAEs from Europe and Asia & Pacific were the only two groups who followed the rule-based ( $P \rightarrow J \rightarrow D$ ), and principle-based ( $I \rightarrow J \rightarrow D$ ) pathways. In other words, they had direct and indirect influence on the CAEs' reporting decision. That is, there is a relation between the information, perception and judgment variables, which influence the decision (i.e., p-value = 0.014 for the Europe group & p-value = .05 for the Asia and Pacific group). This difference may be related to the level of regulation in each region. For example, the requirement of the SOX-Act (2002) in the USA may explain the significant relationship between the CAEs' perception about IT security and their relation with the appropriate authority.

**Table 6-17: Bootstrapping Results for Multi-Group Analysis between Geographical Regions for Model B**

	<i>p-Values</i>					
	<b>Africa</b>	<b>Asia and Pacific</b>	<b>Europe</b>	<b>Middle East</b>	<b>North America</b>	<b>South and Central America and the Caribbean</b>
<b>ITS -&gt; DEC</b>	0.037	0.001	0.004	<b>0.612</b>	0.000	0.038
<b>ITS -&gt; ITU</b>	0.000	0.000	0.000	0.000	0.000	0.000
<b>EXP -&gt; ITU</b>	0.032	0.000	0.026	0.015	0.000	0.000
<b>ITU -&gt; DEC</b>	<b>0.529</b>	0.053	0.014	<b>0.356</b>	<b>0.472</b>	<b>0.208</b>

## 6.6 Summary of the Chapter

This chapter focused on evaluating the reflective and formative measurement models, as well as the evaluating of the structural models. The results of the evaluation confirm the validity and reliability of the reflective and formative measurements models. In addition, the evaluation of the structural models presents the verification of the first six hypotheses. Furthermore, the second six hypotheses related to the boundary span of knowledge and geographical regions were tested, and the results were reported. The final chapter will discuss the study findings, limitation, implications and directions for future research.

# Chapter 7 Discussion and Conclusion

## 7.1 Introduction

This chapter summarises and concludes the research findings. The research discussion begins by recalling the purpose of the study. Then, it focuses on the discussion of the research questions and hypotheses. The main purpose of this study was to examine the ethical pathways of the CAEs' reporting relationships with the appropriate authority in the organisation. Additionally, it aimed to investigate the influence of the boundary span of knowledge and geographical regions on the ethical pathways of the CAEs' reporting decision. The Ethical Process Thinking Model was applied to examine the association between the investigated factors (i.e., information, CAEs' perception and judgment, which leads to a reporting relationship decision). Two different types of internal audit activities were considered, namely, the extent of governance review activities and IT risk and cybersecurity activities. Consequently, two theoretical models were obtained to test the direct and indirect relationships between CAEs' perception regarding these activities and the CAEs' reporting relationships.

Based on the research question and theoretical frameworks, the literature of internal audit reporting relationships was reviewed, and twelve research hypotheses were developed and tested. A world-wide survey administered by the IARF (i.e., the CBOK 2015) was used to test these hypotheses. It was possible to identify 2,235 CAEs representing the total sample of this study. Thus, the CBOK 2015 provides opportunities for comparative purposes between CAEs' characteristics and regions. However, the CBOK data is non-normally distributed, as discussed in the data analysis chapter (section 5.2.5). For this reason, non-parametric techniques were applied to test research hypotheses. For instance,

the Mann-Whitney U Test was used to examine the significant difference between high and low knowledge groups, while the Kruskal-Wallis Test was used to compare among six geographical regions. In addition, SEM, which is similar to a series of multiple regression equations, was used to examine interrelations among the independent and dependent constructs under consideration. Since the current study included a combination of several variables that needed to be examined simultaneously, PLS-SEM was applied, for reasons discussed previously (section 5.6.4).

The remainder of this chapter is divided into six major sections. Section 7.2 discusses the research questions and hypotheses. Then, section 7.3 summarises the significant research findings. The theoretical and methodological contribution are highlighted included in section 7.4. The remaining sections introduce the practical implications in section 7.5, followed by the research limitations and directions for future research in Section 7.6. Finally, concluding remarks are presented in the end of this chapter.

## **7.2 Discussion of the Research Questions**

This section is divided according to the research questions in order to demonstrate how they have been addressed and the objectives fulfilled. Each question is presented, followed by the approach taken to address it and the outcome.

**Q1** *To what extent have the internal audit reporting relationships hitherto been investigated?*

A systematic literature review supported by additional narrative methods was conducted in order to answer this question. The author collected both empirical and theoretical articles that investigate internal audit reporting relationships, either directly or implicitly.



This final review resulted in 85 relevant articles that summarised the advantages and disadvantages for each reporting line and identified five different factors that may influence the CAE's reporting decision (see chapter 2).

The initial findings of the literature review highlighted the importance of internal audit reporting relationships to measure the quality of internal audit, internal audit effectiveness (Lenz et al., 2014; Lenz & Hahn, 2015), internal audit objectivity (Desai et al., 2010; Krishnamoorthy 2002; Lin et al., 2011; Prawitt et al., 2009; Pizzini et al., 2015), and independence (Abbott et al., 2016; Alzeban & Gwiliam 2014; Allegrini et al., 2006; Desai et al., 2010). In addition, audit reporting significantly influences the risk assessment and control activities aspects of the internal control system (Fadzil et al., 2005).

Several attempts have been made by academic researchers and professional practitioners to investigate internal audit reporting relationships, with mixed results. Some studies support dual reporting lines by reporting to high authority functionally and CEO administratively (James, 2003; Munro & Stewart, 2011; Holt, 2012; IIA, 2016c). In contrast, Norman et al. (2010) argued that reporting to high authority could be harmful, while other studies have stated some difficulties related to reporting to high authority (Schneider, 2009; Bame-Aldred et al., 2013). However, the reality of the internal audit reporting relationships is much more complex than dual reporting requirements. For example, there is career risk for CAEs in reporting the deficiencies of their manager's operation (Fraser & Lindsay, 2004). At the same time, there is personal threat from the AC regarding over-reaction. For these reasons, Norman believed that dual reporting to the AC and CEO is not a wise solution for independence (organisation independence) and objectivity (individual independence) (Norman et al., 2010). Furthermore, organisations

are transmitted by various types of vehicles, such as reporting to the board, AC, CEO, and CFO, which indicate reporting relationships. Further, they operate at different levels of jurisdiction (e.g., SOX-Act (2002), the Committee of Sponsoring Organisations (COSO), Highly Recommended International Standards) via relationships between the board and CEO. This may explain why internal audit reporting relationships are so complex in reality.

In this regard, the advantages and disadvantages of each reporting line were summarised (see Table 2.3 in chapter 2). It appears there is widespread agreement that reporting to high authorities, such as the AC or board can provide a better quality of reporting of accounting misstatement (Arel et al., 2012); and earnings management (Prawitt et al., 2009). In addition, it can ensure greater objectivity (Lin et al., 2011; Abbott et al., 2012); independence (Abbot et al., 2016); and complies with IIA requirements (Everett & Tremblay, 2014). There are a few concerns about reporting to high authority, such as leading to unintended consequences (Rose et al., 2013); conflict of interest between actors (Norman et al., 2010; Reynolds, 2000); or generating conservative judgment (Boyle et al., 2015). However, the advantages of reporting to high authority outweigh the disadvantages.

As a result of the aforementioned difficulties of reporting to high authority, a close relationship between the CAE and CEO can be the alternative line. This relationship should be clearly defined in order to avoid any independence threats (Everett & Tremblay, 2014), to establish direction and support (Boyle et al., 2015), and to identify business opportunities (Rittenberg & Covalleski, 2001). However, the main problem of this reporting relationship is the issue of IAF independence threat (Christopher et al., 2009;

Al-Twaijry et al., 2003). According to the three lines of defence model, the first two lines are related to senior management, while the third line is the final assurance line and should maintain the connection between IAF and the highest authority (e.g. governing body/ board of directors / AC). Thus, reporting to a lower authority, such as the CFO may damage the third line of internal defence (Chambers & Odar, 2015), and should be restricted (Stewart & Subramaniam, 2010).

The development of internal audit reporting relationships shows an increase in the percentage of reporting to high authority compared to other executives, but some exceptions still exist. Without making the CAE a true senior executive, removing any ambiguity about reporting line and placing the CAE in a visible position in the organisation's hierarchy, the IAF will not succeed (Deloitte, 2010).

Despite the extensive previous discussion about internal audit reporting relationships, the inconsistent findings and concern about the factors that may influence the CAE's reporting decision highlight a need for further research. Important determinants suggested by the literature include five main factors: the activities of the IAF, independence and objectivity threats, authority characteristics, the organisation environment, and ethical considerations. The lack of empirical evidence about the effect of corporate governance on the strength of the IAF in general (Desai et al., 2010) and reporting relationships in particular, requires more investigation (Lenz & Hahn, 2015), which was a motivation for this research.

Internal auditors are concerned about compliance by reporting to the AC, while managers are concerned about profitability and bonuses. Because of that, it can be expected that

IAF with more compliance and assurance activities will serve a higher authority, while internal audit with more operational and consultant activities will serve management. Two types of assurance and control activities (governance review and IT risk and cybersecurity) were investigated in this research.

Finally, institutional theory can enhance our understanding of how different institutions may develop different reporting strategies. The researcher believes that formal (e.g., laws, regulations and rules), and informal institutions (e.g., norms, cultures, ethics) complement each other. Economists have mostly focused on formal laws and regulations, while sociologists have paid more attention to informal cultures, norms and values (Peng et al., 2009). As a result of the dynamic interaction between organisations and the formal and informal institutional environment, organisations differ across institutional frameworks (Lin et al., 2009). Thus, the quality of the CAE's reporting decisions might vary.

It can be concluded that there has been considerable research investigating the importance of reporting relationships (lines) as a determinant of internal audit quality, objectivity and independence. In addition, the influence of reporting relationships on risk assessment, accounting misstatement and earnings management has been investigated. However, no previous study has investigated the ethical pathways of the CAE's reporting decision and the factors that may influence such reporting relationships. Thus, a research gap was identified with regard to factors and situations that may have an influence on reporting decision.

Q2

*To what extent is the implementation of the Ethical Process Thinking Model useful to study the CAEs' reporting relationships?*

This question is considered to be the main research question, which can be answered through questions 3 and 4 (addressed in hypotheses 1 to 6). The dilemma in the previous literature was the lack of attention to the different environmental conditions that may influence reporting relationships; for example, there has been a lack of investigation of how the interrelationships between the CAE's perception, available information, judgment can influence reporting decision, as well as how the boundary span of knowledge and geography, which entails inequality, conflict, and domination can influence the reporting relationships. For this reason, the Ethical Process Thinking Model was examined in this study as an approach capable of shedding light on this literature neglected and insufficiently understood factors.

The Ethical Process Thinking Model (Rodgers 2009; Rodgers et al., 2009) begins with how individuals use perception or how they think regarding ethical issues. It includes six pathways. Three of them are primary ethical pathways (preferences, rules, and principles); building on these three pathways leads to three secondary pathways (relativism, virtue ethics, and ethics of care). The primary ethical pathways are distinguished by how much weight the individual puts on his or her perception or available information (Rodgers, 2009). The Ethical Process Thinking Model is useful in conceptualising a number of important issues in accounting and management (Foss & Rodgers 2011; Rodgers & Housel 1987; Rodgers et al., 2017), ethics/corporate social responsibility issues (Rodgers et al., 2014), as well as ethical dilemmas in auditing (Guiral et al., 2015; Rodgers et al., 2009). This model clarifies critical pathways in ethical decision-making that are influenced by different sources of information and environmental conditions. The usefulness of this model will be seen in the following

discussion, which highlights how using the Ethical Process Thinking Model produced insight in relation to questions 3 and 4. The discussion recalls and interprets the empirical examination results in order to answer the following research questions and test the related hypotheses.

**Q3** *Does the CAE's perception regarding the extent of the IAF activities have direct and indirect influence on the CAE's reporting decision?*

**Q4** *Do technical expertise competency along with judgment components affect the CAE's reporting decision?*

In order to address these two questions, six hypotheses were proposed and tested as follows:

H1	<i>There is positive relationship between the CAEs' perceptions regarding the activities of governance review and their relationship with the appropriate authority.</i>
H2	<i>There is positive relationship between the CAEs' perceptions regarding the activities of IT risk and cybersecurity, and their relationship with the appropriate authority.</i>
H3	<i>There is positive relationship between the CAEs' perceptions regarding the activities of governance review and the extent of using IT tools and techniques.</i>
H4	<i>There is positive relationship between the CAEs' perception regarding the activities of IT risk and cybersecurity, and the extent of using IT tools and techniques.</i>
H5	<i>There is positive relationship between the CAEs' assessment of technical expertise and the extent of using IT tools and techniques.</i>
H6	<i>There is positive relationship between the extent of using IT tools and techniques and CAEs' relationship with the appropriate authority.</i>

The smart-PLS simultaneous analysis allowed the author to interpret how the CAEs integrated information about the competency of IAF, their perception of internal audit activities, and their judgment about IT tools before making a reporting decision. The result of the path coefficients for the total sample (2235 CAEs) confirmed that the CAEs

follow different ethical pathways related to reporting relationships depending on the technical expertise competency, the extent of internal audit activities and the extent of using technology tools and techniques. The models' results seem to be consistent with the researcher's assumptions (i.e., hypotheses 1 to 6) that the CAE's assessment of the IAF technical competency and governance review ( $r1 = 0.184$ ) and IT risk and cybersecurity activities ( $r2 = 0.272$ ) are correlated ( $I \leftrightarrow P$ ).

Significant pathways and correlations were described in chapter 6 (Table 6.2, Figure 6.1). It was found that the CAEs' perception about the extent of governance review and IT risk and cybersecurity activities have direct impact on their reporting relationships (i.e., **H1**:  $\beta_1 = 0.149$ ,  $p < 0.01$ ; **H2**:  $\beta_2 = 0.157$ ,  $p < 0.01$ ). This direct relationship represents the preference-based ethical pathway ( $P \rightarrow D$ ). This finding may be interpreted in the light of the argument of Norman et al., (2010) that the requirement of internal audit reporting to the audit committee of the board is not a wise solution to independence and objectivity threats, as it raises an ethical consideration, as the quality of audit reports might vary. It seems that some CAEs make decisions according to their perception by ignoring the rule (do not report the full result to the board), and the available information (real risk assessment). In this case, the authors assume that CAEs may have negative intentions, or do not understand (or dismiss) the rules.

The preference-based pathway is also consistent with Schneider's (2009) claim that internal auditors might be reluctant to report directly to the audit committee of the board regarding controversial issues involving senior management. This view has been discussed by a number of researchers (e.g., Bame-Alder et al., 2013), who argue the difficulties of the IAF reporting excessive risks directly to the board. In addition, Fraser

and Lindsay (2004) claim that there is a career risk for CAEs of reporting, in full, about the deficiencies of the operation of their manager or the person who decides their salary, evaluations and bonus, and this is the major problem of the CAEs' reporting mission.

Furthermore, a recent study by Hoos et al. (2015) examined internal auditors' independence in their potentially competing roles of serving two masters and the effect on their judgment. They tested the hierarchy within the IAF and the preferences communicated by a superior internal auditor. Their experimental treatment consisted of two different instructions of a superior internal auditor; the priority of management (cost reduction) and the priority of the audit committee of the board (effectiveness). They found that CAEs make significantly different judgments, depending on communicated superior preferences. They highlighted the importance of hierarchical interactions within the IAF for examination of independence (Hoos et al., 2015).

These studies have demonstrated the difficulties of applying the rule-based pathway. For instance, personal threat, sensitivity, conflict of interest and superior preferences may affect the decision choice (Bame-Alderred et al., 2013; Christopher et al., 2009; Fraser & Lindsay, 2004; Hoos et al., 2015; Norman et al., 2010; Schneider, 2009). In the presence of such difficulties, the CAE may follow the preference-based pathway and ignore the application of the rule. It is predictable that under such pressures, the CAE places very low weight on the information provided by the entity and bases his final decision on his perception. Therefore, the decision to whom he/she should report is taken by ignoring previous judgment or information signals. Personal interest, time pressure and the absence of information might be important factors that encourage the CAE to follow a preference-based ethical pathway. Moeller (2004) claimed that CAEs split their time



between assisting the audit committee, management and external auditors, which creates time constraint problems. In this pathway, CAEs' expert knowledge typically may prove more beneficial in solving an ethical problem that requires a great deal of experience, but they do not necessarily follow the rules or principles when solving an ethical dilemma.

However, in other cases, CAEs employ investigatory and analytical tools to diagnose the cause of problems. In addition, the IAFs' activities generally differ in importance as perceived by the AC and management (IIARF, 2003). Consequently, individuals' perceptions about the extent of IAF activities related to governance review and IT risk and cybersecurity differ, and not all of them have the ability to make a decision without analysing the situation. These factors, as well as differing environmental conditions, lead some CAEs to refer to the judgment stage before making a decision.

It has been found that there is a direct positive relationship between the CAEs' perception and the CAEs' judgment stage, as well as a direct positive relationship between the extent of using IT tools and techniques and the reporting decision. This represents the indirect relationship between the CAEs' perception and decision through their judgment, which can be explained by the lens of a rule-based ethical pathway ( $P \rightarrow J \rightarrow D$ ). In view of all the studies supporting dual reporting lines (e.g., James, 2003; 2004; Holt, 2012), one may assume that the CAEs are highly qualified to apply the standard of organisation independence (high knowledge). These studies assume there are no difficulties or ethical matters that might influence CAEs' or others' interests. In such a case, CAEs should follow the rule-based pathway, in which the decision is non-consequential, and the rule should be implemented regardless of the substance of the transaction. Information is not required because the regulations are well known by the CAE in the entity. In other words,

the CAEs' reporting relationship regulations (e.g. standards, charter and the code of ethics) are captured in their "perception stage" when making a decision.

The rule-based ethical pathway reinforces the idea of making consistent decisions, which may occur more regularly when the same rules are implemented without bias. However, there may be times when the rules do not support the substance of the accounting transaction, as the stress from following the rules is considered to be a major obstacle to achieving organisations' objectives (Rigopoulou et al., 2012). The decision makers may look at the consequence of their decisions and ignore their perceptions. They refer to the principle-based ethical pathway and follow what they think is beneficial for the greatest number of people affected by the situation.

This study finds a direct positive relationship between technical expertise and the judgment stage, as well as a direct positive relationship between the extent of using IT tools and techniques and reporting decision. These relationships represent the principle-based ethical pathway (**I → J → D**). A principle-based ethical pathway can be followed by CAEs who have personal standards and values. They follow what they think is right, aiming to maximise the utility for all. They order information to make their decision according to the greatest good for the greatest number of people. This ethical pathway is controlled by information signals because this type of decision is a consequential decision based on the substance of the transaction.

The choice of this pathway can be viewed in the light of the study by Arnold et al. (2013), which compared three sectors of internal and external auditors to examine the mediation effect of social consensus and magnitude of consequences of the decision path. They

found that the decision paths are influenced by the expected consequences of the decision. The principle-based ethical pathway is practical when a situation exists whereby rules do not specifically address the issue. Moreover, it may operate better in unstable or changing environments. However, a CAE's values, attitudes or beliefs may not be applied on a consistent basis, thereby causing reporting issues or assets production problems.

Indirect relationships between the information construct (i.e., IAF technical expertise), and perception construct (i.e., the extent of internal audit activities) with the reporting to high authority were confirmed in this study. The path coefficient for these indirect relationships are very low, but highly significant with the p-value  $< 0.05$  for both Models (see Table 6.3 chapter 6). These results complement those of the Abbott et al. (2012), who found a strong positive association between AC oversight and the IAF budget allocated toward internal control activities. As a result of the aforementioned, it can be expected that internal audit with more compliance and assurance activities will serve a higher authority, and this is the case with both governance review and IT risk and cybersecurity activities. Abbott et al. (2016) used the formal reporting relationship between IAF and AC in order to measure the extent of AC oversight. They found that a greater degree of AC oversight of the IAF, versus management oversight is associated with better independence. It can be concluded that better IAF technical expertise, a greater extent of internal audit activities related to governance review and IT risk and cybersecurity and the extent of using IT tools are associated with reporting to higher governance authority. The ethical pathways of the CAEs are influenced by the IAF characteristics, such as the nature and extent of internal audit activities and the degree of appropriate authority oversight.

In summary, the implementation of the Ethical Process Thinking Model was found to be useful to study the CAEs' reporting relationships. It helped to identify the ethical pathways of the CAEs' reporting relationships through the direct and indirect relationships between internal audit activities, technical expertise and reporting decision. It was possible to illustrate the strengths and weaknesses of each ethical pathway relating to internal audit reporting relationships (see Appendix 33).

The inconsistency of previous literature that investigated internal audit reporting relationships might be explained by significant differences in the CAEs' knowledge. For example, Norman et al. (2010); Arel et al. (2012); and Boyle et al. (2015) studied only highly experienced internal auditors and did not consider less experienced, which may limit the generalizability of their conclusion. With this in mind, the following research questions addressed the possibility of significant differences between the perceptions of CAEs with high and low knowledge, as well as the influence of the boundary span of such knowledge on the reporting relationships with the appropriate authority. The questions and the associated hypotheses were:

**Q5** *Does the extent of governance review and IT risk and cybersecurity activities vary between high and low knowledge groups?*

H7	<i>There is significant difference between the CAEs' perceptions about the extent of activities related to governance review issues according to their knowledge groups.</i>
H8	<i>There is significant difference between the CAEs' perception about the extent of activities related to IT risk and cybersecurity issues according to their knowledge groups.</i>

H9

*The boundary span of knowledge influences the ethical pathway of the CAE's relationship with the appropriate authority.*

The Mann-Whitney U Test was used to examine the significant difference between high and low knowledge related to the CAEs' perception about governance review activities and IT risk and cybersecurity. The results show that there is significant difference between the perceptions of high and low knowledge groups in two variables of the extent of governance review activities; ethics- related audits (GOV1), and reviews addressing linkage of strategy and performance (GOV2), while there is no significant difference between the extent of activities related to compensation assessments (GOV3) and environmental sustainability audit (GOV4) (H7). In addition, a significant difference was found between the perceptions of high and low knowledge CAEs, of the extent of IT risk and cybersecurity activities (IT risk (ITS1), cybersecurity (ITS2), physical security of data centre (ITS3), access to mobile (ITS4) and social media (ITS5); also, the security of internal internet (ITS6) and external websites (ITS7)) (H8). The statistical results are presented in Table 6.10 and Table 6.11 (see chapter 6).

Smart PLS bootstrapping results for multi-group analysis show significant difference between the perceptions of high and low knowledge CAEs, and hence of their decision pathways (see Table 6.12 chapter 6). It has been found that the CAEs with high knowledge follow their perception about the extent of governance review activities (i.e.,  $\beta_1 = 0.133$ ,  $p < 0.01$ ), and IT risk and cybersecurity activities (i.e.,  $\beta_2 = 0.213$ ,  $p < 0.01$ ), which influences their relationship with the appropriate governance authority (i.e., the

preference-based pathway (P → D)). Only this pathway was found to be followed by CAEs with six years or more experience as CAE and 11 years and more as internal auditor. It can be concluded that the CAE's perception has a direct influence on the CAE's reporting decision. However, the three primary ethical pathways for both governance review and IT risk and cybersecurity activities are expected to be followed by the CAEs with low knowledge.

The findings on the important role played by the CAE's knowledge is consistent with earlier studies of boundary spanning, which illustrated that boundary spanners participate more in strategic decisions (Jemison, 1984). The Ethical Process Thinking Model clarifies how critical pathways in ethical decision-making are influenced by different situations, including individuals' knowledge. Actors with high knowledge can deal with complex cross-functional tasks and bridge organisations to continue innovation and transfer valuable knowledge (Marrone et al., 2007). High knowledge influences the work of product design, consulting and strategic alliances, activities that require include information flow between actors, referred to as boundary spanning (Ancona, 1990; Dailey & Morgan, 1978). The concept of influence refers to the ability of an actor to affect the outcome of a particular decision (Jemison, 1984). Dew et al. (2009) found that experts have a dramatically different way of framing problems and decision compared to non-experts. Since boundaries are important for knowledge transfer within and between organisations, effective boundary spanning benefits not only team effectiveness, but also organisational innovation, effectiveness and protection against external threats (Marrone et al., 2007).

Table 7.1 highlights the primary ethical pathways including different conditions that can influence the ethical pathways of internal audit reporting relationships according to the level of knowledge. Based on Rittenberg and Covaleski's (2001) examination toward outsourcing of IAF, they argue that outsourcing can better serve an AC; nonetheless, if the organisation believes that its management has positive intentions, strong internal control and a long run perspective, then reporting to management can create better business opportunities. Apparently, there are different ethical positions whereby the CAEs may produce varied decisions shaped by the receiving entity.

**Table 7-1: Ethical Positions of Internal Audit Reporting Relationships.**

<i>Ethical Process Thinking Model</i>	<i>Preference-based (Egoism)</i> $P \rightarrow D$		<i>Rule-based (Deontology)</i> $P \rightarrow J \rightarrow D$		<i>Principle-based (Utilitarianism)</i> $I \rightarrow J \rightarrow D$	
	Positive intentions	Negative intentions	Well-understandable	Not well-understandable	positive values	Negative values
<b>High Knowledge</b>	+	-	+	-	+	-
<b>Low Knowledge</b>	Need strong internal control system (refer to Rule-based/ Principle-based)		Legal form over substance	-	Substance over legal form	-

+ = strong.      - = weak.

