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The Moderating Effect of Accounting Information System Between Internal Auditors' Characteristics and Fraud Detection in The Saudi Banking Sector

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Abstract:

This paper investigates the impact of internal auditors' characteristics on fraud detection in Saudi Arabian banks. In addition, the accounting information systems (AIS) role as a moderator in the link between fraud detection and internal auditor characteristics is investigated. The research employs a quantitative approach using an online questionnaire sent to a sample of internal auditors across several banks in Saudi Arabia. A total of 156 questionnaires was valid for analysis. The data were analyzed using partial least squares (PLS) analysis. According to the findings, IT skills and competence have a direct impact on fraud detection, while AIS moderates these connections significantly. Moreover, while objectivity has no direct influence on fraud detection, the interaction impact of having AIS as a moderator is considerable in terms of fraud detection. Our results provide new empirical evidence about the importance of the role of auditors' characteristics together with using AIS to be secure from fraud and make good decisions in any given situation. However, this study provides strong evidence on the relationships between competence, objectivity, IT skills, and AIS, and fraud detection in the context of Saudi Arabian banks.

Keywords: Fraud detection, internal auditors' characteristics, Accounting information system, Saudi banks

1. Background

It is critically important for a bank to implement a robust and secure system for fraud prevention. Internal auditing and Accounting Information Systems (AIS) perform the same function toward fraud prevention. In the context of an internal auditor, they are responsible for anti-fraud activity by identifying gaps in the auditing system and applying corrective measures to rectify the loopholes. Several studies have argued that internal auditors are required to transcend their traditional roles and develop non-technical characteristics toward increasing their internal auditing experience. There appears to be a link between internal auditor characteristics and internal audit effectiveness, according to the evidence (Wen et al., 2019; Hakami & Rahmat, 2019 & Boitan, 2019). On the other hand, it is highly imperative for bank managers to rethink the aspect of running their banking operations without the implementation of AIS, thus exposing the entire bank to a high risk of fraud. It is very important to consider the benefits of AIS and its capacity to enhance and upgrade the bank's operating capabilities more effectively and securely. AIS has been identified as a critical resource in the operations of banks' internal procedures (Ahmad, 2018). Several studies have considered and discussed the importance of the integrated role of internal auditing and AIS in fraud prevention (e.g., Setiawan,Tridig, Gunawan & Sekar Sari, 2020; Nwanyanwu, 2018; Wen, Ying & Nair, 2019). Nevertheless, AIS' moderating role in the relationship between internal auditors' characteristics and fraud detection has not been systematically investigated in the existing studies. Such moderating role is missing in the literature. It has been argued that internal auditing and AIS can help prevent fraud in the banking sector (Rahman & Anwar, 2014; Mohamed, 2011; Al-Matari et al., 2014; Alzeban, 2020 & Nwanyanwu, 2018).

Furthermore, internal audits conducted using AIS can help address key issues, like supporting top management to make strategic decisions and ensuring effective implementation and execution of AIS (Alzeban, 2020). However, the importance of fraud detection raises the question regarding the role of internal auditing while AIS is already performing the same function. Hence, this opens up the opportunity for conducting further studies spanning the role of internal audit and fraud assessment while implementing AIS in the banking sector.

Fraud, according to the Association of Certified Fraud Examiners (ACFE), is unlawful behavior in industries that generates major difficulties for societies and impacts individuals around the globe. Because of its significant impact on organizations and the economy in general, fraud is seen as a crucial concern worldwide for all financial enterprises as well as the public at large. Banks treat this matter as the highest priority and concern since they are directly impacted by fraud and theft, which severely hit their financial and accounting infrastructure (Hakami & Rahmat, 2019 & Boitan, 2019). Any such major incident can likely take down the entire financial and economic infrastructure of the impacted bank, and it could be extended to the nation and beyond. In such a context, implementing a robust internal audit control mechanism by the banks is a key to addressing the fraud menace. However, due to the fact that there is a circulation of massive amounts of data on a daily basis, banks encounter a huge challenge to detect fraudulent activities and occurrences. This is mainly due to the

hackers constantly finding innovative and clandestine ways to circumvent the security protocols and fraud detection mechanisms in order to manipulate data (Munteanu et al., 2017).

Fraud detection is very difficult since fraudsters tend to mask the committed felony by producing authentic documentation. Internal fraud auditors rely on robust and dependable fraud detection techniques to identify suspected fraud cases that need further investigation (Petraşcu & Tieanu, 2014). Internal auditing is considered as one of the most important tasks that can aid banks in evaluating the systemic processes and procedures by adding value and enhancing the operations (Héroux & Fortin, 2018). The efficiency of internal auditing helps the administrations to gain access to financial reports to ensure that the report is credible (Sian et al., 2020 & Abbass & Aleqab, 2013). In addition, auditing can identify and address fraud occurrences that are often due to management malpractices (Endaya & Hanefah, 2016).

Hence, an internal auditor is crucially responsible for overseeing any intent within the bank to commit fraud to identify gaps and apply corrective measures using specific tools to rectify the loopholes. This will thwart future attempts that may be caused if the loopholes are not rectified (Shagari et al., 2017). The key objective of the internal auditor is to identify individuals who have the potential to commit fraud (Shamki & Alhajri, 2017) and to further ensure all the business processes and operations are conducted with integrity and flawlessly.

Internal Auditors should surpass their responsibilities to achieve and develop non-technical features, according to the Institute of Internal Auditors (IIA), such that these can actually be applied towards their traditional internal auditing experience. The auditors must meet certain criteria that touch upon the single neutrality, continuous learning, and enhancement, including IT skills, coupled with effective communication (Shamki & Alhajri, 2017; Endaya & Hanefah, 2016; Alotibi, n.d. & Baker et al., 2017). Another study (Abbass & Aleqab, 2013), based on data from Egyptian company survey respondents, found that non-technical features of internal auditors aid in decreasing auditing effort, time, and fees. Thus, the non-technical characteristics of the auditor are critical for fraud detection. Extant literature has suggested the presence of an association involving internal auditors' characteristics and internal audit effectiveness (Wen et al., 2019 & Endaya & Hanefah, 2016).