Source: Developed by the Author

Table 7.1 indicates that high (low) knowledge represents a strong (weak) understanding of organisational environmental circumstances as well as the expertise of the CAE (Rodgers, 2003). Moreover, positive (negative) intentions refer to ethical preference-based (ethical egoism) wants, needs and desires of the CAE (Rodgers et al., 2015). Rules

such as the international professional practices standards may not be understood for their application to certain environments (e.g., change in product line, different culture, organisation's facilities are affected by different employee norms and beliefs, etc.). The level of understanding of procedures, guidelines, policies, etc., and its application refer to the rule-based ethical pathway, while organisational values, norms and beliefs refer to the principle-based ethical pathway.

After examining the boundary span of knowledge, it is time to discuss the results of the boundary span of geographical regions, which represent the final two research questions.

**Q7** *Does the extent of governance review and IT risk and cybersecurity activities vary in the six different regions?*

This question was addressed through the following hypotheses:

H10	<i>There is significant difference between the CAEs' perceptions about the extent of activities related to governance review issues according to their regions groups.</i>
H11	<i>There is significant difference between the CAEs' perception about the extent of activities related to IT risk and cybersecurity issues according to their regions groups.</i>

**Q8** *Does the boundary span of geography influence the CAES' reporting decision?*

A related question and hypotheses address regional differences as follow:

H12	<i>The boundary span of geographical regions influences the ethical pathway of the CAE's relationship with the appropriate authority.</i>
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The results of the Kruskal-Wallis Test that examined the significant difference among the six geographical regions related to the CAEs' perceptions regarding the extent of internal audit activities showed significant differences (see Table 6.14 and Table 6.15 in chapter 6). These results indicate that the extent of governance review and IT risk and cybersecurity activities vary among the six different regions (H10 & H11). This result can be interpreted in terms of economic inequality among countries (developed and developing countries), where different activities, requirements and policies are applied. In addition, bootstrapping for multi-group analysis was run to examine the influence of such differences (the boundary span of geographical regions) on the CAEs' reporting relationships for both governance review activities (Model A) and IT risk and cybersecurity activities (Model B). The results confirmed the influence of the boundary span on the CAEs' reporting relationships decision in both models (H12) (see Table 6.16 and Table 6.17 in chapter 6).

These results indicated two main findings: first, the ethical pathways of the CAEs vary according to their geographical regions. For example, the ethical pathways of the CAEs from Europe are different from those located in North America or Africa. Second, the ethical pathways of the CAEs vary according to the nature of the internal audit activities. For instance, the CAEs from North America did not reveal direct or indirect relationships between the governance review activities and reporting relationship decisions. In contrast, the extent of the IT risk and cybersecurity activities reveal a direct relationship with reporting relationship for the same CAEs from North America. Another example is the finding that CAEs located in Europe follow only the rule-based and principle-based ethical pathways with governance review activities, but they follow all the three primary

ethical pathways with IT risk and cybersecurity activities. The final example is that the CAEs from the African region follow the preference-based ethical pathway in both models, but the CAEs from South and Central America and the Caribbean follow the rule and principle-based ethical pathways with governance review activities; in contrast, they follow only the preference-based pathway with IT risk and cybersecurity activities.

The Middle East region did not show any particular pathways in both models. In order to find out the reason for that, the author refers to the sample for each included country. It was found that not all included countries had a representative sample. For example, only one CAE was located in Malaysia, six from Lebanon and seven from Qatar. About 58% of the Middle East sample was from Saudi Arabia (29 CAEs) and the United Emirates (42 CAEs). It was difficult to identify a specific ethical pathway for such an unequal sample distribution. However, the two models were run using only the sample from the United Arab Emirates. Table 7.2 shows the path coefficient results. It was possible to identify that the rule-based and principle-based ethical pathways were significant with IT risk activities. This may explain the problem of Middle East sample distribution.

**Table 7-2: The Path Coefficient for Chief Audit Executives from UAE**

		<i>Original Sample</i>	<i>Sample Mean</i>	<i>Standard Deviation</i>	<i>T Statistics</i>	<i>P Values</i>
<b>Model A</b>	<b>GOV -&gt; DEC</b>	0.373	0.313	0.267	1.399	0.162
	<b>GOV -&gt; ITU</b>	0.321	0.321	0.154	2.078	0.038
	<b>EXP -&gt; ITU</b>	0.353	0.378	0.130	2.720	0.007
	<b>ITU -&gt; DEC</b>	-0.103	-0.140	0.250	0.412	0.681
<b>Model B</b>	<b>ITS -&gt; DEC</b>	0.568	0.599	0.184	3.088	0.002
	<b>ITS -&gt; ITU</b>	0.563	0.563	0.116	4.857	0.000
	<b>EXP -&gt; ITU</b>	0.161	0.193	0.131	1.232	0.218
	<b>ITU -&gt; DEC</b>	-0.421	-0.448	0.184	2.282	0.023

Regional differences found in this study can be explained in the light of previous evidence that CAEs' reporting decision can be influenced by available information, environment change and their perception (Rodgers & Gago, 2001). In addition, personal interest and time pressure can be important factors to be taken into consideration before making a decision. Furthermore, organisations' policies, professional standards and decision support systems differ from one organisation to another. These environmental characteristics have the ability to influence judgment and decision motivations. Environmental factors change the task requirements and the class of interaction. For example, the technology environment reduces the time and effort required to correct numerical calculations. This is an example of the influence of the environment on task requirements. However, in some cases the environmental factor may not change the task requirements, but change the effort that decision makers are willing to employ to fulfil those requirements (Libby & Luft, 1993).

Regional environmental differences and their impact reflect Hofstede's (1980; 1983) theory of cultural differences, refined by House et al. (2004). This theory posits that the development and operations of various professional practices are affected by the cultural differences. Therefore, IAF activities are expected to be different from one organisation to another, depending on the internal auditors' respective cultures and legal regimes (Abdolmohammadi & Sarens, 2011). In addition, CAEs' attitudes and actions are different. These varying attitudes and actions are the result of varied traditions and cultural outlooks (Alzeban, 2015). However, the classification of Hofstede (1980; 1983) and House et al. (2004) did not include all countries around the world. For these reasons, the CBOK 2015 survey classified the CAEs according to their geographical regions in

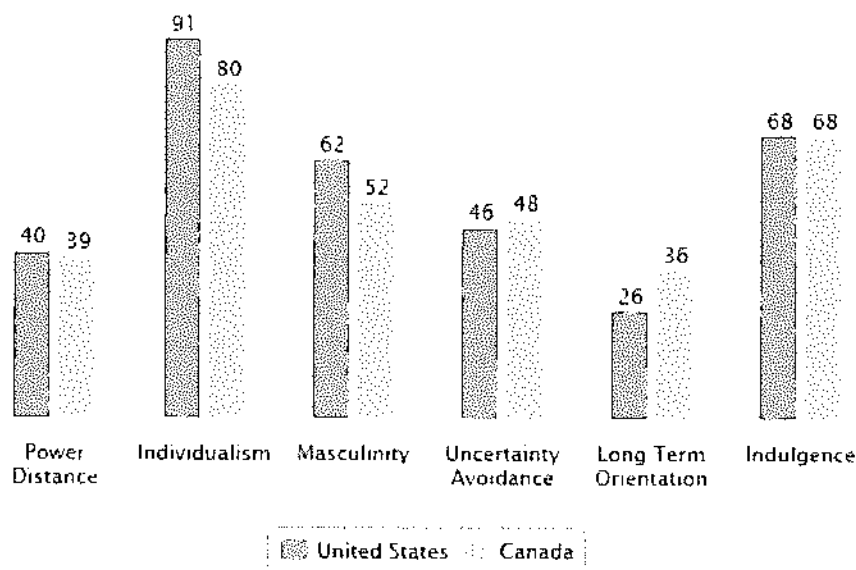
addition to their various cultural clusters and the detail of these differences is supported by the findings of this study.

The findings, in turn, support earlier evidence on the influence of environmental characteristics. For instance, Al-Akra et al. (2016) focus on the literature of independence and objectivity in the Middle East and North Africa and find that independence and objectivity are lacking in this region. They affirm the need to consider cultural and social influences when formulating rules and regulations (Al-Akra et al., 2016). In addition, Alzeban and Gwiliam (2014) in their study consider that perceptions and beliefs, culture and societal relationships can influence behaviour and decisions. Finally, social consensus and magnitude of consequences affect the decision path of auditors (Arnold et al., 2013).

A number of accounting and auditing variables are significantly associated with cultural differences (Abdolmohammadi & Tucker, 2002). Researchers recognise that auditors in different countries face different reporting requirements and litigation settings (Messier et al., 2011). For example, Patel (2003) compared between China, India and Australia cultures and found that whistleblowing, as an internal control mechanism, is more likely to be effective in the Australian culture. In addition, Tsakumis (2007) found that U.S. accountants are more likely to disclose information than Greek accountants (see Abdolmohammadi & Sarens, 2011). The line of these researches can be applied to the internal audit profession. For example, the North America group includes CAEs located in USA and Canada. The requirement of the SOX-Act (2002) in the USA may explain the significant relationship between the CAEs' perception about IT security and their relation with the appropriate authority. In addition, according to Hofstede's cultural

dimensions, it can be considered that both the USA and Canada are individualist cultures (see Figure 7.1). Individualism is associated with a focus on individual benefits rather than the best interest of the group (Chan et al., 2003). Furthermore, these countries' power distance is low, which explains their ability to challenge authority power.

**Figure 7-1: The USA and Canada Cultural Dimensions Comparison**



Source: Geert Hofstede (itim International, 2017)

However, this study did not focus on examining the influence of cultural dimensions on the reporting decision, but rather it aimed to explore the significant difference in the extent of internal audit activities among the six geographical regions. In addition, it examined the influence of boundary span of geographical regions, which may result from environmental factors, litigation settings, and reporting requirements, on the ethical pathways of the CAEs' reporting relationships.

### **7.3 Summary of Significant Findings**

- 1- There are advantages and disadvantages for each reporting line; however, reporting to the board of directors or the AC is preferable and beneficial while reporting to a lower authority is inappropriate and should be restricted.
- 2- The nature of IAF activities, independence threats, authority characteristic, control environment and ethical considerations can provide more insight into the CAE's relationship with different authorities.
- 3- Reporting relationships are not only driven by firm capabilities and industry conditions, but also, they are influenced by the formal (e.g., laws, regulations and rules) and informal institutions (e.g., norms, cultures, and ethics) of a particular institutional framework. For example, within a situation where formal regulations are underdeveloped, the CAEs' norms, cultures, ethics are given stronger control to facilitate transactions.
- 4- A significant positive relation has been found between CAEs' perception regarding the extent of internal audit activities related to governance review and IT risk and cybersecurity, and the CAEs' reporting relationship with the appropriate governance authority
- 5- Smart PLS simultaneous analysis results indicate that CAEs follow different ethical decision-making pathways, depending on their perception, information and judgment regarding the activities and characteristics of the IAF.
- 6- There are significant differences between knowledge and region groups regarding the CAEs' perception of governance review and IT risk and cybersecurity activities, which may cause the boundary span of knowledge and geographical regions. For

example, the ethical pathways of the CAEs' reporting relationships differ according to the CAEs' knowledge and regions. The study reports a significant difference between the investigated groups in term of their perception and ethical pathways (e.g., high knowledge group vs. low knowledge, as well as CAEs from different regions).

- 7- Statistical results show that the boundary span of knowledge and regions influence the ethical pathway of the CAEs' reporting relationships with the appropriate authority. For example, CAEs with expert knowledge typically may prove more capable of solving an ethical problem that requires a great deal of experience (P→D), but do not necessarily follow the rules or principles when solving such an ethical dilemma. In addition, there are direct and indirect influences of the CAE's perception on the reporting decision among different regions.
- 8- Better technical expertise competency and larger extent of internal audit activities are associated positively with the extent of using IT tools and techniques with all different groups (i.e., high (low) knowledge groups and the CAEs from different regions).

## **7.4 Contributions of Study**

This study aims to add to the body of knowledge by providing new and original theoretical and methodological contributions. It began by reviewing the literature of internal audit reporting relationships with the appropriate authority using a systematic literature review method supported by narrative methods. All the relevant studies were included and critically discussed in order to answer the first research question. The result documented the inconsistency in internal audit reporting relationships. It summarised the advantages and disadvantages of each reporting line and stated five main factors that may influence IAF relationships with the organisation governance authority. Relatively little work has

previously been devoted to internal audit reporting relationships, with mixed results. The present study sheds light on how the inconsistency in previous work reflects the complexity of reporting relationships, because of the diversity in situations, such as formal and informal institutions or the boundary span between actors. Considering the results of the literature review can reduce the ambiguity of the reporting relationships decision mechanism and provide a more robust explanation about the current situation of internal audit reporting relationships.

This study has advanced debate on internal audit reporting by shifting the focus from the importance of internal audit reporting relationships to the issue of the reporting decision. Two theoretical frameworks including formative and reflective measurements were developed in order to explain the linkages between investigated constructs. The developed frameworks add to prior research by examining how the extent and nature of IAF activities influence the CAE's perception related to governance review and IT risk and cybersecurity issues. Furthermore, they confirmed the direct and indirect influence of such activities on the reporting relationships through the examination of the interrelationships between three main components (i.e., perception, information and judgment) before making a reporting decision.

Since the primary purpose of this study was to examine the ethical pathways of the CAEs' reporting relationships, the Ethical Process Thinking Model was applied. It was shown to be useful in conceptualising a number of important issues in accounting and management through hypothesising three major concepts of perception, information and judgment, which applied in a certain order, before the decision choice. The investigation of the



primary ethical pathways among these constructs generates new insights which will contribute to a better understanding of CAEs' reporting relationships.

The Ethical Process Thinking Model was implemented in connection with the previous literature of internal audit reporting relationships to examine the ethical pathways of the CAEs reporting relationships with the appropriate authority. It was possible to demonstrate the strengths and weaknesses of the three primary ethical pathways. In addition, this study demonstrates the impacts of CAEs' knowledge (experience) and situational (culture, power, accountability). It is believed that understanding of the three dominant ethical pathways (rule, preference and principle) can provide the accounting and auditing profession with a useful foundation to inform measures for dealing with the very important issue of corporate governance, in terms of objectivity and independence. For example, different ethical positions were proposed according to the CAEs' level of knowledge. It can be considered that such a framework is a useful start for researchers to analyse and debate the impact of format internal audit reporting relationships' on the well-being of an organisation.

From a methodological perspective, a unique survey of CAEs' responses developed and administered by IIARF was obtained, containing new cross-sectional data collected in 2015. The questions posed in the survey reflect the needs, interests, standards and activities of internal auditors. In addition, the questionnaire consists of several components and topics, starting with the respondent's background and their organisation, followed by questions on organisation governance, reporting relationships, internal audit competence IT security and the use of IT Tools (IIARF, 2015). It was possible to identify 2235 CAEs with different levels of experience from six regions. This large sample

provided the opportunity for the researcher to examine the proposed hypotheses and compare between CAEs without restraint.

Moreover, it was possible to split the data according to CAEs' knowledge and geographical regions in order to identify the significant difference in their perceptions related to the internal audit activities. Such empirical examination of the influence of the boundary span of knowledge and geography on the ethical pathways of the CAEs' reporting decision has not been done before. The findings, therefore, provide new insights on how individual, institutional and cultural influences affect the pathways that CAEs may follow.

A further methodological contribution is the provision of valid and reliable measurements for the two theoretical models' components (i.e., governance review, IT risk and cybersecurity, technical expertise, the use of IT tool and techniques and reporting relationships decision). Both theoretical models have been tested through a rigorous statistical methodology, including exploratory factor analysis, smart PLS-SEM quality criteria for the measurements model (reflective and formative measurements) and the evaluation of the structural model results. All the statistical results were presented to meet the requirement of reliability and validity. The results of this study provide empirical support for and confirm the rationality of proposed hypotheses and evidence of benefits of applying the Ethical Process Thinking Model. Furthermore, it was possible to harness the strengths and weaknesses of each primary ethical pathways as depicted in the Ethical Process Thinking Model.

This is the first time SEM has been used in the investigation of internal audit reporting relationships. SEM is among the most useful advanced statistical analysis techniques that have emerged in the social sciences in recent decades (Hair et al., 2017). It is a combination of both factor analysis and multiple regression analysis enabling the researcher to simultaneously assess the measurement model and assess the structural model. Hence, PLS-SEM has the ability to handle extremely non-normal data, as well as the reflective and formative measurement models without additional requirements or constraints. It can map paths to many dependent variables in the same research model and analyse all paths in the structural model simultaneously rather than one at a time. Previous literature relied heavily on the examination of the direct relationships between reporting relationships and other factors. This study adds to previous research through the examination of the interrelationships among four major factors in each model in order to identify the direct and indirect relationships, as well as the influence of the judgment stage as a mediator for such relationships.

Finally, this study used a variety of non-parametric techniques in order to achieve the research objectives. For example, the Mann-Whitney U Test was used to examine the significant difference between high and low knowledge related to the CAEs' perception about internal audit activities. In addition, the Kruskal-Wallis Test was used to examine the significant difference in the CAEs' perception regarding the extent of the internal audit activities among the six different geographical groups. Smart PLS bootstrapping for multi-group analysis was applied to compare between groups. However, the theoretical framework and the empirical results provide a foundation for future research, where more constructs can be investigated to complement the result of this study.

## 7.5 Practical Implications

The role played by internal auditors in the evaluation of the structure of reporting relationships is essential to facilitate organisation independence. External auditors, AC, management and other users desire to know whether an organisation in which they are interested has independent IAF, since internal auditors are the 'pillars' of corporate governance (Gramling et al., 2004). However, no study has discussed the ethical pathways of the CAEs reporting relationships, which might compromise CAEs' inclination to report deficiencies, including those of their managers in full. Several articles have called for more research regarding CAEs reporting relationships (e.g., Abbott et al., 2010; Christopher et al., 2009; Cohen et al., 2004; Gramling et al., 2004; Stewart & Subramaniam, 2010; Zaman & Sarens, 2013).

Standards can reduce uncertainty and ambiguity in practice (Abdolmohammadi & Sarens, 2011). The study results speak to the need for regulators to consider significant differences among internal audit activities, organisations characteristics and the incentives of the various stakeholders when determining policy. In addition, there is a need to consider cultural and social influences when formulating rules and regulations (Al-Akra et al., 2016). For example, internal audit activities in some organisation institutions are limited to regular activities, which might not be important for organisation high authorities. The author concluded that the nature and extent of internal audit activities are significantly associated with reporting relationships with the appropriate authority. This study examines two assurance activities related to the extent of governance activities and IT security and found them to be positively associated with the

organisations' high authorities. It seems that a lower extent of governance review and IT security activities may lead to reporting to a low authority.

This result is beneficial for the organisation institutions to evaluate and decide the nature of internal audit activities and pay more attention toward the extent of internal audit activities that with interest their high authorities. Every organisation has special needs depending on its size, type and activities. They must identify their needs for internal auditing and define them in their charter of internal audit.

Generally, organisation characteristics, such as size and geographical dispersion of operations' are important to consider. The guideline is important for the regulator, board and senior management to identify the responsibilities of each authority and reflect what is the optimal reporting structure. Furthermore, CAEs' knowledge, intentions, and values are different. This study found that different ethical pathways are followed by CAEs. In addition, the boundary span of knowledge and geographical regions have been proven to have an influence on the extent of internal audit activities and the ethical pathways of the CAEs' reporting decisions. Such results inform the CAEs about the primary ethical pathways and help them to make ethical decisions when facing ethical dilemmas. They are responsible for ensuring the objectivity and independence requirements through their reporting decisions. It has been found that high knowledge CAEs may prove more beneficial in solving an ethical problem that requires a great deal of experience, but not necessarily follow the rule. Understanding the CAEs and organisation characteristics, as well as reporting responsibility among actors, will promote better collaboration across boundaries.

It is also important for different hierarchical authorities to consider the conflict concerning the focus of the IAF's activities. CAEs are aware of their central accountability relationship to the highest authority, but if they are appointed or evaluated by a lower authority, this may impede the CAEs in performing their duties and making ethical decisions. In this study, reporting decision was captured by the main reporting line, which makes the final decision for appointing the CAE and finally, who is ultimately responsible for evaluating the CAE's performance. Consequently, CAEs should be appointed and evaluated by the highest authority, to reduce any expected conflict of interest.

Most studies on external auditors' reliance decision used internal audit reporting relationships as a dimension to evaluate internal audit objectivity. However, the findings of this study complement our understanding of how reporting relationships work, which is useful to inform external auditors' reliance decisions by using the work of internal auditors or using them for direct assistance. Rather than only looking at the reporting line, they can look at the technical competency, the extent of activities, and the extent of using IT tools to make a reliable judgment.

Finally, organisations should pay attention to the increased reliance on IT for operations and assurance tasks. The IAF looks at technology as a way to improve the analysis process and productivity as technology can help automate activities. Studies reveal that IT tools and techniques support decision makers faced with difficult decisions. It has been found that better technical expertise competency and larger extent of internal audit activities are associated positively with the extent of using IT tools and techniques with all CAEs. In addition, the extent of using IT tools and techniques is associated positively with reporting

to high authority, especially for low knowledge CAEs. It represents mediation between technical expertise and perception with the reporting decision. Consequently, implementation of and investment in technology is beneficial in general and can help the CAEs to make decision more quickly and effectively.

## **7.6 Limitations and Directions for Future Research**

Despite the significant contributions of this research, it is subject to several limitations. For instance, in terms of the systematic literature review, the author's search was based on well-known databases, identified key words and stopped the review in December 2016. In addition, based on previous literature only five major factors are discussed, however, future research should focus on studying not only those five factors, but also other factors related to regulation, management and organisation characteristics empirically, because understanding of these relationships would assist researchers to improve IAF's ability to fulfil its charge. Furthermore, future research may also explore the role played by different variables which may enhance organisation independence (dual-reporting relationships), such as CAEs' incentives, salary and bonus.

In terms of the research theoretical models, it can be stated that according to Rodgers and Gago (2001), the Ethical Process Thinking Model contains six dominant ethical pathways. This research applied only the three primary ethical pathways and analysed hypothetical scenarios. Future research should study how the six different pathways (preferences, rules, principles, relativism, virtue ethics, and ethics of care) can influence or reduce material misstatement in the financial information, as well as how they prevent misappropriation of assets. In addition, the theoretical models include formative and

reflective measurements. Formative indicator weights are influenced by other relationships in the model, which is called “*interpretational confounding and represents a situation in which the empirically observed meaning between the construct and its measures differs from the theoretically imposed meaning*” (Kim, et al., 2010) (see Hair et al., 2017; 146). Such outcomes can limit the results’ generalisability (Bagozzi, 2007).

In addition, the discussion of the results of the study highlights its main limitations. First, the CBOK is archival data and the author believes any self-selection bias would work against the obtained findings. Furthermore, the study findings depend on the demographic characteristics of the sample. For example, the majority of the obtained sample are members of the IIA around the world, who may have higher knowledge about IPPF requirements than non-members. Furthermore, classification of the sample according to the age, size and source of the IAF, as well as industry types, may provide further information and extend the current studies.

Second, both models have recorded low  $R^2$  values (reflecting predictive accuracy) for both judgment and decision constructs, which means that there are other factors that can predict or explain the endogenous constructs. Furthermore, the survey instrument captures the CAEs’ perceptions regarding governance review and IT cybersecurity risk, which may not indicate the complex relationship between other IAF activities and CAEs’ decision-making pathway. Further studies can explore and examine different IAF activities and different variables that may explain the CAE’s reporting decision.

Third, the boundary span of knowledge and geographical regions are only two of many factors that could potentially influence reporting pathways. Future research may also



explore different boundaries, which may enhance reporting structure between the CAEs and governance authorities, such as physical, social, relational, occupational, and disciplinary boundaries. In addition, this study did not consider external factors, such as economic conditions, union influences, unemployment rates, company sizes, government policies, and culture.

Finally, future research should focus on how organisations adapt to formal and informal institutional changes and regulatory shifts. For instance, studying the difference between developing and developed countries is also important (Alzeban & Gwiliam, 2014), and more tests could be utilised based on experimental and case studies (Al-Akra et al., 2016; Christ et al., 2015).

## **7.7 Concluding Remarks**

This study represents one of the first theoretical efforts to systematically review the literature of internal audit reporting relationships supported by a narrative literature review method. It summarises the advantages and disadvantages of the CAEs' reporting relationship with different authorities, and also it identifies the major factors that may influence the CAEs' reporting decision. It is one of the first empirical efforts to shift the focus from the importance of internal audit reporting relationships to the issue of the reporting decision. The Ethical Process Thinking Model was applied in order to identify the ethical pathway of the CAEs' reporting relationships with the appropriate authority. Two theoretical frameworks were developed to investigate the interrelationships among technical expertise, CAEs' perception and judgment before making a reporting decision.

This study was conducted in an under-researched setting and benefitted from a large sample of 2,235 CAEs from six different regions. The significant differences among sample groups were examined by non-parametric techniques (e.g., the Mann-Whitney U Test and the Kruskal-Wallis Test). The findings of this study provide new insights into internal audit activities and CAEs' reporting ethical pathways, with particular reference to the boundary span of knowledge and geographical regions. Overall, the contributions of this study increase our knowledge about internal audit reporting relationships and provide insights for further research.

## References

- Abbott, L. J., Daugherty, B., Parker, S., & Peters, G. F. (2016). Internal audit quality and financial reporting quality: the joint importance of independence and competence. *Journal of Accounting Research*, 54(1), 3-40.
- Abbott, L. J., Parker, S., & Peters, G. F. (2010). Serving two masters: the association between audit committee internal audit oversight and internal audit activities. *Accounting Horizons*, 24(1), 1-24.
- Abbott, L. J., Parker, S., & Peters, G. F. (2012). Audit fee reductions from internal audit-provided assistance: the incremental impact of internal audit characteristics. *Contemporary Accounting Research*, 29(1), 94-118.
- Abbott, L. J., Parker, S., Peters, G. F., & Rama, D. V. (2007). Corporate governance, audit quality, and the Sarbanes-Oxley act: Evidence from internal audit outsourcing. *The Accounting Review*, 82(4), 803-835.
- Abdolmohammadi, M. J., & Sarens, G. (2011). An investigation of the association between cultural dimensions and variations in perceived use of and compliance with internal auditing standards in 19 countries. *The International Journal of Accounting*, 46(4), 365-389.
- Abdolmohammadi, M. J., & Tucker, R. R. (2002). The influence of accounting and auditing on a country's economic development. *Review of Accounting and Finance*, 1(3), 42-53.
- Ahlawat, S. S., & Lowe, D. J. (2004). An examination of internal auditor objectivity: In-house versus outsourcing. *Auditing: A Journal of Practice & Theory*, 23(2), 147-158.
- Ahmed Haji, A., & Anifowose, M. (2016). Audit committee and integrated reporting practice: does internal assurance matter? *Managerial Auditing Journal*, 31(8/9), 915-948.
- Al-Akra, M., Abdel-Qader, W., & Billah, M. (2016). Internal auditing in the Middle East and North Africa: A literature review. *Journal of International Accounting, Auditing and Taxation*, 26, 13-27.
- Al-Khabash, A. A., & Al-Thuneibat, A. A. (2009). Earnings management practices from the perspective of external and internal auditors. *Managerial Auditing Journal*, 24(1), 58-80.
- Allegrini, M., D'Onza, G., Melville, R., Sarens, G. & Selim, G., M. (2011). What next for internal audit. *Institute of Internal Auditors Research Foundation (IIARF)*, i-853.

- Allegrini, M., D'Onza, G., Paape, L., Melville, R., & Sarens, G. (2006). The European literature review on internal auditing. *Managerial Auditing Journal*, 21(8), 845-853.
- Al-Twajjry, A. A. M., Brierley, J. A., & Gwilliam, D. R. (2003). The development of internal audit in Saudi Arabia: an institutional theory perspective. *Critical Perspectives on Accounting*, 14(5), 507-531.
- Al-Twajjry, A. A. M., Brierley, J. A., & Gwilliam, D. R. (2004). An examination of the relationship between internal and external audit in the Saudi Arabian corporate sector. *Managerial Auditing Journal*, 19(7), 929-944.
- Alzeban, A. (2015). Influence of audit committees on internal audit conformance with internal audit standards. *Managerial Auditing Journal*, 30(6/7), 539-559.
- Alzeban, A., & Gwilliam, D. (2014). Factors affecting the internal audit effectiveness: A survey of the Saudi public sector. *Journal of International Accounting, Auditing and Taxation*, 23(2), 74-86.
- Alzeban, A., & Sawan, N. (2015). The impact of audit committee characteristics on the implementation of internal audit recommendations. *Journal of International Accounting, Auditing and Taxation*, 24, 61-71.
- Ancona, D. G. (1990). Outward bound: strategic for team survival in an organization. *Academy of Management Journal*, 33(2), 334-365.
- Anderson, U. L., Christ, M. H., Johnstone, K. M., & Rittenberg, L. E. (2012). A post-SOX examination of factors associated with the size of internal audit functions. *Accounting Horizons*, 26(2), 167-191.
- Apel, H., & Wold, H. (1982). Soft modeling with latent variables in two or more dimensions: PLS estimation and testing for predictive relevance. *System Under Indirect Observation*, 2, 209-247.
- Arel, B., Beaudoin, C. A., & Cianci, A. M. (2012). The impact of ethical leadership, the internal audit function, and moral intensity on a financial reporting decision. *Journal of Business Ethics*, 109(3), 351-366.
- Arena, M., & Azzone, G. (2009). Identifying organizational drivers of internal audit effectiveness. *International Journal of Auditing*, 13(1), 43-60.
- Arnold, D. F., Sr., Dorminey, J. W., Neidermeyer, A. A., & Neidermeyer, P. E. (2013). Internal and external auditor ethical decision-making. *Managerial Auditing Journal*, 28(4), 300-322.

- Astrachan, C. B., Patel, V. K., & Wanzenried, G. (2014). A comparative study of CB-SEM and PLS-SEM for theory development in family firm research. *Journal of Family Business Strategy*, 5(1), 116-128.
- Association of Business Schools (ABS) (2015). *The Academic Journal Guide 2015*. United Kingdom: Chartered Association of Business Schools.
- ASX Corporate Governance Council. (2014). *Corporate governance principles and recommendations, The basis of the Principles and Recommendations Australia*: Corporate Governance Council. Available at: <http://www.asx.com.au/documents/asx-compliance/cgc-principles-and-recommendations-3rd-edn.pdf>. (Last accessed 10 Jan 2017).
- Australian Prudential Regulation Authority (APRA) (2017). *Prudential Standard CPS 510: internal audit*. Available at: <http://www.apra.gov.au/CrossIndustry/Documents/Prudential%20Standard%20CPS%20510%20Governance.pdf>. (Last accessed 10 Jan 2017).
- Bagozzi, R. P. (2007). On the meaning of formative measurement and how it differs from reflective measurement: comment on Howell, Breivik, and Wilcox (2007). *Psychological Methods*, 12, 229-237.
- Bame-Aldred, C. W., Brandon, D. M., Messier Jr, W. F., Rittenberg, L. E., & Stefaniak, C. M. (2013). A summary of research on external auditor reliance on the internal audit function. *Auditing: A Journal of Practice & Theory*, 32(1), 251-286.
- Barclay, D., Higgins, C., & Thompson, R. (1995). The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration. *Technology Studies*, 2(2), 285-309.
- Barua, A., Rama, D. V., & Sharma, V. (2010). Audit committee characteristics and investment in internal auditing. *Journal of Accounting and Public Policy*, 29(5), 503-513.
- Becker, J.-M., Rai, A., & Rigdon, E. (2013). *Predictive validity and formative measurement in structural equation modeling: Embracing practical relevance*. Paper presented at the in proceedings of the 34th International Conference on Information Systems, Milan, Italy.
- Bedard, J. (1989). Expertise in auditing: Myth or reality? *Accounting, Organizations and Society*, 14(1/2), 113-131.
- Bohanec, M. (2009). Decision making: A computer-science and information-technology viewpoint. *Interdisciplinary Description of Complex Systems*, 7(2), 22-37.
- Bonner, S. E., & Lewis, B. L. (1990). Determinants of auditor expertise. *Journal of Accounting Research*, 28, 1-20.

- Bonyár, A. (2015). *Application of localization factor for the detection of tin oxidation with AFM*. Paper presented at the 2015 IEEE 21st International Symposium for Design and Technology in Electronic Packaging (SIITME).
- Bouwman, M. J. (1984). Expert vs novice decision making in accounting: A summary. *Accounting, Organizations and Society*, 9(3-4), 325-327.
- Boyle, D. M., DeZoort, F. T., & Hermanson, D. R. (2015). The effects of internal audit report type and reporting relationship on internal auditors' risk judgments. *Accounting Horizons*, 29(3), 695-718.
- Broom, A. (2006). Ethical issues in social research. *Complementary Therapies in Medicine*, 14(2), 151-156.
- Bryman, A., & Bell, E. (2015). *Business research methods* (4<sup>th</sup> ed.). United Kingdom: Oxford University Press.
- Burrell, G., & Morgan, G. (1979). *Sociological paradigms and organisational analysis*. London: Heinemann.
- Burrell Nickell, E., & Roberts, R. W. (2014). Organizational legitimacy, conflict, and hypocrisy: An alternative view of the role of internal auditing. *Critical Perspectives on Accounting*, 25(3), 217-221.
- Carlile, P. R. (2002). A pragmatic view of knowledge and boundaries: Boundary objects in new product development. *Organization Science*, 13(4), 442-455.
- Cassel, C., Hackl, P., & Westlund, A. H. (1999). Robustness of partial least-squares method for estimating latent variable quality structures. *Journal of Applied Statistics*, 26(4), 435-446.
- Chambers, A. D. (2014a). Guidance on internal audit's interface with regulators. *Managerial Auditing Journal*, 29(3), 268-283.
- Chambers, A. D. (2014b). New guidance on internal audit - an analysis and appraisal of recent developments. *Managerial Auditing Journal*, 29(2), 196-218.
- Chambers, A. D., & Odar, M. (2015). A new vision for internal audit. *Managerial Auditing Journal*, 30(1), 34-54.
- Chambers, R. (2015). Internal audit should never belong to the CFO. *Internal Auditor*. Available at: <https://iaonline.theiia.org/blogs/chambers/2015/internal-audit-should-never-belong-to-the-cfo> (Last accessed 06. Jan. 2017).
- Chan, K. H., Lin, K. Z., & Mo, P. L. L. (2003). An empirical study on the impact of culture on audit-detected accounting errors. *Auditing: A Journal of Practice & Theory*, 22(2), 281-295.

- Chia, R. (2003). Organization theory as a postmodern science. In Alfred North Whitehead, (1933), H. Bergson, (1922), D. Bohm, (1988). *The Oxford handbook of organization theory*: Oxford University Press, 113-140.
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research*, 295(2), 295-336.
- Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research*, 14(2), 189-217.
- Chin, W. W., & Newsted, P. R. (1998). Structural equation modeling analysis with small samples using partial least squares. In R. H. Hoyle(Ed.). *Statistical strategies for small sample research*, 2, (307-341). Newberry Park, California: Sage.
- Cho, M.-K., Lee, H.-Y., & Park, H.-Y. (2015). Characteristics of statutory internal auditors and operating efficiency. *Managerial Auditing Journal*, 30(4/5), 456-481.
- Christ, M. H., Masli, A., Sharp, N. Y., & Wood, D. A. (2015). Rotational internal audit programs and financial reporting quality: Do compensating controls help? *Accounting Organizations and Society*, 44, 37-59.
- Christopher, J., Sarens, G., & Leung, P. (2009). A critical analysis of the independence of the internal audit function: evidence from Australia. *Accounting, Auditing & Accountability Journal*, 22(2), 200-220.
- Churchill, G. A., & Dawn, I. (2005). *Marketing research: methodological foundations* (9th ed.). Mason, Ohio: Thomson / South-Western.
- Cipriani, A., & Geddes, J. (2003). Comparison of systematic and narrative reviews: the example of the atypical antipsychotics. *Epidemiologia e Psichiatria Sociale*, 12(3), 146-153.
- Central Intelligence Agency World Fact Book (2006). Available at: <https://www.cia.gov/library/publications/resources/the-world-factbook/index.html>. (Last accessed 10 June 2017).
- Cohen, A., & Sayag, G. (2010). The effectiveness of internal auditing: an empirical examination of its determinants in Israeli organisations. *Australian Accounting Review*, 20(3), 296-307.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Mahwah, NJ: Lawrence Erlbaum.

- Cohen, J. R., Krishnamoorthy, G., & Wright, A. (2004). The corporate governance mosaic and financial reporting quality. *Journal of Accounting Literature*, 23(1), 87-152.
- Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *Journal of Financial Economics*, 87(2), 329-356.
- Collis, J., & Hussey, R. (2009). *Business research: A practical guide for undergraduate & postgraduate students* (3rd ed.). Basingstoke: Palgrave Macmillan.
- Cook, D., Randolph, A., Kernerman, P., Cupido, C., King, D., Soukup, C., & Brun-Buisson, C. (1997). Central venous catheter replacement strategies: a systematic review of the literature. *Critical Care Medicine*, 25(8), 1417-1424.
- Cooper, B. J. (1993). The audit committee and internal audit. *Managerial Auditing Journal*, 8(3), 8-10.
- Cooper, B. J., Leung, P., & Mathews, C. (1994). Internal audit: An Australian profile. *Managerial Auditing Journal*, 9(3), 13.
- Cooper, B. J., Leung, P., & Wong, G. (2006). The Asia Pacific literature review on internal auditing. *Managerial Auditing Journal*, 21(8), 822-834.
- Committee of Sponsoring Organization of the Treadway Commission (COSO) (2017). *Operating policies*. Available at: <https://www.coso.org/Pages/aboutus.aspx>. (Last accessed 16. Jan. 2017).
- Council of Ministers (2004). *Cabinet Decree. No 235 issued in 9 October 2004*. The decision of establishing an internal audit unit in each governmental department.
- Council of Ministers (2011). *Cabinet Decree. No 65/A, establish of the National Anti-corruption Commission decision*, Available at: <http://www.nazaha.gov.sa/About/Pages/Organizing.aspx>. (Last accessed 08. May. 2014).
- Craft, J. L. (2013). A review of the empirical ethical decision-making literature: 2004–2011. *Journal of Business Ethics*, 117(2), 221-259.
- Creswell, J. W. (1998). *Research design: qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage
- Crotty, M. (1998). *The foundation of social research*. London: Sage.
- Cunliffe, A. L. (2003). Reflexive inquiry in organizational research: questions and possibilities. *Human Relations*, 56(8), 983-1003.



- Dailey, R. C., & Morgan, C. P. (1978). Personal characteristics and job involvement as antecedents of boundary spanning behaviour: A path analysis. *Journal of Management Studies*, 15(3), 330-339.
- Davison, A. C., & Hinkley, D. V. (1997). *Bootstrap methods and their application*. Cambridge, UK: Cambridge University Press.
- de Zwaan, L., Stewart, J., & Subramaniam, N. (2011). Internal audit involvement in enterprise risk management. *Managerial Auditing Journal*, 26(7), 586-604.
- Deloitte (2010). The broken triangle? Improving the relationship between internal audit, management, and the audit committee. Deloitte Development LLC.
- Demsetz, H., & Lehn, K. (1985). The structure of corporate ownership: Causes and consequences. *Journal of Political Economy*, 93(6), 1155-1177.
- Denyer, D., & Tranfield, D. (2006). Using qualitative research synthesis to build an actionable knowledge base. *Management Decision*, 44(2), 213-227.
- Denyer, D., & Tranfield, D. (2009). *Producing a systematic review*. London: Sage Publications Ltd.
- Denzin, N. K., & Lincoln, Y. S. (2008). *Strategies of qualitative inquiry*. Thousand Oaks, California: Sage Publications, Inc.
- Desai, V., Roberts, R. W., & Srivastava, R. (2010). An analytical model for external auditor evaluation of the internal audit function using belief functions. *Contemporary Accounting Research*, 27(2), 537-575.
- Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009). Effectual versus predictive logics in entrepreneurial decision-making: Differences between experts and novices. *Journal of Business Venturing*, 24(4), 287-309.
- DeZoort, F. T., & Salterio, S. E. (2001). The effects of corporate governance experience and financial-reporting and audit knowledge on audit committee members' judgments. *Auditing: A Journal of Practice & Theory*, 20(2), 31-47.
- Diamantopoulos, A., & Sigauw, J. A. (2002). Formative vs. reflective indicators in measure development: Does the choice of indicators matter? *British Journal of Management*, 13, 263-282.
- Dijkstra, T. (1983). Some comments on maximum likelihood and partial least squares methods. *Journal of Econometrics*, 22(1-2), 67-90.
- Dowling, C. (2009). Appropriate audit support system use: The influence of auditor, audit team, and firm factors. *The Accounting Review*, 84(3), 771-810.

- East West Management Institute (2005). *Three models of corporate governance, Partners for financial stability program*. Available at: <http://www.emergingmarketsesg.net/esg/wp-content/uploads/2011/01/Three-Models-of-Corporate-Governance-January-2009.pdf>. (Last accessed 26. June. 2017).
- Edwards, J. R., & Bagozzi, R. P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological Methods*, 5(2), 155-174.
- Efron, B., & Tibshirani, R. (1986). Bootstrap methods for standard errors, confidence intervals, and other measures of statistical accuracy. *Statistical Science*, 1, 54-75.
- Ege, M. S. (2015). Does internal audit function quality deter management misconduct? *Accounting Review*, 90(2), 495-527.
- Ernst and Young (2012). "Internal audit reporting: Perspectives from Chief Audit Executives." Ernst & Young Global Limited.
- Everett, J., & Tremblay, M.-S. (2014). Ethics and internal audit: Moral will and moral skill in a heteronomous field. *Critical Perspectives on Accounting*, 25(3), 181-196.
- Eweje, G., & Brunton, M. (2010). Ethical perceptions of business students in a New Zealand university: do gender, age and work experience matter? *Business Ethics: A European Review*, 19(1), 95-111.
- Fadzil, F. H., Haron, H., & Jantan, M. (2005). Internal auditing practices and internal control system. *Managerial Auditing Journal*, 20(8/9), 844-866.
- Ferlie, E., Fitzgerald, L., Wood, M., & Hawkins, C. (2005). The nonspread of innovations: the mediating role of professionals. *Academy of Management Journal*, 48(1), 117-134.
- Field, A. P. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). London: Sage Publication Ltd.
- Flowers, P. (2009). Research philosophies—importance and relevance. *Economic Record*, 1(3), 1-5.
- Ford, R. C., & Richardson, W. D. (1994). Ethical decision making: A review of the empirical literature. *Journal of Business Ethics*, 13(3), 205-221.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18, 39-50.
- Foss, K., & Rodgers, W. (2011). Enhancing information usefulness by line managers' involvement in cross-unit activities. *Organization Studies*, 32(5), 683-703.

- Fraser, J., & Lindsay, H. (2004). *20 Questions directors should ask about internal audit*: Canadian Institute of Chartered Accountants, Toronto.
- Frost, J. (2013). *Regression analysis: How do I interpret R-squared and assess the goodness-of-fit?* The Minitab Blog. Available at: <http://blog.minitab.com/blog/adventures-in-statistics/regression-analysis-how-do-i-interpret-r-squared-and-assess-the-goodness-of-fit> (Last accessed 18. November. 2016).
- Gefen, D., Straub, D., & Boudreau, M.-C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems*, 4(7), 1-77.
- Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika*, 61, 101-107.
- Ghauri, P., & Grønhaug, K. (2010). *Research methods in business studies* (4th ed.). England: Financial Times Prentice Hall.
- Gill, J., & Johnson, P. (2010). *Research methods for managers* (4th ed.). London: Sage Publications Ltd.
- Goodhue, D. L., Lewis, W., & Thompson, R. (2012). Does PLS have advantages for small sample size or non-normal data? *MIS Quarterly*, 36(3), 891-1001.
- Goodwin, J. (2003). The relationship between the audit committee and the internal audit function: evidence from Australia and New Zealand. *International Journal of Auditing*, 7(3), 263-278.
- Goodwin, J. (2004). A comparison of internal audit in the private and public sectors. *Managerial Auditing Journal*, 19(5), 640-650.
- Goodwin, J., & Yeo, T. Y. (2001). Two factors affecting internal audit independence and objectivity: Evidence from Singapore. *International Journal of Auditing*, 5(2), 107-125.
- Gough, D., Oliver, S., & Thomas, J. (2012). *An introduction to systematic reviews*. London: Sage Publication Ltd.
- Gramling, A. A., Maletta, M. J., Schneider, A., & Church, B. K. (2004). The role of the internal audit function in corporate governance: a synthesis of extant internal auditing literature and directions for future research. *Journal of Accounting Literature*, 23, 194-244.
- Guiral, A., Rodgers, W., Ruiz, E., & Gonzalo, J. A. (2010). Ethical dilemmas in auditing: Dishonesty or unintentional bias? *Journal of Business Ethics*, 91(1), 151-166.

- Guiral, A., Rodgers, W., Ruiz, E., & Gonzalo-Angulo, J. A. (2015). Can expertise mitigate auditors' unintentional biases? *Journal of International Accounting, Auditing and Taxation*, 24, 105-117.
- Hahn, C. H., Johnson, M. D., Herrmann, A., & Huber, F. (2002). Capturing customer heterogeneity using a finite mixture PLS approach. *Schmalenbach Business Review*, 54, 243-319.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective*. London: Pearson Education.
- Hair, J. F., Celsi, M., Money, A. H., Samouel, P., & Page, M. J. (2016). *Essentials of business research methods*. Armonk, New York: Sharpe.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice*, 19(2), 139-152.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2012a). Partial least squares: The better approach to structural equation modeling? *Long Range Planning*, 45(5-6), 312-319.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: rigorous applications, better results and higher acceptance. *Long Range Planning*, 46(1-2), 1-12.
- Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012b). 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*, 45(5), 320-340.
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012c). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, 40(3), 414-433.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. California: Sage Publications.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). California: Sage Publications.
- Hass, S., Abdolmohammadi, M. J., & Burnaby, P. (2006). The Americas literature review on internal auditing. *Managerial Auditing Journal*, 21(8), 835-844. doi:<http://dx.doi.org/10.1108/02686900610703778>
- Hatch, M. J., & Cunliffe, A. L. (2006). *Organization theory* (2nd ed.). Oxford: Oxford University Press.

- Havelka, D., & Merhout, J. W. (2013). Internal information technology audit process quality: Theory development using structured group processes. *International Journal of Accounting Information Systems*, 14(3), 165-192.
- Hayibor, S., & Wasieleski, D. M. (2009). Effects of the use of the availability heuristic on ethical decision-making in organizations. *Journal of Business Ethics*, 84(1), 151-165.
- Hegazy, K., & Stafford, A. (2016). Audit committee roles and responsibilities in two English public sector settings. *Managerial Auditing Journal*, 31(8/9), 848-870.
- Hermanson, D., & Rittenberg, L., (2003). *Internal audit and organizational governance*. The Institute of Internal Auditors, 247 Maitland Avenue, Altamonte Springs, Florida.
- Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., . . . Calantone, R. J. (2014). Common beliefs and reality about PLS comments on Rönkkö and Evermann (2013). *Organizational Research Methods*, 17, 182-209.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *New Challenges to International Marketing Advances In International Marketing*, 20(1), 277-319.
- Heron, J. (1996). *Co-operative inquiry: research into the human condition*. London: Sage Publications Ltd.
- Hofstede, G. (1983). Dimensions of national cultures in fifty countries and three regions. *Explorations in Cross-Cultural Psychology*. Lisse, Netherlands: Swets & Zeitlinger.
- Hofstede, G. (1980). *Culture's consequences: international differences in work-related values*. London UK: Sage.
- Holt, T. P. (2012). The effects of internal audit role and reporting relationships on investor perceptions of disclosure credibility. *Managerial Auditing Journal*, 27(9), 878-898.
- Hoos, F., Kochetova-Kozloski, N., & d'Arcy, A. C. (2015). The importance of the chief audit executive's communication: experimental evidence on internal auditors' judgments in a 'two masters setting'. *International Journal of Auditing*, 19(3), 166-181.
- House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (2004). *Culture, leadership, and organizations: The GLOBE study of 62 societies*. United States of America: Sage publications.

- Hoyle, R. H. (1999). *Statistical strategies for small sample research*. The United States of America: Sage.
- Hsiao, R. L., Tsai, D. H., & Lee, C. F. (2012). Collaborative knowing: the adaptive nature of cross-boundary spanning. *Journal of Management Studies*, 49(3), 463-491.
- Hu, L.-t., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological methods*, 3(4), 424-453
- Institute of Internal Auditors (IIA) (2002). *Practice Advisory 1110-1 Organizational independence*. IIA Global, Florida, USA.
- Institute of Internal Auditors (IIA) (2010). *2110-3: Governance: definition*. IIA global, available at: [https://ca.groups.yahoo.com/neo/groups/GOV\\_DG2/conversations/topics/4143](https://ca.groups.yahoo.com/neo/groups/GOV_DG2/conversations/topics/4143). (Last accessed 20. March. 2015).
- Institute of Internal Auditors (IIA) (2011). *Independence and objectivity*, IIA, Practice Guide. Available at: <https://na.theiia.org/standards-guidance/Member%20Documents/111032%20PROF-IndependenceObjectivity%20PG-FNL.pdf> (Last accessed 16. Jan. 2017).
- Institute of Internal Auditors (IIA) (2013a). *Reporting lines, priorities, and resources shift for internal auditors*. IIA, Available at: <https://na.theiia.org/news/Pages/Reporting-Lines-Priorities-and-Resources-Shift-for-Internal-Auditors.aspx> (Last accessed 15. Jan. 2016).
- Institute of Internal Auditors (IIA) (2013b). *The IIA global internal audit competency framework*. Florida, USA: IIA Global.
- Institute of Internal Auditors (IIA) (2016a). *International standards for the professional practice of internal auditing (SPP)*. Florida, IIA Global.
- Institute of Internal Auditors (IIA) (2016b). *Practice Advisory 1110-1 Organizational independence*. IIA Global, Available at: <https://global.theiia.org/standards-guidance/Public%20Documents/IPPF-Standards-2017.pdf>. (Last accessed 29. Dec. 2016).
- Institute of Internal Auditors (IIA) (2016c). *Code of ethics*. IIA Global. Available at: <https://global.theiia.org/standards-guidance/mandatory-guidance/Pages/Code-of-Ethics.aspx>. (Last accessed 29. Dec. 2016).
- Institute of Internal Auditors (IIA) (2017a). *Definition of internal auditing*. Available at: <https://global.theiia.org/standards-guidance/mandatory-guidance/Pages/Definition-of-Internal-Auditing.aspx>

- Institute of Internal Auditors (IIA) (2017b). *Mission and history*. Available at: <https://global.theiia.org/about/about-the-iiia/Pages/About-The-Institute-of-Internal-Auditors.aspx> (Last accessed 05. February. 2017).
- Institute of Internal Auditors (IIA) (2017c). *The IPPF: the framework for internal audit effectiveness*. IIA global, Available at: <https://global.theiia.org/standards-guidance/Pages/Standards-and-Guidance-IPPF.aspx> (Last accessed 06. February. 2017).
- Institute of Internal Auditors – Australia (2014). *Internal audit: why it's important*. IIA-Australia. Available at: [http://www.iiia.org.au/sf\\_docs/default-source/quality/why-ia-is-important.pdf?sfvrsn=2](http://www.iiia.org.au/sf_docs/default-source/quality/why-ia-is-important.pdf?sfvrsn=2) (Last accessed 10 Jan 2017).
- Institute of Internal Auditors Research Foundation (IARF) (2003). *Internal audit reporting relationships: serving two masters*. Florida, United States of America: IARF.
- Institute of Internal Auditors Research Foundation (IARF) (2007). *A global summary of the Common Body of Knowledge 2006*. Florida, United States of America: IARF.
- Institute of Internal Auditors Research Foundation (IARF) (2015). *The CBOK 2015 global internal audit practitioner survey questions*. IIA Global, Available at: <https://global.theiia.org/iia/Pages/Public%20Documents/CBOK-2015-Practitioner-Survey-Question-List.pdf>. (Last accessed 15. Jan. 2017).
- Institute of Internal Auditors-Saudi (2011). *Approval of Council of Ministers to the charter of IIA-Saudi*. Available at: <http://www.iiia.org.sa/en/about-iiia-ksa/iiia-ksa>. (Last accessed 08. May. 2014).
- Internal Audit Regulation (2007). Issued by Cabinet Decree No 129. Al-Riyadh: available at: <http://www.alriyadh.com/254229>. (Last accessed 08. May. 2014).
- International Organization for Standardization and International Electrotechnical Commission (ISO/IEC) (2005). *Information technology - Security techniques - Code of practice for information security management*. (ISO/IEC 27002: 2005).
- International Standard on Auditing (ISA) (2013). *ISA 610 Using the work of internal auditors*. International Auditing and Assurance Standards Board. International Federation of Accountants.
- Itim (2017). *Geert Hofstede*. Available at: <https://geert-hofstede.com/united-states.html>. (Last accessed 04. March. 2017).
- James, K. L. (2003). The effects of internal audit structure on perceived financial statement fraud prevention. *Accounting Horizons*, 17(4), 315-327.