In this context, there is a need for further and deeper investigation into the role of internal auditing and AIS in fraud prevention. Such investigation is of utmost importance in the Saudi Arabia context. For example, according to (Alkahtani, 2016), fraud is among the top 10 risks that the Internal Audit Department will face over the forthcoming years. Internal auditing in Saudi Arabia, he claimed, may assist banks in achieving their goals by establishing a methodical and disciplined approach to reviewing and improving risk management, control, and governance systems. Moreover, for every $1 spent in Saudi Arabia for investigating fraud, the country can recover nearly $4, which is very high by industry standards (Alkahtani, 2016). Such indicators prove that the banking sector in Saudi Arabia can use internal auditing as a fraud detection mechanism in order to reduce bank losses and lower risks for stakeholders.

The goals of this study are to look into the impact of internal auditors' traits on fraud detection in Saudi Arabian banks, as well as the function of AIS in the relationship between internal auditors' characteristics and fraud detection. Such investigation is unique to support the banking sector in Saudi Arabia, as very little attention has been given to this area. Additionally, this research adds to the existing literature by providing additional empirical evidence on the moderating impact of AIS in the relationship between fraud detection and internal auditor characteristics.

2. Fraud in Saudi Arabia

More than 4,500 fraudulent transactions were conducted in Saudi Arabian banks in the three years between 2007 and 2009, as per (Hafiz, 2018), the Secretary-General of the Media and Banking Awareness Committee for Saudi banks. He also mentioned that the amount of fraud in Saudi banks had risen significantly, with 4,275 cases worth $152 million reported in 2016 (Hafiz, 2018). In the same context, an article published in the Al Watan magazine mentioned that Saudi banks detected 2,613 fraudulent financial operations during 2018, which were carried out via bank cards that had been cloned or stolen. The number of fraudulent financial operations targeted banks reached are about 13,308 within four years from 2016 to 2019 (Hafiz, 2018). A new study conducted in Saudi Arabia has also revealed that commercial fraud causes a loss of SR 16 billion annually, and a major portion comprises electronic frauds (Hakami & Rahmat, 2019). The ACFE (Burnaby et al., 2011) reported that fraud losses in many organizations around the world about $7 billion in its Report to the Nation on Occupational Fraud and Abuse.

Despite the fact that the number of fraud operations has fallen from 4,347 in 2016 to 2,613 in 2019, fraud in Saudi banks remains a serious problem, with thousands of fraudulent transactions expected. In the context of Saudi Vision 2030, it has been acknowledged that an appropriate AIS and internal control process can likely stave off and deter any potential threat of fraud in Saudi (Alkahtani, 2016). Furthermore, it is an established fact that banks must realize the importance of auditors' role to prevent fraud and make good decisions in any given situation.

3. Literature Review and Hypothesis Development

The following subsections summarize previous studies related to the efficacy of internal auditors' characteristics in fraud detection. Further, hypotheses tested in this study are presented.

a. Prior Studies

Literature has recognized that fraud detection is an arduous task, which requires a high level of expertise in identifying and assessing fraud behavior and the damage it imposes (Hakami & Rahmat, 2019). Regular monitoring of the internal control system, staff training, as well as protection software, according to research by (Wen et al., 2019) on fraud detection in Malaysia, can have a good impact on fraud detection in Malaysian listed businesses. It looked at the relationship between fraud detection and internal auditor responsibilities. Internal auditors from Malaysia's top 100 publicly traded corporations were the target audience. The findings show that protection software, staff

training, internal control systems' continuous monitoring, and fraud detection have a good association.

Literature has also recognized and provided compelling arguments on the association involving fraud detection and internal auditors' characteristics and features. For instance, (Al-Matari et al., 2014; Al-Sayani et al., 2020) addressed the impact of internal auditors' features, e.g., professional qualifications, experience, and audit firm size, on firm performance. These studies have concluded that internal auditors' characteristics are important determinants of fraud detection. The efficacy of the internal audit process is substantially influenced by competence, objectivity, and quality of internal audits, according to a pilot study on banks conducted by (Novranggi, 2019). The study also revealed that senior management support moderates the connection between internal auditors' quality and internal audit effectiveness. Internal auditors' characteristics (experience, education, effective communication, professional care, objectivity, and training) have a great influence on internal audit effectiveness, according to data obtained from 114 members of the Libyan Association of Accountants and Auditors (Endaya & Hanefah, 2016). In contrast, senior management support has a moderating impact on such connections.

Studies have also provided compelling arguments about integrating AIS and internal auditors' characteristics into the auditing processes. For example, several studies (Petraşcu & Tieanu, 2014; Baker et al., 2017; Al-Matari et al., 2012 & Suryandari, 2018) have been undertaken to concentrate on the role of internal auditors in upgrading commercial bank infrastructure for the aim of analyzing risks while utilizing AIS. These studies have addressed the failure of stand-alone AIS in discovering disruptions in management accounting and strategies related to banks' information systems caused by a fraud occurrence. The studies have also determined the importance of AIS and internal auditing in avoiding fraud in financial firms. The results of these studies clarify the critical importance of AIS to auditors. Studies by (Teru et al., 2017 & Alamin et al., 2020) have revealed that tracking and monitoring the operations executed by financial firms is the main objective of AIS to prevent and/or mitigate fraud and errors to achieve improved performance of the financial firms. Further, they recommended the firms set their own robust internal audit mechanisms in place that are aligned with AIS. This will enable effective control and help maintain the quality of internal audits and firm performance.

In a similar vein, (Alamin et al., 2020 & Ganesan et al., 2018) investigated the function of AIS as a moderator in the link between audit complexity, auditor experience, and audit quality at a public accounting firm. The findings show that partially experienced auditors have no impact on audit quality. However, audit complexity has a negative impact on audit quality. Furthermore, AIS improves the quality of audits. According to the findings, high audit complexity reduces audit quality, but a good AIS reduces audit complexity and improves audit quality. Similarly, (Okodo et al., 2019), the AIS positively improves the quality of the audit in detecting fraud, according to a survey of 34 auditors working for public accounting companies in Indonesia. The auditor's skill moderates this association. To produce a high-quality audit report, the research suggests that public accounting firms take into account the auditor's skills in the AIS field. The

study by Ahmad (2018*a*) aimed to inspect the effectiveness of internal auditing operations by using AIS to assess fraud in Jordanian banks. The findings indicate that the Jordanian banks' internal auditing operations can reduce electronic fraud or anticipate fraud occurrence beforehand. It also demonstrates that the administration has a significant impact on the internal auditor's independence through promoting corporate governance systems. This allows the internal auditors to work under no pressure with more efficacies in evaluating and reducing electronic fraud. A review of the literature shows inconclusive findings for the association involving fraud detection and internal auditors' characteristics. Some researchers have discovered a good association, for example (Endaya & Hanefah, 2016 & Alamin et al., 2020). In contrast, different research has discovered a negative association, for example, (Ahmad, 2018 & Okodo et al., 2019). More research is needed to confirm the direct association between fraud detection and internal auditors' traits, given the equivocal results. Furthermore, no empirical study of the moderating function of AIS in the relationship between fraud detection and internal auditors' traits has been conducted. Such moderating role is missing in the literature. More specifically, past studies have not examined the moderating role of AIS in the context of the banking sector.