- James, K. L. (2004). Structuring internal audit reporting to enhance user confidence. *Internal Auditing*, 19(1), 17-21.
- Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research*, 30(2), 199-218.
- Jemison, D. B. (1984). The Importance of boundary spanning roles in strategic decision-making. *Journal of Management Studies*, 21(2), 131-152.
- Johnson, S. (2006). Should internal audit report to the CFO?. <http://ww2.cfo.com/accounting-tax/2006/10/should-internal-audit-report-to-the-cfo/>. (Last accessed 20. Jan. 2015).
- Johl, S. K., Johl, S. K., Subramaniam, N., & Cooper, B. (2013). Internal audit function, board quality and financial reporting quality: evidence from Malaysia. *Managerial Auditing Journal*, 28(9), 780-814.
- Jones, T. M. (1991). Ethical decision making by individuals in organizations: An issue-contingent model. *Academy of Management Review*, 16(2), 366-395.
- Jöreskog, K. G., & Wold, H. (1983). The ML and PLS techniques for modelling with latent variables: Historical and comparative aspects. In H. Wold & K. G. Jöreskog (Eds.). *Systems Under Indirect Observation, Part 1*(263-270). Amsterdam: North-Holland.
- Kacmar, K. M., Zivnuska, S., & White, C. D. (2007). Control and exchange: The impact of work environment on the work effort of low relationship quality employees. *The Leadership Quarterly*, 18(1), 69-84.
- Kagermann, H., William, K., Karlheinz, K., & Claus-Peter, W. (2008). *Internal audit handbook: management with the SAP®-Audit Roadmap*. Heidelberg: Springer.
- Kahneman, D. (2003). A perspective on judgment and choice: mapping bounded rationality. *American Psychologist*, 58(9), 697-720.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 47(2), 263-291.
- Kaplan, S. E., Jr., & Schultz, J. J., Jr. (2007). Intentions to report questionable acts: an examination of the influence of anonymous reporting channel, internal audit quality, and setting. *Journal of Business Ethics*, 71(2), 109-124.
- Karagiorgos, T., Drogalas, G., Christodoulou, P., & Pazarskis, M. (2006). *Conceptual framework, development trends and future prospects of internal audit: Theoretical approach*. Paper presented at the 5th Annual Conference, Hellenic Finance and Accounting Association (HFAA).



- Kelemen, M. L., & Rumens, N. (2008). *An introduction to critical management research*. London: Sage.
- Khelil, I., Hussainey, K., & Noubbigh, H. (2016). Audit committee – internal audit interaction and moral courage. *Managerial Auditing Journal*, 31(4/5), 403-433.
- Kim, G., Shin, B., & Grover, V. (2010). Investigating two contradictory views of formative measurement in information systems research. *MIS Quarterly*, 34, 345-365.
- Koonce, L. (2013). Discussion of 'Is the objectivity of internal audit compromised when the internal audit function is a management training ground?'. *Accounting and Finance*, 53(4), 1021-1028.
- Krishnamoorthy, G. (2001). A cascaded inference model for evaluation of the internal audit report. *Decision Sciences*, 32(3), 499-520.
- Krishnamoorthy, G. (2002). A multistage approach to external auditors' evaluation of the internal audit function. *Auditing-a Journal of Practice & Theory*, 21(1), 95-121.
- Lampe, J. C., Finn, D. W., Gaa, J., & Malley, P. L. (1992). A model of auditors' ethical decision processes; Discussions; Reply. *American Accounting Association*, 11, 33-73.
- 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*, 12(4), 305-328.
- Lenz, R., & Hahn, U. (2015). A synthesis of empirical internal audit effectiveness literature pointing to new research opportunities. *Managerial Auditing Journal*, 30(1), 5-33.
- Lenz, R., & Sarens, G. (2012). Reflections on the internal auditing profession: what might have gone wrong? *Managerial Auditing Journal*, 27(6), 532-549.
- Lenz, R., Sarens, G., & D'Silva, K. (2014). Probing the discriminatory power of characteristics of internal audit functions: sorting the wheat from the chaff. *International Journal of Auditing*, 18(2), 126-138.
- Leung, P., Cooper, B. J., & Perera, L. (2011). Accountability structures and management relationships of internal audit. *Managerial Auditing Journal*, 26(9), 794-816.
- Levina, N., & Vaast, E. (2008). Innovating or doing as told? Status differences and overlapping boundaries in offshore collaboration. *MIS Quarterly*, 32(2), 307-332.
- Libby, R., & Luft, J. (1993). Determinants of judgment performance in accounting settings: Ability, knowledge, motivation, and environment. *Accounting, Organizations and Society*, 18(5), 425-450.

- Lin, S., Pizzini, M., Vargus, M., & Bardhan, I. R. (2011). The role of the internal audit function in the disclosure of material weaknesses. *Accounting Review*, 86(1), 287-323.
- Lisic, L. L., Neal, T. L., Zhang, I. X., & Zhang, Y. (2016). CEO power, internal control quality, and audit committee effectiveness in substance versus in form. *Contemporary Accounting Research*, 33(3), 1199-1237.
- Lyke, B., & Jickling, M. (2002). WorldCom: The accounting scandal. *Congressional Research Service Report for Congress*, August, Washington, The Library of Congress.
- Ma'ayan, Y., & Carmeli, A. (2016). Internal audits as a source of ethical behavior, efficiency, and effectiveness in work units. *Journal of Business Ethics*, 137(2), 347-363.
- Malhotra, N. K. (2012). *Marketing research: an applied approach* (4th ed.). Harlow: Financial Times/Prentice Hall: Pearson Education Limited.
- Marks, N. (2010). *Where should internal audit report? Should it be to the audit committee?* Norman Marks on governance, risk management and audit, Available at: <https://normanmarks.wordpress.com/2010/05/20/where-should-internal-audit-report-should-it-be-to-the-audit-committee/> (Last accessed 07. February. 2017).
- Marrone, J. A., Tesluk, P. E., & Carson, J. B. (2007). A multilevel investigation of antecedents and consequences of team member boundary-spanning behavior. *Academy of Management Journal*, 50(6), 1423-1439.
- Matavire, E. H. M., & Dzama, T. (2013). Dual reporting by the chief audit executive: the situation in the Zimbabwean Parastatals. *International Journal of Applied Research and Studies (iJARS)*, 2, 1-13.
- Mazza, T., & Azzali, S. (2015). Effects of internal audit quality on the severity and persistence of controls deficiencies. *International Journal of Auditing*, 19(3), 148-165.
- McCullough, P. M., & Faught, S. (2005). Rational moralists and moral rationalists value-based management: Model, criterion and validation. *Journal of Business Ethics*, 60(2), 195-205.
- McNulty, T., & Stewart, A. (2015). Developing the governance space: a study of the role and potential of the company secretary in and around the Board of Directors. *Organization Studies*, 36(4), 513-535.
- Messier, W. F., Jr., Reynolds, J. K., Simon, C. A., & Wood, D. A. (2011). The effect of using the internal audit function as a management training ground on the external auditor's reliance decision. *The Accounting Review*, 86(6), 2131-2154.

- Mihret, D. G., & Admassu, M. A. (2011). Reliance of external auditors on internal audit work: A corporate governance perspective. *International Business Research*, 4(2), 67-79.
- Mihret, D. G., & Yismaw, A. W. (2007). Internal audit effectiveness: An Ethiopian public sector case study. *Managerial Auditing Journal*, 22(5), 470-484.
- Mills, C. (2013), *Reporting and relationships case study*. Study mode, available at: <http://www.studymode.com/essays/Reporting-And-Relationships-Case-Study-1008299.html>. (Last accessed 14. March. 2014).
- Moeller, R. (2004). Managing internal auditing in a post-SOA world. *Journal of Corporate Accounting & Finance*, 15(4), 41-45.
- Monks, R., and N. Minow (2001). *Corporate Governance*. Malden, MA (2d ed.), Blackwell Publishers.
- Mohrman, S. A., Gibson, C. B., & Mohrman, A. M. (2001). Doing research that is useful to practice a model and empirical exploration. *Academy of Management Journal*, 44(2), 357-375.
- Munro, L., & Stewart, J. (2011). External auditors' reliance on internal auditing: further evidence. *Managerial Auditing Journal*, 26(6), 464-481.
- Munteanu, V., & Zaharia, D. L. (2014). Current trends in internal audit. *Procedia-Social and Behavioral Sciences*, 116, 2239-2242.
- Murray, M., & Shaikh, R. (2015). *Three audit risk trends to watch in 2016*. Available at: <https://www.cebglobal.com/blogs/internal-audit-three-trends-to-watch-in-2016/>. (Last accessed 16. Feb. 2017).
- NASDAQ Stock Market LLC (NASDAQ). *Notice of Filing of Proposed Rule Change to Require that Listed Companies Have an Internal Audit Function*. Release No. 34-69030; File No. SR-NASDAQ-2013-032, 2013. Available at: <http://www.sec.gov/rules/sro/nasdaq/2013/34-69030.pdf>. (Last accessed 13. May. 2016).
- 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*, 35(5), 546-557.
- Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw-Hill.
- O'Fallon, M. J., & Butterfield, K. D. (2005). A review of the empirical ethical decision-making literature: 1996–2003. *Journal of Business Ethics*, 59(4), 375-413.
- O'Leary, C., & Stewart, J. (2007). Governance factors affecting internal auditors' ethical decision-making. *Managerial Auditing Journal*, 22(8), 787-808.

- Orlikowski, W. J. (2002). Knowing in practice: enacting a collective capability in distributed organizing. *Organization Science*, 13(3), 249-273.
- Paape, L., Scheffe, J., & Snoep, P. (2003). The relationship between the internal audit function and corporate governance in the EU – a survey. *International Journal of Auditing*, 7(3), 247-262.
- Pallant, J. (2013). *SPSS survival manual: a step by step guide to data analysis using IBM SPSS* (5th ed.). Maidenhead: McGraw-Hill.
- Patel, C. (2003). Some cross-cultural evidence on whistle-blowing as an internal control mechanism. *Journal of International Accounting Research*, 2(1), 69-96.
- Pearsall, J., & Hanks, P. (2001). *The new Oxford dictionary of English*. Oxford: Oxford University Press.
- 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*, 30(6), 467-480.
- Peng, M. W., Sun, S. L., Pinkham, B., & Chen, H. (2009). The institution-based view as a third leg for a strategy tripod. *The Academy of Management Perspectives*, 23(3), 63-81.
- Pflugrath, G., Martinov-Bennie, N., & Chen, L. (2007). The impact of codes of ethics and experience on auditor judgments. *Managerial Auditing Journal*, 22(6), 566-589.
- Pickett, K. S. (2004). *The internal auditor at work: A practical guide to everyday challenges*. New Jersey: John Wiley & Sons.
- Pizzini, M., Lin, S., & Ziegenfuss, D. E. (2015). The impact of internal audit function quality and contribution on audit delay. *Auditing-a Journal of Practice & Theory*, 34(1), 25-58.
- Prawitt, D. F., Smith, J. L., & Wood, D. A. (2009). Internal audit quality and earnings management. *Accounting Review*, 84(4), 1255-1280.
- PricewaterhouseCoopers (PwC) 2005. *State of the internal audit profession study: internal audit post Sarbanes- Oxley*. PwC advisory internal audit.
- Public Company Accounting Oversight Board (PCAOB) 2007. *An Audit of Internal Control over Financial Reporting Performed in Conjunction with an Audit of Financial Statements*. PCAOB Release No. 2007-005. Washington, DC: Available at:[http://pcaobus.org/Standards/Auditing/Pages/Auditing\\_Standard\\_5.aspx](http://pcaobus.org/Standards/Auditing/Pages/Auditing_Standard_5.aspx). (Last accessed 13. May. 2016).

- Raghunandan, K., Read, W. J., & Rama, D. V. (2001). Audit committee composition, "gray directors," and interaction with internal auditing. *Accounting Horizons*, 15(2), 105-118.
- Ramamoorti, S. (2003). Internal auditing: history, evolution, and prospects. *The Institute of Internal Auditors Research Foundation*, 1-23.
- Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of research in Marketing*, 26(4), 332-344.
- Reynolds, M. A. (2000). Professionalism, ethical codes and the internal auditor: A moral argument. *Journal of Business Ethics*, 24(2), 115-124.
- Rigopoulou, I., Theodosiou, M., Katsikea, E., & Perdakis, N. (2012). Information control, role perceptions, and work outcomes of boundary-spanning frontline managers. *Journal of Business Research*, 65(5), 626-633.
- Ringle, C. M., Sarstedt, M., & Straub, D. (2012). A critical look at the use of PLS-SEM in MIS Quarterly. *MIS Quarterly (MISQ)*, 36(1), iii-xiv.
- Rittenberg, L., & Covaleski, M. A. (2001). Internalization versus externalization of the internal audit function: an examination of professional and organizational imperatives. *Accounting, Organizations and Society*, 26(7-8), 617-641.
- Rodgers, W. (1997). *Throughput modeling: financial information used by decision makers*. Greenwich: Jai Press.
- Rodgers, W. (1999). The influences of conflicting information on novices and loan officers' actions. *Journal of Economic Psychology*, 20(2), 123-145.
- Rodgers, W. (2003). Measurement and reporting of knowledge-based assets. *Journal of Intellectual Capital*, 4(2), 181-190.
- Rodgers, W. (2006). *Process thinking: Six pathways to successful decision making*. New York: iUniverse.
- Rodgers, W. (2009). *Ethical Beginnings: Preferences, rules, and principles influencing decision making*. New York: iUniverse.
- Rodgers, W., Choy, H. L., & Guiral, A. (2013). Do investors value a firm's commitment to social activities? *Journal of Business Ethics*, 114(4), 607-623.
- Rodgers, W., & Gago, S. (2001). Cultural and ethical effects on managerial decisions: examined in a throughput model. *Journal of Business Ethics*, 31(4), 355-367.

- Rodgers, W., & Guiral, A. (2011). Potential model misspecification bias: Formative indicators enhancing theory for accounting researchers. *The International Journal of Accounting*, 46(1), 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*, 86(3), 347-361.
- Rodgers, W., & Housel, T. J. (1987). The effects of information and cognitive processes on decision making. *Accounting and Business Research*, 18(69), 67-74.
- Rodgers, W., Simon, J., & Gabrielsson, J. (2017). Combining experiential and conceptual learning in accounting education: A review with implications. *Management Learning*, 48(2), 187-205.
- Rodgers, W., Söderbom, A., & Guiral, A. (2014). Corporate social responsibility enhanced control systems reducing the likelihood of fraud. *Journal of Business Ethics*, 131(4), 871-882.
- Roldán, J. L., & Sánchez-Franco, M. J. (2012). Variance-based structural equation modeling: guidelines for using partial least squares in information system research. In M. Mora, O. Gelman, A.L. Steenkamp, & M. Raisinghani (Eds.), *Research methodologies, innovations and philosophies in software systems engineering and information systems*, (193-221). Hershey, PA: IGI Global.
- Rose, A. M., Rose, J. M., & Norman, C. S. (2013). Is the objectivity of internal audit compromised when the internal audit function is a management training ground? *Accounting and Finance*, 53(4), 1001-1019.
- Ross, S. (2015). What are some examples of different corporate governance systems across the world. Available at: [ra7d7oeht f8hahc8ao re09rt8hg](#). (Last accessed 26. June. 2017).
- Rother, E. T. (2007). Systematic literature review X narrative review. *Acta Paulista de Enfermagem*, 20(2), vii-viii.
- Roussy, M. (2013). Internal auditors' roles: from watchdogs to helpers and protectors of the top manager. *Critical Perspectives on Accounting*, 24(7-8), 550-571.
- Roussy, M. (2015). Welcome to the day-to-day of internal auditors: how do they cope with conflicts? *Auditing-a Journal of Practice & Theory*, 34(2), 237-264.
- Roussy, M., & Brivot, M. (2016). Internal audit quality: a polysemous notion? *Accounting Auditing & Accountability Journal*, 29(5), 714-738.
- Roussy, M., & Rodrigue, M. (2016). Internal Audit: Is the 'third line of defense' effective as a form of governance? an exploratory study of the impression management

- techniques chief audit executives use in their annual accountability to the audit committee. *Journal of Business Ethics*, 1-17.
- Sarens, G., Abdolmohammadi, M. J., & Lenz, R. (2012). Factors associated with the internal audit function's role in corporate governance. *Journal of Applied Accounting Research*, 13(2), 191-204.
- Sarens, G., Christopher, J., & Zaman, M. (2013). A study of the informal interactions between audit committees and internal auditors in Australia. *Australian Accounting Review*, 23(4), 307-329.
- Sarens, G., & De Beelde, I. (2006). The relationship between internal audit and senior management: a qualitative analysis of expectations and perceptions. *International Journal of Auditing*, 10(3), 219-241.
- Sarens, G., De Beelde, I., & Everaert, P. (2009). Internal audit: A comfort provider to the audit committee. *The British Accounting Review*, 41(2), 90-106.
- Sarstedt, M., Becker, J.-M., Ringle, C. M., & Schwaiger, M. (2011). Uncovering and treating unobserved heterogeneity with FIMIX-PLS: which model selection criterion provides an appropriate number of segments? *Schmalenbach Business Review*, 63, 34-62.
- Sarstedt, M., Ringle, C. M., Smith, D., Reams, R., & Hair, J. F. (2014). Partial least squares structural equation modeling (PLS-SEM): A useful tool for family business researchers. *Journal of Family Business Strategy*, 5(1), 105-115.
- Saunders, M., Lewis, P., & Thornhill, A. (2016). *Research methods for business students* (7th ed.). England: Pearson Education Limited.
- Scarborough, D. P., Rama, D. V., & Raghunandan, K. (1998). Audit committee composition and interaction with internal auditing: Canadian evidence. *Accounting Horizons*, 12(1), 51-62.
- Schneider, A. (2009). The nature, impact and facilitation of external auditor reliance on internal auditing. *Academy of Accounting and Financial Studies Journal*, 13(4), 41-53.
- Schneider, A. (2010). Analysis of professional standards and research findings to develop decision aids for reliance on internal auditing. *Research in Accounting Regulation*, 22(2), 96-106.
- Scott, W. R. (1995). *Institutions and organizations*. Thousand Oaks, CA: Sage.
- Sekaran, U., & Bougie, R. (2013). *Research methods for business: a skill-building approach* (6th ed.). Chichester: Wiley.

- Shanteau, J., Weiss, D. J., Thomas, R. P., & Pounds, J. C. (2002). Performance-based assessment of expertise: How to decide if someone is an expert or not. *European Journal of Operational Research*, 136(2), 253-263.
- Shmueli, G. (2010). To explain or to predict? *Statistical Science*, 25(3), 289-310.
- Siegel, P. H., O'Shaughnessy, J., & Rigsby, J. T. (1995). A reexamination of the internal auditors' code of ethics. *Journal of Business Ethics*, 14(11), 949.
- Smith, J. K. (1983). Quantitative versus qualitative research: an attempt to clarify the issue. *Educational Researcher*, 12(3), 6-13.
- Stewart, J., & Subramaniam, N. (2010). Internal audit independence and objectivity: emerging research opportunities. *Managerial Auditing Journal*, 25(4), 328-360.
- Stoel, D., Havelka, D., & Merhout, J. W. (2012). An analysis of attributes that impact information technology audit quality: A study of IT and financial audit practitioners. *International Journal of Accounting Information Systems*, 13(1), 60-79.
- Stone, M. (1974). Cross-validators choice and assessment of statistical predictions. *Journal of the Royal Statistical Society*, 36, 111-147.
- Tabachnick, B. G., & Fidell, L. S. (2014). *Using multivariate statistics* (6th ed.). Harlow: Pearson.
- Tabuena, J. (2013). Where the CCO & Internal audit should report. *Compliance week*. Available at: <https://www.complianceweek.com/blogs/jose-tabuena/where-internal-audit-and-compliance-should-report>. (Last accessed 15. Jan. 2017).
- Thiele, K. O., Sarsted, M., & Ringle, C. M. (2015). A comparative evaluation of new and established methods for structural equation modeling. In A. G. Close & D. L. Haytko (Eds.). *Proceedings of the 2015 Academy of Marketing Science Annual Conference*, Denver, CO: Academy of Marketing Science.
- Tsoukas, H., & Knudsen, C. (2003). *The Oxford handbook of organizational theory: meta-theoretical perspectives*. Oxford: Oxford University Press.
- Tysiac, K. (2013). Internal audit reporting line to CEO gains steam as Fed weighs in. *Journal of Accountancy*, Available at: <http://www.journalofaccountancy.com/news/2013/feb/20137291.html>. (Last accessed at 17. Feb. 2017).
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207-222.



- UK Essays. (2015). *Ethics and Responsibility in Accounting and auditing*. Available at: <https://www.ukessays.com/essays/accounting/ethics-and-responsibility-in-accounting-law-essays.php?cref=1>. (Last accessed at 17. Feb. 2017).
- United States Congress (2002), Sarbanes-Oxley Act, Public Law 107-204, 107th Cong., 2nd Sess., GPO, Washington, DC.
- Valentine, S. R., & Rittenburg, T. L. (2007). The ethical decision making of men and women executives in international business situations. *Journal of Business Ethics*, 71(2), 125-134.
- Van Peurse, K. A. (2005). Conversations with internal auditors: The power of ambiguity. *Managerial Auditing Journal*, 20(5), 489-512.
- Vinten, G. (1991). UK internal audit developments-towards Europe or America? *Managerial Auditing Journal*, 6(1), 16-20.
- Watson, G. W., Berkley, R. A., & Papamarcos, S. D. (2009). Ambiguous allure: The value-pragmatics model of ethical decision making. *Business and Society Review*, 114(1), 1-29.
- Zain, M. M., & Subramaniam, N. (2007). Internal auditor perceptions on audit committee interactions: a qualitative study in Malaysian public corporations. *Corporate Governance-an International Review*, 15(5), 894-908.
- Zaman, M., & Sarens, G. (2013). Informal interactions between audit committees and internal audit functions. *Managerial Auditing Journal*, 28(6), 495-515.
- Ziegenfuss, D. E., & Singhapadki, A. (1994). Professional values and the ethical perceptions of internal auditors. *Managerial Auditing Journal*, 9(1), 34-44.
- Ziegenfuss, D. E., Singhapadki, A., & Martinson, O. B. (1994). Do internal auditors and management accountants have different ethical philosophies? *Managerial Auditing Journal*, 9(1), 4-11.