b. The Conceptual Framework

In past studies, several researchers have underlined and found a considerable relationship between fraud detection and internal auditors' traits (Munteanu et al., 2017 & Petraşcu & Tieanu, 2014). Additionally, it has been confirmed by these studies that internal auditors' characteristics are the key variables in terms of fraud detection and improvement of a firm's performance. As a result, internal auditors' characteristics play an important part in assisting them in achieving their goals, which contributes to their effectiveness. Accordingly, this research proposes a structural model (Figure 1), in which internal auditors' characteristics (i.e., competence, objectivity, and IT skills) (IVs) directly affect fraud detection (DVs), and the relationship between these characteristics and fraud detection moderated by AIS (MV). Furthermore, this study argues that if internal auditors are truly efficient, they will aid in effective fraud detection and prevention. Consequently, empowering the Internal Audit Department necessitates helping the auditors to improve their competencies and personal skills to perform successfully and efficiently (Boitan, 2019 & Nurdiono & Gamayuni, 2018). Therefore, the goal of this study's conceptual framework is to explore the association between internal auditors' characteristics and fraud detection in Saudi Arabia's banking sector while taking into account the moderating effect of AIS.

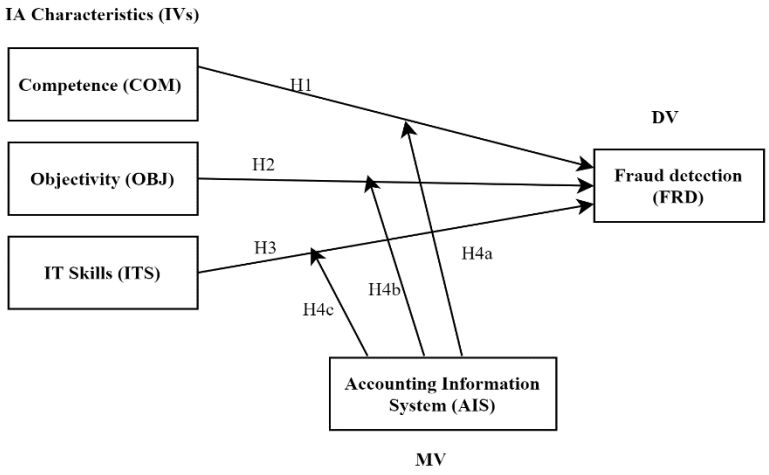

FIGURE 1: THE RESEARCH FRAMEWORK

c. Hypotheses Development

(1). Expertise, knowledge, and experience are all aspects of competence (Alotibi, n.d.). A competent auditor is one who possesses the necessary information, abilities, training, and expertise to effectively do the auditing task. (Alotibi, n.d.). Internal auditors must have the professional competence to perform their auditing responsibilities. The IIA in 2010 defined an auditor's competence as a concept that includes four aspects, i.e., knowledge, behavioral and technical skills, ability, and expertise (Nurdiono & Gamayuni, 2018). Many studies have stated that professional employees in the internal audit department who lack competence, knowledge, skills, experience, and expertise will have a negative impact on the detection of fraud (Petraşcu & Tieanu, 2014; Okodo et al., 2019). According to Mohamed (2011), auditors' competence indicated an effective audit in firms to partake in the auditor's ability to advance with a structured and disciplined audit procedure to advance the internal auditing's influence. The findings also demonstrate that the expertise of internal auditors has a favorable and significant impact on sharia compliance. As a result, this research proposes the following hypothesis:

H1. There is a significant relationship between competence and fraud detection

(2). Objectivity is defined as the ability to gather, assess, and deliver information regarding the action or process under investigation with professionalism (Nurdiono & Gamayuni, 2018). Internal auditors' objectivity must be congruent with the organization's rules of conduct, for instance, not engaging in activities or connections that could jeopardize the organization's interests, not taking anything that could jeopardize or cause offense, and using their professional judgment (Nurdiono & Gamayuni, 2018). Objectivity also means "free from bias" and is one element in the code of ethics, which governs the professionalism and the effectiveness of internal auditors (Endaya & Hanefah, 2016). Internal auditors should be objective, unbiased, and honest, and they must

avoid any conflicts of interest (Mohamed, 2011). According to Novranggi (2019), gathering, analyzing, and disseminating information concerning the conduct under investigation requires a high level of professional objectivity. Internal auditors must be objective and identify threats to their organization's status. They must also be able to foresee and mitigate such risks, as well as determine if they have been objective, given the procedures they have taken to reduce the risks of fraud. As a result, this research proposes the following hypothesis:

H2. There is a significant relationship between objectivity and fraud detection

(3). IT skills of auditors reflect their ability to use their skills and knowledge via a computer system (Setiawan et al., 2020). Auditors must develop the necessary soft as well as hard skills and have sufficient training and experience to be efficient (Novranggi, 2019). Also, (Abdelraheem et al., 2021) conducted another study on the impact of IT on the accounting information quality in Sudanese commercial banks. The researchers concluded that IT applications could assist in achieving reliability, relevance, consistency, consistency in managing and presenting accounting information, as well as accounting information's comparability and understandability. As accounting information is computerized, accountants have to gain the skills to use and work with the computerized systems. Other studies have clarified that IT can perform most accounting functions, and it may bring many opportunities for firms toward effective fraud detection (Héroux & Fortin, 2018 & Alotibi, n.d.). As a result, this research proposes the following hypothesis:

H3. There is a significant relationship between IT skills and fraud detection

(4). AIS is defined as a platform for computer application with the perspective of data analysis and design, and escalation to the financial control of the accounting business for automated processes, offering business information to stakeholders (Rahman & Anwar, 2014). AIS is a key resource in firms and is based on theoretical accounting practices. In the banking sector, the main roles of AIS are to provide services to decision-makers (financial and non-financial decisions), manage the daily transaction processing and information storage, as well as provide relevant services for those who need additional information (Ahmad, 2018). However, there appear to be no related past studies on this area. Furthermore, there is no consensus on the contributions of AIS to internal auditors' effectiveness. One possible explanation for such mixed findings may be the diverse levels of AIS tasks. For example, AIS is used to manage and monitor all transaction processing and reporting (Alamin et al., 2020). Moreover, AIS is used to combine people, transactions, and information. Users of such systems realize that it is not easy to learn because of having less technical knowledge; it requires support for continuous learning and training (Oktavianto & Suryandari, 2018), (Teru et al., 2017). As a result, adopting AIS in the banking industry is predicted to have an impact on the relationship between fraud detection and internal auditor characteristics. Therefore, this study hypothesizes that:

H4a. Accounting information system moderates the relationship between competence and fraud detection

H4b. Accounting information system moderates the relationship between objectivity and fraud detection

H4c. Accounting information system moderates the relationship between IT skills and fraud detection

4. Research Instrument

Based on the literature, a questionnaire with four sections was developed. Section A is on the measurement items for competence, objectivity, and IT skills. Fourteen items were used to measure competence, i.e., auditors' knowledge, skills, expertise, and behavior. These 14 items were adopted from the work of (Héroux & Fortin, 2018). Other than that, ten items were used to measure objectivity, i.e., unbiased and impartial attitudes. These ten items were adopted from the work of (Nurdiono & Gamayuni, 2018). Nine items were used to measure IT skills. These nine items were adopted from the work of (Setiawan et al., 2020). Section B includes six items used to measure fraud detection. These items were adopted from (Nwanyanwu, 2018). Last but not least, six items are included in Section C that is used to assess AIS. These materials were taken from (Setiawan et al., 2020). All the above 45 items have empirically affirmed that the conceptualization and measurement of auditors' characteristics, fraud detection, and AIS are reliable and valid. Section D is on the respondents' profiles.

5. Data Collection, Analysis, and Results

a. Survey Administration

Saudi Arabia is chosen as the area for this research. This is due to the lack of researches in Saudi Arabia that emphasizes the characteristics of internal auditors in fraud detection. Furthermore, as previously said, no study on the influence of internal auditors' features in conjunction with AIS for fraud detection in the Saudi context exists to the greatest of the researcher's knowledge. Therefore, studying the relationship between auditors' characteristics and fraud detection requires considering the internal auditors as respondents. Therefore, internal auditors holding positions of head of the audit department, main auditor, and assistant auditor were selected as the key informants for this research because they are deemed to have the required knowledge.

The number of working banks in Saudi are 12, but the numbers of branches in these banks are 1945 as by the end of 2021. Each branch have the positions of head of the audit department, main auditor, and assistant auditor. The researcher sought to acheive personal contact via telephone with the branches to ask their willing to participate in the study. The bank branches who showed their willing to partcipate have recieved that questionnaire.

The data was collected from the selected group using an online survey form. The measurement items were designed using a closed response approach, where respondents were asked to choose a specific option to examine how strongly they agree or disagree with the statements, anchored on a five-point Likert scale, in which 1

represents strongly disagree whereas 5 indicates strongly agree (Sekaran & Bougie, 2016). Out of 200 questionnaires distributed to the internal auditors in Saudi banks, 168 were returned; 12 observations had missing values (were insufficient). Hence they were removed from the study. For the ensuing study, a total of 156 replies were employed, resulting in a response rate of roughly 78.0%.

In terms of gender, most respondents are male (67%), and 33% are female. With respect to work position, the majority of responders had the position of head of the audit department (49%), main auditor (34%), and assistant auditor (17%). In terms of experience, most of the respondents (82%) have experience of more than five years as auditors. About 23% of the respondents do not have professional membership, while (77%) of respondents have professional membership, such as SOCPA, British fellowship (ACCA), American fellowship (CPA), and others. About 92% of the respondents have a certified auditor certificate, and 87% have attended a course or training in the field of fraud. All of the respondents mentioned that AIS is used in their banks. Similarly, 100% of respondents mentioned that their bank uses AIS for auditing and control purposes. The respondents in the sample represent internal auditors in Saudi banks, which are suitable for this study. The respondents work as auditors, thus indicating the generalizability of the research findings to internal auditing in the Saudi context. Furthermore, most respondents have a certified auditor certificate and work experience of more than five years. This indicates that the respondents are qualified to complete the questionnaire since they possess the necessary understanding for the research.

b. Data Screening

Data screening is mandatory to improve the model and to avoid encountering problems at a later stage of analysis (Hair et al., 2017). As a result, prior to analysis, the raw data must be screened. The data screening procedure looks for inconsistent responses, outlier values, missing values, and data normality distribution to guarantee that data has been translated effectively and accurately (Fornell & Larcker, 1981). Therefore, the data screening process must comprise three assumptions: missing data, outlier values, and normality (Hair et al., 2017). These three assumptions were checked in this study as follows:

Twelve observations were omitted from the analysis, constituting 0.07% of the total returned responses. Seven of the 12 observations had 40% or more incomplete data, while five of the 12 observations had incomplete demographic values. An outlier, according to scholars, is a value in which the Standard Z-score for a big sample is outside of the range of ± 3.29, whereas a small sample is outside of the range of ± 2.5. (which is 80 or fewer) (Hair et al., 2017). The outlier assumption was evaluated in this research by grouping all of the questionnaire items into a single variable. The Z-score was calculated using descriptive statistics in SPSS. All Z-score values were within the cutoff values of ± 3.29, indicating no outliers in this research's dataset, as advised by (Hair et al., 2010). The normality assumption was tested using skewness and kurtosis. Two items out of 45 had a skewness value higher than ± 2, while three out of 59 items had a kurtosis value greater than ± 2. Since normality is not a requirement for

SmartPLS, the data set in this investigation is non-parametric, which is among the justifications for employing Smart- Partial Least Squares (PLS).

c. Assessing the Measurement Model

Before analyzing the linkages in the overall model, the reliability and validity of the variables and their items were examined to verify that only valid and reliable metrics were employed. We looked at discriminant validity, convergent validity, composite reliability, and construct validity. The outer model or measurement model in PLS was utilized for factor analysis to determine the amount to which items loaded on their underlying construct. Confirmatory factor analysis (CFA) was used to verify the observed items' underlying link with the components in the outer model (Hair et al., 2017). The following are the results of the model fit evaluation of the measurement model:

If some factors load higher compared to their respective construct, the items will be candidates for elimination (Hair et al., 2017). To be considerably loaded on their particular construct, the suggested standardized factor loading is 0.5 or above, ideally 0.7 or higher (Hair et al., 2010 & Fornell & Larcker, 1981). The factor loadings of the measurement model components surpass the required value of 0.70, as shown in Table 1, which means that the items loaded highly on the construct they were designed to measure; thus, all the item loadings are significant.

TABLE 1. INTERNAL CONSISTENCY AND CONVERGENT VALIDITY RESULTS

Constructs/Items	Factor Loading	CA	CR	AVE
AIS		0.916	0.936	0.711
AIS1	0.852			
AIS2	0.906			
AIS3	0.907			
AIS4	0.755			
AIS5	0.909			
AIS6	0.708			
Competence		0.951	0.957	0.617
COM1	0.704			
COM10	0.858			
COM11	0.799			
COM12	0.700			
COM13	0.885			
COM14	0.848			
COM2	0.842			
COM3	0.868			
COM4	0.789			
COM5	0.769			
COM6	0.852			
COM7	0.800			
COM8	0.825			

COM9	0.792			
Fraud Detection		0.902	0.919	0.534
FRD1	0.732			
FRD10	0.728			
FRD2	0.765			
FRD3	0.770			
FRD4	0.800			
FRD5	0.794			
FRD6	0.712			
FRD7	0.803			
FRD8	0.802			
FRD9	0.664			
IT Skills		0.920	0.934	0.612
ITS1	0.790			
ITS2	0.891			
ITS3	0.755			
ITS4	0.707			
ITS5	0.706			
ITS6	0.775			
ITS7	0.879			
ITS8	0.801			
ITS9	0.711			
Objectivity		0.906	0.922	0.545
OBJ1	0.792			
OBJ10	0.709			
OBJ33	0.779			
OBJ4	0.837			
OBJ5	0.839			
OBJ7	0.708			
OBJ8	0.732			
OBJ9	0.738			
OBJ2	0.733			
OBJ6	0.863			

The internal consistency was tested using Cronbach's alpha (α) of the entire scale by measuring items of the variables with each other. To assess the item variance, which indicates item reliability; (Hair et al., 2017) recommended Cronbach's alpha (α)'s lower limit is 0.70. The absolute correlations between items and each variable are also indicated in Table 1, where the factor loadings range from 0.704 to 0.909, which is greater than the required threshold (Hair et al., 2010 & Henseler et al., 2015). Composite reliability and Cronbach's alpha (α) were used to assess construct reliability. The amount to which the items consistently resemble similar latent construct, therefore giving a better variance estimate shared by the corresponding variable, is known as composite reliability (Hair et al., 2010). Cronbach's alpha α measures the internal consistency of a multi-item scale (Hair et al., 2017). Table 1 also demonstrates that composite reliability is greater than the suggested value of 0.70, and Cronbach's alpha α is greater than 0.7 (Hair et al., 2010).

Convergent validity was assessed using the Average Variance Extracted (AVE) approach (Hair et al., 2017). The average percentage of variation derived from the observed variables is known as AVE (Hair et al., 2010). Furthermore, Table 1 demonstrates that the AVE explained for each variable is greater than the required value of 0.5 (50%), implying that each variable can describe more than half of the variance in its measuring items on average (Fornell & Larcker, 1981).

The Fornell and Lacker criterion can be seen in Table 2 and is used to verify discriminant validity. A variable must have a bigger variance with its items than the rest of the model's items (Hair et al., 2010 & Hair et al., 2017). The value of one variable's AVE square root must be greater than the value of inter-correlations between the variables in this scenario. The AVE square roots of all constructs are greater than their corresponding inter-correlations, as seen in Table 2. As a result, the discriminant validity examination demonstrates that the measurement model fit is satisfactory. The measurement model's outside loadings are shown in Figure 3.

The model fit for the measurement model was evaluated using discriminant validity, convergent validity, Cronbach's Alpha (*α),* and factor loading. In addition, AIS, fraud detection, IT skills, objectivity, and competence were all put to the test. The findings back up the model's validity and reliability. Thus, the measurement model used in this work has good goodness of fit (GoF) and excellent prediction quality.

TABLE 2. DISCRIMINANT VALIDITY–FORNELL AND LACKER CRITERION

Constructs	AIS	Compe-Tence	Fraud Detection	IT Skills	Objectiv-ity
AIS	0.843				
Competence	0.650	0.786			
Fraud Detection	0.633	0.649	0.731		
IT Skills	0.656	0.741	0.688	0.782	
Objectivity	0.655	0.668	0.654	0.645	0.738

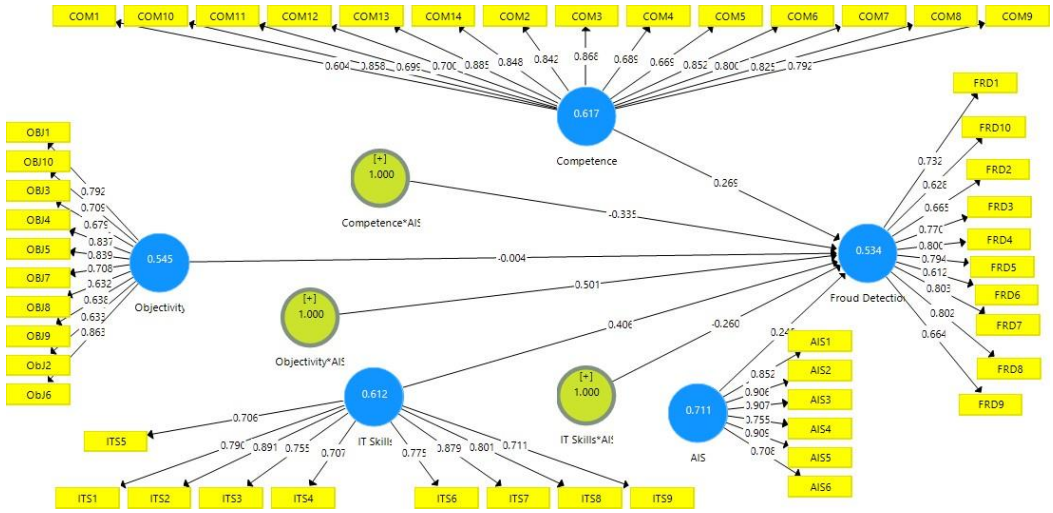

FIGURE 2: MEASUREMENT MODEL (FACTOR LOADINGS/OUTER LOADINGS)