## Appendices

Appendix 1: Internal Audit Reporting Relationships Literature

Author & year	Title	Journal	Type of study	Participants	Research Issue(s)	Finding(s)
Cooper (1993)	The audit committee and internal audit	Managerial Auditing Journal	Article	N/A	The relationship between AC and internal audit	Good relationship between AC and internal audit can improve corporate management and control. Distributing charter to management and reporting to the AC can foster good relationship. AC should consist of non-executive members of the board.
Cooper et al. (1994)	Internal audit: an Australian profile	Managerial Auditing Journal	Survey	N = 491 internal audit manager	The situation of internal audit in Australia	There is conflict of interest between CEO and internal auditors
Ziegenfuss & Singhapakdi (1994)	Professional values and the ethical perceptions of internal auditors	Managerial Auditing Journal	Survey	N= 493 IIA members	Determines the influence of Code of Ethics on the IIA members	The Code of Ethics can help in solving ethical dilemmas. It can positively influence the ethical perceptions of members more than personal ethical

<p>philosophies or organisational environment.</p>				<p>Internal auditors' personal ethical philosophies are different from those of management accountants. This could lead to a breakdown in the reporting system. The ethical philosophies are related to occupational status, but related more to the corporate ethical values.</p>
<p>Internal auditors' personal ethical philosophies are different from those of management accountants. This could lead to a breakdown in the reporting system. The ethical philosophies are related to occupational status, but related more to the corporate ethical values.</p>	<p>There are ethical pressures or self-interest between groups.</p>	<p>Some may lose their job, promotion or the right action.</p>	<p>Close relationship with management complicates the code through legal and moral responsibilities when there is a conflict of interest. In addition,</p>	
<p>philosophies or organisational environment.</p>	<p>Internal auditors' personal ethical philosophies are different from those of management accountants. This could lead to a breakdown in the reporting system. The ethical philosophies are related to occupational status, but related more to the corporate ethical values.</p>	<p>There are ethical pressures or self-interest between groups.</p>	<p>Some may lose their job, promotion or the right action.</p>	
<p>Internal auditors' personal ethical philosophies are different from those of management accountants. This could lead to a breakdown in the reporting system. The ethical philosophies are related to occupational status, but related more to the corporate ethical values.</p>	<p>There are ethical pressures or self-interest between groups.</p>	<p>Some may lose their job, promotion or the right action.</p>	<p>Close relationship with management complicates the code through legal and moral responsibilities when there is a conflict of interest. In addition,</p>	

**Ziegenfuss et al. (1994)**

**Siegel et al. (1995)**

<p>there is substantial need for a strong Code of Conduct.</p>					
<p>ACs with independent members had more frequent meetings with internal auditors and were more likely to review the result of internal auditing.</p>	<p>Examines AC composition and its interaction with internal auditing</p>	<p>N = 118 manufacturing companies in Canadian</p>	<p>Survey</p>	<p>Accounting Horizons</p>	<p>Audit committee composition and interaction with internal auditing: Canadian Evidence</p>
<p>Internal auditors may face a conflict between loyalties to the professional standards as they are articulated in the Standards and the Code of Ethics, and their employer. Internal audit reporting to the AC can impose conflict with management. The Code of Ethics maintains both moral character and professional competence.</p>	<p>Examines the case of internal audit's claim to professionalism based on its function in society, criteria for professions and development of an ethical code.</p>	<p>N/A</p>	<p>Conceptual paper</p>	<p>Journal of Business Ethics</p>	<p>Professionalism, Ethical Codes and the internal auditor, a moral argument</p>
		<p>N/A</p>	<p>Mathematical formulation</p>	<p>Decision Sciences</p>	<p>A cascaded inference model</p>
		<p>N/A</p>			<p>Krishnamoorty (2001)</p>

for evaluation of the internal audit function	Provides a theoretical framework on how internal audit work should be evaluated by external auditors with a view to assessing the risk of material misstatement	IAF report is highly sensitive to internal auditor reporting bias, and is conditional on the level of internal auditor competence, thus suggesting significant interaction effects between the objectivity and competence factors.
Audit committee composition, "Gray Directors," and interaction with internal audit	Examines AC composition and its interaction with internal audit.	ACs with independent members and with at least one member who has accounting or finance qualifications are more likely to have a higher degree of active oversight on internal audit.
Internalization versus externalization of the internal audit function: and examination of professional and	Examines the recent trend toward the outsourcing of IAF to the public accounting profession.	Outsourcing can serve AC better, but when management has positive intentions, strong internal control and a long run perspective, then reporting to management can identify business opportunities.
	N = 114 CAE survey	
	Qualitative analysis of archival material from two literature perspectives	
	Accounting Horizons	
	Accounting, Organisations and Society	
	N/A	

**Raghunandan et al. (2001)**

**Rittenberg & Covaeski (2001)**

<p>organisational imperatives A multistage approach to external auditors' evaluation of the internal audit function</p>	<p>Auditing: A journal of Practice &amp; Theory</p>	<p>N/A</p>	<p>Understand how Objectivity, performance and competence interact in determining the strength of the IAF.</p>	<p>Internal audit reporting line is used as a dimension to measure objectivity.</p>
<p>The development of internal audit in Saudi Arabia: an institutional theory perspective</p>	<p>Critical Perspectives on Accounting</p>	<p>N=78 IAs N= 39 EAs N=120 Interviews.</p>	<p>Examines the development and effectiveness of IAF in Saudi Arabia corporate sector</p>	<p>The internal auditors tend to report to management rather than board as a result of management pressure.</p>
<p>The relationship between the audit committee and the internal audit function: evidence from Australia and New Zealand</p>	<p>International Journal of Auditing</p>	<p>N = 120 head of IAF</p>	<p>Examines AC characteristics (independence and accounting expertise members) and the relations with IAF</p>	<p>The independence of AC members and the level of accounting experience have a complementary impact on AC relations with IAF.</p>

<p><b>James (2003)</b></p> <p>The effects of internal audit structure on perceived financial statement fraud prevention</p>	<p>Accounting Horizons</p>	<p>Survey</p>	<p>N = 63 Lending Officers</p>	<p>Examines whether reporting structure and sourcing arrangement affect the perception of financial statement users</p> <p>IAF that report reporting to the AC is more likely to prevent financial statement fraud than reporting to management.</p>
<p><b>Paape et al. (2003)</b></p> <p>The relationship between the internal audit function and corporate governance in the EU – a survey</p>	<p>International Journal of Auditing</p>	<p>Survey</p>	<p>N = 105 CAEs from 15 European countries</p>	<p>Studies the relationship between IAF and corporate governance among top listed companies in European Union</p> <p>The recommendation to report to high authority may create tension with management as the traditional role of IAF is the ‘eyes and ears’ of management. Not all listed companies have IAF or AC.</p>
<p><b>Ahlawat &amp; Lowe (2004)</b></p> <p>An examination of internal auditor objectivity: in-house vs outsourcing</p>	<p>Auditing: A Journal of Practice and Theory</p>	<p>Case study</p>	<p>N = 66 IAs 35 in-house &amp; 31 outsourcing</p>	<p>Examines internal auditors advocacy to measure objectivity and the difference between in-house and outsourcing</p> <p>IAs’ judgment is influenced by significant advocacy with both, and outsourced auditors showed less advocacy. However, reporting relationships should be taken into consideration as they can influence IAF activities</p>

<b>Al-Twajry et al. (2004)</b>	An examination of the relationship between internal and external audit in the Saudi Arabian corporate sector	Managerial Auditing Journal	Questionnaire and interviews	N= 78 IAs and 15 interviews. N= 23 EAs and 13 interviews	Examines the relationship between internal and external auditors in the corporate sector in Saudi Arabia	orientation, conduct and outcomes. Lack of co-operation between internal and external auditors stems from low level of internal audit professionalism and independence from management, which influence both work values and reliance decisions.
<b>Goodwin (2004)</b>	A comparison of internal audit in the private and public sectors	Managerial Auditing Journal	Questionnaire	N = 120 CAEs from Australia and New Zealand.	The differences between internal auditing in public and private sectors.	Internal auditors in the private sector have a lower status, because they tend to report to the CFO.
<b>Fadzil et al. (2005)</b>	Internal auditing practices and internal control system	Managerial Auditing Journal	Questionnaire	N = 250 Public listed companies in Malaysia	The effect of compliance with SPPIA on the quality of internal control system	Audit reporting significantly influences the risk assessment and control activities aspects of the internal control system



<b>Van Peurseem (2005)</b>	Conversations with internal auditors: the power of ambiguity	Managerial Auditing Journal	Interview	N = 6 Senior internal auditors in New Zealand organisations	Finds out how an effective internal auditor can overcome the tension of working with management.	Auditor's position can be promoted by the presence of formal reporting structure, strong charter and an active governing board or AC. Also, the presence of formal procedures for management control assessment and audit follow-up process.
<b>Sarens &amp; De Beelde (2006)</b>	The relationship between internal audit and senior management: a qualitative analysis of expectations and perceptions	International Journal of Auditing	Case study	N = 5 Belgian firms	Explores the relationship between IAF and senior management	A formalised risk management and internal control system helps the IAF to meet expectations and is considered to be the most supportive environment.
<b>Kaplan &amp; Schultz, (2007)</b>	Intentions to report questionable acts: an examination of the influence of anonymous reporting channel,	Journal of Business Ethics	Experiment	N = 73 MBA students	Explores whether internal audit quality influences the intention of using internal audit as a reporting channel	Participants tend to report to management in the absence of an anonymous reporting channel. Internal audit quality is measured by multiple dimensions including

<p><b>Mihret &amp; Yismaw (2007)</b></p>	<p>internal audit quality, and setting</p>	<p>Managerial Auditing Journal</p>	<p>Case study</p>	<p>Responses and director of IAF in Ethiopian University</p>	<p>Identifies factors influencing IAF effectiveness</p>	<p>reporting to AC versus management.</p>
<p>Internal audit effectiveness an Ethiopian public sector</p>					<p>Expanding the scope of IAF activities would improve audit effectiveness.</p>	
<p>Governance factors affecting internal auditors' ethical decision-making</p>		<p>Managerial Auditing Journal</p>	<p>Experiment</p>	<p>N = 66 internal auditors</p>	<p>Explores five ethical decisions of internal auditors and the impact of governance mechanisms. Also, examines the influence of internal auditing experience on the ethical decision-making</p>	<p>Internal auditors may not always act ethically. In addition, strong governance mechanisms did not influence ethical decision-making, except external auditors. The existence of an effective AC, code of conduct and integrated management do not support internal auditors to act more ethically when faced with a dilemma. However, internal auditors with more experience adopted a more ethical stance in some cases.</p>
<p><b>O'Leary &amp; Stewart (2007)</b></p>						

<p>Internal auditor perceptions on audit committee interactions: a qualitative study in Malaysian public corporations</p> <p>Earnings management practices from the perspective of external and internal auditors: evidence from Jordan</p>	<p>Corporate Governance an International Review</p> <p>In-depth interviews (semi-structured questionnaire)</p>	<p>N= 11 head of IAFs</p>	<p>Investigates internal auditors' perceptions and their interactions with AC members in Malaysia.</p>	<p>They confirm the need for clear reporting lines. Also, they highlight the problem of infrequent informal communications and limited private meeting between internal auditors and AC.</p>
<p>Al-Khabash &amp; Al-Thuneibat, (2009)</p>	<p>Managerial Auditing Journal</p> <p>Questionnaire</p>	<p>N=61 Internal auditors N=66 External auditors</p>	<p>Investigates the existence of earnings management from the perspectives of external and internal auditors</p>	<p>To ensure the effectiveness of IAF, internal auditors should be appointed, supervised, and compensated by AC or the board of directors (independent party) rather than management.</p>
<p>Arena &amp; Azzone (2009)</p>	<p>International Journal of Auditing</p> <p>Questionnaire</p>	<p>N = 153 Italian companies</p>	<p>Studies internal audit effectiveness drivers</p>	<p>There are positive relationships between IAF effectiveness and close interaction with AC, AC involvement in IAF activities and legitimating IAF role with management level.</p>

<b>Christopher et al. (2009)</b>	A critical analysis of the independence of the internal audit function: evidence from Australia	Accounting, Auditing & accountability Journal	Questionnaire	N= 34 CAEs An e-mail	Analyses the independence of the IAF through its relationship with management and the AC	A combination of independence threats stems from management and AC.
<b>Prawitt et al. (2009)</b>	Internal audit quality and earnings management	The Accounting Review	IIA survey (GAIN and Compustat)	N=528 firm for fiscal years 2000 to 2005	Examines whether IAF quality is negatively associated with levels of earnings management	Reporting to AC is one measure of IAF quality negatively associated with earnings management.
<b>Sarens et al. (2009)</b>	Internal audit: a comfort provider to the audit committee	The British Accounting Review	Case studies	N= 4 Belgian companies	Identifies specific needs for ACs' comfort	Strong relationship between internal audit and AC provides comfort.
<b>Abbott et al. (2010)</b>	Serving two masters: the association between audit committee internal	Accounting Horizons	Survey	N=134 CAE of Fortune 1000 companies	Investigates the association between the nature of IAF activities and the extent of AC oversight of the IAF.	There is a positive association between AC oversight and IAF budget being allocated toward internal control activities. Also, a significant number of Fortune

audit oversight and internal audit activities	during fiscal 2005	1000 companies have ACs that appear to have little oversight of the IAF.
Audit committee characteristics and investment in internal audit	N = 181 SEC registrants	There is a positive relationship between IAF budget and AC meetings. In addition, there are negative relationships between IAF budget and the existence of auditor expert in the AC and the average tenure of AC members.
The effectiveness of internal auditing: an empirical examination of its determinants in Israeli organisations	N = 108 managers and internal auditors	Top management support is the strongest determinant of IAF effectiveness, with some effect of organisation independence (reporting to AC).
An analytical model for external auditor evaluation	Questionnaire Analytical model N/A	Independence and objectivity can be measured by internal audit reporting relationships cited by

**Barua et al. (2010)**

**Cohen & Sauag (2010)**

**Desai et al. (2010)**

<p><b>Norman et al. (2010)</b></p>	<p>of the internal audit function using belief functions Internal audit reporting lines, fraud risk decomposition, and assessments of fraud risk Analysis of professional standards and research findings to develop decision aids for reliance on internal auditing</p>	<p>Accounting, Organisations and Society</p>	<p>Experiment &amp; survey</p>	<p>N =142 IAs for experiment N= 27 IAs for survey</p>	<p>Studies the effects of Internal audit reporting lines on fraud risk</p>	<p>external auditors as the most important criterion.</p>
<p><b>Schneider (2010)</b></p>	<p>Research in Accounting Regulation</p>	<p>Analytical</p>	<p>N/A</p>	<p>Analyses pertaining to external auditors' reliance decision.</p>	<p>Decision aid to evaluate internal audit objectivity contains reporting to senior officer administratively, direct access to the AC and responsibility of appointment, removal and compensation of CAE.</p>	
<p><b>de Zwaan et al. (2011)</b></p>	<p>Managerial Auditing Journal</p>	<p>Experimental</p>	<p>N= 117 Certified</p>	<p>Examines the perceptions of internal auditors' willingness to</p>	<p>High involvement in enterprise risk management affects the perception of internal auditors'</p>	

<b>Leung et al. (2011)</b>	<p>enterprise risk management</p> <p>Accountability structures and management relationships of internal audit: an Australian study</p> <p>The role of the internal audit function in the disclosure of material weaknesses</p>	<p>Managerial Auditing Journal</p>	<p>Survey</p> <p>N = 85 CAEs</p>	<p>Examines accountability structures and the relationships</p>	<p>internal auditors</p> <p>report a breakdown in risk procedures</p>	<p>willingness to report a breakdown in risk procedures to the AC.</p> <p>A clear reporting role with AC of the board can provide relevant, timely and complete information.</p> <p>A close relationship between the CAE and CEO can lead to career risk or management pressure.</p>
<b>Lin et al. (2011)</b>	<p>The Accounting Review</p>	<p>The Accounting Review</p>	<p>Multiple sources (GAIN survey &amp; EDGAR)</p> <p>N= 214 firms</p>	<p>Studies the relation between IAF quality attributes and material weaknesses disclosure</p>	<p>Internal audit reporting line is a key determinant of objectivity.</p>	
<b>Munro &amp; Stewart, (2011)</b>	<p>External auditors' reliance on internal auditing further evidence</p>	<p>Managerial Auditing Journal</p>	<p>Experiment</p> <p>N = 66 audit partners, managers and seniors</p>	<p>Whether reporting relationship and the client's business risk affect reliance decision.</p>	<p>Reporting to the AC influences reliance decisions. In addition, strong relationship with AC manipulates reporting lines and the privacy of meeting.</p>	

<p><b>Abbott et al. (2012)</b></p>	<p>Audit free reductions from internal audit-provided assistance: the incremental impact of internal audit characteristics</p> <p>A post-SOX examination of factors associated with the Size of internal audit functions</p>	<p>Contemporary Accounting Research</p> <p>Questionnaire</p> <p>N=134 CIAs</p>	<p>Studies oversight status, firm's commitment and sourcing of the reduction of audit fee resulting from internal audit assistance provided to external auditors</p>	<p>Close relationships with AC versus management lead to greater objectivity and reliance.</p>
<p><b>Anderson et al. (2012)</b></p>	<p>The impact of ethical leadership, the internal audit function, and moral intensity on a financial reporting decision</p>	<p>Accounting Horizons</p> <p>Web-based survey</p> <p>N= 173 CAEs in North American</p>	<p>Examines some factors influencing internal audit size</p>	<p>There are positive and negative associations between internal audit size and AC characteristics.</p>
<p><b>Arel et al. (2012)</b></p>	<p>Journal of Business Ethics</p>	<p>Experiment</p> <p>N= 78 experienced accountants</p>	<p>The strength of IAF and executive ethical leadership affect the decision to book a questionable journal entry.</p>	<p>Internal audit reporting lines are used to measure the quality of IAF.</p>



<b>Holt (2012)</b>	The effects of internal audit role and reporting relationships on investor perceptions of disclosure credibility	Managerial Auditing Journal	Experimental	N = 84 MBA students.	Whether internal audit role and reporting relationships affect investor judgment on disclosure credibility	When CAE reports strategically to the AC and administratively to CEO, participants perceived higher disclosure credibility (versus reporting to the CFO).
<b>Lenz and Sarens (2012)</b>	Reflections on the internal auditing profession: what might have gone wrong?	Managerial Auditing Journal	Conceptual discussion	N/A	Demonstrates the ambiguities concerning IAF customers	Serving two masters (AC and management) is challenging in practice.
<b>Sarens et al. (2012)</b>	Factors associated with the internal audit function's role in corporate governance	Journal of Applied Accounting Research	CBOOK survey	N = 782	Examines several variables associated with IAF's active role in governance	Relationship between the internal audit and the AC is important and can strengthen corporate governance.
<b>Arnold et al. (2013)</b>	Internal and external auditor	Managerial Auditing Journal	Experiment	N=730	Compares three sectors of internal and external auditors. Examines the	

ethical decision-making	mediation effect of social consensus and magnitude of consequences on the decision path between ethical evaluation and the intent to act.	Both the social consensus and magnitude of consequences constructs mediate the ethical decision path for all three-audit groups. In addition, the decision paths are influenced by the expected consequences of the decision.
Internal audit function, board quality and financial reporting quality: evidence from Malaysia	Managerial Auditing Journal	Internal audit quality components include organisation independence measured by the CAE's reporting lines, appointing and termination, approving annual budget, approving remuneration and performance evaluation.
Discussion of 'is internal audit compromised when the internal	Dataset survey	Internal auditors do not deal with financial reporting issues and the board does not typically concern itself with hiring all management positions.
<b>Johl et al. (2013)</b>	N = 620 Firms	
<b>Koonce (2013)</b>	Accounting & Finance	Critique of the Rose et al., (2013) paper
	N/A	

<p>audit function is a management training ground? Is the objectivity of internal audit compromised when the internal audit function is a management training ground? Internal auditors' roles: from watchdogs to helpers and protectors of the top manager</p>	<p>Accounting &amp; Finance</p>	<p>Experiment</p>	<p>N = 74 internal auditors</p>	<p>Examines whether training grounds influence internal auditors' objectivity.</p>	<p>Objectivity of internal auditors can be impaired when the IAF is used as a training ground for future senior managers, as a result of the strong incentives to please existing senior managers.</p>
<p>A study of the informal interactions between audit committees and</p>	<p>Critical Perspectives on Accounting</p>	<p>Semi-structured interviews</p>	<p>N= 42 experienced internal auditors</p>	<p>How the roles performed by internal auditors impede their governance role in Quebec public sector</p>	<p>Internal auditors must prioritise the top manager at the expense of AC members as their primary role is to serve the top manager and the organisation.</p>
<p>Sarens et al. (2013)</p>	<p>Australian Accounting Review</p>	<p>Questionnaire</p>	<p>N = 100 CAEs</p>	<p>Investigates informal interaction between IAF and AC in Australia</p>	<p>There is informal interaction (e.g., email and telephone) between Australian CAEs and ACs and that interaction remained stable or even</p>

internal auditors in Australia		increased during the last two years. Characteristics of CAEs and AC increase the interaction
Informal interactions between audit committees and internal audit functions: exploratory evidence and directions for future research	<p>N = 160 CAEs for UK private sector organisations with an AC</p> <p>Questionnaire</p> <p>Managerial Auditing Journal</p>	<p>Examines the importance of informal interaction between AC and IAFs.</p> <p>Informal interactions between ACs and IAFs are associated positively with independent AC members, and the knowledge and experience of AC chair.</p>
Factors affecting the internal audit effectiveness: a survey of the Saudi public sector	<p>N=239 Internal auditors N= 203 managers</p> <p>Survey</p> <p>Journal of International Accounting, Auditing and Taxation</p>	<p>Management support is linked to hiring qualified staff, providing sufficient resources, and having an independent IAF.</p> <p>Assess five principal factors influencing the effectiveness of IAF in Saudi Arabia public sector</p>

**Zaman & Sarens (2013)**

**Alzeban & Gwiliam (2014)**

<b>Burrell Nickell &amp; Roberts (2014)</b>	Organisational legitimacy, conflict, and hypocrisy: an alternative view of the role of internal auditing	Critical Perspectives on Accounting	Commentary article	N/A	Provides a commentary on Everett and Tremblay (2014) that connects their work with the theoretical work on organised hypocrisy	Internal auditors' position within business organisations makes them accountable to AC and management, which may undermine internal auditors' cultural and moral authority. Brinson's model of organised hypocrisy complements the work of Everett and Tremblay (2014).
<b>Chambers (2014a)</b>	New guidance on internal audit- an analysis and appraisal of recent developments	Managerial Auditing Journal	Analytical	N/A	Analyses and comment on the current five 2012-2013 sources of internal audit guidance.	The standards do not clearly state whether internal auditor should report for all purposes to the board or the AC.
<b>Chambers (2014b)</b>	Guidance on internal audit's interface with regulators: an analysis and appraisal of recent developments	Managerial Auditing Journal	Analytical	N/A	Reviews the current regulatory requirements of the IIA Standards to determine regulators' expectations regarding the interface between	Future standards and internal audit charters should reflect what regulators currently require from their relationship with internal audit.