d. Assessing the Structural Model

For structural models, the R package in PLS gives a suitable index for GoF (Tabachnick et al., 2007). In the Covariance-based Structural Equation Modeling (CB-SEM) technique, the coefficient of determination of R^2 in PLS is regarded as an equivalent measure for GoF for structural fit. To check the model fit for the structural model, some evaluation criteria are suggested, such as the explanation of endogenous latent variables (coefficient of determination of $R^{2)}$, relevance and significance of path coefficients (β), and multi-collinearity (inner VIF) and predictive relevance (Q), as well as effects size (f^2 and q^2) of path coefficients (Hair et al., 2010; Hair et al., 2017 & Henseler et al., 2015).

The R^2 number is the proportion of variance explained by the exogenous variable(s) in the endogenous variable(s) (Henseler et al., 2015). Additionally, (Cohen, 2013) proposed three criteria for determining the endogenous variable's R^2 value: weak (ranging from 0.02 to 0.12), moderate (0.13 to 0.25), and considerable (0.26 and above). Table 3 reveals that the R^2 value for fraud detection is 0.747, which is significant, indicating a high level of prediction.

TABLE 3. R-SQUARED (R^2) RESULT

Endogenous Variables	R-Squared	Adjusted R-Squared
Fraud Detection	0.758	0.747

Substantial > 0.25; Moderate > 0.12, Weak > 0.02 (Cohen, 1988)

When a certain predictor variable is excluded from the structural model, the effect size (f^2) is employed to decide the change in R^2 value (Henseler et al., 2015). Also, (Cohen,

2013) proposed three criteria for f^2 evaluation, namely 0.02 for small effect size, 0.15 for medium effect size, and 0.35 for large effect size. Table 4 shows that fraud detection has high effect on fraud detection ($f^2 = 0.222$), competence has medium effect ($f^2 = 0.052$), while other exogenous variables (i.e., AIS and objectivity) have small effects on fraud detection (0.034 and 0.000).

TABLE 4. EFFECT SIZE RESULT

Exogenous Variables	Fraud Detection
AIS	0.077
Competence	0.052
IT Skills	0.222
Objectivity	0.000

When two predictor variables in a multiple regression have a strong correlation for the former, and more than two predictor variables are significantly inter-correlated for the latter, multi-collinearity and collinearity arise. To examine all of the variables' collinearity in the model, the variance inflation factor (VIF) is proposed (Henseler et al., 2015). As a general rule, the VIF value should not exceed five since anything more than that indicates collinearity within the variables. For example, Table 5 shows that the VIF values are between 2.805 and 4.659, indicating no collinearity between the independent variables.

TABLE 5. RESULT OF MULTI-COLLINEARITY – INNER VIF VALUES

Exogenous Variables	Fraud Detection
AIS	3.229
Competence	2.805
IT Skills	3.067
Objectivity	4.659

As proposed by (Hair et al., 2010), Q^2 value assessment is employed to measure the predictive accuracy of the structural model's endogenous variables. As a general rule, the model has predictive significance if the Q^2 value for a given endogenous variable is greater than zero, implying that the path model's predictive accuracy for this construct, which is fraud detection in this investigation, is appropriate (Henseler et al., 2015). Table 6 reveals that the structural model in this investigation has a strong predictive relevance, as the Q^2 value for the endogenous (fraud detection) variable is 0.432, which is greater than zero.

TABLE 6. RESULT OF PREDICTIVE RELEVANCE

Endogenous Variables	$CCRQ^2$ (=1-SSE/SSO)	$CCCQ^2$ (=1-SSE/SSO)
Fraud Detection	0.385	0.432

Figure 3 shows the inner loadings (t-value) of the structural model.

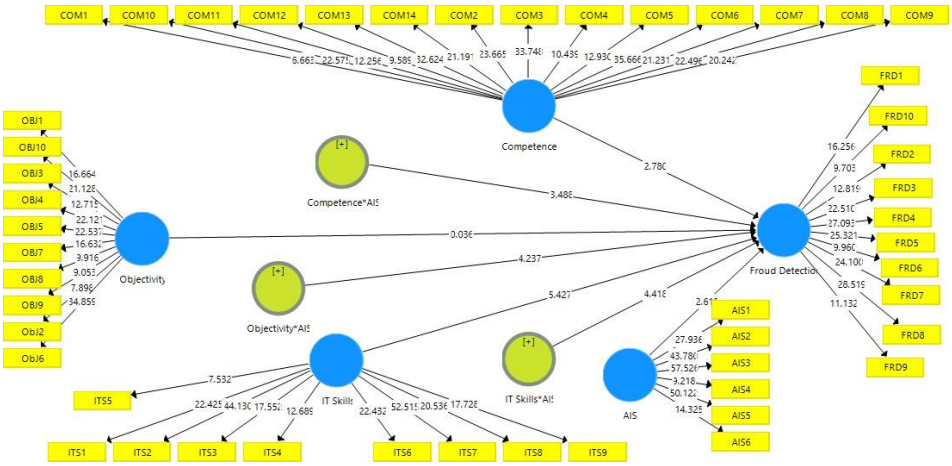

FIGURE 3. STRUCTURAL MODEL WITH T-VALUES (BOOTSTRAPPING RESULT)

Table 7 demonstrates that the first direct hypothesis, competence -> fraud detection, is statistically significant with p representing 0.006 (that is less than 0.05) and a t-value of 2.780 (greater than the standardized value of 1.96), with a regression weight of β=0.269. As a result, hypothesis H1 is accepted. The second direct hypothesis, objectivity -> detection of fraud, is insignificant. Subsequently, hypothesis H2 is refuted. The third direct hypothesis, IT Skills -> Fraud Detection, is significant with a p-value of 0.000, which is less than 0.05, a t-value of 5.427, greater than the standardized value of 1.96, and a regression weight of β=0.406. As a result, hypothesis H3 is confirmed.

TABLE 7. PATH COEFFICIENT RESULT (DIRECT EFFECT)

Hypotheses	OS/Beta	LL	UL	T	P	Decision
Competence -> Fraud Detection	0.269	0.095	0.467	2.780	0.006	Significant
IT Skills -> Fraud Detection	0.406	0.252	0.543	5.427	0.000	Significant
Objectivity -> Fraud Detection	-0.004	-0.252	0.220	0.036	0.971	Not Significant

Table 8 reveals that the first moderating hypothesis, competence*AIS -> fraud detection, is statistically significant as p represents 0.001 (that is less than 0.05), a t-value of 3.488 (greater than the standardized value of 1.96), and a regression weight of *β*=-0.335. As a result, H4a is a viable hypothesis. The second moderating hypothesis, objectivity*AIS -> fraud detection, has a statistical significance of p resembling 0.000, which is less than 0.05, and a t-value of 4.237, which is larger than the standardized

value of 1.96, with a regression weight of β=0.501. Subsequently, hypothesis H4b is believed to be true. Finally, the third moderating hypothesis, IT skills*AIS -> fraud detection, is significant with p representing 0.000, which is less than 0.05, with a t-value of 4.418, greater than the standardized value of 1.96, and a regression weight of β= -0.260. As a result, H4c is a viable theory.

TABLE 8. PATH COEFFICIENT RESULT (MODERATING EFFECT)

Hypotheses	OS/Beta	LL	UL	T	P	Decision
Competence*AIS -> Fraud Detection	-0.335	-0.524	-0.157	3.488	0.001	Significant
IT Skills*AIS -> Fraud Detection	-0.260	-0.347	-0.136	4.418	0.000	Significant
Objectivity*AIS -> Fraud Detection	0.501	0.288	0.750	4.237	0.000	Significant

Figure 4 shows the graphical effect of the AIS construct on competence and fraud detection. The beta value is negative (-0.335), and the interaction impact is substantial, as shown in Table 8. (0.001). Figure 4 illustrates that competence has a smaller effect on fraud detection when AIS is strong. As a result, the direct association between fraud detection and competence would be less significant in the event of a high AIS.

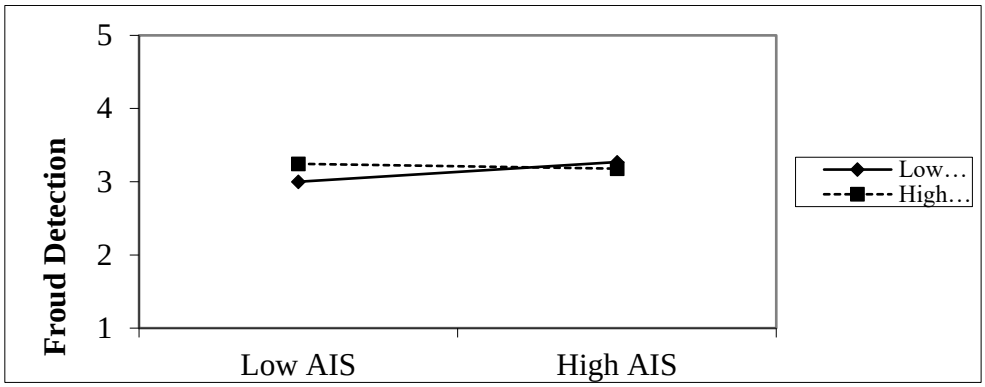

FIGURE 4. REGRESSION COEFFICIENTS OF MODERATING HYPOTHESIS (H4A) (COMPETENCE)

Figure 5. Shows the graphical effect of the AIS construct on objectivity and fraud detection. Although, Table 7 shows that the direct relationship between objectivity and fraud detection is not significant. The beta value is positive (0.501), where the interaction effect is significant (0.000), as shown in Table 8. Therefore, Figure 5 demonstrates that when AIS is high, objectivity has a greater influence on fraud

detection. As a result, the direct relationship between fraud detection and objectivity would be more significant in the event of high AIS.

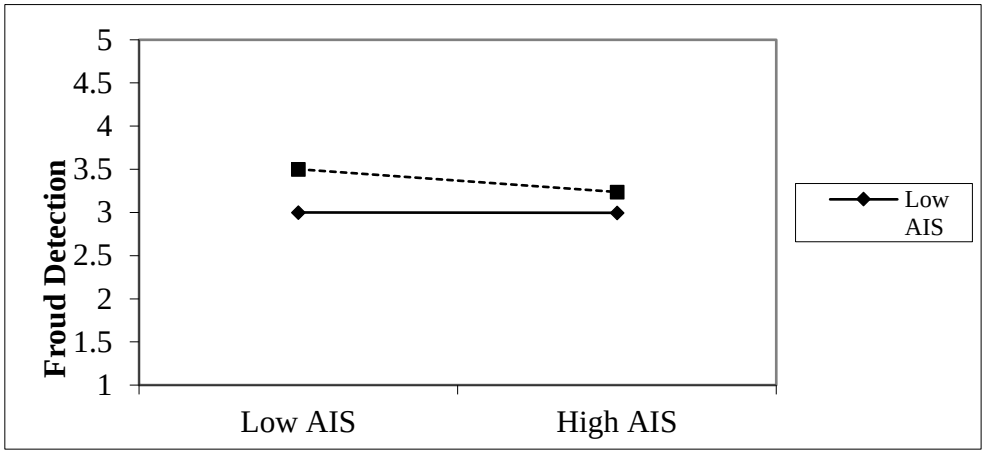

FIGURE 5. REGRESSION COEFFICIENTS OF MODERATING HYPOTHESIS (H4B) (OBJECTIVITY)

Figure 6 shows the graphical effect of the AIS construct on IT skills and fraud detection. Table 8 further reveals that beta has a negative value (-0.260), whereas the interaction effect is substantial (0.000). As a result, in the event of high AIS, the direct association between fraud detection and IT skills would be less significant (Figure 6).