<p><b>Everett &amp; Tremblay (2014)</b></p>	<p>Ethics and internal audit: Moral will and moral skill in heteronomous field</p>	<p>Critical Perspectives on Accounting</p>	<p>Interview, autobiography for Cynthia Cooper and IIA website</p>	<p>N=2 Internal auditors N=1 AC me. N=1 financial manager</p>	<p>Examines IAF ethics through three ethical lenses (Kantian, utilitarian, and virtue lenses)</p>	<p>Internal auditors are concerned about compliance by reporting to AC, while managers are concerned about profitability and bonus. The question here is whether auditors serve shareholders and general public or management? If all three, the conflict of interest between these groups should be considered and stated.</p>
<p><b>Lenz et al. (2014)</b></p>	<p>Probing the discriminatory power of characteristics of internal audit function: sorting the wheat from the chaff</p>	<p>International Journal of Auditing</p>	<p>Questionnaire</p>	<p>N = 46 CAEs in private organisations in Germany</p>	<p>Examines IAF Characteristics and perceived effectiveness</p>	<p>Organisation factors, IAF resources, processes and relationship influence IAF effectiveness. Particularly, access to high authority, the use of technology and risk based. Also, existence of a plan and</p>

<p><b>Alzeban (2015)</b></p>	<p>Influence of audit committee on internal audit conformance with internal auditing standards</p>	<p>Managerial Auditing Journal</p>	<p>Questionnaire</p>	<p>N = 159 CIAs from Saudi listed companies</p>	<p>Studies the association between AC characteristics and IAF conformance with International standards</p>	<p>charter approved by high authority. There is association between the presence of independent members in AC, the presence of expertise in accounting and number of meetings with IAF conformance with standards</p>
<p><b>Alzeban and Sawan (2015)</b></p>	<p>The impact of audit committee characteristics on the implementation of internal audit recommendations</p>	<p>Journal of International Accounting, Auditing and Taxation</p>	<p>Survey</p>	<p>N=188 CAEs</p>	<p>Investigates the association between AC characteristics and perceptions of implementation of internal audit recommendations</p>	<p>Greater perceptions of implementing internal audit recommendations are strongly related to the presence of independent members of the AC and their expertise in accounting.</p>
<p><b>Boyle et al. (2015)</b></p>	<p>The effects of internal audit report type and reporting relationship on</p>	<p>Accounting Horizons</p>	<p>Experiment</p>	<p>N= 108 Experienced internal auditors</p>	<p>Examines the effects of internal audit reporting relationship and type on the assessment of fraud risk and control risk</p>	<p>Providing assurance report and reporting to AC provide higher assessment for fraud risk and control risk. Also, reporting type and reporting relationships that increase accountability to</p>

	internal auditors' risk judgments			explores how internal audit moves from corporate governance gatekeepers to assurance provider	stakeholders and to the AC can lead to more conservative judgments. The CAEs' primary or only reporting line should be to the non-executive member (independent element) of the board.
<b>Chambers &amp; Odar (2015)</b>	A new vision for internal audit	Managerial Auditing Journal	Conceptual analysis	N/A	
<b>Cho, et al. (2015)</b>	Characteristics of statutory internal auditors and operating efficiency	Managerial Auditing Journal	Data from Korean listed firms	N = 1340 firm	There is no association between compensation of IAs and operating efficiency. In contrast to, full time work status and newness. There is a positive association between attending board meetings and operating efficiency.
<b>Christ et al. (2015)</b>	Rotational internal audit programs and financial reporting quality:	Accounting, Organisations and Society	Interview	N= 11 CAEs & 2 AC chairpersons	Systematic rotation is associated negatively with low financial reporting quality, but the situation is better when only staff are rotated, there is effective AC



<p>Do Compensation controls help</p>	<p>financial reporting quality</p>	<p>and greater role in the financial reporting process. Internal audit quality and competence deter the likelihood of management misconduct. This is not the case with IAF objectivity. Future study should use better measures for objectivity and re-examine these relationships.</p>
<p>Does internal audit function quality deter management misconduct</p>	<p>Whether IAF quality deters management misconduct</p>	<p>Conflict of priorities were resulted. Internal auditors stress cost reduction when they favour management, and internal control effectiveness when they favour AC. The CAE's message influence internal auditor's judgments when the task environment contains a high ambiguity.</p>
<p>The importance of the chief audit executive's communication: experimental evidence on internal auditors' judgments in a 'two masters setting'</p>	<p>Studies the influence of the CAE on internal auditors' judgments when IAF serves two masters (cost reduction vs. internal control effectiveness)</p>	<p>relationship.</p>
<p>Do Compensation controls help</p>	<p>Experimental</p>	<p>relationship.</p>
<p>Does internal audit function quality deter management misconduct</p>	<p>Experiment</p>	<p>relationship.</p>
<p>The importance of the chief audit executive's communication: experimental evidence on internal auditors' judgments in a 'two masters setting'</p>	<p>Experiment</p>	<p>relationship.</p>

Ege (2015)

Hoos et al. (2015)

<b>Mazza &amp; Azzali (2015)</b>	Effects of internal audit quality on the severity and persistence of controls deficiencies	International Journal of Auditing	Interview Questionnaire	N = 4284 14 company 6 year	Studies the influence of IAF quality on the severity and persistence of internal control deficiencies	Competence and independence are associated negatively with internal control deficiencies persistence.
<b>Pizzini et al. (2015)</b>	The impact of internal audit function quality and contribution on audit delay	Auditing: A Journal of Practice & Theory	GAIN survey	N= 292 CAEs	Investigates whether IAF quality and the IAF contribution to financial statement audits affect audit delay.	Reporting to AC is used as indicator for objectivity.
<b>Roussy (2015)</b>	Welcome to the Day-to-Day of internal auditors: how do they cope with conflicts?	Auditing: A Journal of Practice & Theory	Semi-structured interviews "Micro-level" analysis	N= 42 experienced internal auditors	Studies internal auditors' role conflict management process in context	Internal auditors in Quebec public administration are not independent from management. This is a result of the weak power exercised by the AC compared to the top managers, AC oversight, versus CEO and CFO oversight enhance IAF independence. The oversight
<b>Abbott et al. (2016)</b>	Internal audit quality and financial reporting	Journal of Accounting Research	Survey	N =189 CAEs from Fortune 1000 companies	The importance of joint presence of independence and competence	AC oversight, versus CEO and CFO oversight enhance IAF independence. The oversight

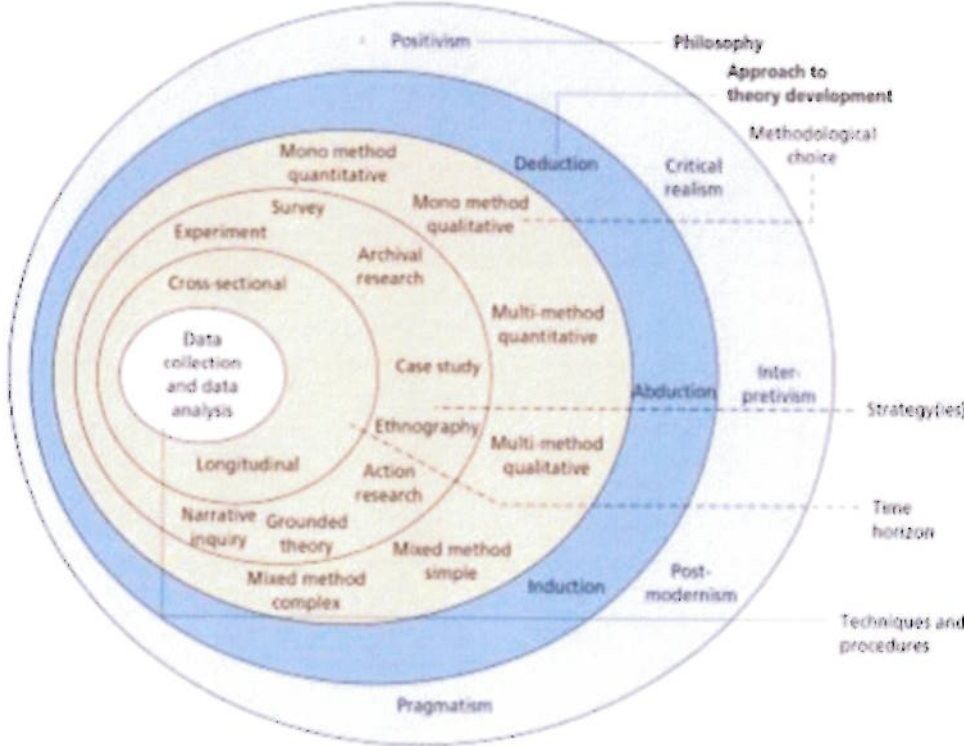
<p>quality: the joint importance of independence and competence</p>	<p>during fiscal 2009</p>	<p>extends beyond formal reporting lines.</p>
<p>Ahmed Haji &amp; Anifowose (2016)</p>	<p>Audit committee and integrated reporting practice: does internal assurance matter</p>	<p>Observation for 82 large South African companies for 3 years</p>
<p>Hegazy &amp; Stafford (2016)</p>	<p>Audit committee roles and responsibilities in two English public sector settings</p>	<p>Explores the role of the AC function in the emerging integrated reporting practice</p>
<p>Khelil et al. (2016)</p>	<p>Audit committee – internal audit</p>	<p>There is association between AC effectiveness (meeting &amp; authority) and both extent and quality of integrated reporting practice. Technical challenges can be overcome by AC through close relationships with IAF. ACs' structures and working mechanisms are different in public sector. Different institutional pressures in more complex public sector environment should be explored. There is a significant relationship between private access and number of meetings with AC and</p>

<p><b>Lisic et al. (2016)</b></p> <p>interaction and moral courage</p> <p>CEO power, internal control quality, and audit committee effectiveness in substance versus in form</p>	<p>structure interview</p> <p>Contemporary Accounting Research</p> <p>Compustata, ExecuComp, and Corporate Library Directors</p>	<p>N = 22 CAEs interview</p> <p>N = 7217 Firm-year</p>	<p>and IAF on the moral courage of the CAEs</p> <p>Examines the influence of CEO power on the effectiveness of AC</p>	<p>moral courage. AC contribution to CAE's appointment and dismissal, as well as examination of IAF programmes and results, do not have significant effect on moral courage.</p> <p>Powerful CEO reduces AC effectiveness, but stronger governance can mitigate such influence.</p>
<p><b>Ma'ayan &amp; Carmeli (2016)</b></p> <p>Internal audits as a source of ethical behaviour, efficiency, and effectiveness in work units</p>	<p>Survey</p> <p>Journal of Business Ethics</p>	<p>N= 316 and 244 managers, auditees, and auditors from 79</p>	<p>Examines the influence of both the role of management and auditor's capacity on performance improvement</p>	<p>Top management support and auditor skills are important for IAs ethicality, efficiency and effectiveness. Also, there is no difference between governmental agencies and both local</p>

<p><b>Roussy &amp; Brivot (2016)</b></p>	<p>Internal audit quality: a polysemous notion?</p>	<p>Accounting, Auditing and Accountability Journal</p>	<p>Interviews</p>	<p>N = 42 experienced internal auditors and 14 AC members</p>	<p>authorities and public organisations who have ACs in reporting structure. There is room to study the importance of high authority attributes to the IAF activities and its applications.</p>
<p><b>Roussy &amp; Rodrigue (2016)</b></p>	<p>Internal audit: is the 'third line of defence' effective as a Form of Governance? ...</p>	<p>Journal of business Ethics</p>	<p>Interview</p>	<p>N = 13 CAEs Quebec public and para-public organisations</p>	<p>External auditors' and the IIA's frames focus on professional quality controls. In contrast, internal auditors' and AC members' frames focus on administrative controls. The effectiveness of internal auditors as a third line of defence and as a governance function is influenced by teaming up with managers</p>

Source: Developed by the Author

**Appendix 2: The Research 'Onion'**



Source: Saunders et al. (2016; 124).

### Appendix 3: Assumptions of the Main Philosophies.

<i>Philosophical assumption</i>	<i>Positivism (Objectivism)</i>	<i>Interpretivism (Subjectivism)</i>
<b>Ontological assumption</b> (The nature of reality)	Reality is objective and singular, separate from the researcher.	Reality is subjective and multiple, as seen by the participants.
<b>Epistemological assumption</b> (What constitutes valid knowledge)	Researcher is independent of that being researched.	Researcher interacts with that being researched.
<b>Axiological assumption</b> (The role of values)	Research is value-free and unbiased.	Researcher acknowledges that research is value-bound and biases are present.

Source: Adapted from Creswell (1998; 75) and Collis & Hussey (2009; 58).

### Appendix 4: Research Approaches

	<i>Deduction</i>	<i>Induction</i>	<i>Abductive</i>
<b>Purpose</b>	Testing theory	Building theory	Generate or modify theory
<b>Reasoning</b>	Generalizing from the general to the specific	Generalizing from the specific to the general	Generalizing from the interaction between the specific and general
<b>Sample size</b>	Large Sample	Small Sample	Small Sample
<b>Pattern</b>	Data follow theory	Theory would follow data	Theory would follow data
<b>Process</b>	Constructs a rigid methodology that does not permit alternative explanations	Permits alternative explanations	Permits possible explanations for particular case
<b>Approach</b>	Examines specific outcomes of the inquiry	Is concerned about context	Is concerned about context and outcomes

Source: Developed by the Author

## Appendix 5: Confidentiality and Non-Disclosure Agreement

THIS CONFIDENTIALITY AND NON-DISCLOSURE AGREEMENT (“Agreement”) is entered into on this May 11th, 2015 (“Effective Date”) by and between Institute of Internal Auditors-Research Foundation, a not-for-profit incorporated in the Washington, D.C., (“The IIA”) and Salem Al Fayi (“Contractor”) (both hereinafter referred to as “Parties”).

The Parties agree as follows:

1. **Disclosing Party.** For the purposes herein, the Disclosing Party is The IIA where said party provides information to the Contractor.
2. **Receiving Party.** For the purposes herein, the Receiving Party is the Contractor where said party receives information from The IIA.
3. **Purpose.** See Attachment A: Data Access Request Form. (“Purpose”).
4. **Confidential Information.** For purposes herein, “Confidential Information” shall mean any and all information of a confidential nature that the Disclosing Party discloses to the Receiving Party, including, but not limited to specifications, formulas, prototypes, computer programs and any and all records, data, ideas, methods, techniques, processes and projections, plans, business plans, marketing information, materials, financial statements, memoranda, analyses, notes, legal documents and other data and information, regardless of form, as well as improvements, patents (whether pending or duly registered) and any know-how related thereto, as well as any information learned by the Receiving Party from the Disclosing Party through inspection of the Disclosing Party’s property and/or its products and/or designs, and any third-party confidential information disclosed to the Receiving Party by the Disclosing Party.

Notwithstanding, Confidential Information shall not include information that: (i) is now or subsequently becomes generally available in the public domain through no fault or breach on the part of the Receiving Party; (ii) the Receiving Party can demonstrate in its records to have had rightfully in its possession prior to disclosure of the Confidential Information by the Disclosing Party; (iii) Receiving Party rightfully obtains from a third party who has the right to transfer or disclose it, without default or breach of confidentiality obligation; (iv) the Receiving Party can demonstrate in its records to have independently developed, without breach of this Agreement and/or any use or reference to the Disclosing Party’s Confidential Information; or (v) is disclosed pursuant to the order or requirement of a court, administrative agency, or other governmental body; provided, however, that the Receiving Party shall make the best effort to provide prompt notice of such court order or requirement to the Disclosing Party to enable the Disclosing Party to seek a protective order or otherwise prevent or restrict such disclosure. For the purpose of the foregoing exceptions, disclosures which are specific, such as design practices and techniques, products, software, operating parameters, etc. shall not be deemed to be within the foregoing exceptions merely because they are embraced by general disclosures which are in the public domain or in the possession of the Receiving Party. In addition, any combination of features shall not be deemed to be within the foregoing exceptions merely because individual features thereof are in the public domain or in the possession of the Receiving Party, but only if the combination itself and its principle of operation are in the public domain or in the possession of the Receiving Party. Furthermore, certain information may be generally known in the relevant industry, but the fact that the Disclosing Party uses it may not be so known, and therefore, such information shall be treated as Confidential Information.



5. **Non-disclosure and Non-use.** The Receiving Party agrees to accept and use Confidential Information solely for the Purpose. The Receiving Party will not disclose, publish, or disseminate Confidential Information to a third party. The Receiving Party further agrees to take all reasonable precautions to prevent any unauthorized use, disclosure, publication, or dissemination of Confidential Information to any third party. The Receiving Party agrees not to use Confidential Information otherwise for its own or any third party's benefit without the prior written approval of an authorized representative of the Disclosing Party in each instance. In performing its duties and obligations hereunder, the Receiving Party agrees to use at least the same degree of care as it does with respect to its own confidential information of like importance but, in any event, at least reasonable care. Further, the Receiving Party agrees that it shall not make any copies of the Confidential Information on any type of media, without the prior express written permission of the authorized representative of the Disclosing Party, other than for the fulfillment of the Purpose.

6. **Ownership.** All Confidential Information, and any derivatives thereof is and shall remain the property of the Disclosing Party and no license or other rights to Confidential Information is granted or implied hereby to have been granted to the Receiving Party, now or in the future.

7. **No Warranty.** The Confidential Information and any other information is provided by the disclosing party "as is", without any warranty, whether express or implied, as to its accuracy or completeness, operability, use, fitness for a particular purpose, or non-infringement.

8. **Return of Confidential Information.** Nothing herein shall be construed as imposing an obligation on the Disclosing Party to disclose, now or in the future, Confidential Information to the Receiving Party. The Disclosing Party may, at any time, with or without cause, demand the return of the Confidential Information, or any part thereof, by giving written notice to the Receiving Party, with immediate effect. Upon the earlier of: (i) the Disclosing Party's foregoing written notice; or (ii) the termination, or expiration of this Agreement as set forth in paragraph 8 below, the Receiving Party shall forthwith:

(a) return to the Disclosing Party any information disclosed in any tangible form, and all copies thereof (on whatever physical, electronic or other media such information may be stored) containing any of the Confidential Information, unless such Confidential Information is stored in electronic form, in which case it is to be immediately deleted; and

(b) provide a written certification that the Receiving Party has complied with all of the terms of this Agreement, that it has retained no copies of the Confidential Information on any media and that it has retained no notes, or other embodiments, of the Confidential Information.

9. **Equitable Relief.** The Receiving Party hereby acknowledges that unauthorized disclosure or use of Confidential Information may cause irreparable harm and significant injury to the Disclosing Party that may be difficult to ascertain. Accordingly, the Receiving Party agrees that the Disclosing Party, without prejudice to any other right or remedy that it may have available to it at law or in equity, will have the right to seek and obtain immediate injunctive relief to enforce obligations under this Agreement without the necessity of proving actual damages and without the necessity of posting bond or making any undertaking in connection therewith.

10. **Entire Agreement and Governing Law.** The laws of the State of Florida govern all matters arising out of this Agreement. Any action to enforce any terms of this Agreement must be brought in Seminole County, Florida and both parties consent to a court of competent jurisdiction in that state.

11. **Term.** This Agreement shall govern the communications relating to Confidential Information between the Parties hereto as of the Effective Date, and shall expire or terminate upon the earlier of the following to occur: (i) the period of two (2) years; or (ii) until such time as the present Agreement is expressly superseded by a subsequent agreement between the Parties hereto; or, (iii) upon termination of the Agreement by either Party hereto, at any time, with or without cause, subject to a seven (7) day prior written notice (hereinafter, all of the above "Term"). The obligations set forth in this Agreement shall bind the Parties for a period of three (3) years from the date of disclosure of the Confidential Information or any part thereof, and such obligations shall survive the termination or earlier expiration of this Agreement.

12. **Assignment.** This Agreement shall not be assignable by either party without the prior written consent of the other party, and any purported assignment not permitted hereunder shall be construed null and void. However, it is hereby clarified that consent of the Receiving Party shall not be required for the terms and conditions of this agreement to apply towards the company formed by the Disclosing party upon its incorporation.

The parties are signing this agreement on the Effective Date, which is stated in the introductory clause.

Proposed by:  
 Salem Al Fayi  
 By: Salem Al Fayi  
 Authorized Signature

Institute of Internal Auditors Research  
 Foundation  
 Signed by:  
 Bonnie Ulmer  
 By: Bonnie Ulmer  
 Authorized Signature

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Hull Business School  
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Bonnie Ulmer  
 Name  
Vice President Learning Solutions  
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OS  
 DP

## Appendix 6: Research Ethics Committee



Mr Salem Al Fayi  
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HULL  
HU6 7SH

Hull University Business School  
School Services Office  
T +44(0)1482 463336  
E h.carpenter@hull.ac.uk

Ref: HUHSREC 2015/09

11 September 2015

Dear Salem

**Re: The boundary span of knowledge between internal audit reporting lines and board/CEO**

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, Jon Simon has approved your application on 11 September 2015.

I wish you every success with your research.

Yours sincerely,

Hilary Carpenter  
Secretary,  
Research Ethics Committee



Association  
of MBAs

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### Appendix 7: Decision Measures Transformation (DEC1)

<b>What is the primary functional reporting line for the chief audit executive (CAE) or equivalent in your Organisation? (CAEs only)</b>				
<b><i>DEC1 Before Transformation</i></b>	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
Audit committee, or equivalent	1412	42.2	53.6	53.6
Board of directors	482	14.4	18.3	71.9
General or legal counsel	17	.5	.6	72.6
Chief executive officer (CEO), president, head of government agency	508	15.2	19.3	91.8
Chief financial officer (CFO), vice president of finance	108	3.2	4.1	95.9
Chief risk officer (CRO), or equivalent	13	.4	.5	96.4
Chief compliance officer (CCO), or equivalent	7	.2	.3	96.7
Chief operating officer (COO)	19	.6	.7	97.4
Controller or financial director	16	.5	.6	98.0
Other	52	1.6	2.0	100.0
Total	2634	78.8	100.0	
Missing System	710	21.2		
Total	3344	100.0		

<b><i>DEC1 After Transformation</i></b>	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
1- Other (CRO, CCO, COO, Controller or financial director), or equivalent	107	3.2	4.1	4.1
2- Chief financial officer (CFO), vice president of finance	108	3.2	4.1	8.2
3- Chief executive officer (CEO), president, head of government agency, General or legal counsel	525	15.7	19.9	28.1
4- Audit committee, or equivalent	1412	42.2	53.6	81.7
5- Board of directors	482	14.4	18.3	100.0
Total	2634	78.8	100.0	
Missing System	710	21.2		
Total	3344	100.0		

### Appendix 8: Decision Measures Transformation (DEC2)

<b>Who makes the final decision for the appointment of the chief audit executive (CAE) or equivalent? (CAEs only)</b>				
<b><i>DEC2 Before Transformation</i></b>	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
Board, or supervisory committee	780	23.3	32.4	32.4
Chair of the board or supervisory committee	146	4.4	6.1	38.4
Chief executive officer (CEO), president, or head of government agency	635	19.0	26.4	64.8
Audit committee	516	15.4	21.4	86.2
Chair of the audit committee	117	3.5	4.9	91.1
Chief operating officer (COO)	19	.6	.8	91.9
Chief financial officer (CFO), or vice president of finance	98	2.9	4.1	95.9
Other	98	2.9	4.1	100.0
Total	2409	72.0	100.0	
Missing System	935	28.0		
Total	3344	100.0		
-----				
<b><i>DEC2 After Transformation</i></b>	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
1- Other or Chief operating officer (COO)	117	3.5	4.9	4.9
2- Chief financial officer (CFO), or vice president of finance	98	2.9	4.1	8.9
3- Chief executive officer (CEO), president, or head of government agency	635	19.0	26.4	35.3
4- Audit committee or Chair of the audit committee	633	18.9	26.3	61.6
5- Board, Chair of the board or supervisory committee	926	27.7	38.4	100.0
Total	2409	72.0	100.0	
Missing System	935	28.0		
Total	3344	100.0		

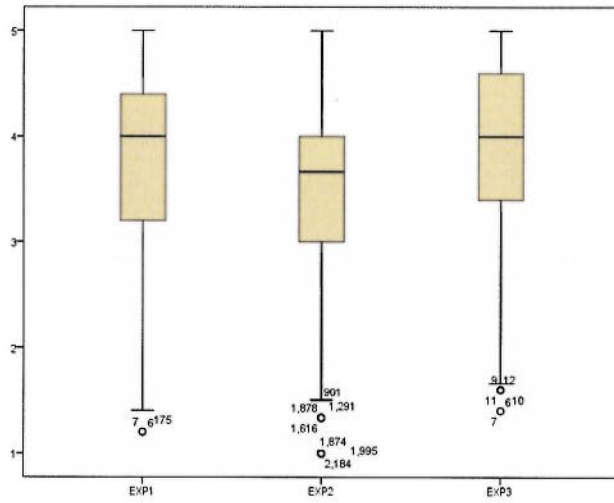
**Appendix 9: Decision Measures Transformation (DEC3)**

<b>Who is ultimately responsible for the performance evaluation of the chief audit executive (CAE), or head of internal audit, at your Organisation? (CAEs only)</b>				
<b><i>DCE3 Before Transformation</i></b>	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
Board, or supervisory committee	395	11.8	16.4	16.4
Chair of the board or supervisory committee	188	5.6	7.8	24.2
Chief executive officer (CEO), president, or head of government agency	743	22.2	30.9	55.1
Audit committee	462	13.8	19.2	74.3
Chair of the audit committee	146	4.4	6.1	80.3
Chief operating officer (COO)	38	1.1	1.6	81.9
Chief financial officer (CFO), or vice president of finance	234	7.0	9.7	91.6
Senior management	56	1.7	2.3	93.9
The CAE is not evaluated.	33	1.0	1.4	95.3
Other	113	3.4	4.7	100.0
<b>Total</b>	<b>2408</b>	<b>72.0</b>	<b>100.0</b>	
Missing System	936	28.0		
<b>Total</b>	<b>3344</b>	<b>100.0</b>		

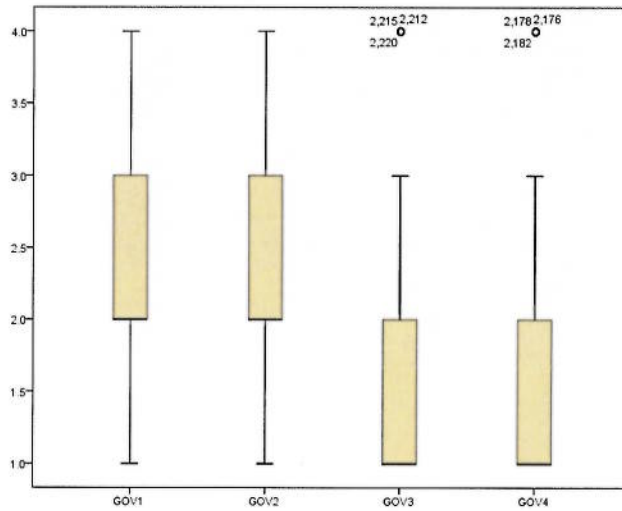
  

<b><i>DEC3 After Transformation</i></b>	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
1- Other (COO, Senior management)	240	7.2	10.0	10.0
2- Chief financial officer (CFO), or vice president of finance	234	7.0	9.7	19.7
3- Chief executive officer (CEO), president, or head of government agency	743	22.2	30.9	50.5
4- Audit committee or Chair of the audit committee	608	18.2	25.2	75.8
5- Board, Chair of the board or supervisory committee	583	17.4	24.2	100.0
<b>Total</b>	<b>2408</b>	<b>72.0</b>	<b>100.0</b>	
Missing System	936	28.0		
<b>Total</b>	<b>3344</b>	<b>100.0</b>		

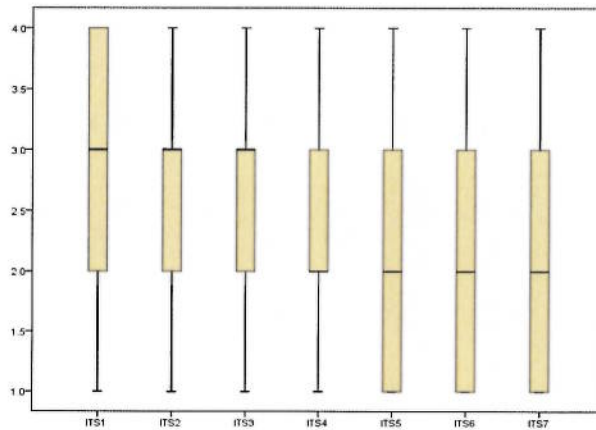
**Appendix 10: Box Plots for Information Variables (EXP)**



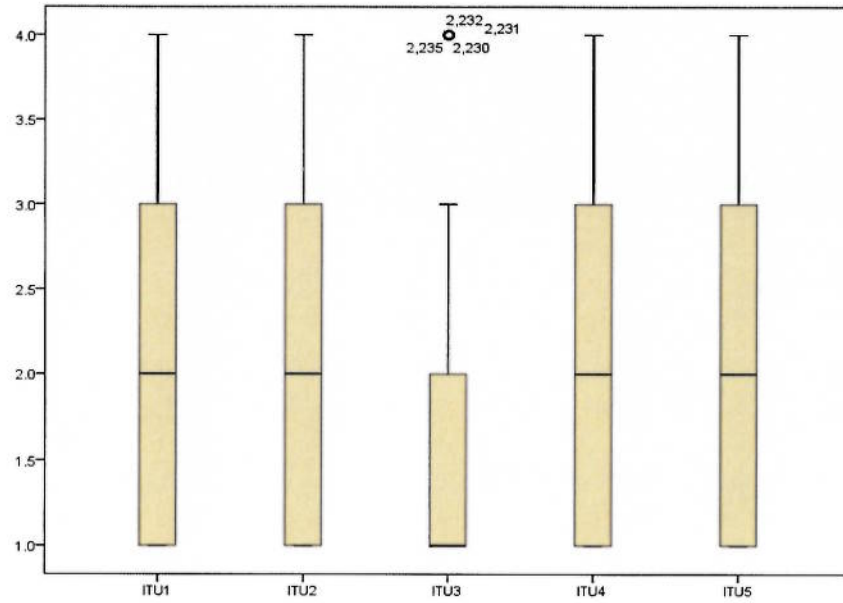
**Appendix 11: Box Plots for Perception Variables (GOV)**



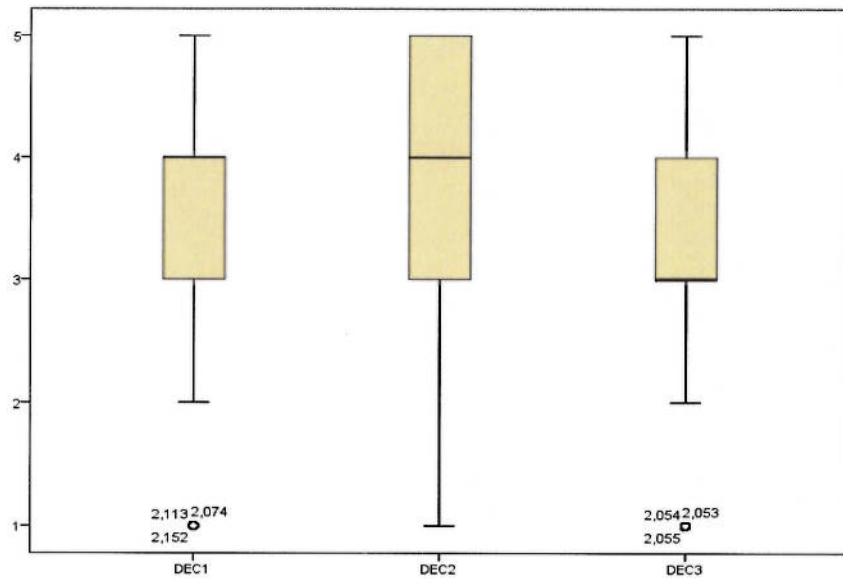
**Appendix 12: Box Plots for Perception Variables (ITS)**



### Appendix 13: Box Plots for Judgment Variables (ITU)

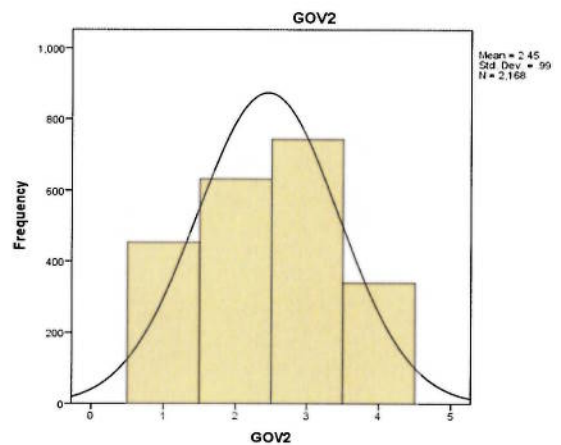
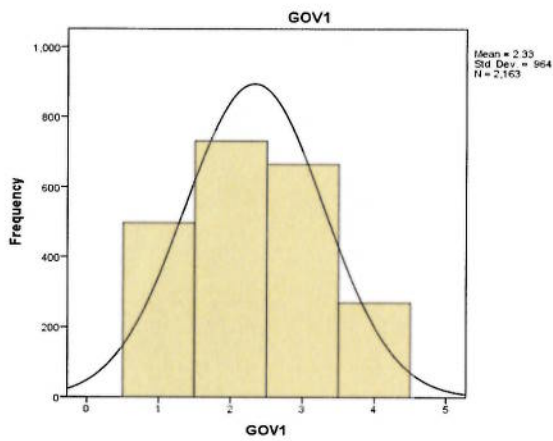
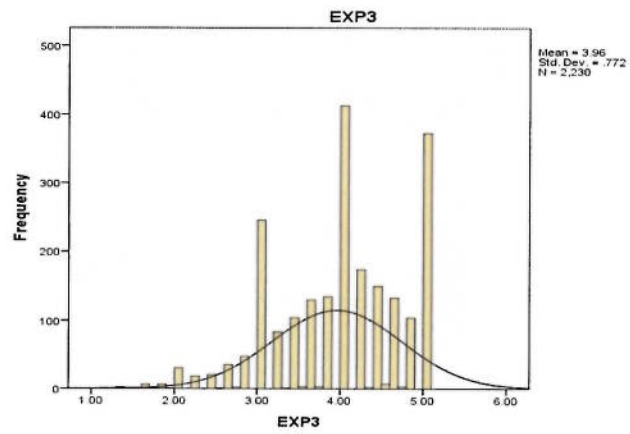
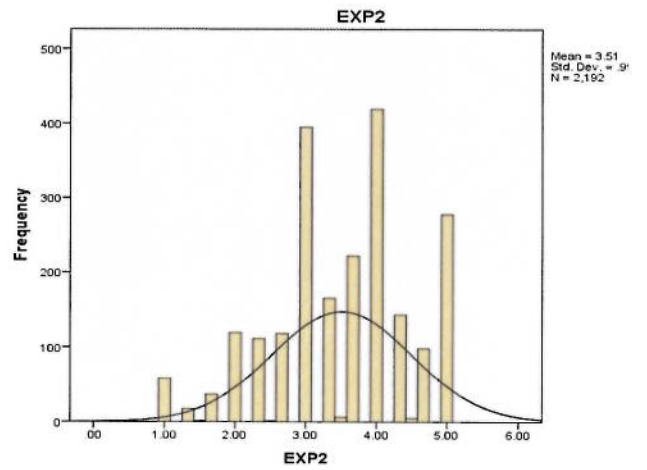
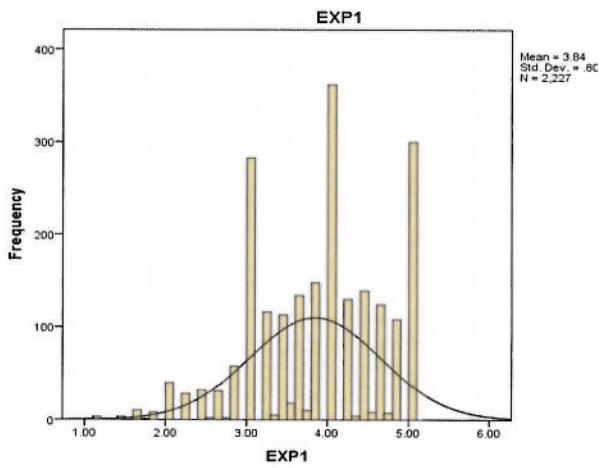


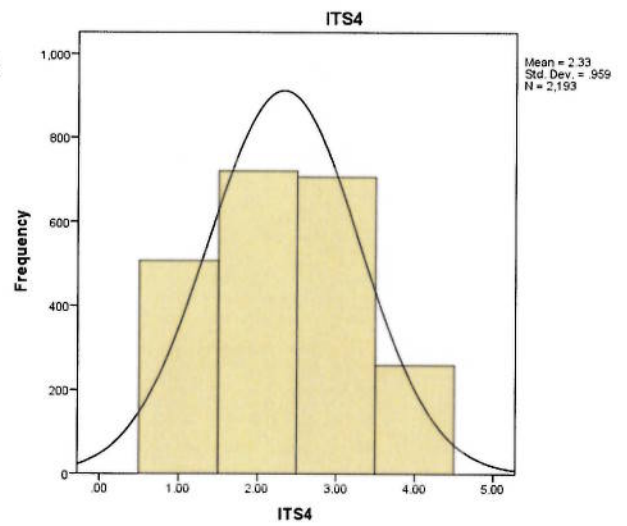
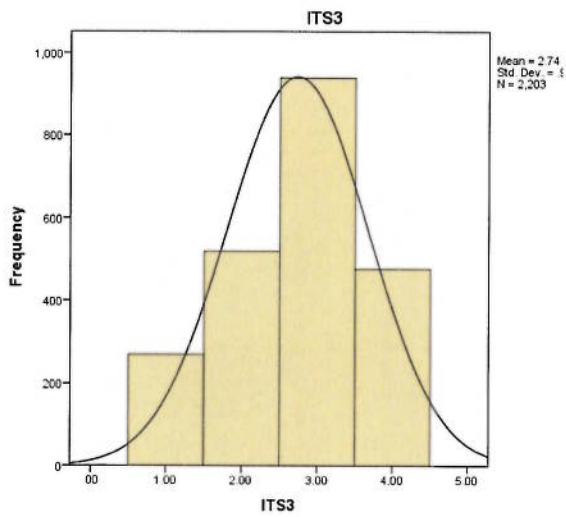
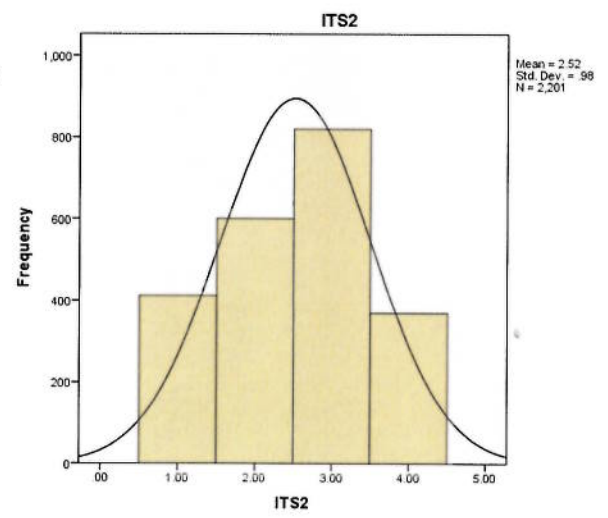
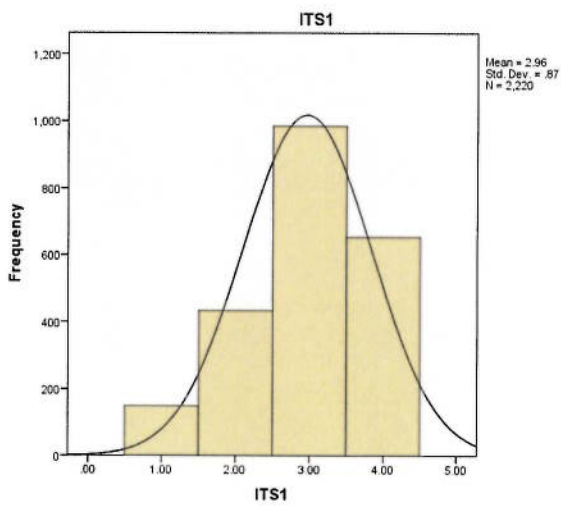
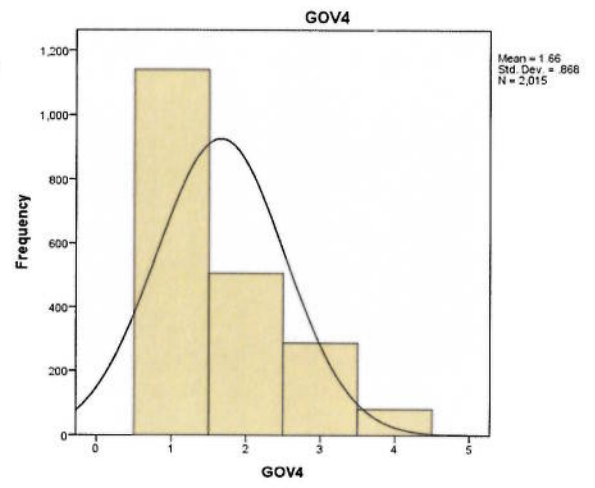
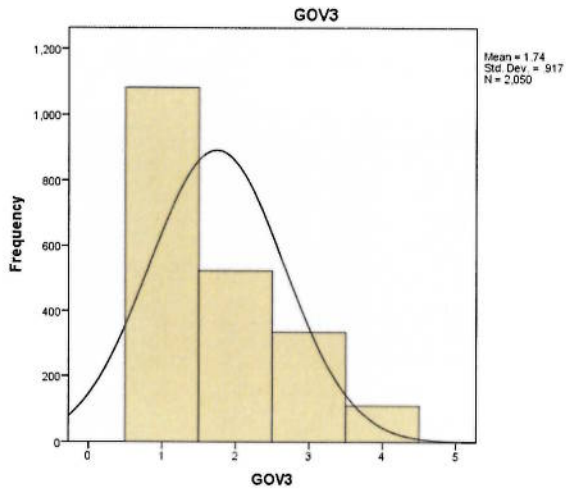
### Appendix 14: Box Plots for Decision Variables (DEC)

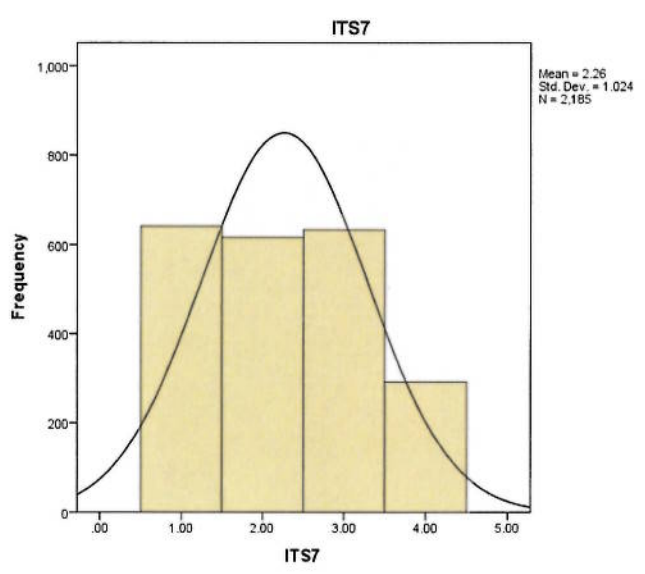
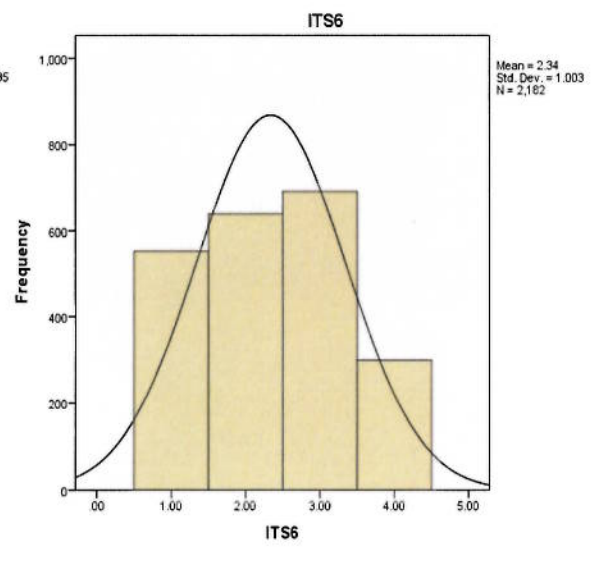
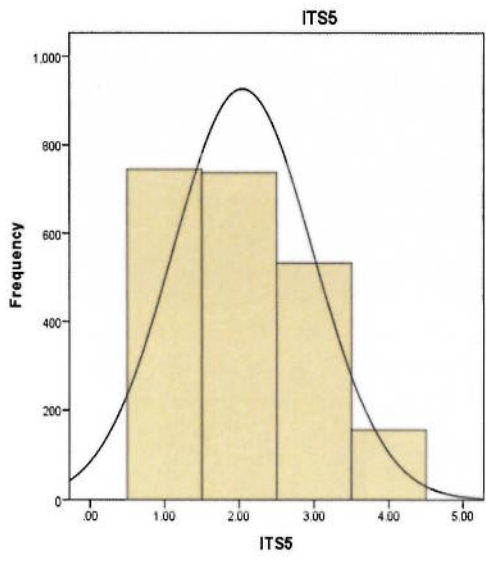


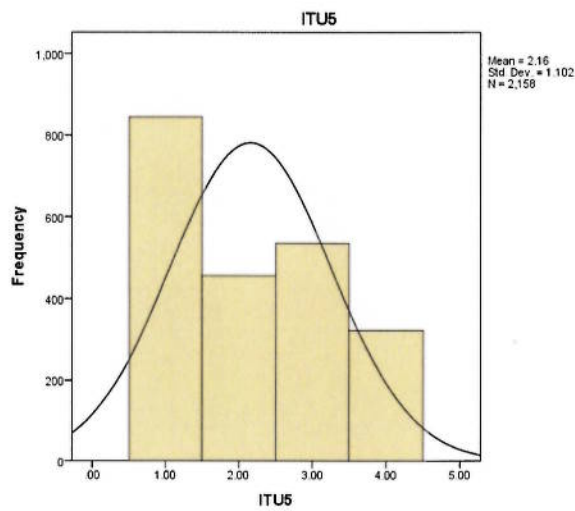
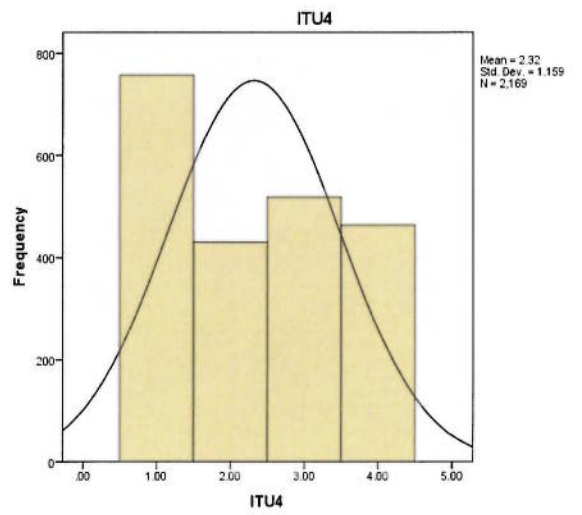
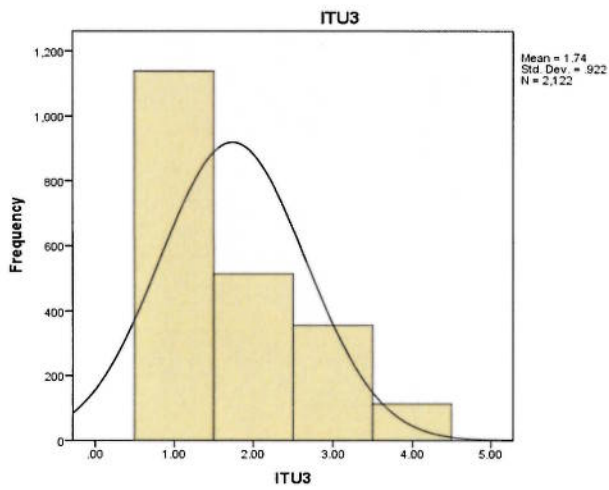
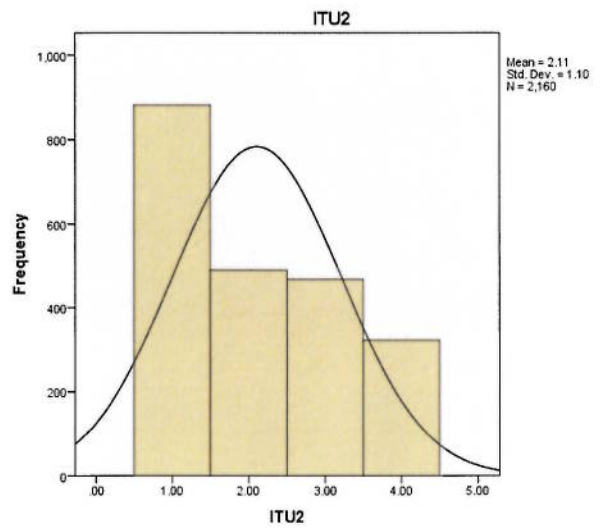
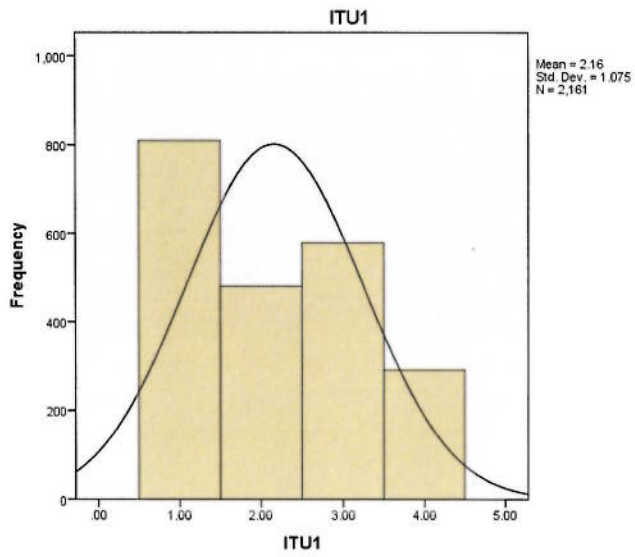


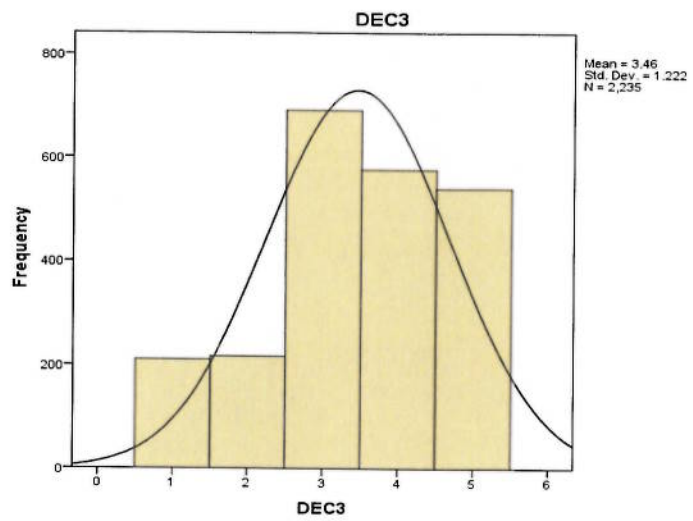
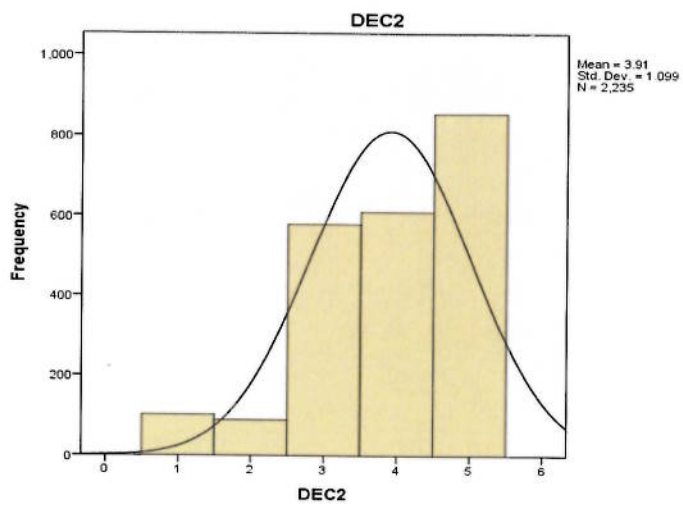
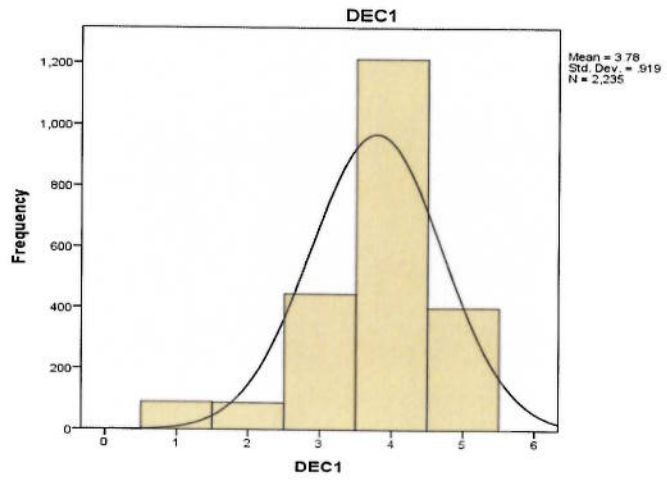
## Appendix 15: Variables Histograms