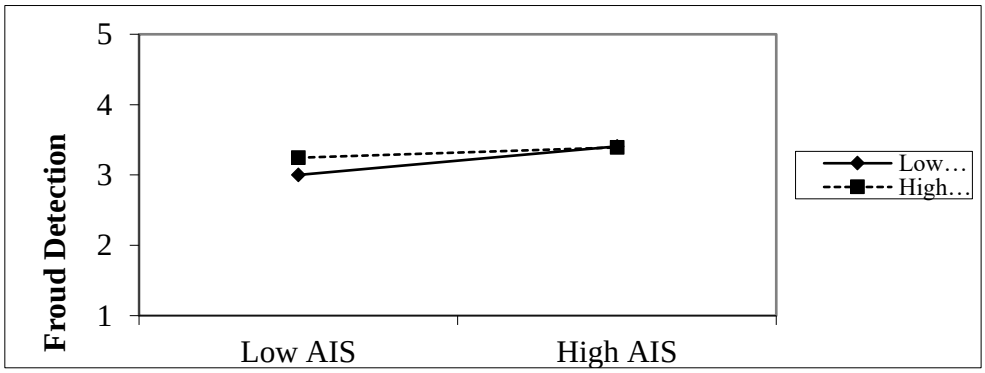

FIGURE 6. REGRESSION COEFFICIENTS OF MODERATING HYPOTHESIS (H4C) (IT SKILLS)

6. Discussion

The hypotheses were tested by employing PLS-SEM path modeling. The findings of the empirical data analysis back up the notion that competency and IT abilities are directly related to fraud detection. At the 0.006 and 0.000 levels of significance, the two straightforward hypotheses are both significant. These findings support the previous

research that shows that expertise has a direct impact on fraud detection – for example (Alkahtani, 2016 & Setiawan et al., 2020). These findings are also in line with previous research that shows that IT abilities have a direct impact on fraud detection (Abdelraheem et al., 2021). It is also consistent with the arguments of (Shagari et al., 2017). However, the results from the empirical data analysis show that the direct relationship between objectivity and fraud detection is not significant in the Saudi banks' context. This result contradicts the result of (Okodo et al., 2019), who found that the greater the objectivity, the greater the potential for internal auditors to contribute to fraud detection. This finding was also supported by the stringent implementation of international standards for the professional practise of internal auditing in Saudi banks, which may eliminate any potential conflicts of interest between internal auditors and stakeholders. For example, such standards prevent internal auditors from evaluating operations or confirming services which they were previously supervising, in addition to the high salaries that the internal auditors receive which prevent them from accepting gifts related to their work as auditors. These reasons may lead to reducing the importance of the relationship between objectivity and fraud detection in the Saudi bank context from the perspective of internal auditors.

Regarding the moderating role of AIS, as expected, the empirical data analysis shows that AIS has a significantly moderating association at the 0.05 and 0.001 levels of significance on the relationships between the two dimensions of internal auditors' characteristics (i.e., competence and IT skills) and fraud detection. In this regard, the research highlights that AIS plays an explicit connection between fraud detection with IT skills and competence. As the beta value for the interaction effect is negative, in the case of high AIS, the significance of the direct relationship between competence and fraud detection would be smaller. These results can be explained in that internal auditors and AIS perform the same function for fraud prevention. Thus, heavy use of AIS reduces the relationship significance between competence and IT skills and fraud detection. However, AIS is not a substitute for competence and IT skills as the interaction effects are significant.

Meanwhile, although this study finds that the direct relationship between objectivity and fraud detection is not significant, the interaction effect is significant toward fraud detection in the existence of AIS as a moderator. Relevant literature has argued that competence, objectivity, and IT skills can play an important role in fraud detection in the banks' context (Novranggi, 2019 & Abdelraheem et al., 2021). Consistent with these arguments, the results of this study add new insights into these relationships that internal auditors' characteristics and AIS can help Saudi banks reduce risks caused by fraud occurrences.

7. Conclusion

Fraud is not merely financial fraud but extends to other domains as well. People have committed fraud and a felony in diverse realms from financial to property and beyond. All these have resulted in economic losses affecting the nation over the long term (Alotibi, n.d.). Nowadays, fraud is the highest critical risk to any organization because it has a close relationship with the market, credit, and financial systems. Therefore, accounting and auditing relate to AIS in the context of the economy and finance with

the aim of preventing financial losses (Shamki & Alhajri, 2017). Researchers and professionals are concerned with developing proper and reliable models to prevent fraud at an early stage, and most of them depend on techniques, such as data mining (Munteanu et al., 2017). All business sectors, including banks, use data and information for their daily processes or for making future strategic decisions to yield profitable returns, revenue, and benefits. Ta and Nguyen (Ta & Nguyen, 2020; Petraşcu & Tieanu, 2014). This study concludes that banks must realize the importance of the role of auditors' characteristics together with using AIS to be secure from fraud and make good decisions in any given situation. Although this study provides strong evidence on the relationships between competence, objectivity, IT skills, and AIS and fraud detection, future researchers may consider adding other non-technical auditors' characteristics, such as education and experience, in the model. Furthermore, they may consider the technical and non- technical auditors' characteristics in one framework to provide a comprehensive model on the duty of internal auditors' characteristics in fraud detection, as well as to answer the relative significance of both these internal auditors' characteristics on fraud detection.

8. Limitations and Suggestions for Future Research

This study provides key insights into the relationships between internal auditors' characteristics (i.e., competence, objectivity, and IT skills), accounting information systems (AIS), and fraud detection. Although the study's robust findings suggest that auditor characteristics, in combination with the use of AIS, have significant power to explain how Saudi banks protect themselves from fraud, it would be interesting to investigate these relationships in a different context, such as by country, time, and industry. This study might be expanded in the future to explore the links outside of the Saudi context. Because this study focuses on Saudi banks, the conclusions may not apply in other contexts. Future research should broaden the sample frame to include insurance firms, financial firms, and other businesses in order to obtain more generalizable results. This study used a cross-sectional design, which means that all variables were measured at the same time. Internal auditors' characteristics (i.e., competence, objectivity, and IT abilities), accounting information systems (AIS), and fraud detection might all be studied over time in a longitudinal research. Because the precise number of Internal Auditors firms in Saudi Arabia is unknown, the sample frame for this study is derived from internal auditors holding positions of head of the audit department, main auditor, and assistant auditor in Saudi banks. This is because those key informants are thought to possess the necessary expertise and knowledge for the study. Such a sample strategy may reduce the ability to generalise the survey results to all auditors, as well as the risk of under- or over-representation of the population. Future research might use a more generalizable sampling strategy that includes other types of auditors.

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