**Appendix 16: The CBOK 2015 Survey Language**

	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
Arabic	47	2.1	2.1	2.1
Bengali	1	.0	.0	2.1
Czech	12	.5	.5	2.7
German	153	6.8	6.8	9.5
English	1101	49.3	49.3	58.8
Spanish	292	13.1	13.1	71.9
Estonian	17	.8	.8	72.6
French	121	5.4	5.4	78.0
Croatian	13	.6	.6	78.6
Italian	48	2.1	2.1	80.8
Japanese	100	4.5	4.5	85.2
Korean	6	.3	.3	85.5
Lithuanian	7	.3	.3	85.8
Latvian	14	.6	.6	86.4
Polish	20	.9	.9	87.3
Portuguese	37	1.7	1.7	89.0
Romanian	7	.3	.3	89.3
Albanian	3	.1	.1	89.4
Serbian	20	.9	.9	90.3
Turkish	22	1.0	1.0	91.3
Ukrainian	16	.7	.7	92.0
Chinese (simplified)	75	3.4	3.4	95.4
Chinese (traditional)	103	4.6	4.6	100.0
<b>Total</b>	<b>2235</b>	<b>100.0</b>	<b>100.0</b>	

**Appendix 17: The IIA Institute Where the Chief Audit Executives Primarily Identify**

	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumula. Percent</i>
Not an IIA member	52	2.3	2.3	2.3
Albania	5	.2	.2	2.6
Algeria	5	.2	.2	2.8
Argentina	26	1.2	1.2	3.9
Armenia	2	.1	.1	4.0
Australia	35	1.6	1.6	5.6
Austria	26	1.2	1.2	6.8
Bahamas (IIA–North America)	2	.1	.1	6.9
Bangladesh	4	.2	.2	7.0
Barbados (IIA–North America)	3	.1	.1	7.2
Belgium	9	.4	.4	7.6
Bolivia	2	.1	.1	7.7
Bosnia & Herzegovina	7	.3	.3	8.0
Botswana	2	.1	.1	8.1
Brazil	26	1.2	1.2	9.2
Bulgaria	1	.0	.0	9.3
Canada (IIA–North America)	60	2.7	2.7	12.0
Cayman Islands (IIA–North America)	1	.0	.0	12.0
Chile	42	1.9	1.9	13.9
China	58	2.6	2.6	16.5
Chinese Taiwan	99	4.4	4.4	21.0
Colombia	26	1.2	1.2	22.1
Costa Rica	25	1.1	1.1	23.2
Cote D'ivoire	3	.1	.1	23.4
Croatia	12	.5	.5	23.9
Cyprus	5	.2	.2	24.1
Czech Republic	10	.4	.4	24.6
Denmark	16	.7	.7	25.3
Dominican Republic	9	.4	.4	25.7
Ecuador	24	1.1	1.1	26.8
Egypt (Cairo)	2	.1	.1	26.9
El Salvador	17	.8	.8	27.6
Estonia	17	.8	.8	28.4
Ethiopia	2	.1	.1	28.5
Fiji	2	.1	.1	28.6
Finland	9	.4	.4	29.0
Former Yugoslav Republic of Macedonia	9	.4	.4	29.4

France	79	3.5	3.5	32.9
Germany	81	3.6	3.6	36.6
Greece	22	1.0	1.0	37.6
Guyana (IIA--North America)	1	.0	.0	37.6
Haiti	3	.1	.1	37.7
Honduras	4	.2	.2	37.9
Hong Kong, China	2	.1	.1	38.0
Hungary	4	.2	.2	38.2
Iceland	3	.1	.1	38.3
India	27	1.2	1.2	39.5
Indonesia	26	1.2	1.2	40.7
Israel	14	.6	.6	41.3
Italy	44	2.0	2.0	43.3
Jamaica (IIA--North America)	2	.1	.1	43.4
Japan	98	4.4	4.4	47.8
Kenya	7	.3	.3	48.1
Korea Rep. (South)	5	.2	.2	48.3
Latvia	18	.8	.8	49.1
Lebanon	6	.3	.3	49.4
Lithuania	8	.4	.4	49.8
Luxembourg	8	.4	.4	50.1
Malawi	1	.0	.0	50.2
Malaysia	36	1.6	1.6	51.8
Mali	1	.0	.0	51.8
Mauritius	9	.4	.4	52.2
Mexico	19	.9	.9	53.1
Montenegro	4	.2	.2	53.3
Morocco	1	.0	.0	53.3
Netherlands	8	.4	.4	53.7
New Zealand	12	.5	.5	54.2
Nicaragua	11	.5	.5	54.7
Nigeria	7	.3	.3	55.0
Norway	9	.4	.4	55.4
North America	18	.8	.8	56.2
Oman	10	.4	.4	56.7
Panama	11	.5	.5	57.2
Papua New Guinea	1	.0	.0	57.2
Paraguay	2	.1	.1	57.3
Peru	19	.9	.9	58.2
Philippines	11	.5	.5	58.7
Poland	20	.9	.9	59.6
Portugal	3	.1	.1	59.7
Puerto Rico (IIA--North America)	3	.1	.1	59.8
Qatar	7	.3	.3	60.1



Romania	6	.3	.3	60.4
Russia	12	.5	.5	61.0
Saudi Arabia	29	1.3	1.3	62.3
Serbia	15	.7	.7	62.9
Singapore	11	.5	.5	63.4
Slovenia	18	.8	.8	64.2
South Africa	47	2.1	2.1	66.3
Spain	48	2.1	2.2	68.5
Sri Lanka	4	.2	.2	68.7
Swaziland	2	.1	.1	68.8
Sweden	19	.9	.9	69.6
Switzerland	75	3.4	3.4	73.0
Tanzania	30	1.3	1.3	74.3
Thailand	2	.1	.1	74.4
Trinidad & Tobago (IIA–North America)	3	.1	.1	74.6
Tunisia	3	.1	.1	74.7
Turkey	23	1.0	1.0	75.7
Uganda	14	.6	.6	76.3
Ukraine	10	.4	.4	76.8
United Arab Emirates	42	1.9	1.9	78.7
United Kingdom & Ireland	17	.8	.8	79.4
United States (IIA–North America)	414	18.5	18.6	98.0
Uruguay	8	.4	.4	98.4
Zimbabwe	24	1.1	1.1	99.5
Member at large — not affiliated with an Institute	12	.5	.5	100.0
Total	2228	99.7	100.0	
Missing System	7	.3		
Total	2235	100.0		

## Appendix 18: EFA results for Model A

### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.826
	Approx. Chi-Square	11000.101
Bartlett's Test of Sphericity	df	105
	Sig.	.000

### Communalities

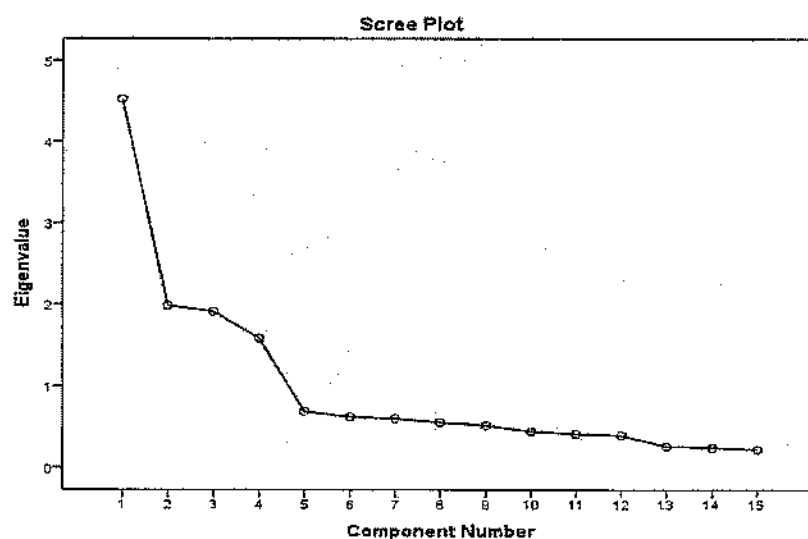
	Initial	Extraction
EXP1	1.000	.840
EXP2	1.000	.692
EXP3	1.000	.772
GOV1	1.000	.572
GOV2	1.000	.569
GOV3	1.000	.525
GOV4	1.000	.576
ITU1	1.000	.662
ITU2	1.000	.756
ITU3	1.000	.644
ITU4	1.000	.714
ITU5	1.000	.768
DEC1	1.000	.523
DEC2	1.000	.718
DEC3	1.000	.692

Extraction Method: Principal  
Component Analysis.

### Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.522	30.14	30.14	4.52	30.14	30.14	3.492	23.28	23.28
2	1.988	13.25	43.39	1.98	13.25	43.39	2.341	15.60	38.88
3	1.914	12.76	56.15	1.91	12.76	56.15	2.256	15.04	53.93
4	1.587	10.58	66.73	1.58	10.58	66.73	1.92	12.80	66.73
5	.69	4.603	71.34						
6	.62	4.173	75.51						
7	.60	4.021	79.53						
8	.55	3.719	83.25						
9	.51	3.455	86.71						
10	.44	2.978	89.69						
11	.41	2.773	92.46						
12	.397	2.646	95.10						
13	.26	1.766	96.87						
14	.246	1.640	98.51						
15	.223	1.485	100.0						

Extraction Method: Principal Component Analysis.



**Rotated Component Matrix<sup>a</sup>**

	Component			
	1	2	3	4
EXP1		.902		
EXP2		.812		
EXP3		.873		
GOV1			.733	
GOV2			.727	
GOV3			.697	
GOV4			.736	
ITU1	.797			
ITU2	.856			
ITU3	.754			
ITU4	.823			
ITU5	.864			
DEC1				.695
DEC2				.845
DEC3				.828

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

**Component Transformation Matrix**

Component	1	2	3	4
1	.786	.375	.454	.190
2	-.230	.911	-.260	-.224
3	-.470	.174	.336	.797
4	.330	-.011	-.783	.527

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.

**Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.816	.816	15

## Appendix 19: EFA results for Model B

### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.885
	Approx. Chi-Square	19520.225
Bartlett's Test of Sphericity	df	153
	Sig.	.000

### Communalities

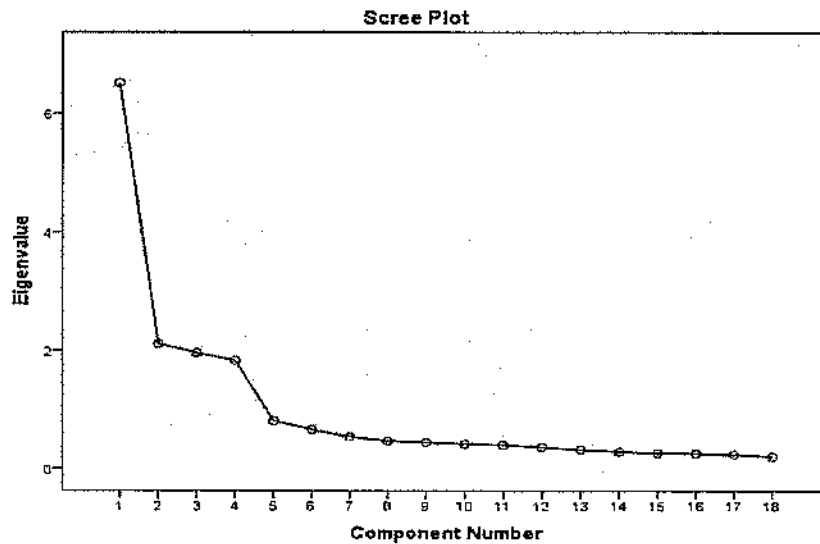
	Initial	Extraction
EXP1	1.000	.832
EXP2	1.000	.691
EXP3	1.000	.766
ITS1	1.000	.566
ITS2	1.000	.675
ITS3	1.000	.640
ITS4	1.000	.655
ITS5	1.000	.611
ITS6	1.000	.767
ITS7	1.000	.745
ITU1	1.000	.662
ITU2	1.000	.753
ITU3	1.000	.638
ITU4	1.000	.702
ITU5	1.000	.769
DEC1	1.000	.522
DEC2	1.000	.719
DEC3	1.000	.695

Extraction Method: Principal  
Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative e %	Total	% of Variance	Cumulative e %	Total	% of Variance	Cumulative e %
1	6.51	36.19	36.19	6.51	36.19	36.19	4.58	25.45	25.45
2	2.11	11.73	47.93	2.11	11.73	47.93	3.50	19.45	44.90
3	1.95	10.86	58.80	1.95	10.86	58.80	2.39	13.28	58.19
4	1.82	10.15	68.95	1.82	10.15	68.95	1.93	10.76	68.95
5	.80	4.493	73.45						
6	.66	3.697	77.14						
7	.53	2.981	80.12						
8	.46	2.556	82.68						
9	.43	2.436	85.12						
10	.40	2.273	87.39						
11	.39	2.173	89.56						
12	.35	1.990	91.55						
13	.31	1.740	93.29						
14	.27	1.534	94.83						
15	.25	1.409	96.24						
16	.24	1.382	97.62						
17	.23	1.293	98.91						
18	.195	1.084	100.0						

Extraction Method: Principal Component Analysis.



Rotated Component Matrix<sup>a</sup>

	Component			
	1	2	3	4
EXP1			.892	
EXP2			.808	
EXP3			.862	
ITS1	.684			
ITS2	.785			
ITS3	.755			
ITS4	.790			
ITS5	.758			
ITS6	.848			
ITS7	.843			
ITU1		.771		
ITU2		.835		
ITU3		.746		
ITU4		.799		
ITU5		.850		
DEC1				.704
DEC2				.845
DEC3				.828

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 4 iterations.

Component Transformation Matrix

Component	1	2	3	4
1	.752	.573	.291	.146
2	-.602	.547	.559	-.162
3	.136	-.604	.775	.127
4	-.233	.085	-.052	.967

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.881	.883	18

**Appendix 20: The Differences between CB-SEM and PLS-SEM**

<i>Criterion</i>	<i>CB-SEM</i>	<i>PLS-SEM</i>
<b>Objective</b>	Test theory or hypotheses	Predict and explain targeted constructs
<b>Concept</b>	Precise and direct method to empirically measure theoretical concepts	Provide approximations
<b>Parameter estimates</b>	Typically, multivariate normal distribution and independent observations (parametric)	Predictor specification (non-parametric)
<b>Assumption</b>	Its requirements are sometimes not easily fulfilled	distribution-free approach
<b>Natural application</b>	Applies maximum likelihood (ML) estimation method to compare the observed and estimated covariance matrix	Applies Ordinary least squares (OLS) regression with the objective of minimizing the error terms.
<b>approach</b>	Covariance-based common factors that explain the covariation between its associated indicators	Variance-based (component based) Estimates coefficients (path model relationships)
<b>Epistemic relationship between a latent variable and its measure</b>	Indeterminate	Explicitly estimated
<b>Implications</b>	Optimal for parameter accuracy	Optimal for prediction accuracy
<b>Model complexity</b>	Small to moderate complexity (e.g., less than 100 indicators)	Large complexity (e.g., 100 constructs and 1000 indicators)
<b>Sample size</b>	Ideally based on power analysis of specific model -- minimal recommendations range from 200 to 800 cases	Power analysis based on the portion of the model with the largest number of predictors. Minimal recommendations range from 30 to 100 cases

Source: Adapted from Hoyle (1999; 314) & Hair et al. (2017; 14-20)



## Appendix 21: Systematic Evaluation of PLS-SEM Results

<b>6.2 Evaluation of the Measurement Models</b>	
<b>6.2.1 Reflective Measurement Models</b>	<b>6.2.2 Formative Measurement Models</b>
<ul style="list-style-type: none"> <li>• Internal consistency (Cronbach's alpha, composite reliability)</li> <li>• Convergent validity (indicator reliability, average variance extracted)</li> <li>• Discriminant validity</li> </ul>	<ul style="list-style-type: none"> <li>• Convergent validity</li> <li>• Collinearity between indicators</li> <li>• Significance and relevance of outer weight</li> </ul>
<b>6.3 Evaluation of the Structural Model</b>	
<ul style="list-style-type: none"> <li>• Coefficients of determination (<math>R^2</math>)</li> <li>• Size and significance of path coefficients</li> <li>• Effect sizes <math>f^2</math></li> <li>• Predictive Relevance <math>Q^2</math></li> <li>• Effect sizes <math>q^2</math></li> </ul>	

Source: Hair et al. (2017; 106)

## Appendix 22: Discriminant Validity (Cross Loadings)

		<i>DEC</i>	<i>EXP</i>	<i>GOV</i>	<i>ITU</i>
<b>Model A</b>	<b>DEC1</b>	<b>0.688</b>	0.101	0.109	0.086
	<b>DEC2</b>	<b>0.841</b>	0.044	0.143	0.101
	<b>DEC3</b>	<b>0.863</b>	0.067	0.165	0.126
	<b>EXP1</b>	0.061	<b>0.881</b>	0.177	0.240
	<b>EXP2</b>	0.086	<b>0.932</b>	0.154	0.252
	<b>EXP3</b>	0.071	<b>0.771</b>	0.150	0.210
	<b>GOV1</b>	0.074	0.180	<b>0.723</b>	0.256
	<b>GOV2</b>	0.138	0.179	<b>0.759</b>	0.264
	<b>GOV3</b>	0.172	0.135	<b>0.778</b>	0.286
	<b>GOV4</b>	0.141	0.052	<b>0.757</b>	0.255
	<b>ITU1</b>	0.135	0.246	0.279	<b>0.819</b>
	<b>ITU2</b>	0.119	0.220	0.280	<b>0.867</b>
	<b>ITU3</b>	0.119	0.192	0.375	<b>0.814</b>
	<b>ITU4</b>	0.090	0.269	0.230	<b>0.827</b>
	<b>ITU5</b>	0.088	0.216	0.304	<b>0.871</b>

		<i>DEC</i>	<i>EXP</i>	<i>ITS</i>	<i>ITU</i>
<b>Model B</b>	<b>DEC1</b>	<b>0.694</b>	0.101	0.118	0.087
	<b>DEC2</b>	<b>0.845</b>	0.044	0.155	0.100
	<b>DEC3</b>	<b>0.856</b>	0.067	0.165	0.125
	<b>EXP1</b>	0.061	<b>0.881</b>	0.240	0.241
	<b>EXP2</b>	0.086	<b>0.931</b>	0.247	0.253
	<b>EXP3</b>	0.071	<b>0.774</b>	0.230	0.212
	<b>ITS1</b>	0.116	0.311	<b>0.736</b>	0.353
	<b>ITS2</b>	0.129	0.255	<b>0.823</b>	0.402
	<b>ITS3</b>	0.173	0.236	<b>0.805</b>	0.381
	<b>ITS4</b>	0.130	0.188	<b>0.806</b>	0.383
	<b>ITS5</b>	0.130	0.171	<b>0.778</b>	0.396
	<b>ITS6</b>	0.187	0.187	<b>0.872</b>	0.402
	<b>ITS7</b>	0.176	0.211	<b>0.863</b>	0.405
	<b>ITU1</b>	0.135	0.246	0.393	<b>0.819</b>
	<b>ITU2</b>	0.119	0.221	0.406	<b>0.870</b>
<b>ITU3</b>	0.118	0.192	0.429	<b>0.802</b>	
<b>ITU4</b>	0.090	0.269	0.389	<b>0.836</b>	
<b>ITU5</b>	0.088	0.216	0.392	<b>0.871</b>	

**Appendix 23: Discriminant Validity (Fornell-Larcker)**

		<i>DEC</i>	<i>EXP</i>	<i>GOV</i>	<i>ITU</i>
<b>Model A</b>	<b>DEC</b>	0.801			
	<b>EXP</b>	0.084			
	<b>GOV</b>	0.177	0.181	0.754	
	<b>ITU</b>	0.132	0.271	0.353	0.840
<b>Model B</b>	<b>DEC</b>	0.802			
	<b>EXP</b>	0.085			
	<b>ITS</b>	0.184	0.272	0.813	
	<b>ITU</b>	0.131	0.273	0.479	0.840

**Appendix 24: Heterotrait-Monotrait Ratio (HTMT)**

		<i>DEC</i>	<i>GOV</i>	<i>ITU</i>
<b>Model A</b>	<b>DEC</b>			
	<b>GOV</b>	0.240		
	<b>ITU</b>	0.162	0.440	

		<i>DEC</i>	<i>ITS</i>	<i>ITU</i>
<b>Model B</b>	<b>DEC</b>			
	<b>ITS</b>	0.225		
	<b>ITU</b>	0.162	0.534	

**Appendix 25: Collinearity Statistic (Inner VIF Values)**

		<i>DEC</i>	<i>EXP</i>	<i>GOV</i>	<i>ITU</i>
<b>Model A</b>	<b>DEC</b>				
	<b>EXP</b>				1.034
	<b>GOV</b>	1.142			1.034
	<b>ITU</b>	1.142			

		<i>DEC</i>	<i>EXP</i>	<i>ITS</i>	<i>ITU</i>
<b>Model B</b>	<b>DEC</b>				
	<b>EXP</b>				1.080
	<b>ITS</b>	1.297			1.080
	<b>ITU</b>	1.297			

**Appendix 26: Collinearity Statistic (Outer VIF Values)**

<i>Model A</i>	<i>VIF</i>
DEC1	1.249
DEC2	1.639
DEC3	1.592
EXP1	2.765
EXP2	1.796
EXP3	2.288
GOV1	1.381
GOV2	1.409

GOV3	1.343
GOV4	1.365
ITU1	2.221
ITU2	2.743
ITU3	1.873
ITU4	2.443
ITU5	2.902
<hr/>	
<b>Model B</b>	<b>VIF</b>
DEC1	1.249
DEC2	1.639
DEC3	1.592
EXP1	2.765
EXP2	1.796
EXP3	2.288
ITS1	2.137
ITS2	2.421
ITS3	2.378
ITS4	2.323
ITS5	2.307
ITS6	3.432
ITS7	3.286
ITU1	2.221
ITU2	2.743
ITU3	1.873
ITU4	2.443
ITU5	2.902

**Appendix 27: Outer VIF Values**

		<b>VIF</b>
<b>Model A</b>	EXP1	2.765
	EXP2	1.796
	EXP3	2.288
<b>Model B</b>	EXP1	2.765
	EXP2	1.796
	EXP3	2.288

### Appendix 28: Outer Weights

		<i>Original Sample</i>	<i>Sample Mean</i>	<i>Standard Deviation</i>	<i>T Statistics</i>	<i>P Values</i>
<b>Model A</b>	EXP1 -> EXP	0.373	0.368	0.118	3.168	0.002
	EXP2 -> EXP	0.594	0.592	0.090	6.599	0.000
	EXP3 -> EXP	0.167	0.169	0.110	1.518	0.129
<b>Model B</b>	EXP1 -> EXP	0.370	0.369	0.119	3.113	0.002
	EXP2 -> EXP	0.590	0.588	0.089	6.613	0.000
	EXP3 -> EXP	0.175	0.173	0.109	1.598	0.110

### Appendix 29: Outer Loadings

		<i>EXP</i>
<b>Model A</b>	EXP1	0.881
	EXP2	0.932
	EXP3	0.771
<b>Model B</b>	EXP1	0.881
	EXP2	0.931
	EXP3	0.774

### Appendix 30: The Standardised Root Mean Square Residual (SRMR)

		<i>Original Sample</i>	<i>Sample Mean</i>	<i>Standard Deviation</i>	<i>T Statistics</i>	<i>P Values</i>
<b>Model A</b>	<b>Saturated Model</b>	0.055	0.041	0.002	28.962	0.000
	<b>Estimated Model</b>	0.056	0.041	0.002	28.253	0.000
<b>Model B</b>	<b>Saturated Model</b>	0.050	0.033	0.002	24.758	0.000
	<b>Estimated Model</b>	0.050	0.034	0.002	24.467	0.000

### Appendix 31: The Three Significance Levels

<i>t-value</i>	<i>Significance level – <math>\alpha</math> - two tail test</i>	
<b>Above 2.57</b>	1 %	0.01
<b>Above 1.96</b>	5%	0.05
<b>Above 1.65</b>	10%	0.1

Source: Hair et al. (2017; 195)

**Appendix 32: Path Coefficient for Sample without Missing Values  
(Casewise Deletion)**

		<i>Original Sample</i>	<i>Sample Mean</i>	<i>Standard Deviation</i>	<i>T Statistics</i>	<i>P Values</i>
<b>Model A</b>	<b>EXP -&gt; ITU</b>	0.214	0.216	0.021	10.245	0.000
	<b>GOV -&gt; DEC</b>	0.149	0.150	0.025	5.987	0.000
	<b>GOV -&gt; ITU</b>	0.325	0.326	0.022	14.663	0.000
	<b>ITU -&gt; DEC</b>	0.076	0.076	0.025	3.074	0.002
<b>Model B</b>	<b>ITS -&gt; DEC</b>	0.147	0.148	0.027	5.438	0.000
	<b>ITS -&gt; ITU</b>	0.436	0.437	0.020	22.321	0.000
	<b>EXP -&gt; ITU</b>	0.162	0.164	0.020	8.231	0.000
	<b>ITU -&gt; DEC</b>	0.061	0.061	0.026	2.315	0.021

**Appendix 33: Strengths and Weaknesses of the Primary Ethical Pathways.**

<i>CAE Reporting</i>	<i>Preference- Based (Egoism)</i>	<i>Rule- Based (Deontology)</i>	<i>Principle - Based (Utilitarianism)</i>
<b>Strengths</b>	CAEs with expert knowledge typically may prove more beneficial in solving an ethical problem that requires a great deal of experience.	Making consistent decisions may occur more regularly when the same rules are implemented without bias.	When a situation exists whereby rules do not specifically address the issue, then a generalizable format may operate better in unstable or changing environments.
<b>Weaknesses</b>	A CAE does not necessarily have to follow rules or conventions (principles) when solving an ethical dilemma.	There may be times when the rules do not support the substance of the accounting transaction.	A CAE's values, attitudes or beliefs may not be applied on a consistent basis, thereby causing reporting issues or assets production problems.

Source: Developed by the Author